

Summary for Input Data

Plot Reference	B 1205	Issued on Date	19/03/2026
Assessment Reference	Be Green	Plot Type Ref	
Plot Address		SAP Version	10.2

SAP Rating	83 B	DER	4.92	TER	14.48
Environmental	96 A	% DER < TER			66.02
CO ₂ Emissions (t/year)	0.31	DFEE	33.50	TFEE	34.99
Compliance Check	See BREL	% DFEE < TFEE			4.28
% DPER < TPER	34.09	DPER	52.07	TPER	79.01

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, Semi-Detached	
Position of Flat	Mid-floor flat	
Which Floor	12	
2.0 Number of Storeys	1	
3.0 Date Built	2026	
4.0 Sheltered Sides	2	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	177.19	kJ/m²K
7.0 Electricity Tariff	Standard	
Smart electricity meter fitted	Yes	
Smart gas meter fitted	Yes	

7.0 Measurements		Heat Loss Perimeter	Internal Floor Area	Average Storey Height
	Ground floor:	29.34 m	70.49 m ²	2.80 m

8.0 Living Area	32.21	m ²
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Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Res	Shelter	Openings	Area Calculation Type
External Wall 1	Cavity Wall	Cavity wall : dense plaster, AAC block, filled cavity, any outside structure	0.15	70.00	48.86	36.07	0.00	None	12.79	Enter Gross Area
Corridor wall	Cavity Wall	Cavity wall : dense plaster, AAC block, filled cavity, any outside structure	0.22	70.00	33.29	30.87	0.90	Stairwell Access Corridor 4	2.42	Enter Gross Area

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)	Shelter Res	Shelter
Party Wall 1	Filled Cavity with Edge Sealing	Single plasterboard on dabs on both sides, dense blocks, cavity or cavity fill	0.00	70.00	18.37	0.00	None

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall 1	Plasterboard on timber frame	9.00	175.99

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Party Ceiling 1	Precast concrete planks floor, screed, carpeted	30.00	70.49

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 70.49

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	South West	2.42	
SE Windows	Window	External Wall 1	South East	2.39	
NE windows	Window	External Wall 1	North East	10.40	

14.0 Conservatory

None

15.0 Draught Proofing

100 %

16.0 Draught Lobby

No

17.0 Thermal Bridging

Calculate Bridges

17.1 List of Bridges

Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported
E1 Steel lintel with perforated steel base plate	Independently assessed	8.05	0.05	0.05	No
E3 Sill	Independently assessed	4.55	0.04	0.04	No
E4 Jamb	Independently assessed	24.60	0.04	0.04	No
E7 Party floor between dwellings (in blocks of flats)	Independently assessed	28.10	0.05	0.05	No
E7 Party floor between dwellings (in blocks of flats)	Independently assessed	23.78	0.04	0.04	No
E9 Balcony between dwellings, wall insulation continuous	Independently assessed	6.80	0.05	0.05	No
E16 Corner (normal)	Independently assessed	5.60	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	2.80	0.05	0.05	No
E18 Party wall between dwellings	Independently assessed	2.80	0.04	0.04	No
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	Table K1 - Default	13.12	0.00	0.00	No

Y-value 0.06 W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation

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

20.0 Fans, Open Fireplaces, Flues

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

Summary for Input Data

21.0 Fixed Cooling System		No	
22.0 Pressure Testing		Yes	
Designed AP ₅₀	3.00	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	Count	
	1125.00	7	
24.0 Main Heating 1		None	
25.0 Main Heating 2		None	
26.0 Heat Networks		Space and Water Combined	
Space Community Heating			
Distribution Loss	Calculated		
Distribution Loss Value	1.50		
SAP Code	2306		
	Heat Source	Fuel Type	Heating Use
	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	Percentage Of Heat	Heat
	232.00	100.00	
	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 1	Combi boiler or unvented hot water system	8.00	
Shower 2	Combi boiler or unvented hot water system	8.00	
		Connected	Connected To
		No	No
28.3 Waste Water Heat Recovery System			
29.0 Hot Water Cylinder		Internal Store	
Insulation Type	Measured Loss		
Cylinder Volume	180.00		
Loss	1.20		
		L	kWh/day
32.0 Photovoltaic Unit		Multiple Dwellings – Not Connected	
Export Capable Meter?	No		
Connected To Dwelling	Yes		
Diverter	No		
Battery Capacity [kWh]	0.00		

Summary for Input Data



PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Overshading Factor	MCS Certificate Reference	Panel Manufacturer
0.34	North West	Horizontal	Modest		No	0.80		

34.0 Small-scale Hydro

None

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

Lower cost measures

None

Further measures to achieve even higher standards

None

Full SAP Calculation Printout



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Compliance Check	See BREL	% DFEE < TFEE				4.28	
% DPER < TPER	34.09	DPER	52.07	TPER	79.01		
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	70.4900 (1b)	2.8000 (2b)	197.3720 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	70.4900		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	197.3720 (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	2	(19)

