

Summary for Input Data



Plot Reference	B 105	Issued on Date	19/03/2026
Assessment Reference	Be Green	Plot Type Ref	
Plot Address		SAP Version	10.2

SAP Rating	81 B	DER	6.68	TER	20.79
Environmental	96 A	% DER < TER			67.87
CO ₂ Emissions (t/year)	0.24	DFEE	40.99	TFEE	47.37
Compliance Check	See BREL	% DFEE < TFEE			13.47
% DPER < TPER	37.72	DPER	70.91	TPER	113.85

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

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

Orientation	Southwest	
Property Tenture	1	
Transaction Type	6	
Terrain Type	Suburban	
1.0 Property Type	Flat, Mid-Terrace	
Position of Flat	Mid-floor flat	
Which Floor	1	
2.0 Number of Storeys	1	
3.0 Date Built	2026	
4.0 Sheltered Sides	3	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	265.47	kJ/m²K
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
		14.09 m	39.45 m ²	2.80 m

8.0 Living Area	30.48	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	17.70	10.98	0.00	None	6.72	Enter Gross Area
	Corridor wall	Cavity Wall	Cavity wall : dense plaster, AAC block, filled cavity, any outside structure	0.22	70.00	21.76	19.34	0.70	Stairwell Access Corridor 3	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	32.68	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	59.99

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	39.45

11.0 Heat Loss Floors	Description	Type	Storey Index	Construction	U-Value (W/m ² K)	Shelter Code	Shelter Factor	Kappa (kJ/m ² K)	Area (m ²)
	Heatloss Floor 1	Exposed Floor - Solid	Lowest occupied	Other	0.10	None	0.00	110.00	39.45

Summary for Input Data

12.0 Opening Types

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

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Opening	Door	Corridor wall	South West	2.42	
NE windows	Windows	External Wall 1	North East	6.72	

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	4.41	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	2.92	0.05	0.05	No
E7 Party floor between dwellings (in blocks of flats)	Independently assessed	7.77	0.04	0.04	No
E9 Balcony between dwellings, wall insulation continuous	Independently assessed	3.40	0.10	0.10	No
E9 Balcony between dwellings, wall insulation continuous	Independently assessed	3.40	0.05	0.05	No
E16 Corner (normal)	Independently assessed	5.60	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	5.60	0.05	0.05	No
E20 Exposed floor (normal)	Independently assessed	2.92	0.10	0.10	No
E21 Exposed floor (inverted)	Independently assessed	7.77	0.10	0.10	No
E25 Staggered party wall between dwellings	Independently assessed	5.60	0.04	0.04	No
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	Table K1 - Default	11.67	0.00	0.00	No
P7 Party Wall - Exposed floor (normal)	Independently assessed	11.67	0.08	0.08	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
Number of flueless gas fires	0

Summary for Input Data



21.0 Fixed Cooling System		No	
22.0 Pressure Testing		Yes	
Designed AP ₅₀	3.00	m³/(h.m²) @ 50 Pa	
Test Method	Blower Door		
22.0 Lighting		No	
No Fixed Lighting	No		
	Name	Efficacy	Power
	Lighting 1	75.00	15.00
			Capacity
			1125.00
			Count
			4
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
	Heat source 1	Heat pump	Electricity
	Heat source 2	None	Space and Water
	Heat source 3	None	
	Heat source 4	None	
	Heat source 5	None	
			Efficiency
			232.00
			Percentage Of Heat
			100.00
			Heat
			Heat Power Ratio
			Electrical
			Fuel Factor
			Efficiency type
27.0 Secondary Heating		None	
28.0 Water Heating		Community Heating	
Water Heating			
SAP Code	901		
Flue Gas Heat Recovery System	No		
Waste Water Heat Recovery Instantaneous System 1	No		
Waste Water Heat Recovery Instantaneous System 2	No		
Waste Water Heat Recovery Storage System	No		
Solar Panel	No		
Water use <= 125 litres/person/day	Yes		
Cold Water Source	From header tank		
Bath Count	1		
28.1 Showers			
Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]
Shower	Combi boiler or unvented hot water system	8.00	
			Connected
			No
			Connected To
28.3 Waste Water Heat Recovery System			
29.0 Hot Water Cylinder		Internal Store	
Insulation Type	Measured Loss		
Cylinder Volume	180.00		
Loss	1.20		
			L
			kWh/day
32.0 Photovoltaic Unit		Multiple Dwellings – Not Connected	
Export Capable Meter?	No		
Connected To Dwelling	Yes		
Diverter	No		
Battery Capacity [kWh]	0.00		
PV Cells kWp	Orientation	Elevation	Overshading FGHRs
			MCS Certificate
			Overshading Factor
			MCS Certificate
			Panel Manufacturer

Summary for Input Data



0.19		South West	Horizontal	Modest	No		0.80		Reference		
34.0 Small-scale Hydro				None							
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

Full SAP Calculation Printout



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Compliance Check	See BREL	TFEE	47.37
% DPER < TPER	37.72	% DFEE < TFEE	13.47
		DPER	70.91
		TPER	113.85
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	39.4500 (1b)	2.8000 (2b)	110.4600 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	39.4500		110.4600 (4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	110.4600 (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							
Windows			6.7200	1.1450	7.6947		(27)
Door			2.4200	1.0000	2.4200		(26)
Heatloss Floor 1			39.4500	0.1000	3.9450	110.0000	4339.5000 (28b)
External Wall 1	17.7000	6.7200	10.9800	0.1500	1.6470	70.0000	768.6001 (29a)
Corridor wall	21.7600	2.4200	19.3400	0.1900	3.6746	70.0000	1353.8000 (29a)
Total net area of external elements Aum(A, m ²)			78.9100				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		19.3813		(33)
Main dwelling							
Party Wall 1			32.6800	0.0000	0.0000	70.0000	2287.6000 (32)
Party Ceiling 1			39.4500			30.0000	1183.5000 (32b)
Internal Wall 1			59.9900			9.0000	539.9100 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	10472.9101 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							265.4730 (35)
List of Thermal Bridges							

