

Summary for Input Data



Plot Reference	A 503	Issued on Date	19/03/2026
Assessment Reference	Be Green	Plot Type Ref	
Plot Address		SAP Version	10.2

SAP Rating	82 B	DER	5.85	TER	15.79
Environmental	96 A	% DER < TER			62.95
CO ₂ Emissions (t/year)	0.27	DFEE	35.63	TFEE	36.45
Compliance Check	See BREL	% DFEE < TFEE			2.26
% DPER < TPER	26.81	DPER	61.97	TPER	84.67

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	Top-floor flat	
Which Floor	5	
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	164.50	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:	20.80 m	50.90 m ²	2.80 m

8.0 Living Area	29.08	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	18.14	9.80	0.00	None	8.34	Enter Gross Area
Corridor wall	Cavity Wall	Cavity wall : dense plaster, AAC block, filled cavity, any outside structure	0.22	70.00	40.10	37.68	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	21.92	0.00	None

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall 1	Plasterboard on timber frame	9.00	113.43

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Code	Shelter Factor	Calculation Type	Openings
External Roof 1	External Flat Roof	Plasterboard, insulated flat roof	0.10	9.00	50.90	50.90	None	0.00	Enter Gross Area	0.00

11.1 Party Floors

Summary for Input Data



Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor 1	Lowest occupied	Precast concrete planks floor, screed, carpeted	40.00	50.90

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
Window	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	Window	External Wall 1	South West	8.34	

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	5.08	0.05	0.05	No
E3 Sill	Independently assessed	1.59	0.04	0.04	No
E4 Jamb	Independently assessed	12.60	0.04	0.04	No
E7 Party floor between dwellings (in blocks of flats)	Independently assessed	3.12	0.05	0.05	No
E7 Party floor between dwellings (in blocks of flats)	Independently assessed	14.32	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	2.80	0.05	0.05	No
E16 Corner (normal)	Independently assessed	2.80	0.04	0.04	No
E18 Party wall between dwellings	Independently assessed	2.80	0.05	0.05	No
E18 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	7.83	0.00	0.00	No
E14 Flat roof	Independently assessed	17.25	0.05	0.05	No
E24 Eaves (insulation at ceiling level - inverted)	Independently assessed	3.55	0.07	0.07	No
P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	7.83	0.05	0.05	No

Y-value 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	1
Manufacturer SFP	0.63
Duct Type	Rigid
MVHR Efficiency	90.00
Wet Rooms	1
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

Summary for Input Data



Number of flueless gas fires	0									
21.0 Fixed Cooling System	No									
22.0 Pressure Testing	Yes									
Designed AP ₅₀	3.00					m ³ /(h.m ²) @ 50 Pa				
Test Method	Blower Door									
22.0 Lighting	No									
No Fixed Lighting	No									
	Name	Efficacy	Power	Capacity	Count					
	Lighting 1	75.00	15.00	1125.00	5					
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	232.00	100.00					
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]	Connected	Connected To					
Shower	Combi boiler or unvented hot water system	8.00		No						
28.3 Waste Water Heat Recovery System										
29.0 Hot Water Cylinder	Internal Store									
Insulation Type	Measured Loss									
Cylinder Volume	180.00					L				
Loss	1.20					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									

Summary for Input Data



PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Overshading Factor	MCS Certificate Reference	Panel Manufacturer
0.24	South East	Horizontal	Modest		No	0.80		

34.0 Small-scale Hydro

None

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

Lower cost measures

None

Further measures to achieve even higher standards

None

Full SAP Calculation Printout



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Compliance Check	See BREL	% DFEE < TFEE			2.26
% DPER < TPER	26.81	DPER	61.97	TPER	84.67
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	50.9000 (1b)	2.8000 (2b)	142.5200 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	50.9000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	142.5200 (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)

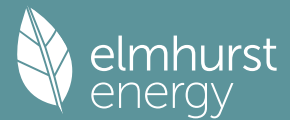
Shelter factor	(20) = 1 - [0.075 x (19)] =	0.7750 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =	0.1162 (21)

	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) =												81.0000 (23c)
Effective ac	0.2432	0.2403	0.2374	0.2229	0.2200	0.2054	0.2054	0.2025	0.2112	0.2200	0.2258	0.2316 (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)
Window			8.3400	1.1450	9.5496		(27)
External Wall 1	18.1400	8.3400	9.8000	0.1500	1.4700	70.0000	686.0000 (29a)
Corridor wall	40.1000	2.4200	37.6800	0.1900	7.1592	70.0000	2637.5999 (29a)
External Roof 1	50.9000		50.9000	0.1000	5.0900	9.0000	458.1000 (30)
Total net area of external elements A _{um} (A, m ²)			109.1400				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	25.6888		(33)
Main dwelling							
Party Wall 1			21.9200	0.0000	0.0000	70.0000	1534.4000 (32)
Party Floor 1			50.9000			40.0000	2036.0000 (32d)
Internal Wall 1			113.4300			9.0000	1020.8700 (32c)
Heat capacity C _m = Sum(A x k)					(28)...(30) + (32) + (32a)...(32e) =		8372.9699 (34)
Thermal mass parameter (TMP = C _m / TFA) in kJ/m ² K							164.4984 (35)
List of Thermal Bridges							