Shelter factor	(20) = 1 - [0.075 x (19)] =	0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =	0.1275 (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	0.1626	0.1594	0.1562	0.1403	0.1371	0.1211	0.1211	0.1179	0.1275	0.1371	0.1434	0.1498 (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	0.2621	0.2589	0.2557	0.2397	0.2366	0.2206	0.2206	0.2174	0.2270	0.2366	0.2429	0.2493 (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			12.7900	1.1450	14.6450		(27)
External Wall 1	48.8600	12.7900	36.0700	0.1500	5.4105	70.0000	2524.9000 (29a)
Corridor wall	33.2900	2.4200	30.8700	0.1800	5.5566	70.0000	2160.9001 (29a)
Total net area of external elements Aum(A, m ²)			82.1500				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	28.0321	(33)
Main dwelling							
Party Wall 1			18.3700	0.0000	0.0000	70.0000	1285.9001 (32)
Party Floor 1			70.4900			40.0000	2819.6000 (32d)
Party Ceiling 1			70.4900			30.0000	2114.7000 (32b)
Internal Wall 1			175.9900			9.0000	1583.9100 (32c)

Heat capacity Cm = Sum(A x k)	(28)...(30) + (32) + (32a)...(32e) =	12489.9102 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K		177.1870 (35)
List of Thermal Bridges		

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K1 Element	Length	Psi-value	Total
E1 Steel lintel with perforated steel base plate	8.0500	0.0500	0.4025
E3 Sill	4.5500	0.0400	0.1820
E4 Jamb	24.6000	0.0400	0.9840
E7 Party floor between dwellings (in blocks of flats)	28.1000	0.0500	1.4050
E7 Party floor between dwellings (in blocks of flats)	23.7800	0.0360	0.8561
E9 Balcony between dwellings, wall insulation continuous	6.8000	0.0500	0.3400
E16 Corner (normal)	5.6000	0.0500	0.2800
E16 Corner (normal)	5.6000	0.0360	0.2016
E17 Corner (inverted - internal area greater than external area)	5.6000	0.0000	0.0000
E18 Party wall between dwellings	2.8000	0.0500	0.1400
E18 Party wall between dwellings	2.8000	0.0360	0.1008
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	13.1200	0.0000	0.0000
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			4.8920 (36)
Point Thermal bridges			0.0000
Total fabric heat loss		(33) + (36) + (36a) =	32.9241 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(38)m	17.0689	16.8612	16.6536	15.6156	15.4080	14.3699	14.3699	14.1623	14.7851	15.4080	15.8232	16.2384	(38)
Heat transfer coeff	49.9930	49.7854	49.5778	48.5397	48.3321	47.2940	47.2940	47.0864	47.7093	48.3321	48.7473	49.1625	(39)
Average = Sum(39)m / 12 =												48.4878	
HLP	0.7092	0.7063	0.7033	0.6886	0.6857	0.6709	0.6709	0.6680	0.6768	0.6857	0.6915	0.6974	(40)
HLP (average)												0.6879	
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31	