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	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	62.4815	69.1759	62.4815	64.5642	62.4815	64.5642	62.4815	62.4815	64.5642	62.4815	64.5642	62.4815 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	120.1527	121.3995	118.2576	111.5688	103.1254	95.1898	89.8884	88.6416	91.7835	98.4723	106.9156	114.8512 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590 (69)
Pumps, fans	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718 (71)
Water heating gains (Table 5)	122.1721	120.5142	117.3990	112.1927	108.0304	102.4347	98.1085	102.5528	104.6183	110.2233	116.9491	121.9808 (72)
Total internal gains	348.6832	354.9666	342.0150	332.2026	317.5142	306.0657	294.3553	297.5528	304.8429	315.0540	332.3058	343.1904 (73)

6. Solar gains												

[Jan]	Area		Solar flux		g		FF		Access		Gains	

Full SAP Calculation Printout



		m2		Table 6a W/m2		Specific data or Table 6b		Specific data or Table 6c		factor Table 6d		W	
Northeast		6.7200		11.2829		0.3500		0.7000		0.7700		12.8733 (75)	
Solar gains	12.8733	26.2040	47.2113	77.5346	104.2217	111.1114	103.9424	82.8641	57.5278	32.0234	16.1980	10.5130 (83)	
Total gains	361.5565	381.1706	389.2264	409.7372	421.7359	417.1770	398.2977	380.4169	362.3707	347.0774	348.5038	353.7034 (84)	

7. Mean internal temperature (heating season)													

Temperature during heating periods in the living area from Table 9, Th1 (C)													
Utilisation factor for gains for living area, nil,m (see Table 9a)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	88.9277	89.2166	89.5074	90.9903	91.2928	92.8360	92.8360	93.1509	92.2125	91.2928	90.6898	90.0948	
alpha	6.9285	6.9478	6.9672	7.0660	7.0862	7.1891	7.1891	7.2101	7.1475	7.0862	7.0460	7.0063	
util living area	0.9799	0.9678	0.9413	0.8495	0.6845	0.4794	0.3461	0.3774	0.5943	0.8552	0.9554	0.9820 (86)	
MIT	20.4732	20.5716	20.7119	20.8932	20.9789	20.9985	20.9999	20.9998	20.9936	20.9047	20.6893	20.4637 (87)	
Th 2	20.2281	20.2304	20.2327	20.2443	20.2466	20.2582	20.2582	20.2606	20.2536	20.2466	20.2420	20.2373 (88)	
util rest of house	0.9742	0.9592	0.9258	0.8166	0.6351	0.4245	0.2878	0.3169	0.5328	0.8172	0.9422	0.9770 (89)	
MIT 2	19.6338	19.7574	19.9297	20.1450	20.2308	20.2575	20.2582	20.2605	20.2499	20.1626	19.9128	19.6297 (90)	
Living area fraction	fLA = Living area / (4) =												
MIT	20.2823	20.3865	20.5341	20.7231	20.8088	20.8300	20.8312	20.8317	20.8245	20.7360	20.5127	20.2740 (92)	
Temperature adjustment	0.0000												
adjusted MIT	20.2823	20.3865	20.5341	20.7231	20.8088	20.8300	20.8312	20.8317	20.8245	20.7360	20.5127	20.2740 (93)	

8. Space heating requirement													

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9747	0.9611	0.9323	0.8380	0.6723	0.4669	0.3328	0.3637	0.5801	0.8426	0.9473	0.9773 (94)	
Useful gains	352.4053	366.3447	362.8718	343.3602	283.5222	194.7829	132.5591	138.3433	210.2061	292.4596	330.1301	345.6587 (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	522.8383	504.9781	456.1306	378.0066	290.2604	195.2260	132.5917	138.4034	212.1465	322.9933	430.2524	519.0270 (97)	
Space heating kWh	126.8021	93.1617	69.3845	24.9454	5.0132	0.0000	0.0000	0.0000	0.0000	22.7171	72.0880	128.9860 (98a)	
Space heating requirement - total per year (kWh/year)	543.0981												
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	126.8021	93.1617	69.3845	24.9454	5.0132	0.0000	0.0000	0.0000	0.0000	22.7171	72.0880	128.9860 (98c)	
Space heating requirement after solar contribution - total per year (kWh/year)	543.0981												
Space heating per m2	(98c) / (4) =												

