

Summary for Input Data



Plot Reference	A 209		Issued on Date	15/05/2026
Assessment Reference	Be Green 260515	Plot Type Ref		
Plot Address			SAP Version	10.2

SAP Rating	85 B	DER	4.10	TER	11.07
Environmental	97 A	% DER < TER			62.96
CO ₂ Emissions (t/year)	0.27	DFEE	23.39	TFEE	22.77
Compliance Check	See BREL	% DFEE < TFEE			-2.74
% DPER < TPER	25.81	DPER	43.74	TPER	58.96

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

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

Orientation	Northwest
Property Tenture	1
Transaction Type	6
Terrain Type	Suburban
1.0 Property Type	Flat, Mid-Terrace
Position of Flat	Mid-floor flat
Which Floor	2
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	179.75 kJ/m ² K
7.0 Electricity Tariff	Standard
Smart electricity meter fitted	Yes
Smart gas meter fitted	Yes

7.0 Measurements	Ground floor:	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
		16.57 m	70.52 m ²	2.80 m

8.0 Living Area	32.46 m ²
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9.0 External Walls	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	30.80	20.08	0.00	None	10.72	Enter Gross Area
	Corridor wall	Cavity Wall	Cavity wall : dense plaster, AAC block, filled cavity, any outside structure	0.22	70.00	15.60	13.18	0.90	Stairwell Access Corridor 4	2.42	Enter Gross Area

9.1 Party Walls	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	57.40	0.00	None

9.2 Internal Walls	Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
	Internal Wall 1	Plasterboard on timber frame	9.00	154.84

10.1 Party Ceilings	Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
	Party Ceiling 1	Precast concrete planks floor, screed, carpeted	30.00	70.52

11.1 Party Floors	Description	Storey Index	Construction	Kappa (kJ/m ² K)	Area (m ²)
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Summary for Input Data

Party Floor 1 Lowest occupied Precast concrete planks floor, screed, carpeted 40.00 70.52

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 West	2.42	
Windows	Window	External Wall 1	South East	10.72	

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
E3 Sill	Independently assessed	3.17	0.04	0.04	No
E4 Jamb	Independently assessed	15.60	0.04	0.04	No
E7 Party floor between dwellings (in blocks of flats)	Independently assessed	13.28	0.05	0.05	No
E7 Party floor between dwellings (in blocks of flats)	Independently assessed	11.14	0.04	0.04	No
E9 Balcony between dwellings, wall insulation continuous	Independently assessed	8.72	0.05	0.05	No
E16 Corner (normal)	Independently assessed	2.80	0.05	0.05	No
E18 Party wall between dwellings	Independently assessed	2.80	0.05	0.05	No
E25 Staggered party wall between dwellings	Independently assessed	2.80	0.05	0.05	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	41.00	0.00	0.00	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	5.60	0.00	0.00	No
E18 Party wall between dwellings	Independently assessed	2.80	0.04	0.04	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	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

Summary for Input Data

Number of flueless gas fires

0

21.0 Fixed Cooling System

No

22.0 Pressure Testing

Yes

Designed AP₅₀

3.00

m³/(h.m²) @ 50 Pa

Test Method

Blower Door

22.0 Lighting

No Fixed Lighting

No

Name	Efficacy	Power	Capacity	Count
Lighting 1	75.00	15.00	1125.00	7

24.0 Main Heating 1

None

25.0 Main Heating 2

None

26.0 Heat Networks

Space Community Heating

Space and Water Combined

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
Shower 2

Combi boiler or unvented hot water system
Combi boiler or unvented hot water system

8.00
8.00

No
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
0.36	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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Environmental	97 A	% DER < TER				62.96	
CO ₂ Emissions (t/year)	0.27	DFEE	23.39	TFEE	22.77		
Compliance Check	See BREL	% DFEE < TFEE				-2.74	
% DPER < TPER	25.81	DPER	43.74	TPER	58.96		
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	70.5200 (1b)	2.8000 (2b)	197.4560 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	70.5200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	197.4560 (5)