4. Water heating energy requirements (kWh/year)

Assumed occupancy													2.2580 (42)
Hot water usage for mixer showers	60.5098	59.5834	58.2182	56.1179	54.2362	51.6036	49.5214	51.9556	53.1799	55.7874	58.5028	60.4553	(42a)
Hot water usage for baths	26.2210	25.8252	25.2621	24.4188	23.6589	22.6127	21.8189	22.7895	23.2989	24.3355	25.4133	26.2002	(42b)
Hot water usage for other uses	37.7538	36.3809	35.0081	33.6352	32.2623	30.8895	30.8895	32.2623	33.6352	35.0081	36.3809	37.7538	(42c)
Average daily hot water use (litres/day)												114.4201	(43)
Daily hot water use	124.4847	121.7896	118.4884	114.1720	110.1574	105.1057	102.2298	107.0075	110.1140	115.1310	120.2970	124.4093	(44)
Energy conte	183.2630	161.1523	169.3174	149.1371	141.9489	121.5513	112.9670	125.9498	127.7268	148.3579	162.5854	182.7042	(45)
Energy content (annual)										Total = Sum(45)m =		1786.6610	
Distribution loss (46)m = 0.15 x (45)m	27.4894	24.1728	25.3976	22.3706	21.2923	18.2327	16.9450	18.8925	19.1590	22.2537	24.3878	27.4056	(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	238.5398	211.0797	224.5942	202.6308	197.2257	175.0450	168.2438	181.2266	181.2204	203.6347	216.0791	237.9810	(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	238.5398	211.0797	224.5942	202.6308	197.2257	175.0450	168.2438	181.2266	181.2204	203.6347	216.0791	237.9810	(64)
12Total per year (kWh/year)										Total per year (kWh/year) = Sum(64)m =		2437.5007	(64)
Electric shower(s)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(64a)
												0.0000	(64a)
Heat gains from water heating, kWh/month	105.1564	93.5251	100.5195	92.3830	91.4195	83.2107	81.7830	86.0997	85.2641	93.5504	96.8546	104.9706	(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	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	102.0977	113.0367	102.0977	105.5010	102.0977	105.5010	102.0977	102.0977	105.5010	102.0977	105.5010	102.0977	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	198.4380	200.4971	195.3081	184.2613	170.3166	157.2106	148.4550	146.3959	151.5849	162.6317	176.5764	189.6824	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	(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)	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	(71)
Water heating gains (Table 5)	141.3392	139.1742	135.1068	128.3098	122.8756	115.5705	109.9233	115.7254	118.4223	125.7398	134.5203	141.0895	(72)
Total internal gains	498.7443	509.5775	489.3821	474.9415	452.1594	435.1515	417.3455	421.0885	432.3776	447.3387	473.4670	489.7390	(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
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Northeast				10.4000		11.2829		0.3500		0.7000		0.7700		19.9230 (75)		
Southeast				2.3900		36.7938		0.3500		0.7000		0.7700		14.9304 (77)		
Solar gains	34.8534	65.9859	107.8624	163.1095	209.5884	219.9017	207.0860	170.6022	126.7091	77.6679	42.9515	29.0475	(83)			
Total gains	533.5978	575.5634	597.2445	638.0509	661.7478	655.0532	624.4315	591.6907	559.0867	525.0066	516.4186	518.7865	(84)			
7. Mean internal temperature (heating season)																
Temperature during heating periods in the living area from Table 9, Th1 (C)													21.0000 (85)			
Utilisation factor for gains for living area, nil,m (see Table 9a)																
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec				
tau	69.3981	69.6875	69.9794	71.4759	71.7829	73.3585	73.3585	73.6820	72.7201	71.7829	71.1715	70.5704				
alpha	5.6265	5.6458	5.6653	5.7651	5.7855	5.8906	5.8906	5.9121	5.8480	5.7855	5.7448	5.7047				
util living area	0.9693	0.9511	0.9165	0.8147	0.6542	0.4594	0.3329	0.3655	0.5776	0.8335	0.9405	0.9726	(86)			
MIT	20.2994	20.4391	20.6212	20.8503	20.9632	20.9961	20.9995	20.9992	20.9860	20.8555	20.5748	20.2890	(87)			
Th 2	20.3327	20.3353	20.3379	20.3509	20.3535	20.3666	20.3666	20.3692	20.3614	20.3535	20.3483	20.3431	(88)			
util rest of house	0.9637	0.9425	0.9021	0.7876	0.6149	0.4149	0.2852	0.3156	0.5279	0.8031	0.9288	0.9675	(89)			
MIT 2	19.5195	19.6952	19.9205	20.1993	20.3213	20.3640	20.3664	20.3688	20.3510	20.2117	19.8758	19.5149	(90)			
Living area fraction	fLA = Living area / (4) =												0.4569 (91)			
MIT	19.8759	20.0351	20.2407	20.4967	20.6146	20.6528	20.6557	20.6569	20.6412	20.5059	20.1952	19.8686	(92)			
Temperature adjustment													0.0000			
adjusted MIT	19.8759	20.0351	20.2407	20.4967	20.6146	20.6528	20.6557	20.6569	20.6412	20.5059	20.1952	19.8686	(93)			
8. Space heating requirement																
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec				
Utilisation	0.9591	0.9381	0.8998	0.7940	0.6310	0.4351	0.3070	0.3384	0.5499	0.8106	0.9257	0.9632	(94)			
Useful gains	511.7902	539.9128	537.4096	506.5847	417.5815	285.0298	191.6823	200.2195	307.4331	425.5833	478.0446	499.6724	(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	778.6848	753.5064	681.2305	562.9022	430.8604	286.2629	191.8093	200.4399	312.0756	478.7735	638.3544	770.3076	(97)			
Space heating kWh	198.5696	143.5349	107.0027	40.5486	9.8795	0.0000	0.0000	0.0000	0.0000	39.5736	115.4231	201.3525	(98a)			
Space heating requirement - total per year (kWh/year)													855.8845			
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	198.5696	143.5349	107.0027	40.5486	9.8795	0.0000	0.0000	0.0000	0.0000	39.5736	115.4231	201.3525	(98c)			
Space heating requirement after solar contribution - total per year (kWh/year)													855.8845			
Space heating per m2											(98c) / (4) =			12.1419 (99)		
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																
	198.5696	143.5349	107.0027	40.5486	9.8795	0.0000	0.0000	0.0000	0.0000	39.5736	115.4231	201.3525	(98)			
Space heat from Heat pump = (98) x 1.00 x 1.00 x 1.50																
307a	297.8544	215.3023	160.5041	60.8229	14.8193	0.0000	0.0000	0.0000	0.0000	59.3603	173.1346	302.0288				
Space heating requirement																
	297.8544	215.3023	160.5041	60.8229	14.8193	0.0000	0.0000	0.0000	0.0000	59.3603	173.1346	302.0288	(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																
	238.5398	211.0797	224.5942	202.6308	197.2257	175.0450	168.2438	181.2266	181.2204	203.6347	216.0791	237.9810	(64)			
Water heat from Heat pump = (64) x 1.00 x 1.00 x 1.50																
310a	357.8096	316.6195	336.8914	303.9462	295.8386	262.5674	252.3656	271.8398	271.8306	305.4520	324.1187	356.9715				
Water heating fuel																
	357.8096	316.6195	336.8914	303.9462	295.8386	262.5674	252.3656	271.8398	271.8306	305.4520	324.1187	356.9715	(310)			
Cooling System Energy Efficiency Ratio																
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	(314)			
Pumps and Fa	15.5939	14.0848	15.5939	15.0908	15.5939	15.0908	15.5939	15.5939	15.0908	15.5939	15.0908	15.5939	(315)			
Lighting	21.7053	17.4128	15.6783	11.4866	8.8726	7.2490	8.0939	10.5207	13.6654	17.9297	20.2515	22.3086	(332)			
Electricity generated by PVs (Appendix M) (negative quantity)																
(333a)m	-3.7279	-6.6189	-12.2134	-17.1924	-21.4957	-21.2016	-20.7577	-17.8612	-13.4258	-8.6311	-4.4767	-3.0433	(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													1283.8267 (307)			
Space heating fuel - secondary													0.0000 (309)			
Water heating fuel - community heating													3656.2511 (310)			
Efficiency of water heater													0.0000 (311)			
Electricity used for heat distribution													12.8383 (313)			
Space cooling fuel													0.0000 (321)			
Electricity for pumps and fans:																
(BalancedWithHeatRecovery, Database: in-use factor = 1.2500, SFP = 0.7625)																
mechanical ventilation fans (SFP = 0.7625)													183.6053 (330a)			
Total electricity for the above, kWh/year													183.6053 (331)			
Electricity for lighting (calculated in Appendix L)													175.1742 (332)			