9b. Energy requirements													

Fraction of space heat from secondary/supplementary system (Table 11)													
0.0000 (301)													
Fraction of space heat from community system													
1.0000 (302)													
Fraction of heat from community Heat pump-Space and Water													
1.0000 (303a)													
Factor for control and charging method (Table 4c(3)) for space heating													
1.0000 (305)													
Factor for charging method (Table 4c(3)) for water heating													
1.0000 (305a)													
Distribution loss factor (Table 12c) for community heating system													
1.5000 (306)													
Efficiency of secondary/supplementary heating system, %													
0.0000 (208)													
Space heating:													
Space heating requirement	126.8021	93.1617	69.3845	24.9454	5.0132	0.0000	0.0000	0.0000	0.0000	22.7171	72.0880	128.9860 (98)	
Space heat from Heat pump = (98) x 1.00 x 1.00 x 1.50													
307a	190.2031	139.7425	104.0768	37.4182	7.5198	0.0000	0.0000	0.0000	0.0000	34.0756	108.1320	193.4790	
Space heating requirement	190.2031	139.7425	104.0768	37.4182	7.5198	0.0000	0.0000	0.0000	0.0000	34.0756	108.1320	193.4790 (307)	
Efficiency of secondary/supplementary heating system in % (from Table 4a or Appendix E)	0.0000 (308)												
Space heating fuel for secondary/supplementary system	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (309)	
Water heating													
Annual water heating requirement	195.6515	173.3669	184.9714	167.7307	164.0081	146.6005	141.8070	151.7516	151.3289	168.9151	178.0301	195.2234 (64)	
Water heat from Heat pump = (64) x 1.00 x 1.00 x 1.50													
310a	293.4772	260.0503	277.4571	251.5960	246.0122	219.9008	212.7105	227.6274	226.9934	253.3726	267.0452	292.8352	
Water heating fuel	293.4772	260.0503	277.4571	251.5960	246.0122	219.9008	212.7105	227.6274	226.9934	253.3726	267.0452	292.8352 (310)	
Cooling System Energy Efficiency Ratio	0.0000 (314)												
Space coolin	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (315)	
Pumps and Fa	9.0133	8.1411	9.0133	8.7226	9.0133	8.7226	9.0133	9.0133	8.7226	9.0133	8.7226	9.0133 (331)	
Lighting	13.2831	10.6562	9.5948	7.0295	5.4298	4.4362	4.9533	6.4384	8.3629	10.9726	12.3935	13.6523 (332)	
Electricity generated by PVs (Appendix M) (negative quantity)													
(333a)m	-2.0967	-3.7334	-6.9132	-9.7709	-12.2582	-12.1100	-11.8579	-10.1831	-7.6275	-4.8803	-2.5212	-1.7107 (333a)	
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(334a)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 (334a)	
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(335a)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 (335a)	
Electricity generated by PVs (Appendix M) (negative quantity)													
(333b)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 (333b)	
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(334b)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 (334b)	
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(335b)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 (335b)	
Annual totals kWh/year													
Space heating fuel - community heating	814.6472 (307)												
Space heating fuel - secondary	0.0000 (309)												
Water heating fuel - community heating	3029.0779 (310)												
Efficiency of water heater	0.0000 (311)												
Electricity used for heat distribution	8.1465 (313)												
Space cooling fuel	0.0000 (321)												
Electricity for pumps and fans:													
(BalancedWithHeatRecovery, Database: in-use factor = 1.2500, SFP = 0.7875)													
mechanical ventilation fans (SFP = 0.7875)													
106.1244 (330a)													

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Total electricity for the above, kWh/year	106.1244 (331)
Electricity for lighting (calculated in Appendix L)	107.2026 (332)
Energy saving/generation technologies (Appendices M ,N and Q)	
PV generation	-85.6632 (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	3971.3889 (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	1656.7780	0.1573	55.2278 (367)
Electrical energy for heat distribution (space & water)	8.1465	0.0000	5.5418 (372)
Overall CO2 factor for heat network			0.0636 (386)
Total CO2 associated with community systems			244.4112 (373)
Space and water heating			244.4112 (376)
Pumps, fans and electric keep-hot	106.1244	0.1387	14.7208 (378)
Energy for lighting	107.2026	0.1443	15.4727 (379)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-85.6632	0.1305	-11.1759
PV Unit electricity exported	0.0000	0.0000	0.0000
Total			-11.1759 (380)
Total CO2, kg/year			263.4287 (383)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			6.6800 (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	1656.7780	1.5823	555.6031 (467)
Electrical energy for heat distribution (space & water)	8.1465	0.0000	58.9341 (472)
Overall CO2 factor for heat network			0.6762 (486)
Total CO2 associated with community systems			2599.1974 (473)
Space and water heating			2599.1974 (476)
Pumps, fans and electric keep-hot	106.1244	1.5128	160.5451 (478)
Energy for lighting	107.2026	1.5338	164.4310 (479)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-85.6632	1.4819	-126.9468
PV Unit electricity exported	0.0000	0.0000	0.0000
Total			-126.9468 (480)
Total Primary energy kWh/year			2797.2267 (483)
Dwelling Primary energy Rate (DPER)			70.9100 (484)

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

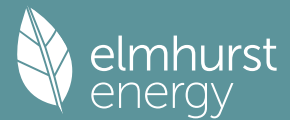
1. Overall dwelling characteristics

	Area (m2)	Storey height (m)	Volume (m3)
Main dwelling	39.4500 (1b)	x 2.8000 (2b)	= 110.4600 (1b) - (3b)
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	39.4500		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	110.4600 (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) = 0.1811 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	5.0000 (17)
Infiltration rate	0.4311 (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) = 0.3341 (21)

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Wind speed	Jan 5.1000	Feb 5.0000	Mar 4.9000	Apr 4.4000	May 4.3000	Jun 3.8000	Jul 3.8000	Aug 3.7000	Sep 4.0000	Oct 4.3000	Nov 4.5000	Dec 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	0.4259	0.4176	0.4092	0.3675	0.3591	0.3174	0.3174	0.3090	0.3341	0.3591	0.3758	0.3925 (22b)
	0.5907	0.5872	0.5837	0.5675	0.5645	0.5504	0.5504	0.5477	0.5558	0.5645	0.5706	0.5770 (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			6.7200	1.1450	7.6947		(27)
Heatloss Floor 1			39.4500	0.1300	5.1285		(28b)
External Wall 1	17.7000	6.7200	10.9800	0.1800	1.9764		(29a)
Corridor wall	21.7600	2.4200	19.3400	0.1800	3.4812		(29a)
Total net area of external elements Aum(A, m2)			78.9100				(31)
Fabric heat loss, W/K = Sum (A x U)					20.7008		(33)
Main dwelling							
Party Wall 1			32.6800	0.0000	0.0000		(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							265.4730 (35)