2. Ventilation rate

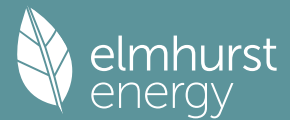
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
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)
Window			10.7200	1.1450	12.2748		(27)
External Wall 1	30.8000	10.7200	20.0800	0.1500	3.0120	70.0000	1405.5999 (29a)
Corridor wall	15.6000	2.4200	13.1800	0.1800	2.3724	70.0000	922.6000 (29a)
Total net area of external elements Aum(A, m ²)			46.4000				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 20.0792		(33)
Main dwelling							
Party Wall 1			57.4000	0.0000	0.0000	70.0000	4018.0000 (32)
Party Floor 1			70.5200			40.0000	2820.8000 (32a)
Party Ceiling 1			70.5200			30.0000	2115.6000 (32b)
Internal Wall 1			154.8400			9.0000	1393.5600 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	12676.1599 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							179.7527 (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
E3 Sill	3.1700	0.0400	0.1268
E4 Jamb	15.6000	0.0400	0.6240
E7 Party floor between dwellings (in blocks of flats)	13.2800	0.0500	0.6640
E7 Party floor between dwellings (in blocks of flats)	11.1400	0.0360	0.4010
E9 Balcony between dwellings, wall insulation continuous	8.7200	0.0500	0.4360
E16 Corner (normal)	2.8000	0.0500	0.1400
E18 Party wall between dwellings	2.8000	0.0500	0.1400
E25 Staggered party wall between dwellings	2.8000	0.0500	0.1400
E25 Staggered party wall between dwellings	2.8000	0.0360	0.1008
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	41.0000	0.0000	0.0000
E16 Corner (normal)	2.8000	0.0360	0.1008
E17 Corner (inverted - internal area greater than external area)	5.6000	0.0000	0.0000
E18 Party wall between dwellings	2.8000	0.0360	0.1008
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			3.3077 (36)
Point Thermal bridges			0.0000
Total fabric heat loss		(33) + (36) + (36a) =	23.3869 (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	16.1415	15.9521	15.7627	14.8159	14.6265	13.6796	13.6796	13.4903	14.0584	14.6265	15.0052	15.3840	(38)
Heat transfer coeff	39.5284	39.3390	39.1497	38.2028	38.0134	37.0666	37.0666	36.8772	37.4453	38.0134	38.3922	38.7709	(39)
Average = Sum(39)m / 12 =												38.1555	
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP (average)	0.5605	0.5578	0.5552	0.5417	0.5390	0.5256	0.5256	0.5229	0.5310	0.5390	0.5444	0.5498	(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													2.2587 (42)
Hot water usage for mixer showers	60.5216	59.5950	58.2295	56.1289	54.2468	51.6137	49.5311	51.9657	53.1903	55.7982	58.5142	60.4671	(42a)
Hot water usage for baths	26.2261	25.8302	25.2670	24.4236	23.6634	22.6170	21.8232	22.7939	23.3034	24.3402	25.4182	26.2053	(42b)
Hot water usage for other uses	37.7612	36.3880	35.0149	33.6418	32.2686	30.8955	30.8955	32.2686	33.6418	35.0149	36.3880	37.7612	(42c)
Average daily hot water use (litres/day)												114.4424	(43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Energy conte	124.5089	121.8133	118.5114	114.1942	110.1788	105.1262	102.2497	107.0283	110.1355	115.1534	120.3204	124.4336	(44)
Energy content (annual)	183.2987	161.1837	169.3504	149.1662	141.9766	121.5749	112.9890	125.9743	127.7516	148.3868	162.6171	182.7398	(45)
Distribution loss (46)m = 0.15 x (45)m	27.4948	24.1775	25.4026	22.3749	21.2965	18.2362	16.9483	18.8961	19.1627	22.2580	24.3926	27.4110	(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	238.5755	211.1111	224.6272	202.6599	197.2534	175.0686	168.2658	181.2511	181.2453	203.6636	216.1108	238.0166	(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	238.5755	211.1111	224.6272	202.6599	197.2534	175.0686	168.2658	181.2511	181.2453	203.6636	216.1108	238.0166	(64)
12Total per year (kWh/year)												2437.8487	(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	105.1682	93.5355	100.5305	92.3927	91.4287	83.2186	81.7903	86.1079	85.2724	93.5600	96.8651	104.9824	(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	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	105.5472	116.8558	105.5472	109.0654	105.5472	109.0654	105.5472	105.5472	109.0654	105.5472	109.0654	105.5472	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	198.5077	200.5675	195.3767	184.3260	170.3764	157.2658	148.5072	146.4473	151.6381	162.6888	176.6384	189.7490	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	(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)	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	(71)
Water heating gains (Table 5)	141.3552	139.1898	135.1216	128.3232	122.8880	115.5814	109.9332	115.7364	118.4338	125.7527	134.5349	141.1054	(72)
Total internal gains	502.2902	513.4933	492.9257	478.5948	455.6918	438.7929	420.8677	424.6111	436.0176	450.8690	477.1189	493.2818	(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)	181.0926 (332)
Energy saving/generation technologies (Appendices M ,N and Q)	
PV generation	-158.0814 (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	4307.2057 (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	1767.4617	0.1591	30.4394 (367)
Electrical energy for heat distribution (space & water)	4.4374	0.0000	5.8553 (372)
Overall CO2 factor for heat network			0.0630 (386)
Total CO2 associated with community systems			258.2410 (373)
Space and water heating			258.2410 (376)
Pumps, fans and electric keep-hot	183.6834	0.1387	25.4792 (378)
Energy for lighting	181.0926	0.1443	26.1373 (379)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-158.0814	0.1306	-20.6395
PV Unit electricity exported	0.0000	0.0000	0.0000
Total			-20.6395 (380)
Total CO2, kg/year			289.2179 (383)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			4.1000 (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	1767.4617	1.5891	303.9376 (467)
Electrical energy for heat distribution (space & water)	4.4374	0.0000	62.6586 (472)
Overall CO2 factor for heat network			0.6739 (486)
Total CO2 associated with community systems			2763.4596 (473)
Space and water heating			2763.4596 (476)
Pumps, fans and electric keep-hot	183.6834	1.5128	277.8763 (478)
Energy for lighting	181.0926	1.5338	277.7659 (479)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-158.0814	1.4823	-234.3244
PV Unit electricity exported	0.0000	0.0000	0.0000
Total			-234.3244 (480)
Total Primary energy kWh/year			3084.7775 (483)
Dwelling Primary energy Rate (DPER)			43.7400 (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	70.5200 (1b)	2.8000 (2b)	197.4560 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	70.5200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	197.4560 (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)
Air changes per hour	
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	30.0000 / (5) = 0.1519 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	5.0000 (17)
Infiltration rate	0.4019 (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) = 0.3115 (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												
	0.3972	0.3894	0.3816	0.3426	0.3349	0.2959	0.2959	0.2881	0.3115	0.3349	0.3504	0.3660 (22b)
Effective ac	0.5789	0.5758	0.5728	0.5587	0.5561	0.5438	0.5438	0.5415	0.5485	0.5561	0.5614	0.5670 (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			10.7200	1.1450	12.2748		(27)
External Wall 1	30.8000	10.7200	20.0800	0.1800	3.6144		(29a)
Corridor wall	15.6000	2.4200	13.1800	0.1800	2.3724		(29a)
Total net area of external elements Aum(A, m2)			46.4000				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	20.6816	(33)
Main dwelling							
Party Wall 1			57.4000	0.0000	0.0000		(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							179.7527 (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
E3 Sill	3.1700	0.0500	0.1585
E4 Jamb	15.6000	0.0500	0.7800
E7 Party floor between dwellings (in blocks of flats)	13.2800	0.0700	0.9296
E7 Party floor between dwellings (in blocks of flats)	11.1400	0.0700	0.7798
E9 Balcony between dwellings, wall insulation continuous	8.7200	0.0200	0.1744
E16 Corner (normal)	2.8000	0.0900	0.2520
E18 Party wall between dwellings	2.8000	0.0600	0.1680
E25 Staggered party wall between dwellings	2.8000	0.0600	0.1680
E25 Staggered party wall between dwellings	2.8000	0.0600	0.1680
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	41.0000	0.0000	0.0000
E16 Corner (normal)	2.8000	0.0900	0.2520
E17 Corner (inverted - internal area greater than external area)	5.6000	-0.0900	-0.5040
E18 Party wall between dwellings	2.8000	0.0600	0.1680