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Energy saving/generation technologies (Appendices M ,N and Q)	
PV generation	-150.6457 (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	5148.2116 (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	2129.3439	0.1571	86.9210 (367)
Electrical energy for heat distribution (space & water)	12.8383	0.0000	7.1650 (372)
Overall CO2 factor for heat network			0.0640 (386)
Total CO2 associated with community systems			316.0003 (373)
Space and water heating			316.0003 (376)
Pumps, fans and electric keep-hot	183.6053	0.1387	25.4683 (378)
Energy for lighting	175.1742	0.1443	25.2831 (379)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-150.6457	0.1305	-19.6638
PV Unit electricity exported	0.0000	0.0000	0.0000
Total			-19.6638 (380)
Total CO2, kg/year			347.0878 (383)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			4.9200 (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	2129.3439	1.5815	875.1642 (467)
Electrical energy for heat distribution (space & water)	12.8383	0.0000	75.9031 (472)
Overall CO2 factor for heat network			0.6776 (486)
Total CO2 associated with community systems			3347.5879 (473)
Space and water heating			3347.5879 (476)
Pumps, fans and electric keep-hot	183.6053	1.5128	277.7581 (478)
Energy for lighting	175.1742	1.5338	268.6881 (479)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-150.6457	1.4822	-223.2842
PV Unit electricity exported	0.0000	0.0000	0.0000
Total			-223.2842 (480)
Total Primary energy kWh/year			3670.7499 (483)
Dwelling Primary energy Rate (DPER)			52.0700 (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	70.4900 (1b)	x 2.8000 (2b)	= 197.3720 (1b) - (3b)
Ground floor			(4)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	70.4900		
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 197.3720 (5)

2. Ventilation rate

	m3 per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	3 * 10 = 30.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans	= (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) = 30.0000 / (5) = 0.1520 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	5.0000 (17)
Infiltration rate	0.4020 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.3417 (21)

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

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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	0.4357	0.4271	0.4186	0.3759	0.3673	0.3246	0.3246	0.3161	0.3417	0.3673	0.3844	0.4015 (22b)
Effective ac	0.5949	0.5912	0.5876	0.5706	0.5675	0.5527	0.5527	0.5500	0.5584	0.5675	0.5739	0.5806 (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			12.7900	1.1450	14.6450		(27)
External Wall 1	48.8600	12.7900	36.0700	0.1800	6.4926		(29a)
Corridor wall	33.2900	2.4200	30.8700	0.1800	5.5566		(29a)
Total net area of external elements Aum(A, m2)			82.1500				(31)
Fabric heat loss, W/K = Sum (A x U)				(26) ... (30) + (32) =	29.1142		(33)
Main dwelling							
Party Wall 1			18.3700	0.0000	0.0000		(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							177.1870 (35)