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

List of Thermal Bridges

K1 Element	Length	Psi-value	Total
E1 Steel lintel with perforated steel base plate	4.4100	0.0500	0.2205
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)	2.9200	0.0700	0.2044
E7 Party floor between dwellings (in blocks of flats)	7.7700	0.0700	0.5439
E9 Balcony between dwellings, wall insulation continuous	3.4000	0.0200	0.0680
E9 Balcony between dwellings, wall insulation continuous	3.4000	0.0200	0.0680
E16 Corner (normal)	5.6000	0.0900	0.5040
E17 Corner (inverted - internal area greater than external area)	5.6000	-0.0900	-0.5040
E18 Party wall between dwellings	5.6000	0.0600	0.3360
E20 Exposed floor (normal)	2.9200	0.3200	0.9344
E21 Exposed floor (inverted)	7.7700	0.3200	2.4864
E25 Staggered party wall between dwellings	5.6000	0.0600	0.3360
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	11.6700	0.0000	0.0000
P7 Party Wall - Exposed floor (normal)	11.6700	0.1600	1.8672
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			7.7743 (36)
Point Thermal bridges			(36a) = 0.0000
Total fabric heat loss			(33) + (36) + (36a) = 28.4751 (37)

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

Point Thermal bridges

Total fabric heat loss

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

(38)m	Jan 21.5326	Feb 21.4042	Mar 21.2783	Apr 20.6871	May 20.5765	Jun 20.0617	Jul 20.0617	Aug 19.9663	Sep 20.2600	Oct 20.5765	Nov 20.8003	Dec 21.0342 (38)
Heat transfer coeff	50.0076	49.8792	49.7534	49.1622	49.0516	48.5367	48.5367	48.4414	48.7350	49.0516	49.2754	49.5093 (39)
Average = Sum(39)m / 12 =												49.1617

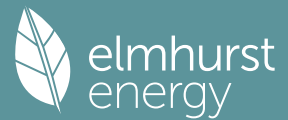
HLP	Jan 1.2676	Feb 1.2644	Mar 1.2612	Apr 1.2462	May 1.2434	Jun 1.2303	Jul 1.2303	Aug 1.2279	Sep 1.2354	Oct 1.2434	Nov 1.2491	Dec 1.2550 (40)
HLP (average)												1.2462
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.3918 (42)
Hot water usage for mixer showers	47.5552	46.8406	45.7992	43.8066	42.3362	40.6964	39.7643	40.7978	41.9307	43.6914	45.7267	47.3730 (42a)
Hot water usage for baths	20.5735	20.2680	19.8377	19.0444	18.4503	17.7916	17.4358	17.8631	18.3283	19.0331	19.8428	20.5040 (42b)
Hot water usage for other uses	28.8834	27.8331	26.7828	25.7325	24.6822	23.6319	23.6319	24.6822	25.7325	26.7828	27.8331	28.8834 (42c)
Average daily hot water use (litres/day)												89.1769 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	97.0121	94.9416	92.4197	88.5835	85.4687	82.1198	80.8320	83.3431	85.9915	89.5073	93.4026	96.7604 (44)
Energy content (annual)	153.6435	135.1956	142.0456	121.2663	115.0573	100.9759	97.7593	103.1961	106.0361	121.4606	133.0692	151.5034 (45)
Distribution loss (46)m = 0.15 x (45)m	23.0465	20.2793	21.3068	18.1900	17.2586	15.1464	14.6639	15.4794	15.9054	18.2191	19.9604	22.7255 (46)
Water storage loss (or HIU loss):												
Store volume												180.0000 (47)
a) If manufacturer declared loss factor is known (kWh/day):												1.5520 (48)
Temperature factor from Table 2b												0.5400 (49)
Enter (49) or (54) in (55)												0.8381 (55)
Total storage loss	25.9803	23.4661	25.9803	25.1422	25.9803	25.1422	25.9803	25.9803	25.1422	25.9803	25.1422	25.9803 (56)
If cylinder contains dedicated solar storage	25.9803	23.4661	25.9803	25.1422	25.9803	25.1422	25.9803	25.9803	25.1422	25.9803	25.1422	25.9803 (57)
Primary loss	23.2624	21.0112	23.2624	22.5120	23.2624	22.5120	23.2624	23.2624	22.5120	23.2624	22.5120	23.2624 (59)
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (61)
Total heat required for water heating calculated for each month	202.8862	179.6729	191.2882	168.9205	164.2999	148.6301	147.0019	152.4388	153.6903	170.7032	180.7234	200.7461 (62)
WWHRS	-21.7403	-19.2273	-20.1337	-16.6715	-15.5372	-13.2953	-12.4622	-13.2523	-13.7558	-16.2166	-18.3715	-21.3377 (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	181.1459	160.4456	171.1545	152.2490	148.7627	135.3348	134.5397	139.1864	139.9345	154.4866	162.3519	179.4084 (64)
12Total per year (kWh/year)								Total per year (kWh/year) = Sum(64)m =				1859.0001 (64)
Electric shower(s)												1859 (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	90.4806	80.5343	86.6243	78.4444	77.6507	71.6979	71.8991	73.7068	73.3804	79.7798	82.3689	89.7690 (65)