Full SAP Calculation Printout



K1 Element	Length	Psi-value	Total
E1 Steel lintel with perforated steel base plate	5.0800	0.0500	0.2540
E3 Sill	1.5900	0.0400	0.0636
E4 Jamb	12.6000	0.0400	0.5040
E7 Party floor between dwellings (in blocks of flats)	3.1200	0.0500	0.1560
E7 Party floor between dwellings (in blocks of flats)	14.3200	0.0390	0.5585
E9 Balcony between dwellings, wall insulation continuous	3.3600	0.0500	0.1680
E16 Corner (normal)	2.8000	0.0500	0.1400
E16 Corner (normal)	2.8000	0.0390	0.1092
E18 Party wall between dwellings	2.8000	0.0500	0.1400
E18 Party wall between dwellings	2.8000	0.0390	0.1092
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	7.8300	0.0000	0.0000
E14 Flat roof	17.2500	0.0500	0.8625
E24 Eaves (insulation at ceiling level - inverted)	3.5500	0.0750	0.2662
P4 Party wall - Roof (insulation at ceiling level)	7.8300	0.0500	0.3915
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			3.7227 (36)
Point Thermal bridges			0.0000
Total fabric heat loss		(33) + (36) + (36a) =	29.4115 (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	11.4390	11.3023	11.1656	10.4822	10.3455	9.6621	9.6621	9.5254	9.9354	10.3455	10.6189	10.8922	(38)
Heat transfer coeff	40.8505	40.7138	40.5771	39.8937	39.7570	39.0736	39.0736	38.9369	39.3470	39.7570	40.0304	40.3038	(39)
Average = Sum(39)m / 12 =												39.8595	
HLP	0.8026	0.7999	0.7972	0.7838	0.7811	0.7677	0.7677	0.7650	0.7730	0.7811	0.7865	0.7918	(40)
HLP (average)												0.7831	
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31	

4. Water heating energy requirements (kWh/year)

Assumed occupancy													1.7166 (42)
Hot water usage for mixer showers													
Hot water usage for baths	51.6625	50.8716	49.7059	47.9128	46.3062	44.0585	42.2807	44.3590	45.4043	47.6305	49.9489	51.6159	(42a)
Hot water usage for other uses	22.4048	22.0666	21.5854	20.8649	20.2155	19.3216	18.6434	19.4727	19.9080	20.7937	21.7146	22.3870	(42b)
Hot water usage for other uses	32.2099	31.0387	29.8674	28.6961	27.5248	26.3536	26.3536	27.5248	28.6961	29.8674	31.0387	32.2099	(42c)
Average daily hot water use (litres/day)													97.6852 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Energy conte	106.2773	103.9768	101.1588	97.4738	94.0465	89.7337	87.2777	91.3566	94.0084	98.2916	102.7022	106.2129	(44)
Energy content (annual)	156.4585	137.5824	144.5538	127.3251	121.1885	103.7740	96.4444	107.5284	109.0450	126.6587	138.8054	155.9814	(45)
Distribution loss (46)m = 0.15 x (45)m													
Water storage loss (or HIU loss):	23.4688	20.6374	21.6831	19.0988	18.1783	15.5661	14.4667	16.1293	16.3568	18.9988	20.8208	23.3972	(46)
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	211.7353	187.5098	199.8306	180.8188	176.4653	157.2677	151.7212	162.8052	162.5387	181.9355	192.2991	211.2582	(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	211.7353	187.5098	199.8306	180.8188	176.4653	157.2677	151.7212	162.8052	162.5387	181.9355	192.2991	211.2582	(64)
12Total per year (kWh/year)													2176.1854 (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)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												0.0000	(64a)
Heat gains from water heating, kWh/month	96.2439	85.6881	92.2856	85.1305	84.5166	77.2998	76.2892	79.9746	79.0524	86.3355	88.9478	96.0853	(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	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	78.3435	86.7374	78.3435	80.9549	78.3435	80.9549	78.3435	78.3435	80.9549	78.3435	80.9549	78.3435	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	149.5712	151.1232	147.2121	138.8856	128.3749	118.4964	111.8969	110.3448	114.2560	122.5825	133.0931	142.9717	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	(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)	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	(71)
Water heating gains (Table 5)	129.3601	127.5120	124.0398	118.2369	113.5976	107.3608	102.5393	107.4928	109.7950	116.0423	123.5385	129.1469	(72)
Total internal gains	406.0240	414.1220	398.3446	386.8267	369.0653	355.5615	341.5290	344.9304	353.7553	365.7176	386.3360	399.2114	(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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elmhurst
energy

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Electricity for lighting (calculated in Appendix L)	134.4179 (332)
Energy saving/generation technologies (Appendices M ,N and Q)	
PV generation	-107.7323 (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	4449.6038 (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	1847.4104	0.1567	69.0146 (367)
Electrical energy for heat distribution (space & water)	10.2171	0.0000	6.1946 (372)
Overall CO2 factor for heat network			0.0637 (386)
Total CO2 associated with community systems			273.2038 (373)
Space and water heating			273.2038 (376)
Pumps, fans and electric keep-hot	136.9261	0.1387	18.9933 (378)
Energy for lighting	134.4179	0.1443	19.4007 (379)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-107.7323	0.1305	-14.0571
PV Unit electricity exported	0.0000	0.0000	0.0000
Total			-14.0571 (380)
Total CO2, kg/year			297.5407 (383)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			5.8500 (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	1847.4104	1.5802	695.8904 (467)
Electrical energy for heat distribution (space & water)	10.2171	0.0000	65.7721 (472)
Overall CO2 factor for heat network			0.6768 (486)
Total CO2 associated with community systems			2900.7771 (473)
Space and water heating			2900.7771 (476)
Pumps, fans and electric keep-hot	136.9261	1.5128	207.1418 (478)
Energy for lighting	134.4179	1.5338	206.1747 (479)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-107.7323	1.4820	-159.6589
PV Unit electricity exported	0.0000	0.0000	0.0000
Total			-159.6589 (480)
Total Primary energy kWh/year			3154.4347 (483)
Dwelling Primary energy Rate (DPER)			61.9700 (484)