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

Point Thermal bridges	(36a) =	0.0000
Total fabric heat loss	(33) + (36) + (36a) =	24.5094 (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	37.7193	37.5198	37.3241	36.4054	36.2335	35.4333	35.4333	35.2851	35.7415	36.2335	36.5812	36.9448 (38)
Average = Sum(39)m / 12 =												60.9140

HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	0.8824	0.8796	0.8768	0.8638	0.8614	0.8500	0.8500	0.8479	0.8544	0.8614	0.8663	0.8714 (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												2.2587 (42)
Hot water usage for mixer showers												
62.0903	61.1572	59.7975	57.1960	55.2761	53.1351	51.9181	53.2675	54.7467	57.0456	59.7030	61.8524 (42a)	
Hot water usage for baths												
26.8241	26.4257	25.8647	24.8304	24.0558	23.1970	22.7331	23.2902	23.8967	24.8157	25.8714	26.7334 (42b)	
Hot water usage for other uses												
37.7612	36.3880	35.0149	33.6418	32.2686	30.8955	30.8955	32.2686	33.6418	35.0149	36.3880	37.7612 (42c)	
Average daily hot water use (litres/day)												116.4437 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use												
126.6756	123.9710	120.6772	115.6681	111.6006	107.2276	105.5467	108.8263	112.2852	116.8762	121.9624	126.3470 (44)	
Energy content (annual)	200.6232	176.5331	185.4763	158.3439	150.2358	131.8488	127.6496	134.7497	138.4589	158.5998	173.7578	197.8289 (45)
Distribution loss (46)m = 0.15 x (45)m										Total = Sum(45)m =		1934.1058
30.0935	26.4800	27.8214	23.7516	22.5354	19.7773	19.1474	20.2125	20.7688	23.7900	26.0637	29.6743 (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												
249.8659	221.0103	234.7190	205.9981	199.4785	179.5030	176.8923	183.9924	186.1131	207.8425	221.4120	247.0716 (62)	
WWHRS	-28.3851	-25.1040	-26.2875	-21.7671	-20.2861	-17.3590	-16.2713	-17.3029	-17.9603	-21.1732	-23.9867 (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												
221.4808	195.9063	208.4315	184.2310	179.1923	162.1440	160.6210	166.6895	168.1528	186.6693	197.4253	219.2121 (64)	
12Total per year (kWh/year)												2250.1560 (64)
Electric shower(s)												2250 (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												
106.1013	94.2790	101.0650	90.7727	89.3475	81.9631	81.8376	84.1984	84.1609	92.1286	95.8978	105.1723 (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
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(66)m	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	105.5472	116.8558	105.5472	109.0654	105.5472	109.0654	105.5472	105.5472	109.0654	105.5472	109.0654	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	198.5077	200.5675	195.3767	184.3260	170.3764	157.2658	148.5072	146.4473	151.6381	162.6888	176.6384	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	(69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	(71)
Water heating gains (Table 5)	142.6093	140.2962	135.8401	126.0732	120.0908	113.8376	109.9968	113.1699	116.8902	123.8287	133.1914	(72)
Total internal gains	506.5444	517.5998	496.6442	479.3448	455.8946	437.0491	420.9314	422.0446	434.4740	451.9450	478.7755	(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	