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

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Metabolic gains (Table 5), Watts												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5												
	62.4815	69.1759	62.4815	64.5642	62.4815	64.5642	62.4815	62.4815	64.5642	62.4815	64.5642	62.4815 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5												
	120.1527	121.3995	118.2576	111.5688	103.1254	95.1898	89.8884	88.6416	91.7835	98.4723	106.9156	114.8512 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5												
	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590 (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	3.0000 (70)
Losses e.g. evaporation (negative values) (Table 5)												
	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718 (71)
Water heating gains (Table 5)												
	121.6137	119.8428	116.4305	108.9506	104.3692	99.5803	96.6386	99.0683	101.9172	107.2309	114.4012	120.6573 (72)
Total internal gains												
	351.1248	357.2951	344.0465	331.9605	316.8530	303.2113	292.8854	294.0683	302.1418	315.0616	332.7580	344.8669 (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
Northeast				6.7200	11.2829		0.6300		0.7000		0.7700	23.1720 (75)
Solar gains	23.1720	47.1673	84.9804	139.5622	187.5990	200.0004	187.0963	149.1553	103.5500	57.6421	29.1564	18.9234 (83)
Total gains	374.2968	404.4624	429.0269	471.5227	504.4521	503.2118	479.9817	443.2237	405.6918	372.7037	361.9143	363.7903 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												
Utilisation factor for gains for living area, nil,m (see Table 9a)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	58.1740	58.3237	58.4713	59.1744	59.3078	59.9369	59.9369	60.0549	59.6930	59.3078	59.0385	58.7595
alpha	4.8783	4.8882	4.8981	4.9450	4.9539	4.9958	4.9958	5.0037	4.9795	4.9539	4.9359	4.9173
util living area	0.9889	0.9823	0.9667	0.9122	0.7876	0.5948	0.4406	0.4946	0.7463	0.9327	0.9793	0.9903 (86)
MIT	19.8195	19.9694	20.2205	20.5803	20.8499	20.9711	20.9947	20.9908	20.9145	20.5857	20.1583	19.8004 (87)
Th 2	20.3662	20.3678	20.3694	20.3769	20.3783	20.3848	20.3848	20.3860	20.3823	20.3783	20.3755	20.3725 (88)
util rest of house	0.9870	0.9793	0.9607	0.8969	0.7545	0.5442	0.3808	0.4318	0.6987	0.9178	0.9752	0.9886 (89)
MIT 2	19.2644	19.4142	19.6632	20.0168	20.2634	20.3671	20.3824	20.3817	20.3243	20.0276	19.6084	19.2504 (90)
Living area fraction									fLA = Living area / (4) =			0.7726 (91)
MIT	19.6933	19.8431	20.0938	20.4522	20.7166	20.8338	20.8555	20.8523	20.7803	20.4588	20.0332	19.6754 (92)
Temperature adjustment												0.0000
adjusted MIT	19.6933	19.8431	20.0938	20.4522	20.7166	20.8338	20.8555	20.8523	20.7803	20.4588	20.0332	19.6754 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9845	0.9763	0.9578	0.8989	0.7730	0.5815	0.4267	0.4797	0.7301	0.9199	0.9726	0.9864 (94)
Useful gains	368.5072	394.8812	410.9129	423.8455	389.9570	292.5936	204.7922	212.6211	296.1847	342.8539	351.9909	358.8260 (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	769.7831	745.3518	676.3375	567.9300	442.2778	302.5672	206.5458	215.6744	325.5637	483.5913	637.2903	766.1744 (97)
Space heating kWh	298.5493	235.5163	197.4759	103.7409	38.9267	0.0000	0.0000	0.0000	0.0000	104.7086	205.4156	303.0672 (98a)
Space heating requirement - total per year (kWh/year)												
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)												
Space heating kWh	298.5493	235.5163	197.4759	103.7409	38.9267	0.0000	0.0000	0.0000	0.0000	104.7086	205.4156	303.0672 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												
Space heating per m ²										(98c) / (4) =		37.7034 (99)

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

Fraction of space heat from secondary/supplementary system (Table 11)												
Fraction of space heat from main system(s)												
Efficiency of main space heating system 1 (in %)												
Efficiency of main space heating system 2 (in %)												
Efficiency of secondary/supplementary heating system, %												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Space heating requirement	298.5493	235.5163	197.4759	103.7409	38.9267	0.0000	0.0000	0.0000	0.0000	104.7086	205.4156	303.0672 (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)	323.4553	255.1639	213.9501	112.3953	42.1741	0.0000	0.0000	0.0000	0.0000	113.4438	222.5521	328.3502 (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												
	181.1459	160.4456	171.1545	152.2490	148.7627	135.3348	134.5397	139.1864	139.9345	154.4866	162.3519	179.4084 (64)
Efficiency of water heater												79.8000 (216)
(217)m	85.1725	84.9192	84.3814	83.2180	81.5134	79.8000	79.8000	79.8000	79.8000	83.2068	84.5885	85.2258 (217)
Fuel for water heating, kWh/month	212.6811	188.9391	202.8344	182.9520	182.5008	169.5925	168.5961	174.4191	175.3565	185.6659	191.9314	210.5095 (219)

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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	0.0000	(221)
Pumps and Fa	7.3041	6.5973	7.3041	7.0685	7.3041	7.0685	7.3041	7.0685	7.3041	7.0685	7.3041	7.0685	7.3041	(231)
Lighting	12.9824	10.4150	9.3775	6.8704	5.3069	4.3358	4.8411	6.2927	8.1735	10.7241	12.1129	13.3432	13.3432	(232)
Electricity generated by PVs (Appendix M) (negative quantity)														
(233a)m	-3.3182	-5.2179	-8.3556	-10.5040	-12.3586	-11.9306	-11.7929	-10.6083	-8.7291	-6.4227	-3.8360	-2.8099	-2.8099	(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	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	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	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)														
(233b)m	-0.5326	-1.1758	-2.4442	-3.8348	-5.2343	-5.3151	-5.2466	-4.3611	-3.0969	-1.7268	-0.7253	-0.4168	-0.4168	(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	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	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	0.0000	(235d)
Annual totals kWh/year														
Space heating fuel - main system 1													1611.4848	(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													2245.9784	(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)													104.7755	(232)
Energy saving/generation technologies (Appendices M ,N and Q)														
PV generation													-129.9943	(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													3918.2444	(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	1611.4848	0.2100	338.4118	(261)
Total CO2 associated with community systems			0.0000	(373)
Water heating (other fuel)	2245.9784	0.2100	471.6555	(264)
Space and water heating			810.0673	(265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293	(267)
Energy for lighting	104.7755	0.1443	15.1223	(268)
Energy saving/generation technologies				
PV Unit electricity used in dwelling	-95.8839	0.1324	-12.6921	
PV Unit electricity exported	-34.1105	0.1247	-4.2528	
Total			-16.9449	(269)
Total CO2, kg/year			820.1740	(272)
EPC Target Carbon Dioxide Emission Rate (TER)			20.7900	(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	1611.4848	1.1300	1820.9778	(275)
Total CO2 associated with community systems			0.0000	(473)
Water heating (other fuel)	2245.9784	1.1300	2537.9556	(278)
Space and water heating			4358.9335	(279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008	(281)
Energy for lighting	104.7755	1.5338	160.7082	(282)
Energy saving/generation technologies				
PV Unit electricity used in dwelling	-95.8839	1.4891	-142.7792	
PV Unit electricity exported	-34.1105	0.4576	-15.6088	
Total			-158.3880	(283)
Total Primary energy kWh/year			4491.3545	(286)
Target Primary Energy Rate (TPER)			113.8500	(287)