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

1. Overall dwelling characteristics

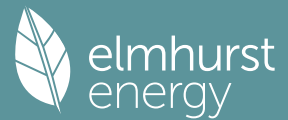
	Area (m2)	Storey height (m)	Volume (m3)
Main dwelling			
Ground floor	50.9000 (1b)	2.8000 (2b)	142.5200 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	50.9000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	142.5200 (5)

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)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	20.0000 / (5) = 0.1403 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	5.0000 (17)
Infiltration rate	0.3903 (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) = 0.3025 (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	0.3857	0.3781	0.3706	0.3328	0.3252	0.2874	0.2874	0.2798	0.3025	0.3252	0.3403	0.3554 (22b)
	0.5744	0.5715	0.5687	0.5554	0.5529	0.5413	0.5413	0.5391	0.5458	0.5529	0.5579	0.5632 (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			8.3400	1.1450	9.5496		(27)
External Wall 1	18.1400	8.3400	9.8000	0.1800	1.7640		(29a)
Corridor wall	40.1000	2.4200	37.6800	0.1800	6.7824		(29a)
External Roof 1	50.9000		50.9000	0.1100	5.5990		(30)
Total net area of external elements Aum(A, m2)			109.1400				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	26.1150	(33)
Main dwelling							
Party Wall 1			21.9200	0.0000	0.0000		(32)

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

164.4984 (35)

List of Thermal Bridges

K1 Element	Length	Psi-value	Total
E1 Steel lintel with perforated steel base plate	5.0800	0.0500	0.2540
E3 Sill	1.5900	0.0500	0.0795
E4 Jamb	12.6000	0.0500	0.6300
E7 Party floor between dwellings (in blocks of flats)	3.1200	0.0700	0.2184
E7 Party floor between dwellings (in blocks of flats)	14.3200	0.0700	1.0024
E9 Balcony between dwellings, wall insulation continuous	3.3600	0.0200	0.0672
E16 Corner (normal)	2.8000	0.0900	0.2520
E16 Corner (normal)	2.8000	0.0900	0.2520
E18 Party wall between dwellings	2.8000	0.0600	0.1680
E18 Party wall between dwellings	2.8000	0.0600	0.1680
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	7.8300	0.0000	0.0000
E14 Flat roof	17.2500	0.0800	1.3800
E24 Eaves (insulation at ceiling level - inverted)	3.5500	0.2400	0.8520
P4 Party wall - Roof (insulation at ceiling level)	7.8300	0.1200	0.9396

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

(36a) = 6.2631 (36)

Point Thermal bridges

(33) + (36) + (36a) = 32.3781 (37)

Total fabric heat loss

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	27.0140	26.8782	26.7451	26.1196	26.0026	25.4579	25.4579	25.3571	25.6677	26.0026	26.2393	26.4868 (38)
Average = Sum(39)m / 12 =	59.3922	59.2563	59.1232	58.4978	58.3808	57.8360	57.8360	57.7352	58.0459	58.3808	58.6175	58.8649 (39)
												58.4972

HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.1668	1.1642	1.1616	1.1493	1.1470	1.1363	1.1363	1.1343	1.1404	1.1470	1.1516	1.1565 (40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

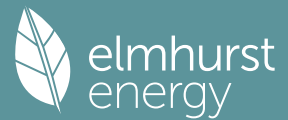
4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.7166 (42)
Hot water usage for mixer showers												
53.0016	52.2051	51.0444	48.8237	47.1848	45.3572	44.3184	45.4703	46.7329	48.6953	50.9637	52.7985	(42a)
Hot water usage for baths												
22.9157	22.5753	22.0961	21.2124	20.5507	19.8170	19.4207	19.8966	20.4148	21.1999	22.1017	22.8382	(42b)
Hot water usage for other uses												
32.2099	31.0387	29.8674	28.6961	27.5248	26.3536	26.3536	27.5248	28.6961	29.8674	31.0387	32.2099	(42c)
Average daily hot water use (litres/day)												99.3939 (43)
Daily hot water use												
108.1272	105.8191	103.0079	98.7322	95.2604	91.5278	90.0927	92.8917	95.8439	99.7625	104.1041	107.8466	(44)
Energy conte	171.2470	150.6849	158.3193	135.1594	128.2388	112.5441	108.9593	115.0194	118.1851	135.3768	148.3154	168.8618 (45)
Energy content (annual)												Total = Sum(45)m = 1650.9114
Distribution loss (46)m = 0.15 x (45)m												
25.6871	22.6027	23.7479	20.2739	19.2358	16.8816	16.3439	17.2529	17.7278	20.3065	22.2473	25.3293	(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	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	(61)
Total heat required for water heating calculated for each month												
220.4897	195.1622	207.5619	182.8136	177.4815	160.1983	158.2020	164.2621	165.8393	184.6195	195.9696	218.1044	(62)
WWHRS	-24.2301	-21.4293	-22.4395	-18.5808	-17.3167	-14.8180	-13.8895	-14.7701	-15.3313	-18.0739	-20.4755	-23.7814 (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	(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	(63c)
FGHRS	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												
196.2596	173.7329	185.1224	164.2328	160.1648	145.3803	144.3125	149.4920	150.5080	166.5456	175.4941	194.3230	(64)
Total per year (kWh/year)												2005.5680 (64)
Electric shower(s)												2006 (64)
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)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												0.0000 (64a)
Heat gains from water heating, kWh/month												
96.3338	85.6845	92.0353	83.0639	82.0335	75.5443	75.6231	77.6381	77.4199	84.4069	87.4382	95.5407	(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	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	78.3435	86.7374	78.3435	80.9549	78.3435	80.9549	78.3435	78.3435	80.9549	78.3435	80.9549	78.3435	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	149.5712	151.1232	147.2121	138.8856	128.3749	118.4964	111.8969	110.3448	114.2560	122.5825	133.0931	142.9717	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	(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)	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	(71)
Water heating gains (Table 5)	129.4809	127.5068	123.7033	115.3665	110.2601	104.9226	101.6440	104.3523	107.5276	113.4502	121.4420	128.4149	(72)
Total internal gains	409.1449	417.1168	401.0082	386.9563	368.7279	353.1232	340.6337	341.7899	351.4879	366.1255	387.2394	401.4794	(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				8.3400	36.7938	0.6300	0.7000			0.7700		93.7806 (79)