List of Thermal Bridges

K1 Element	Length	Psi-value	Total
E1 Steel lintel with perforated steel base plate	8.0500	0.0500	0.4025
E3 Sill	4.5500	0.0500	0.2275
E4 Jamb	24.6000	0.0500	1.2300
E7 Party floor between dwellings (in blocks of flats)	28.1000	0.0700	1.9670
E7 Party floor between dwellings (in blocks of flats)	23.7800	0.0700	1.6646
E9 Balcony between dwellings, wall insulation continuous	6.8000	0.0200	0.1360
E16 Corner (normal)	5.6000	0.0900	0.5040
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	2.8000	0.0600	0.1680
E18 Party wall between dwellings	2.8000	0.0600	0.1680
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	13.1200	0.0000	0.0000
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			6.4676 (36)
Point Thermal bridges			(36a) = 0.0000
Total fabric heat loss		(33) + (36) + (36a) =	35.5818 (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	38.7476	38.5076	38.2723	37.1672	36.9605	35.9980	35.9980	35.8198	36.3687	36.9605	37.3787	37.8160 (38)
Heat transfer coeff	74.3294	74.0894	73.8541	72.7491	72.5423	71.5798	71.5798	71.4016	71.9506	72.5423	72.9606	73.3979 (39)
Average = Sum(39)m / 12 =												72.7481
HLP	1.0545	1.0511	1.0477	1.0320	1.0291	1.0155	1.0155	1.0129	1.0207	1.0291	1.0350	1.0413 (40)
HLP (average)												1.0320
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

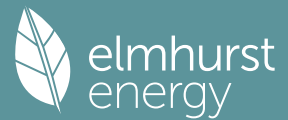
4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.2580 (42)
Hot water usage for mixer showers												
62.0782	61.1453	59.7859	57.1848	55.2653	53.1247	51.9080	53.2572	54.7361	57.0344	59.6914	61.8404 (42a)	
Hot water usage for baths												
26.8189	26.4206	25.8597	24.8255	24.0512	23.1925	22.7287	23.2857	23.8921	24.8109	25.8664	26.7282 (42b)	
Hot water usage for other uses												
37.7538	36.3809	35.0081	33.6352	32.2623	30.8895	30.8895	32.2623	33.6352	35.0081	36.3809	37.7538 (42c)	
Average daily hot water use (litres/day)												116.4210 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use												
126.6509	123.9469	120.6537	115.6456	111.5788	107.2067	105.5262	108.8051	112.2634	116.8534	121.9386	126.3224 (44)	
Energy content (annual)	200.5841	176.4987	185.4402	158.3130	150.2066	131.8231	127.6247	134.7235	138.4319	158.5689	173.7240	197.7904 (45)
Distribution loss (46)m = 0.15 x (45)m										Total = Sum(45)m =		1933.7292
30.0876	26.4748	27.8160	23.7470	22.5310	19.7735	19.1437	20.2085	20.7648	23.7853	26.0586	29.6686 (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												
249.8268	220.9759	234.6829	205.9672	199.4492	179.4773	176.8674	183.9662	186.0861	207.8116	221.3781	247.0331 (62)	
WWHRS	-28.3796	-25.0991	-26.2824	-21.7628	-20.2822	-17.3556	-16.2681	-17.2995	-17.9568	-21.1691	-23.9820	-27.8540 (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												
221.4472	195.8768	208.4005	184.2044	179.1670	162.1217	160.5993	166.6666	168.1294	186.6426	197.3962	219.1790 (64)	
12Total per year (kWh/year)												2249.8307 (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												
106.0884	94.2676	101.0530	90.7624	89.3378	81.9545	81.8294	84.1897	84.1520	92.1183	95.8866	105.1594 (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	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	102.0977	113.0367	102.0977	105.5010	102.0977	105.5010	102.0977	102.0977	105.5010	102.0977	105.5010	102.0977 (67)