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Plot Reference	B 105	Issued on Date	19/03/2026
Assessment Reference	Be Green	Plot Type Ref	
Plot Address		SAP Version	10.2
SAP Rating	81 B	DER	6.68
Environmental	96 A	TER	20.79
CO ₂ Emissions (t/year)	0.24	% DER < TER	67.87
Compliance Check	See BREL	DFEE	40.99
% DPER < TPER	37.72	TFEE	47.37
		% DFEE < TFEE	13.47
		TPER	113.85
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	39.4500 (1b)	2.8000 (2b)	110.4600 (1b) - (3b)
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	39.4500		110.4600 (4)
Dwelling volume			110.4600 (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) = 0.1811 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	3.0000 (17)
Infiltration rate	0.3311 (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) = 0.2566 (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	0.3271	0.3207	0.3143	0.2822	0.2758	0.2437	0.2437	0.2373	0.2566	0.2758	0.2886	0.3015 (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	0.5535	0.5514	0.5494	0.5398	0.5380	0.5297	0.5297	0.5282	0.5329	0.5380	0.5417	0.5454 (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							
Windows			6.7200	1.1450	7.6947		(27)
Door			2.4200	1.0000	2.4200		(26)
Heatloss Floor 1			39.4500	0.1000	3.9450	110.0000	4339.5000 (28b)
External Wall 1	17.7000	6.7200	10.9800	0.1500	1.6470	70.0000	768.6001 (29a)
Corridor wall	21.7600	2.4200	19.3400	0.1900	3.6746	70.0000	1353.8000 (29a)
Total net area of external elements Aum(A, m ²)			78.9100				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 19.3813		(33)
Main dwelling							
Party Wall 1			32.6800	0.0000	0.0000	70.0000	2287.6000 (32)
Party Ceiling 1			39.4500			30.0000	1183.5000 (32b)
Internal Wall 1			59.9900			9.0000	539.9100 (32c)
Heat capacity Cm = Sum(A x k)							(28)...(30) + (32) + (32a)...(32e) = 10472.9101 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							265.4730 (35)
List of Thermal Bridges							
K1 Element					Length	Psi-value	Total
E1 Steel lintel with perforated steel base plate					4.4100	0.0500	0.2205
E3 Sill					1.5900	0.0400	0.0636

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7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)
Utilisation factor for gains for living area, nil,m (see Table 9a)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	66.0806	66.1945	66.3065	66.8377	66.9381	67.4091	67.4091	67.4971	67.2269	66.9381	66.7354	66.5248
alpha	5.4054	5.4130	5.4204	5.4558	5.4625	5.4939	5.4939	5.4998	5.4818	5.4625	5.4490	5.4350
util living area	0.9970	0.9950	0.9905	0.9705	0.9068	0.7456	0.5714	0.6289	0.8648	0.9765	0.9940	0.9975 (86)
MIT	19.7929	19.9160	20.1240	20.4533	20.7533	20.9419	20.9889	20.9817	20.8636	20.4979	20.1006	19.7729 (87)
Th 2	19.9878	19.9894	19.9909	19.9981	19.9995	20.0058	20.0058	20.0069	20.0033	19.9995	19.9968	19.9939 (88)
util rest of house	0.9960	0.9932	0.9869	0.9582	0.8673	0.6553	0.4492	0.5048	0.7960	0.9643	0.9915	0.9966 (89)
MIT 2	18.8961	19.0199	19.2275	19.5548	19.8311	19.9795	20.0031	20.0019	19.9285	19.6024	19.2098	18.8810 (90)
Living area fraction									fLA = Living area / (4) =			
MIT	19.5889	19.7123	19.9201	20.2490	20.5436	20.7231	20.7647	20.7589	20.6510	20.2943	19.8981	19.5701 (92)
Temperature adjustment												0.0000
adjusted MIT	19.5889	19.7123	19.9201	20.2490	20.5436	20.7231	20.7647	20.7589	20.6510	20.2943	19.8981	19.5701 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9955	0.9926	0.9865	0.9617	0.8905	0.7223	0.5435	0.6002	0.8435	0.9685	0.9911	0.9961 (94)
Useful gains	271.5504	291.0535	299.0386	314.4558	304.1697	246.0750	176.5592	182.5620	240.3681	257.6466	260.7273	264.0412 (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	673.0823	650.9751	588.7972	493.9692	384.3456	264.2518	179.7343	187.8706	283.4842	421.3148	557.8967	672.1375 (97)
Space heating kWh	298.7397	241.8673	215.5805	129.2497	59.6509	0.0000	0.0000	0.0000	0.0000	121.7692	213.9620	303.6236 (98a)
Space heating requirement - total per year (kWh/year)												1584.4428
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	298.7397	241.8673	215.5805	129.2497	59.6509	0.0000	0.0000	0.0000	0.0000	121.7692	213.9620	303.6236 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1584.4428
Space heating per m2												(98c) / (4) = 40.1633 (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	405.6711	319.3581	327.5620	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.8120	0.8907	0.8563	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	329.4190	284.4646	280.5003	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	375.9084	358.8114	335.6912	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	33.4724	55.3140	41.0621	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	8.3681	13.8285	10.2655	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												32.4621 (107)
Energy for space heating												40.1633 (99)
Energy for space cooling												0.8229 (108)
Total												40.9862 (109)
Fabric Energy Efficiency (DFEE)												41.0 (109)