Southeast					10.7200	36.7938	0.6300		0.7000		0.7700	120.5429 (77)	

Solar gains	120.5429	205.3292	280.9403	348.0987	389.8995	387.0800	373.1864	342.0011	304.1989	226.9325	144.3826	103.1596 (83)	
Total gains	627.0873	722.9289	777.5845	827.4435	845.7942	824.1291	794.1178	764.0457	738.6729	678.8775	623.1581	599.6965 (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)														
tau	56.5841	56.7661	56.9457	57.8046	57.9682	58.7420	58.7420	58.8876	58.4415	57.9682	57.6382	57.2972		
alpha	4.7723	4.7844	4.7964	4.8536	4.8645	4.9161	4.9161	4.9258	4.8961	4.8645	4.8425	4.8198		
util living area	0.9624	0.9304	0.8807	0.7779	0.6335	0.4596	0.3311	0.3585	0.5475	0.7983	0.9289	0.9681	(86)	
MIT	20.0916	20.3198	20.5579	20.8045	20.9391	20.9898	20.9984	20.9976	20.9763	20.8119	20.4341	20.0553	(87)	
Th 2	20.1825	20.1849	20.1872	20.1984	20.2005	20.2102	20.2102	20.2120	20.2064	20.2005	20.1962	20.1918	(88)	
util rest of house	0.9551	0.9180	0.8606	0.7450	0.5877	0.4051	0.2722	0.2978	0.4897	0.7610	0.9141	0.9618	(89)	
MIT 2	19.1406	19.4234	19.7126	20.0055	20.1486	20.2036	20.2095	20.2109	20.1898	20.0215	19.5774	19.1028	(90)	
Living area fraction														
MIT	19.5784	19.8360	20.1017	20.3732	20.5124	20.5655	20.5726	20.5730	20.5518	20.3853	19.9717	19.5412	(92)	
Temperature adjustment												0.0000		
adjusted MIT	19.5784	19.8360	20.1017	20.3732	20.5124	20.5655	20.5726	20.5730	20.5518	20.3853	19.9717	19.5412	(93)	

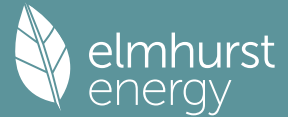
8. Space heating requirement

Utilisation	0.9486	0.9120	0.8583	0.7525	0.6059	0.4298	0.2993	0.3257	0.5152	0.7701	0.9095	0.9557	(94)	
Useful gains	594.8749	659.3100	667.3641	622.6815	512.5059	354.2259	237.6809	248.8433	380.5981	522.8025	566.7324	573.1313	(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	950.7525	926.4675	841.0408	698.8906	535.2932	357.5891	238.1284	249.5224	388.7284	594.3872	786.3420	942.7835	(97)	
Space heating kWh	264.7729	179.5298	129.2155	54.8706	16.9538	0.0000	0.0000	0.0000	0.0000	53.2591	158.1189	275.0212	(98a)	
Space heating requirement - total per year (kWh/year)												1131.7418		
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	264.7729	179.5298	129.2155	54.8706	16.9538	0.0000	0.0000	0.0000	0.0000	53.2591	158.1189	275.0212	(98c)	
Space heating requirement after solar contribution - total per year (kWh/year)												1131.7418		
Space heating per m2												16.0485	(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	264.7729	179.5298	129.2155	54.8706	16.9538	0.0000	0.0000	0.0000	0.0000	53.2591	158.1189	275.0212	(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)	286.8613	194.5069	139.9951	59.4481	18.3681	0.0000	0.0000	0.0000	0.0000	57.7021	171.3098	297.9645	(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	221.4808	195.9063	208.4315	184.2310	179.1923	162.1440	160.6210	166.6895	168.1528	186.6693	197.4253	219.2121	(64)	
Efficiency of water heater	84.4612	83.8645	83.0201	81.7002	80.5052	79.8000	79.8000	79.8000	79.8000	81.6367	83.5666	79.8000	(216)	
Fuel for water heating, kWh/month	262.2278	233.5985	251.0616	225.4962	222.5847	203.1880	201.2794	208.8841	210.7178	228.6587	236.2490	259.2093	(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)	
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)	