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Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	198.4380	200.4971	195.3081	184.2613	170.3166	157.2106	148.4550	146.3959	151.5849	162.6317	176.5764	189.6824 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898 (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)	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185 (71)
Water heating gains (Table 5)	142.5919	140.2792	135.8239	126.0589	120.0777	113.8258	109.9857	113.1582	116.8777	123.8149	133.1758	141.3433 (72)
Total internal gains	502.9970	513.6825	493.0992	475.6906	452.3615	433.4068	417.4079	418.5212	430.8330	448.4138	475.1226	492.9928 (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				10.4000	11.2829	0.6300	0.7000	0.7700	35.8614 (75)			
Southeast				2.3900	36.7938	0.6300	0.7000	0.7700	26.8748 (77)			
Solar gains	62.7362	118.7746	194.1523	293.5970	377.2591	395.8231	372.7549	307.0840	228.0764	139.8022	77.3127	52.2854 (83)
Total gains	565.7332	632.4571	687.2515	769.2876	829.6206	829.2299	790.1628	725.6052	658.9094	588.2160	552.4353	545.2783 (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	46.6763	46.8275	46.9766	47.6902	47.8261	48.4692	48.4692	48.5902	48.2195	47.8261	47.5520	47.2687
alpha	4.1118	4.1218	4.1318	4.1793	4.1884	4.2313	4.2313	4.2393	4.2146	4.1884	4.1701	4.1512
util living area	0.9781	0.9642	0.9361	0.8571	0.7161	0.5314	0.3937	0.4439	0.6804	0.8929	0.9622	0.9809 (86)
MIT	19.6094	19.8206	20.1344	20.5511	20.8362	20.9644	20.9920	20.9870	20.9019	20.5338	20.0199	19.5841 (87)
Th 2	20.0382	20.0410	20.0438	20.0567	20.0591	20.0705	20.0705	20.0726	20.0661	20.0591	20.0542	20.0491 (88)
util rest of house	0.9733	0.9566	0.9223	0.8279	0.6651	0.4616	0.3128	0.3583	0.6097	0.8639	0.9528	0.9767 (89)
MIT 2	18.4322	18.6995	19.0918	19.6010	19.9165	20.0474	20.0671	20.0667	19.9941	19.5946	18.9629	18.4079 (90)
Living area fraction	18.9701	19.2118	19.5682	20.0351	20.3367	20.4664	20.4898	20.4872	20.4089	20.0237	19.4459	18.9454 (92)
MIT	18.9701	19.2118	19.5682	20.0351	20.3367	20.4664	20.4898	20.4872	20.4089	20.0237	19.4459	18.9454 (93)
Temperature adjustment												0.0000
adjusted MIT	18.9701	19.2118	19.5682	20.0351	20.3367	20.4664	20.4898	20.4872	20.4089	20.0237	19.4459	18.9454 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	546.7407	599.8110	628.2805	636.3381	564.8382	407.9315	276.2354	288.1330	419.6597	507.4447	522.2110	529.0884 (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	1090.4225	1060.3519	965.1437	810.0711	626.5297	419.9180	278.4288	291.8352	453.9319	683.6191	900.7635	1082.2773 (97)
Space heating kWh	404.4993	309.4835	250.6262	125.0878	45.8985	0.0000	0.0000	0.0000	0.0000	131.0738	272.5577	411.5726 (98a)
Space heating requirement - total per year (kWh/year)												1950.7993
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	404.4993	309.4835	250.6262	125.0878	45.8985	0.0000	0.0000	0.0000	0.0000	131.0738	272.5577	411.5726 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1950.7993
Space heating per m2										(98c) / (4) =		27.6748 (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)
Space heating requirement	404.4993	309.4835	250.6262	125.0878	45.8985	0.0000	0.0000	0.0000	0.0000	131.0738	272.5577	411.5726 (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)	438.2441	335.3017	271.5343	135.5230	49.7275	0.0000	0.0000	0.0000	0.0000	142.0084	295.2955	445.9074 (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	221.4472	195.8768	208.4005	184.2044	179.1670	162.1217	160.5993	166.6666	168.1294	186.6426	197.3962	219.1790 (64)
Efficiency of water heater (217)m	85.3928	85.0808	84.4746	83.2108	81.4842	79.8000	79.8000	79.8000	79.8000	83.2822	84.7836	85.4511 (217)
Fuel for water heating, kWh/month	259.3277	230.2245	246.7020	221.3708	219.8795	203.1601	201.2523	208.8554	210.6884	224.1085	232.8235	256.4963 (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)
Lighting	21.2139	17.0186	15.3233	11.2265	8.6717	7.0848	7.9106	10.2825	13.3560	17.5237	19.7930	21.8035 (232)
Electricity generated by PVs (Appendix M) (negative quantity)												

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(233a)m	-5.8710	-9.1989	-14.6755	-18.3724	-21.5376	-20.7522	-20.5020	-18.4748	-15.2548	-11.2840	-6.7731	-4.9743	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233b)m	-1.0098	-2.2254	-4.6218	-7.2485	-9.8979	-10.0629	-9.9444	-8.2728	-5.8762	-3.2777	-1.3772	-0.7912	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)													
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)													
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)													
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year													
Space heating fuel - main system 1												2113.5420	(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												2714.8889	(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)												171.2082	(232)
Energy saving/generation technologies (Appendices M ,N and Q)													
PV generation												-232.2763	(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												4853.3628	(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	2113.5420	0.2100	443.8438 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	2714.8889	0.2100	570.1267 (264)
Space and water heating			1013.9705 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	171.2082	0.1443	24.7106 (268)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-167.6706	0.1325	-22.2088
PV Unit electricity exported	-64.6057	0.1247	-8.0536
Total			-30.2624 (269)
Total CO2, kg/year			1020.3480 (272)
EPC Target Carbon Dioxide Emission Rate (TER)			14.4800 (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	2113.5420	1.1300	2388.3025 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	2714.8889	1.1300	3067.8244 (278)
Space and water heating			5456.1270 (279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008 (281)
Energy for lighting	171.2082	1.5338	262.6049 (282)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-167.6706	1.4894	-249.7298
PV Unit electricity exported	-64.6057	0.4575	-29.5584
Total			-279.2882 (283)
Total Primary energy kWh/year			5569.5445 (286)
Target Primary Energy Rate (TPER)			79.0100 (287)