Solar gains	93.7806	159.7430	218.5674	270.8156	303.3360	301.1424	290.3334	266.0717	236.6622	176.5501	112.3275	80.2566 (83)
Total gains	502.9254	576.8598	619.5756	657.7719	672.0639	654.2657	630.9671	607.8616	588.1501	542.6755	499.5669	481.7360 (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	39.1605	39.2502	39.3386	39.7592	39.8389	40.2141	40.2141	40.2844	40.0688	39.8389	39.6780	39.5112		
alpha	3.6107	3.6167	3.6226	3.6506	3.6559	3.6809	3.6809	3.6856	3.6713	3.6559	3.6452	3.6341		
util living area	0.9556	0.9289	0.8900	0.8128	0.6949	0.5333	0.3947	0.4250	0.6174	0.8270	0.9275	0.9610	(86)	
MIT	19.5305	19.7973	20.1196	20.5000	20.7806	20.9385	20.9842	20.9791	20.8918	20.5425	19.9860	19.4843	(87)	
Th 2	19.9466	19.9488	19.9509	19.9608	19.9627	19.9713	19.9713	19.9729	19.9680	19.9627	19.9589	19.9550	(88)	
util rest of house	0.9469	0.9156	0.8694	0.7785	0.6411	0.4582	0.3062	0.3352	0.5435	0.7880	0.9116	0.9533	(89)	
MIT 2	18.2755	18.6070	19.0031	19.4608	19.7718	19.9310	19.9647	19.9634	19.8903	19.5218	18.8544	18.2237	(90)	
Living area fraction									fLA = Living area / (4) =			0.5713	(91)	
MIT	18.9925	19.2870	19.6410	20.0545	20.3482	20.5066	20.5472	20.5437	20.4625	20.1049	19.5009	18.9439	(92)	
Temperature adjustment												0.0000		
adjusted MIT	18.9925	19.2870	19.6410	20.0545	20.3482	20.5066	20.5472	20.5437	20.4625	20.1049	19.5009	18.9439	(93)	

8. Space heating requirement

Utilisation	0.9371	0.9057	0.8625	0.7818	0.6620	0.4982	0.3563	0.3858	0.5802	0.7939	0.9034	0.9440	(94)	
Useful gains	471.2988	522.4832	534.3691	514.2545	444.9104	325.9382	224.8048	234.5100	341.2257	430.8197	451.2994	454.7355	(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	872.6201	852.5228	776.9378	652.5127	504.8855	341.6154	228.2877	239.2366	369.3154	554.9036	726.9085	867.8988	(97)	
Space heating kWh	298.5830	221.7866	180.4711	99.5459	44.6215	0.0000	0.0000	0.0000	0.0000	92.3184	198.4385	307.3935	(98a)	
Space heating requirement - total per year (kWh/year)												1443.1586		
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	298.5830	221.7866	180.4711	99.5459	44.6215	0.0000	0.0000	0.0000	0.0000	92.3184	198.4385	307.3935	(98c)	
Space heating requirement after solar contribution - total per year (kWh/year)												1443.1586		
Space heating per m ²										(98c) / (4) =		28.3528	(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	298.5830	221.7866	180.4711	99.5459	44.6215	0.0000	0.0000	0.0000	0.0000	92.3184	198.4385	307.3935	(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)	323.4919	240.2888	195.5267	107.8504	48.3440	0.0000	0.0000	0.0000	0.0000	100.0200	214.9930	333.0374	(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	196.2596	173.7329	185.1224	164.2328	160.1648	145.3803	144.3125	149.4920	150.5080	166.5456	175.4941	194.3230	(64)	
Efficiency of water heater (217)m	84.9980	84.6085	84.0027	82.9736	81.6021	79.8000	79.8000	79.8000	79.8000	82.7925	84.3360	79.8000	(216)	
Fuel for water heating, kWh/month	230.8990	205.3373	220.3766	197.9338	196.2754	182.1809	180.8427	187.3333	188.6065	201.1602	208.0891	228.3913	(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	16.2782	13.0590	11.7582	8.6145	6.6541	5.4365	6.0701	7.8902	10.2485	13.4466	15.1880	16.7307	(232)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233a)m	-11.3924	-17.1464	-26.2956	-31.6180	-35.9370	-34.2414	-33.8432	-31.0359	-26.4084	-20.5016	-12.9097	-9.7282	(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	-3.5131	-7.6017	-15.5075	-23.8836	-32.1605	-32.5122	-32.1119	-26.9064	-19.3668	-11.0429	-4.7460	-2.7615	(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												1563.5521	(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												2427.4262	(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)												131.3746	(232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation												-503.1720	(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												3705.1810	(238)