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Lighting	21.9306	17.5936	15.8410	11.6058	8.9647	7.3242	8.1779	10.6299	13.8072	18.1158	20.4618	22.5401 (232)
Electricity generated by PVs (Appendix M) (negative quantity)												
(233a)m	-15.6410	-23.4623	-35.8553	-42.9434	-48.6408	-46.2622	-45.7039	-41.9847	-35.8432	-27.9650	-17.6910	-13.3634 (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	(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	(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	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)												
(233b)m	-5.0100	-10.8252	-22.0612	-33.9520	-45.7057	-46.2224	-45.6744	-38.2922	-27.5766	-15.7387	-6.7703	-3.9405 (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	(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	(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	(235d)
Annual totals kWh/year												
Space heating fuel - main system 1												1226.1558 (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												2743.1552 (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)												176.9927 (232)
Energy saving/generation technologies (Appendices M ,N and Q)												
PV generation												-697.1255 (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												3535.1782 (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	1226.1558	0.2100	257.4927 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	2743.1552	0.2100	576.0626 (264)
Space and water heating			833.5553 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	176.9927	0.1443	25.5455 (268)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-395.3564	0.1333	-52.7034
PV Unit electricity exported	-301.7691	0.1252	-37.7788
Total			-90.4822 (269)
Total CO2, kg/year			780.5479 (272)
EPC Target Carbon Dioxide Emission Rate (TER)			11.0700 (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	1226.1558	1.1300	1385.5561 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	2743.1552	1.1300	3099.7654 (278)
Space and water heating			4485.3215 (279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008 (281)
Energy for lighting	176.9927	1.5338	271.4772 (282)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-395.3564	1.4926	-590.1104
PV Unit electricity exported	-301.7691	0.4595	-138.6638
Total			-728.7742 (283)
Total Primary energy kWh/year			4158.1254 (286)
Target Primary Energy Rate (TPER)			58.9600 (287)

Full SAP Calculation Printout



Plot Reference	A 209				Issued on Date	15/05/2026	
Assessment Reference	Be Green 260515			Plot Type Ref			
Plot Address					SAP Version	10.2	
SAP Rating	85 B	DER	4.10	TER	11.07		
Environmental	97 A	% DER < TER				62.96	
CO ₂ Emissions (t/year)	0.27	DFEE	23.39	TFEE	22.77		
Compliance Check	See BREL	% DFEE < TFEE				-2.74	
% DPER < TPER	25.81	DPER	43.74	TPER	58.96		
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)	70.5200		
Dwelling volume			

2. Ventilation rate

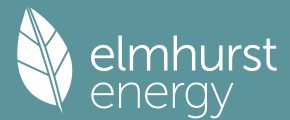
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
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) = 0.1519 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	3.0000 (17)
Infiltration rate	0.3019 (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) = 0.2340 (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	0.2983	0.2925	0.2866	0.2574	0.2515	0.2223	0.2223	0.2164	0.2340	0.2515	0.2632	0.2749 (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	0.5445	0.5428	0.5411	0.5331	0.5316	0.5247	0.5247	0.5234	0.5274	0.5316	0.5346	0.5378 (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			10.7200	1.1450	12.2748		(27)
External Wall 1	30.8000	10.7200	20.0800	0.1500	3.0120	70.0000	1405.5999 (29a)
Corridor wall	15.6000	2.4200	13.1800	0.1800	2.3724	70.0000	922.6000 (29a)
Total net area of external elements Aum(A, m ²)			46.4000				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	20.0792		(33)
Main dwelling							
Party Wall 1			57.4000	0.0000	0.0000	70.0000	4018.0000 (32)
Party Floor 1			70.5200			40.0000	2820.8000 (32a)
Party Ceiling 1			70.5200			30.0000	2115.6000 (32b)
Internal Wall 1			154.8400			9.0000	1393.5600 (32c)
Heat capacity Cm = Sum (A x k)						(28)...(30) + (32) + (32a)...(32e) =	12676.1599 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							179.7527 (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
E3 Sill					3.1700	0.0400	0.1268

Full SAP Calculation Printout



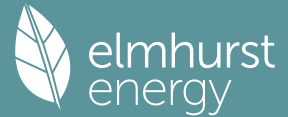
E4 Jamb													15.6000	0.0400	0.6240	
E7 Party floor between dwellings (in blocks of flats)													13.2800	0.0500	0.6640	
E7 Party floor between dwellings (in blocks of flats)													11.1400	0.0360	0.4010	
E9 Balcony between dwellings, wall insulation continuous													8.7200	0.0500	0.4360	
E16 Corner (normal)													2.8000	0.0500	0.1400	
E18 Party wall between dwellings													2.8000	0.0500	0.1400	
E25 Staggered party wall between dwellings													2.8000	0.0500	0.1400	
E25 Staggered party wall between dwellings													2.8000	0.0360	0.1008	
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)													41.0000	0.0000	0.0000	
E16 Corner (normal)													2.8000	0.0360	0.1008	
E17 Corner (inverted - internal area greater than external area)													5.6000	0.0000	0.0000	
E18 Party wall between dwellings													2.8000	0.0360	0.1008	
Thermal bridges (Sum(L x Psi) calculated using Appendix K)																3.3077 (36)
Point Thermal bridges																0.0000
Total fabric heat loss																(33) + (36) + (36a) = 23.3869 (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	35.4802	35.3676	35.2572	34.7388	34.6418	34.1902	34.1902	34.1066	34.3642	34.6418	34.8380	35.0432	(38)			
Average = Sum(39)m / 12 =	58.8672	58.7546	58.6442	58.1257	58.0287	57.5772	57.5772	57.4936	57.7511	58.0287	58.2250	58.4301	(39)			
												58.1253				
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec				
HLP (average)	0.8348	0.8332	0.8316	0.8242	0.8229	0.8165	0.8165	0.8153	0.8189	0.8229	0.8257	0.8286	(40)			
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31				
												0.8242				
												31				