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Plot Reference	B 1205	Issued on Date	19/03/2026
Assessment Reference	Be Green	Plot Type Ref	
Plot Address		SAP Version	10.2
SAP Rating	83 B	DER	4.92
Environmental	96 A	TER	14.48
CO ₂ Emissions (t/year)	0.31	% DER < TER	66.02
Compliance Check	See BREL	DFEE	33.50
% DPER < TPER	34.09	TFEE	34.99
		% DFEE < TFEE	4.28
		TPER	79.01
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	70.4900 (1b)	2.8000 (2b)	197.3720 (1b) - (3b)
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	70.4900		197.3720 (4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 197.3720 (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	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) = 0.1520 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	3.0000 (17)
Infiltration rate	0.3020 (18)
Number of sides sheltered	2 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 0.8500 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.2567 (21)

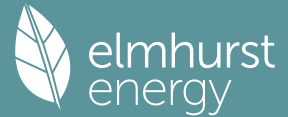
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.3273	0.3209	0.3145	0.2824	0.2759	0.2439	0.2439	0.2374	0.2567	0.2759	0.2888	0.3016 (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	0.5536	0.5515	0.5494	0.5399	0.5381	0.5297	0.5297	0.5282	0.5329	0.5381	0.5417	0.5455 (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			12.7900	1.1450	14.6450		(27)
External Wall 1	48.8600	12.7900	36.0700	0.1500	5.4105	70.0000	2524.9000 (29a)
Corridor wall	33.2900	2.4200	30.8700	0.1800	5.5566	70.0000	2160.9001 (29a)
Total net area of external elements Aum(A, m ²)			82.1500				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	28.0321		(33)
Main dwelling							
Party Wall 1			18.3700	0.0000	0.0000	70.0000	1285.9001 (32)
Party Floor 1			70.4900			40.0000	2819.6000 (32d)
Party Ceiling 1			70.4900			30.0000	2114.7000 (32b)
Internal Wall 1			175.9900			9.0000	1583.9100 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	12489.9102 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							177.1870 (35)
List of Thermal Bridges							
K1 Element					Length	Psi-value	Total
E1 Steel lintel with perforated steel base plate					8.0500	0.0500	0.4025
E3 Sill					4.5500	0.0400	0.1820

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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	50.2968	50.3957	50.4931	50.9556	51.0431	51.4543	51.4543	51.5312	51.2951	51.0431	50.8665	50.6831
alpha	4.3531	4.3597	4.3662	4.3970	4.4029	4.4303	4.4303	4.4354	4.4197	4.4029	4.3911	4.3789
util living area	0.9909	0.9852	0.9743	0.9373	0.8512	0.6854	0.5255	0.5790	0.8072	0.9502	0.9838	0.9922 (86)
MIT	19.5173	19.6886	19.9566	20.3595	20.7056	20.9202	20.9806	20.9705	20.8297	20.3981	19.9018	19.4897 (87)
Th 2	20.1012	20.1028	20.1044	20.1118	20.1132	20.1197	20.1197	20.1209	20.1172	20.1132	20.1104	20.1075 (88)
util rest of house	0.9888	0.9818	0.9680	0.9211	0.8125	0.6120	0.4279	0.4801	0.7464	0.9342	0.9794	0.9904 (89)
MIT 2	18.7443	18.9153	19.1813	19.5779	19.8974	20.0756	20.1127	20.1094	20.0105	19.6213	19.1336	18.7217 (90)
Living area fraction									fLA = Living area /	(4) =		0.4569 (91)
MIT	19.0975	19.2686	19.5356	19.9350	20.2667	20.4615	20.5093	20.5029	20.3848	19.9762	19.4846	19.0727 (92)
Temperature adjustment												0.0000
adjusted MIT	19.0975	19.2686	19.5356	19.9350	20.2667	20.4615	20.5093	20.5029	20.3848	19.9762	19.4846	19.0727 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9857	0.9777	0.9630	0.9173	0.8198	0.6419	0.4721	0.5244	0.7665	0.9312	0.9755	0.9876 (94)
Useful gains	429.6498	468.2235	484.3945	502.8303	471.6079	367.9876	258.0987	267.5967	364.9716	407.2745	412.6419	416.0023 (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	1020.7189	989.1874	895.6830	751.3424	582.2790	395.2265	263.5921	276.2333	425.0840	637.3069	844.7107	1018.0808 (97)
Space heating kWh	439.7554	350.0878	305.9986	178.9287	82.3393	0.0000	0.0000	0.0000	0.0000	171.1441	311.0895	447.9464 (98a)
Space heating requirement - total per year (kWh/year)												2287.2897
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	439.7554	350.0878	305.9986	178.9287	82.3393	0.0000	0.0000	0.0000	0.0000	171.1441	311.0895	447.9464 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												2287.2897
Space heating per m2										(98c) / (4) =		32.4484 (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	633.8156	498.9612	511.6822	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.8136	0.8832	0.8513	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	515.6978	440.6589	435.5981	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	630.4054	601.4518	560.7267	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh												
	0.0000	0.0000	0.0000	0.0000	0.0000	82.5894	119.6299	93.0957	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	20.6474	29.9075	23.2739	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												73.8288 (107)
Energy for space heating												32.4484 (99)
Energy for space cooling												1.0474 (108)
Total												33.4958 (109)
Fabric Energy Efficiency (DFEE)												33.5 (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	70.4900 (1b)	x 2.8000 (2b)	= 197.3720 (1b) - (3b)
Ground floor			(4)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	70.4900		
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	197.3720 (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	