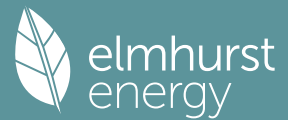
12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year	
Space heating - main system 1	1563.5521	0.2100	328.3459	(261)
Total CO2 associated with community systems			0.0000	(373)
Water heating (other fuel)	2427.4262	0.2100	509.7595	(264)
Space and water heating			838.1055	(265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293	(267)
Energy for lighting	131.3746	0.1443	18.9614	(268)
Energy saving/generation technologies				
PV Unit electricity used in dwelling	-291.0578	0.1332	-38.7754	
PV Unit electricity exported	-212.1142	0.1252	-26.5528	
Total			-65.3282	(269)
Total CO2, kg/year			803.6679	(272)
EPC Target Carbon Dioxide Emission Rate (TER)			15.7900	(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	1563.5521	1.1300	1766.8139	(275)
Total CO2 associated with community systems			0.0000	(473)
Water heating (other fuel)	2427.4262	1.1300	2742.9917	(278)
Space and water heating			4509.8055	(279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008	(281)
Energy for lighting	131.3746	1.5338	201.5068	(282)
Energy saving/generation technologies				
PV Unit electricity used in dwelling	-291.0578	1.4923	-434.3423	
PV Unit electricity exported	-212.1142	0.4595	-97.4601	
Total			-531.8024	(283)
Total Primary energy kWh/year			4309.6108	(286)
Target Primary Energy Rate (TPER)			84.6700	(287)

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Plot Reference	A 503				Issued on Date	19/03/2026	
Assessment Reference	Be Green			Plot Type Ref			
Plot Address					SAP Version	10.2	
SAP Rating	82 B	DER	5.85	TER	15.79		
Environmental	96 A	% DER < TER				62.95	
CO ₂ Emissions (t/year)	0.27	DFEE	35.63	TFEE	36.45		
Compliance Check	See BREL	% DFEE < TFEE				2.26	
% DPER < TPER	26.81	DPER	61.97	TPER	84.67		
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	50.9000 (1b)	2.8000 (2b)	142.5200 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	50.9000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	142.5200 (5)

2. Ventilation rate

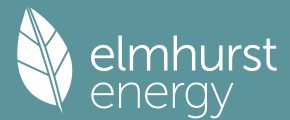
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
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) = 0.1403 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	3.0000 (17)
Infiltration rate	0.2903 (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) = 0.2250 (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	0.2869	0.2813	0.2756	0.2475	0.2419	0.2138	0.2138	0.2081	0.2250	0.2419	0.2531	0.2644 (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	0.5412	0.5396	0.5380	0.5306	0.5293	0.5228	0.5228	0.5217	0.5253	0.5293	0.5320	0.5349 (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)
Window			8.3400	1.1450	9.5496		(27)
External Wall 1	18.1400	8.3400	9.8000	0.1500	1.4700	70.0000	686.0000 (29a)
Corridor wall	40.1000	2.4200	37.6800	0.1900	7.1592	70.0000	2637.5999 (29a)
External Roof 1	50.9000		50.9000	0.1000	5.0900	9.0000	458.1000 (30)
Total net area of external elements A _{um} (A, m ²)			109.1400				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 25.6888		(33)
Main dwelling							
Party Wall 1			21.9200	0.0000	0.0000	70.0000	1534.4000 (32)
Party Floor 1			50.9000			40.0000	2036.0000 (32a)
Internal Wall 1			113.4300			9.0000	1020.8700 (32c)
Heat capacity C _m = Sum (A x k)							(28)...(30) + (32) + (32a)...(32e) = 8372.9699 (34)
Thermal mass parameter (TMP = C _m / TFA) in kJ/m ² K							164.4984 (35)
List of Thermal Bridges							
K1 Element					Length	Psi-value	Total
E1 Steel lintel with perforated steel base plate					5.0800	0.0500	0.2540
E3 Sill					1.5900	0.0400	0.0636