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

1. Overall dwelling characteristics

	Area (m2)	Storey height (m)	Volume (m3)
Main dwelling	39.4500 (1b)	x 2.8000 (2b)	= 110.4600 (1b) - (3b)
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	39.4500		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 110.4600 (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)

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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	
Pressure test												20.0000 / (5) =	0.1811 (8)
Pressure Test Method												Yes	
Measured/design AP50												Blower Door	
Infiltration rate												5.0000	(17)
Number of sides sheltered												0.4311	(18)
												3	(19)
Shelter factor												(20) = 1 - [0.075 x (19)] =	0.7750 (20)
Infiltration rate adjusted to include shelter factor												(21) = (18) x (20) =	0.3341 (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)
	0.4259	0.4176	0.4092	0.3675	0.3591	0.3174	0.3174	0.3090	0.3341	0.3591	0.3758	0.3925	(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	0.5907	0.5872	0.5837	0.5675	0.5645	0.5504	0.5504	0.5477	0.5558	0.5645	0.5706	0.5770	(25)

3. Heat losses and heat loss parameter

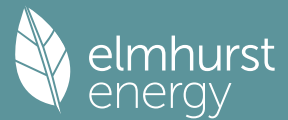
Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K
Main dwelling							
TER Opaque door			2.4200	1.0000	2.4200		(26)
TER Opening Type			6.7200	1.1450	7.6947		(27)
Heatloss Floor 1			39.4500	0.1300	5.1285		(28b)
External Wall 1	17.7000	6.7200	10.9800	0.1800	1.9764		(29a)
Corridor wall	21.7600	2.4200	19.3400	0.1800	3.4812		(29a)
Total net area of external elements Aum(A, m2)			78.9100				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	20.7008		(33)
Main dwelling							
Party Wall 1			32.6800	0.0000	0.0000		(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							265.4730 (35)
List of Thermal Bridges							
K1 Element				Length	Psi-value	Total	
E1 Steel lintel with perforated steel base plate				4.4100	0.0500	0.2205	
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)				2.9200	0.0700	0.2044	
E7 Party floor between dwellings (in blocks of flats)				7.7700	0.0700	0.5439	
E9 Balcony between dwellings, wall insulation continuous				3.4000	0.0200	0.0680	
E9 Balcony between dwellings, wall insulation continuous				3.4000	0.0200	0.0680	
E16 Corner (normal)				5.6000	0.0900	0.5040	
E17 Corner (inverted - internal area greater than external area)				5.6000	-0.0900	-0.5040	
E18 Party wall between dwellings				5.6000	0.0600	0.3360	
E20 Exposed floor (normal)				2.9200	0.3200	0.9344	
E21 Exposed floor (inverted)				7.7700	0.3200	2.4864	
E25 Staggered party wall between dwellings				5.6000	0.0600	0.3360	
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)				11.6700	0.0000	0.0000	
P7 Party Wall - Exposed floor (normal)				11.6700	0.1600	1.8672	
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							7.7743 (36)
Point Thermal bridges						(36a) =	0.0000
Total fabric heat loss						(33) + (36) + (36a) =	28.4751 (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	21.5326	21.4042	21.2783	20.6871	20.5765	20.0617	20.0617	19.9663	20.2600	20.5765	20.8003	21.0342	(38)
Average = Sum(39)m / 12 =	50.0076	49.8792	49.7534	49.1622	49.0516	48.5367	48.5367	48.4414	48.7350	49.0516	49.2754	49.5093	(39)
													49.1617
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP (average)	1.2676	1.2644	1.2612	1.2462	1.2434	1.2303	1.2303	1.2279	1.2354	1.2434	1.2491	1.2550	(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												1.3918	(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	20.5735	20.2680	19.8377	19.0444	18.4503	17.7916	17.4358	17.8631	18.3283	19.0331	19.8428	20.5040	(42b)
Hot water usage for other uses	28.8834	27.8331	26.7828	25.7325	24.6822	23.6319	23.6319	24.6822	25.7325	26.7828	27.8331	28.8834	(42c)
Average daily hot water use (litres/day)													45.3325 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Energy conte	49.4569	48.1011	46.6205	44.7768	43.1325	41.4235	41.0677	42.5452	44.0608	45.8159	47.6759	49.3874	(44)
Energy content (annual)	78.3277	68.4953	71.6540	61.2973	58.0646	50.9350	49.6678	52.6799	54.3313	62.1717	67.9230	77.3287	(45)
Distribution loss (46)m = 0.15 x (45)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(46)
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	(56)
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	(57)
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	(59)
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	(61)
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	(62)
Total heat required for water heating calculated for each month	66.5785	58.2210	60.9059	52.1027	49.3549	43.2947	42.2176	44.7779	46.1816	52.8460	57.7346	65.7294	(63a)
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	(63b)
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	(63c)
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	(63d)
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	(64)
Output from w/h	66.5785	58.2210	60.9059	52.1027	49.3549	43.2947	42.2176	44.7779	46.1816	52.8460	57.7346	65.7294	(64)
Total per year (kWh/year) = Sum(64)m =													639.9448 (64)