4. Water heating energy requirements (kWh/year)																
Assumed occupancy																2.2587 (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																
	26.2261	25.8302	25.2670	24.4236	23.6634	22.6170	21.8232	22.7939	23.3034	24.3402	25.4182	26.2053	(42b)			
Hot water usage for other uses																
	37.7612	36.3880	35.0149	33.6418	32.2686	30.8955	30.8955	32.2686	33.6418	35.0149	36.3880	37.7612	(42c)			
Average daily hot water use (litres/day)													58.6462	(43)		
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec				
	63.9873	62.2183	60.2819	58.0653	55.9321	53.5125	52.7187	55.0626	56.9452	59.3551	61.8063	63.9665	(44)			
Energy conte	94.2004	82.3274	86.1416	75.8479	72.0741	61.8855	58.2557	64.8097	66.0536	76.4851	83.5332	93.9395	(45)			
Energy content (annual)																
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																
	80.0703	69.9782	73.2204	64.4707	61.2630	52.6027	49.5173	55.0882	56.1455	65.0123	71.0032	79.8486	(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																
	80.0703	69.9782	73.2204	64.4707	61.2630	52.6027	49.5173	55.0882	56.1455	65.0123	71.0032	79.8486	(64)			
12Total per year (kWh/year)													778	(64)		
Electric shower(s)																
	49.7240	44.3045	48.3788	46.1673	47.0336	44.8655	46.3610	47.0336	46.1673	48.3788	47.4691	49.7240	(64a)			
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =													565.6077	(64a)		
Heat gains from water heating, kWh/month																
	32.4486	28.5707	30.3998	27.6595	27.0742	24.3670	23.9696	25.5305	25.5782	28.3478	29.6181	32.3931	(65)			

5. Internal gains (see Table 5 and 5a)																
Metabolic gains (Table 5), Watts																
(66)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec				
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5																
	105.5472	116.8558	105.5472	109.0654	105.5472	109.0654	105.5472	105.5472	109.0654	105.5472	109.0654	105.5472	(67)			
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5																
	198.5077	200.5675	195.3767	184.3260	170.3764	157.2658	148.5072	146.4473	151.6381	162.6888	176.6384	189.7490	(68)			
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5																
	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	(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)																
	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	(71)			
Water heating gains (Table 5)																
	43.6137	42.5159	40.8599	38.4160	36.3900	33.8431	32.2172	34.3151	35.5253	38.1019	41.1362	43.5392	(72)			
Total internal gains																
	404.5488	416.8195	398.6641	388.6876	369.1939	357.0546	343.1518	343.1898	353.1091	363.2181	383.7203	395.7156	(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				
Southeast				10.7200		36.7938		0.3500		0.7000		0.7700		66.9683	(77)	
Solar gains	66.9683	114.0718	156.0779	193.3881	216.6108	215.0444	207.3258	190.0006	168.9994	126.0736	80.2126	57.3109	(83)			
Total gains	471.5170	530.8912	554.7420	582.0758	585.8047	572.0990	550.4775	533.1904	522.1085	489.2917	463.9328	453.0265	(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	59.8152	59.9299	60.0427	60.5782	60.6795	61.1554	61.1554	61.2443	60.9712	60.6795	60.4750	60.2627	
alpha	4.9877	4.9953	5.0028	5.0385	5.0453	5.0770	5.0770	5.0830	5.0647	5.0453	5.0317	5.0175	
util living area	0.9865	0.9747	0.9556	0.9024	0.7986	0.6177	0.4553	0.4888	0.7061	0.9086	0.9731	0.9888 (86)	
MIT	19.9072	20.0956	20.3237	20.6233	20.8479	20.9680	20.9943	20.9919	20.9369	20.6637	20.2432	19.8722 (87)	
Th 2	20.2233	20.2247	20.2260	20.2324	20.2336	20.2391	20.2391	20.2401	20.2370	20.2336	20.2312	20.2286 (88)	
util rest of house	0.9836	0.9694	0.9459	0.8814	0.7575	0.5532	0.3789	0.4113	0.6449	0.8849	0.9665	0.9863 (89)	
MIT 2	19.2241	19.4104	19.6344	19.9242	20.1247	20.2218	20.2370	20.2370	20.1995	19.9667	19.5625	19.1937 (90)	
Living area fraction									fLA = Living area / (4) =				0.4603 (91)
MIT	19.5385	19.7258	19.9517	20.2460	20.4576	20.5652	20.5856	20.5845	20.5389	20.2875	19.8758	19.5060 (92)	
Temperature adjustment												0.0000	
adjusted MIT	19.5385	19.7258	19.9517	20.2460	20.4576	20.5652	20.5856	20.5845	20.5389	20.2875	19.8758	19.5060 (93)	