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E4 Jamb	12.6000	0.0400	0.5040
E7 Party floor between dwellings (in blocks of flats)	3.1200	0.0500	0.1560
E7 Party floor between dwellings (in blocks of flats)	14.3200	0.0390	0.5585
E9 Balcony between dwellings, wall insulation continuous	3.3600	0.0500	0.1680
E16 Corner (normal)	2.8000	0.0500	0.1400
E16 Corner (normal)	2.8000	0.0390	0.1092
E18 Party wall between dwellings	2.8000	0.0500	0.1400
E18 Party wall between dwellings	2.8000	0.0390	0.1092
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	7.8300	0.0000	0.0000
E14 Flat roof	17.2500	0.0500	0.8625
E24 Eaves (insulation at ceiling level - inverted)	3.5500	0.0750	0.2662
P4 Party wall - Roof (insulation at ceiling level)	7.8300	0.0500	0.3915
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			3.7227 (36)
Point Thermal bridges			0.0000
Total fabric heat loss		(33) + (36) + (36a) =	29.4115 (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	25.4512	25.3760	25.3024	24.9564	24.8916	24.5903	24.5903	24.5345	24.7064	24.8916	25.0226	25.1595 (38)
Average = Sum(39)m / 12 =	54.8627	54.7876	54.7139	54.3679	54.3032	54.0018	54.0018	53.9460	54.1179	54.3032	54.4341	54.5711 (39)
												54.3676
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.0779	1.0764	1.0749	1.0681	1.0669	1.0609	1.0609	1.0598	1.0632	1.0669	1.0694	1.0721 (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												1.7166 (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												
	22.4048	22.0666	21.5854	20.8649	20.2155	19.3216	18.6434	19.4727	19.9080	20.7937	21.7146	22.3870 (42b)
Hot water usage for other uses												
	32.2099	31.0387	29.8674	28.6961	27.5248	26.3536	26.3536	27.5248	28.6961	29.8674	31.0387	32.2099 (42c)
Average daily hot water use (litres/day)												50.0563 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	54.6147	53.1053	51.4528	49.5610	47.7404	45.6752	44.9970	46.9976	48.6041	50.6611	52.7533	54.5970 (44)
Energy conte	80.4023	70.2690	73.5250	64.7391	61.5183	52.8218	49.7230	55.3170	56.3783	65.2819	71.2978	80.1796 (45)
Energy content (annual)										Total = Sum(45)m =		781.4531
Distribution loss (46)m = 0.15 x (45)m												
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (46)
Water storage loss (or HIU loss):												
Total storage loss												
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)
If cylinder contains dedicated solar storage												
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (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												
	68.3420	59.7286	62.4963	55.0282	52.2905	44.8985	42.2645	47.0194	47.9215	55.4896	60.6031	68.1527 (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												
	68.3420	59.7286	62.4963	55.0282	52.2905	44.8985	42.2645	47.0194	47.9215	55.4896	60.6031	68.1527 (64)
12Total per year (kWh/year)												664.2352 (64)
Electric shower(s)												664 (64)
	42.4454	37.8192	41.2972	39.4094	40.1489	38.2981	39.5747	40.1489	39.4094	41.2972	40.5206	42.4454 (64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												482.8145 (64a)
Heat gains from water heating, kWh/month												
	27.6969	24.3870	25.9484	23.6094	23.1099	20.7992	20.4598	21.7921	21.8327	24.1967	25.2809	27.6495 (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
	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5												
	78.3435	86.7374	78.3435	80.9549	78.3435	80.9549	78.3435	78.3435	80.9549	78.3435	80.9549	78.3435 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5												
	149.5712	151.1232	147.2121	138.8856	128.3749	118.4964	111.8969	110.3448	114.2560	122.5825	133.0931	142.9717 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5												
	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831 (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)												
	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649 (71)
Water heating gains (Table 5)												
	37.2270	36.2901	34.8768	32.7908	31.0616	28.8877	27.4998	29.2904	30.3232	32.5224	35.1124	37.1634 (72)
Total internal gains												
	313.8909	322.9001	309.1817	301.3807	286.5294	277.0884	266.4895	266.7281	274.2835	282.1977	297.9098	307.2279 (73)

6. Solar gains												
[Jan]												
	Area											
	m2											
Southwest	8.3400											
Solar gains	52.1003	88.7461	121.4263	150.4531	168.5200	167.3014	161.2964	147.8176	131.4790	98.0834	62.4042	44.5870 (83)
Total gains	365.9913	411.6463	430.6080	451.8338	455.0494	444.3897	427.7858	414.5457	405.7625	380.2811	360.3140	351.8149 (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	42.3935	42.4517	42.5088	42.7794	42.8304	43.0694	43.0694	43.1139	42.9770	42.8304	42.7273	42.6201
alpha	3.8262	3.8301	3.8339	3.8520	3.8554	3.8713	3.8713	3.8743	3.8651	3.8554	3.8485	3.8413
util living area	0.9818	0.9705	0.9537	0.9121	0.8332	0.6852	0.5286	0.5628	0.7602	0.9167	0.9690	0.9843 (86)
MIT	19.3632	19.5809	19.8743	20.2759	20.6290	20.8786	20.9661	20.9561	20.8084	20.3629	19.7997	19.3206 (87)
Th 2	20.0190	20.0202	20.0214	20.0269	20.0280	20.0329	20.0329	20.0338	20.0310	20.0280	20.0259	20.0237 (88)
util rest of house	0.9780	0.9642	0.9434	0.8914	0.7916	0.6084	0.4235	0.4588	0.6928	0.8930	0.9614	0.9809 (89)
MIT 2	18.5362	18.7514	19.0401	19.4312	19.7567	19.9649	20.0205	20.0166	19.9134	19.5199	18.9736	18.4976 (90)
Living area fraction	fLA = Living area / (4) =											0.5713 (91)
MIT	19.0087	19.2253	19.5167	19.9138	20.2551	20.4869	20.5607	20.5533	20.4247	20.0015	19.4456	18.9678 (92)
Temperature adjustment												0.0000
adjusted MIT	19.0087	19.2253	19.5167	19.9138	20.2551	20.4869	20.5607	20.5533	20.4247	20.0015	19.4456	18.9678 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9729	0.9580	0.9370	0.8886	0.8022	0.6462	0.4823	0.5164	0.7221	0.8923	0.9557	0.9762 (94)
Useful gains	356.0637	394.3513	403.4904	401.5215	365.0309	287.1467	206.3196	214.0656	292.9994	339.3106	344.3576	343.4522 (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	806.9574	784.8513	712.1939	598.7975	464.5677	317.9049	213.8848	224.0563	342.2817	510.5309	672.0201	805.8958 (97)
Space heating kWh	335.4649	262.4160	229.6754	142.0387	74.0554	0.0000	0.0000	0.0000	0.0000	127.3879	235.9170	344.0581 (98a)
Space heating requirement - total per year (kWh/year)												1751.0133
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	335.4649	262.4160	229.6754	142.0387	74.0554	0.0000	0.0000	0.0000	0.0000	127.3879	235.9170	344.0581 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1751.0133
Space heating per m2												(98c) / (4) = 34.4010 (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	507.6172	399.6135	409.9897	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.7800	0.8550	0.8362	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	395.9558	341.6524	342.8151	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	489.4986	471.7938	457.7345	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh												
	0.0000	0.0000	0.0000	0.0000	0.0000	67.3508	96.8252	85.5000	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	16.8377	24.2063	21.3750	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												62.4190 (107)
Energy for space heating												34.4010 (99)
Energy for space cooling												1.2263 (108)
Total												35.6274 (109)
Fabric Energy Efficiency (DFEE)												35.6 (109)