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12Total per year (kWh/year)	640 (64)										
Electric shower(s)	Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =										
	38.0838	33.9330	37.0535	35.3597	36.0232	34.3627	35.5081	36.0232	35.3597	37.0535	36.3568
Heat gains from water heating, kWh/month	26.1656	23.0385	24.4898	21.8656	21.3445	19.4144	19.4314	20.2003	20.3853	22.4749	23.5228
	25.9533 (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
	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898	69.5898
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	62.4815	69.1759	62.4815	64.5642	62.4815	64.5642	62.4815	62.4815	64.5642	62.4815	64.5642
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	120.1527	121.3995	118.2576	111.5688	103.1254	95.1898	89.8884	88.6416	91.7835	98.4723	106.9156
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590	29.9590
Pumps, fans	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Losses e.g. evaporation (negative values) (Table 5)	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718	-55.6718
Water heating gains (Table 5)	35.1688	34.2835	32.9165	30.3689	28.6889	26.9644	26.1175	27.1509	28.3130	30.2082	32.6706
Total internal gains	261.6799	268.7358	257.5324	250.3788	238.1727	230.5953	222.3643	222.1509	228.5376	235.0388	248.0274
	256.0931 (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		
Northeast				6.7200	11.2829		0.6300		0.7000		0.7700		23.1720 (75)
Solar gains	23.1720	47.1673	84.9804	139.5622	187.5990	200.0004	187.0963	149.1553	103.5500	57.6421	29.1564	18.9234 (83)	
Total gains	284.8519	315.9031	342.5128	389.9411	425.7718	430.5958	409.4606	371.3063	332.0876	292.6810	277.1837	275.0165 (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
tau	58.1740	58.3237	58.4713	59.1744	59.3078	59.9369	59.9369	60.0549	59.6930	59.3078	59.0385
alpha	4.8783	4.8882	4.8981	4.9450	4.9539	4.9958	4.9958	5.0037	4.9795	4.9539	4.9359
util living area	0.9965	0.9936	0.9862	0.9536	0.8594	0.6756	0.5117	0.5806	0.8379	0.9718	0.9931
	0.9971 (86)										
MIT	19.6005	19.7575	20.0250	20.4317	20.7699	20.9496	20.9897	20.9814	20.8519	20.4246	19.9567
Th 2	19.8663	19.8689	19.8714	19.8832	19.8854	19.8958	19.8958	19.8977	19.8918	19.8854	19.8810
util rest of house	0.9953	0.9913	0.9808	0.9351	0.8067	0.5778	0.3885	0.4514	0.7587	0.9569	0.9902
MIT 2	18.6098	18.7678	19.0344	19.4365	19.7375	19.8747	19.8935	19.8930	19.8144	19.4383	18.9760
Living area fraction	19.3753	19.5324	19.7997	20.2054	20.5351	20.7052	20.7404	20.7340	20.6160	20.2004	19.7337
MIT	19.3753	19.5324	19.7997	20.2054	20.5351	20.7052	20.7404	20.7340	20.6160	20.2004	19.7337
Temperature adjustment	0.0000										
adjusted MIT	19.3753	19.5324	19.7997	20.2054	20.5351	20.7052	20.7404	20.7340	20.6160	20.2004	19.7337
	19.3580 (93)										

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	0.9946	0.9905	0.9804	0.9411	0.8393	0.6511	0.4836	0.5508	0.8136	0.9619	0.9897	0.9954
Useful gains	283.3102	312.8925	335.8094	366.9792	357.3590	280.3423	197.9991	204.5043	270.1862	281.5223	274.3262	273.7620
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	753.8775	729.8550	661.7064	555.7993	433.3774	296.3277	200.9637	209.9432	317.5588	470.9128	622.5321	750.4637
Space heating kWh	350.1021	280.1988	242.4673	135.9504	56.5577	0.0000	0.0000	0.0000	0.0000	140.9065	250.7083	354.6661
Space heating requirement - total per year (kWh/year)	1811.5572											
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
Solar heating contribution - total per year (kWh/year)	0.0000											
Space heating kWh	350.1021	280.1988	242.4673	135.9504	56.5577	0.0000	0.0000	0.0000	0.0000	140.9065	250.7083	354.6661
Space heating requirement after solar contribution - total per year (kWh/year)	1811.5572											
Space heating per m2	(98c) / (4) =											
	45.9203 (99)											

8c. Space cooling requirement

Calculated for June, July and August. See Table 10b												
Ext. temp.	Jan 4.3000	Feb 4.9000	Mar 6.5000	Apr 8.9000	May 11.7000	Jun 14.6000	Jul 16.6000	Aug 16.4000	Sep 14.1000	Oct 10.6000	Nov 7.1000	Dec 4.2000
Heat loss rate W												
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	456.2452	359.1717	368.1544	0.0000	0.0000	0.0000	0.0000 (100)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.8543	0.9162	0.8783	0.0000	0.0000	0.0000	0.0000 (101)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	389.7752	329.0608	323.3563	0.0000	0.0000	0.0000	0.0000 (102)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	480.8509	457.4489	414.0460	0.0000	0.0000	0.0000	0.0000 (103)
Cooled fraction	0.0000	0.0000	0.0000	0.0000	0.0000	65.5745	95.5207	67.4732	0.0000	0.0000	0.0000	0.0000 (104)
Intermittency factor (Table 10b)	fc = cooled area / (4) = 1.0000 (105)											
Space cooling kWh	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 requirement	0.0000	0.0000	0.0000	0.0000	0.0000	16.3936	23.8802	16.8683	0.0000	0.0000	0.0000	0.0000 (107)
												57.1421 (107)

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Energy for space heating
Energy for space cooling
Total
Fabric Energy Efficiency (TFEE)

45.9203 (99)
1.4485 (108)
47.3688 (109)
47.4 (109)