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9804	0.9653	0.9420	0.8818	0.7702	0.5815	0.4140	0.4468	0.6701	0.8867	0.9629	0.9835 (94)
Useful gains	462.2745	512.4706	522.5714	513.2963	451.1774	332.6844	227.8974	238.2499	349.8611	433.8624	446.7043	445.5340 (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	897.0492	871.0838	788.8630	659.4971	508.1923	343.4621	229.4801	240.5797	371.8538	562.1562	743.8725	894.3334 (97)
Space heating kWh	323.4724	240.9881	198.1210	105.2646	42.4191	0.0000	0.0000	0.0000	0.0000	95.4506	213.9611	333.9067 (98a)
Space heating requirement - total per year (kWh/year)												1553.5836
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	323.4724	240.9881	198.1210	105.2646	42.4191	0.0000	0.0000	0.0000	0.0000	95.4506	213.9611	333.9067 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1553.5836
Space heating per m2										(98c) / (4) =		22.0304 (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	541.2255	426.0712	436.9511	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.8893	0.9425	0.9304	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	481.3345	401.5592	406.5493	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	625.1383	602.1616	583.9269	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh												
	0.0000	0.0000	0.0000	0.0000	0.0000	103.5387	149.2482	131.9689	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	25.8847	37.3121	32.9922	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												96.1890 (107)
Energy for space heating												22.0304 (99)
Energy for space cooling												1.3640 (108)
Total												23.3944 (109)
Fabric Energy Efficiency (DFEE)												23.4 (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	70.5200 (1b)	x 2.8000 (2b)	= 197.4560 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	70.5200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	197.4560 (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) =											Air changes per hour	30.0000 / (5) =	0.1519 (8)
Pressure test												Yes		
Pressure Test Method												Blower Door		
Measured/design AP50												5.0000	(17)	
Infiltration rate												0.4019	(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) =											0.3115	(21)	
Wind speed	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Wind factor	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000	(22)	
Adj infilt rate	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750	(22a)	
	0.3972	0.3894	0.3816	0.3426	0.3349	0.2959	0.2959	0.2881	0.3115	0.3349	0.3504	0.3660	(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	0.5789	0.5758	0.5728	0.5587	0.5561	0.5438	0.5438	0.5415	0.5485	0.5561	0.5614	0.5670	(25)	

3. Heat losses and heat loss parameter

Element	Gross	Openings	NetArea	U-value	A x U	K-value	A x K	
Main dwelling	m2	m2	m2	W/m2K	W/K	kJ/m2K	kJ/K	
TER Opaque door			2.4200	1.0000	2.4200			(26)
TER Opening Type			10.7200	1.1450	12.2748			(27)
External Wall 1	30.8000	10.7200	20.0800	0.1800	3.6144			(29a)
Corridor wall	15.6000	2.4200	13.1800	0.1800	2.3724			(29a)
Total net area of external elements Aum(A, m2)			46.4000					(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		20.6816			(33)
Main dwelling								
Party Wall 1			57.4000	0.0000	0.0000			(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K								179.7527 (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		
E3 Sill				3.1700	0.0500	0.1585		
E4 Jamb				15.6000	0.0500	0.7800		
E7 Party floor between dwellings (in blocks of flats)				13.2800	0.0700	0.9296		
E7 Party floor between dwellings (in blocks of flats)				11.1400	0.0700	0.7798		
E9 Balcony between dwellings, wall insulation continuous				8.7200	0.0200	0.1744		
E16 Corner (normal)				2.8000	0.0900	0.2520		
E18 Party wall between dwellings				2.8000	0.0600	0.1680		
E25 Staggered party wall between dwellings				2.8000	0.0600	0.1680		
E25 Staggered party wall between dwellings				2.8000	0.0600	0.1680		
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)				41.0000	0.0000	0.0000		
E16 Corner (normal)				2.8000	0.0900	0.2520		
E17 Corner (inverted - internal area greater than external area)				5.6000	-0.0900	-0.5040		
E18 Party wall between dwellings				2.8000	0.0600	0.1680		
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							3.8278	(36)
Point Thermal bridges						(36a) =	0.0000	
Total fabric heat loss						(33) + (36) + (36a) =	24.5094	(37)

4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.2587 (42)	
Hot water usage for mixer showers												0.0000 (42a)	
Hot water usage for baths	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (42b)	
Hot water usage for other uses	26.8241	26.4257	25.8647	24.8304	24.0558	23.1970	22.7331	23.2902	23.8967	24.8157	25.8714	26.7334 (42b)	
Average daily hot water use (litres/day)	37.7612	36.3880	35.0149	33.6418	32.2686	30.8955	30.8955	32.2686	33.6418	35.0149	36.3880	37.7612 (42c)	
												59.1985 (43)	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	64.5853	62.8138	60.8796	58.4721	56.3245	54.0925	53.6286	55.5588	57.5385	59.8306	62.2594	64.4946 (44)	
Energy content (annual)	102.2873	89.4460	93.5697	80.0454	75.8236	66.5130	64.8591	68.7934	70.9507	81.1896	88.6999	100.9829 (45)	
Distribution loss (46)m = 0.15 x (45)m												983.1607	
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	86.9442	76.0291	79.5343	68.0386	64.4500	56.5361	55.1303	58.4744	60.3081	69.0111	75.3950	85.8355 (62)	
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)	
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63b)	
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)	
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63d)	
Output from w/h	86.9442	76.0291	79.5343	68.0386	64.4500	56.5361	55.1303	58.4744	60.3081	69.0111	75.3950	85.8355 (64)	
12Total per year (kWh/year)												835.6866 (64)	
Electric shower(s)	49.7240	44.3045	48.3788	46.1673	47.0336	44.8655	46.3610	47.0336	46.1673	48.3788	47.4691	49.7240 (64a)	