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

CALCULATION OF TARGET FABRIC ENERGY EFFICIENCY

1. Overall dwelling characteristics

Main dwelling	Area (m2)	Storey height (m)	Volume (m3)
Ground floor	50.9000 (1b)	x 2.8000 (2b)	= 142.5200 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	50.9000	(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	142.5200 (5)
Dwelling volume			

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)

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Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) = 20.0000 / (5) = 0.1403 (8)
Pressure test Yes
Pressure Test Method Blower Door
Measured/design AP50 5.0000 (17)
Infiltration rate 0.3903 (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) = 0.3025 (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	0.3857	0.3781	0.3706	0.3328	0.3252	0.2874	0.2874	0.2798	0.3025	0.3252	0.3403	0.3554 (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	0.5744	0.5715	0.5687	0.5554	0.5529	0.5413	0.5413	0.5391	0.5458	0.5529	0.5579	0.5632 (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			8.3400	1.1450	9.5496		(27)
External Wall 1	18.1400	8.3400	9.8000	0.1800	1.7640		(29a)
Corridor wall	40.1000	2.4200	37.6800	0.1800	6.7824		(29a)
External Roof 1	50.9000		50.9000	0.1100	5.5990		(30)
Total net area of external elements Aum(A, m2)			109.1400				(31)
Fabric heat loss, W/K = Sum (A x U)					26.1150		(32)
Main dwelling							
Party Wall 1			21.9200	0.0000	0.0000		(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							164.4984 (35)

List of Thermal Bridges

K1 Element	Length	Psi-value	Total
E1 Steel lintel with perforated steel base plate	5.0800	0.0500	0.2540
E3 Sill	1.5900	0.0500	0.0795
E4 Jamb	12.6000	0.0500	0.6300
E7 Party floor between dwellings (in blocks of flats)	3.1200	0.0700	0.2184
E7 Party floor between dwellings (in blocks of flats)	14.3200	0.0700	1.0024
E9 Balcony between dwellings, wall insulation continuous	3.3600	0.0200	0.0672
E16 Corner (normal)	2.8000	0.0900	0.2520
E16 Corner (normal)	2.8000	0.0900	0.2520
E18 Party wall between dwellings	2.8000	0.0600	0.1680
E18 Party wall between dwellings	2.8000	0.0600	0.1680
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	7.8300	0.0000	0.0000
E14 Flat roof	17.2500	0.0800	1.3800
E24 Eaves (insulation at ceiling level - inverted)	3.5500	0.2400	0.8520
P4 Party wall - Roof (insulation at ceiling level)	7.8300	0.1200	0.9396
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			6.2631 (36)
Point Thermal bridges			(36a) = 0.0000
Total fabric heat loss			(33) + (36) + (36a) = 32.3781 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)

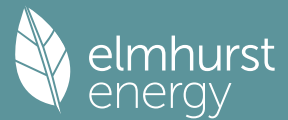
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(38)m	27.0140	26.8782	26.7451	26.1196	26.0026	25.4579	25.4579	25.3571	25.6677	26.0026	26.2393	26.4868 (38)
Heat transfer coeff	59.3922	59.2563	59.1232	58.4978	58.3808	57.8360	57.8360	57.7352	58.0459	58.3808	58.6175	58.8649 (39)
Average = Sum(39)m / 12 =												58.4972

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.1668	1.1642	1.1616	1.1493	1.1470	1.1363	1.1363	1.1343	1.1404	1.1470	1.1516	1.1565 (40)
HLP (average)												1.1493
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.7166 (42)
Hot water usage for mixer showers												0.0000 (42a)
Hot water usage for baths												22.9157 (42b)
Hot water usage for other uses												32.2099 (42c)
Average daily hot water use (litres/day)												50.5282 (43)
Daily hot water use												
Energy conte	55.1256	53.6140	51.9635	49.9085	48.0756	46.1706	45.7743	47.4215	49.1109	51.0673	53.1404	55.0481 (44)
Energy content (annual)	87.3054	76.3456	79.8659	68.3223	64.7190	56.7722	55.3601	58.7177	60.5587	69.2978	75.7082	86.1920 (45)
Distribution loss (46)m = 0.15 x (45)m												839.1648
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	74.2096	64.8938	67.8860	58.0739	55.0111	48.2563	47.0561	49.9100	51.4749	58.9031	64.3520	73.2632 (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	74.2096	64.8938	67.8860	58.0739	55.0111	48.2563	47.0561	49.9100	51.4749	58.9031	64.3520	73.2632 (64)
12Total per year (kWh/year)												713.2901 (64)
Electric shower(s)												713 (64)