Full SAP Calculation Printout



Heat gains from water heating, kWh/month
 34.1671 30.0834 31.9783 28.5515 27.8709 25.3504 25.3728 26.3770 26.6189 29.3475 30.7160 33.8899 (65)

Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m = 565.6077 (64a)

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	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341	112.9341 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	105.5472	116.8558	105.5472	109.0654	105.5472	109.0654	105.5472	105.5472	109.0654	105.5472	109.0654	105.5472 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	198.5077	200.5675	195.3767	184.3260	170.3764	157.2658	148.5072	146.4473	151.6381	162.6888	176.6384	189.7490 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934	34.2934 (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)	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473	-90.3473 (71)
Water heating gains (Table 5)	45.9235	44.7670	42.9815	39.6548	37.4609	35.2089	34.1033	35.4530	36.9706	39.4455	42.6611	45.5509 (72)
Total internal gains	406.8585	419.0705	400.7857	389.9265	370.2648	358.4204	345.0378	344.3277	354.5544	364.5618	385.2452	397.7273 (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
Southeast					10.7200	36.7938		0.6300	0.7000	0.7700		120.5429 (77)
Solar gains	120.5429	205.3292	280.9403	348.0987	389.8995	387.0800	373.1864	342.0011	304.1989	226.9325	144.3826	103.1596 (83)
Total gains	527.4014	624.3997	681.7260	738.0251	760.1643	745.5004	718.2242	686.3287	658.7534	591.4943	529.6278	500.8869 (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)												
tau	56.5841	56.7661	56.9457	57.8046	57.9682	58.7420	58.7420	58.8876	58.4415	57.9682	57.6382	57.2972
alpha	4.7723	4.7844	4.7964	4.8536	4.8645	4.9161	4.9161	4.9258	4.8961	4.8645	4.8425	4.8198
util living area	0.9803	0.9576	0.9191	0.8286	0.6885	0.5049	0.3655	0.3981	0.6049	0.8556	0.9592	0.9840 (86)
MIT	19.9113	20.1639	20.4362	20.7371	20.9130	20.9848	20.9974	20.9961	20.9638	20.7366	20.2859	19.8720 (87)
Th 2	20.1825	20.1849	20.1872	20.1984	20.2005	20.2102	20.2102	20.2102	20.2064	20.2005	20.1962	20.1918 (88)
util rest of house	0.9761	0.9492	0.9035	0.7990	0.6422	0.4461	0.3007	0.3311	0.5438	0.8235	0.9496	0.9806 (89)
MIT 2	19.1952	19.4433	19.7063	19.9919	20.1415	20.2024	20.2093	20.2106	20.1861	19.9992	19.5743	19.1641 (90)
Living area fraction									fLA = Living area / (4) =			
MIT	19.5248	19.7750	20.0423	20.3349	20.4966	20.5625	20.5721	20.5722	20.5441	20.3386	19.9018	19.4900 (92)
Temperature adjustment												0.0000
adjusted MIT	19.5248	19.7750	20.0423	20.3349	20.4966	20.5625	20.5721	20.5722	20.5441	20.3386	19.9018	19.4900 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9720	0.9443	0.9005	0.8043	0.6599	0.4726	0.3305	0.3619	0.5704	0.8295	0.9455	0.9769 (94)
Useful gains	512.6164	589.6001	613.8630	593.6194	501.6203	352.3314	237.3979	248.3848	375.7272	490.6593	500.7770	489.3141 (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	947.4190	922.6841	837.3679	696.5556	534.3310	357.4090	238.0981	249.4737	388.2612	591.5531	782.0726	939.6326 (97)
Space heating kWh	323.4931	223.8324	166.2877	74.1141	24.3368	0.0000	0.0000	0.0000	0.0000	75.0650	202.5329	335.0370 (98a)
Space heating requirement - total per year (kWh/year)												1424.6989
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	323.4931	223.8324	166.2877	74.1141	24.3368	0.0000	0.0000	0.0000	0.0000	75.0650	202.5329	335.0370 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1424.6989
Space heating per m ²												20.2028 (99)

8c. Space cooling requirement

Calculated for June, July and August. See Table 10b												
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	563.4615	443.5761	454.4384	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.9462	0.9744	0.9669	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	533.1738	432.2374	439.4090	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	827.5846	797.9108	762.7276	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	211.9757	272.0610	240.5491	0.0000	0.0000	0.0000	0.0000 (104)
Cooled fraction									fc = cooled area / (4) =			
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 (105)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	52.9939	68.0152	60.1373	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												181.1465 (107)
Energy for space heating												20.2028 (99)
Energy for space cooling												2.5687 (108)
Total												22.7715 (109)

Fabric Energy Efficiency (TFEE)

22.8 (109)