Full SAP Calculation Printout



	42.4454	37.8192	41.2972	39.4094	40.1489	38.2981	39.5747	40.1489	39.4094	41.2972	40.5206	42.4454 (64a)
	Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =											482.8145 (64a)
Heat gains from water heating, kWh/month	29.1638	25.6782	27.2958	24.3708	23.7900	21.6386	21.6577	22.5147	22.7211	25.0501	26.2182	28.9272 (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	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311	85.8311 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	78.3435	86.7374	78.3435	80.9549	78.3435	80.9549	78.3435	78.3435	80.9549	78.3435	80.9549	78.3435 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	149.5712	151.1232	147.2121	138.8856	128.3749	118.4964	111.8969	110.3448	114.2560	122.5825	133.0931	142.9717 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831	31.5831 (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)	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649	-68.6649 (71)
Water heating gains (Table 5)	39.1986	38.2117	36.6879	33.8484	31.9758	30.0536	29.1098	30.2617	31.5570	33.6695	36.4141	38.8806 (72)
Total internal gains	315.8626	324.8217	310.9928	302.4382	287.4435	278.2543	268.0995	267.6994	275.5173	283.3447	299.2115	308.9451 (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	8.3400		36.7938		0.6300		0.7000		0.7700		93.7806 (79)	
Solar gains	93.7806	159.7430	218.5674	270.8156	303.3360	301.1424	290.3334	266.0717	236.6622	176.5501	112.3275	80.2566 (83)
Total gains	409.6432	484.5647	529.5601	573.2538	590.7795	579.3967	558.4330	533.7711	512.1795	459.8948	411.5390	389.2017 (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	39.1605	39.2502	39.3386	39.7592	39.8389	40.2141	40.2141	40.2844	40.0688	39.8389	39.6780	39.5112
alpha	3.6107	3.6167	3.6226	3.6506	3.6559	3.6809	3.6809	3.6856	3.6713	3.6559	3.6452	3.6341
util living area	0.9755	0.9556	0.9252	0.8591	0.7509	0.5883	0.4416	0.4777	0.6808	0.8789	0.9572	0.9793 (86)
MIT	19.2977	19.5878	19.9427	20.3783	20.7131	20.9152	20.9772	20.9693	20.8500	20.4138	19.7857	19.2485 (87)
Th 2	19.9466	19.9488	19.9509	19.9608	19.9627	19.9713	19.9713	19.9729	19.9680	19.9627	19.9589	19.9550 (88)
util rest of house	0.9703	0.9465	0.9096	0.8298	0.6996	0.5097	0.3444	0.3792	0.6065	0.8473	0.9468	0.9748 (89)
MIT 2	18.4180	18.7031	19.0484	19.4661	19.7632	19.9268	19.9636	19.9618	19.8812	19.5094	18.9083	18.3757 (90)
Living area fraction	18.9206	19.2085	19.5593	19.9873	20.3059	20.4915	20.5427	20.5374	20.4347	20.0261	19.4096	18.8743 (92)
MIT	18.9206	19.2085	19.5593	19.9873	20.3059	20.4915	20.5427	20.5374	20.4347	20.0261	19.4096	18.8743 (93)
Temperature adjustment	18.9206	19.2085	19.5593	19.9873	20.3059	20.4915	20.5427	20.5374	20.4347	20.0261	19.4096	18.8743 (93)
adjusted MIT	18.9206	19.2085	19.5593	19.9873	20.3059	20.4915	20.5427	20.5374	20.4347	20.0261	19.4096	18.8743 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	0.9638	0.9387	0.9029	0.8306	0.7176	0.5507	0.3993	0.4344	0.6417	0.8495	0.9401	0.9689 (94)
Useful gains	394.8203	454.8729	478.1171	476.1365	423.9540	319.0457	222.9614	231.8965	328.6805	390.6802	386.8877	377.1025 (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	868.3468	847.8716	772.1093	648.5801	502.4180	340.7407	228.0298	238.8735	367.7046	550.3016	721.5556	863.8033 (97)
Space heating kWh	352.3037	264.0952	218.7302	124.1594	58.3772	0.0000	0.0000	0.0000	0.0000	118.7583	240.9609	362.1054 (98a)
Space heating requirement - total per year (kWh/year)												1739.4902
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	352.3037	264.0952	218.7302	124.1594	58.3772	0.0000	0.0000	0.0000	0.0000	118.7583	240.9609	362.1054 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1739.4902
Space heating per m2										(98c) / (4) =		34.1747 (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	543.6588	427.9867	438.7873	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.8490	0.9055	0.8884	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	461.5568	387.5368	389.8234	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	647.1021	624.2265	596.9249	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	133.5926	176.0971	154.0835	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	33.3982	44.0243	38.5209	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												115.9433 (107)
Energy for space heating												34.1747 (99)
Energy for space cooling												2.2779 (108)

Total
Fabric Energy Efficiency (TFEE)

36.4525 (109)
36.5 (109)