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Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) = 30.0000 / (5) = 0.1520 (8)
 Pressure test Yes
 Pressure Test Method Blower Door
 Measured/design AP50 5.0000 (17)
 Infiltration rate 0.4020 (18)
 Number of sides sheltered 2 (19)

Shelter factor (20) = 1 - [0.075 x (19)] = 0.8500 (20)
 Infiltration rate adjusted to include shelter factor (21) = (18) x (20) = 0.3417 (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	0.4357	0.4271	0.4186	0.3759	0.3673	0.3246	0.3246	0.3161	0.3417	0.3673	0.3844	0.4015	(22b)
If exhaust air heat pump using Appendix N, (23b) = (23a) x Fmv (equation (N5)), otherwise (23b) = (23a)													(23b)
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =													(23c)
Effective ac	0.5949	0.5912	0.5876	0.5706	0.5675	0.5527	0.5527	0.5500	0.5584	0.5675	0.5739	0.5806	(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			12.7900	1.1450	14.6450			(27)
External Wall 1	48.8600	12.7900	36.0700	0.1800	6.4926			(29a)
Corridor wall	33.2900	2.4200	30.8700	0.1800	5.5566			(29a)
Total net area of external elements Aum(A, m2)			82.1500					(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 29.1142			(33)
Main dwelling								
Party Wall 1			18.3700	0.0000	0.0000			(32)

Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K 177.1870 (35)

List of Thermal Bridges

K1 Element	Length	Psi-value	Total	
E1 Steel lintel with perforated steel base plate	8.0500	0.0500	0.4025	
E3 Sill	4.5500	0.0500	0.2275	
E4 Jamb	24.6000	0.0500	1.2300	
E7 Party floor between dwellings (in blocks of flats)	28.1000	0.0700	1.9670	
E7 Party floor between dwellings (in blocks of flats)	23.7800	0.0700	1.6646	
E9 Balcony between dwellings, wall insulation continuous	6.8000	0.0200	0.1360	
E16 Corner (normal)	5.6000	0.0900	0.5040	
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	2.8000	0.0600	0.1680	
E18 Party wall between dwellings	2.8000	0.0600	0.1680	
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	13.1200	0.0000	0.0000	

Thermal bridges (Sum(L x Psi) calculated using Appendix K) 6.4676 (36)

Point Thermal bridges

Total fabric heat loss (33) + (36) + (36a) = 35.5818 (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	38.7476	38.5076	38.2723	37.1672	36.9605	35.9980	35.9980	35.8198	36.3687	36.9605	37.3787	37.8160	(38)
Heat transfer coeff	74.3294	74.0894	73.8541	72.7491	72.5423	71.5798	71.5798	71.4016	71.9506	72.5423	72.9606	73.3979	(39)
Average = Sum(39)m / 12 =													72.7481

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP	1.0545	1.0511	1.0477	1.0320	1.0291	1.0155	1.0155	1.0129	1.0207	1.0291	1.0350	1.0413	(40)
HLP (average)													1.0320
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31	

4. Water heating energy requirements (kWh/year)

Assumed occupancy 2.2580 (42)

Hot water usage for mixer showers 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 (42a)

Hot water usage for baths 26.8189 26.4206 25.8597 24.8255 24.0512 23.1925 22.7287 23.2857 23.8921 24.8109 25.8664 26.7282 (42b)

Hot water usage for other uses 37.7538 36.3809 35.0081 33.6352 32.2623 30.8895 30.8895 32.2623 33.6352 35.0081 36.3809 37.7538 (42c)

Average daily hot water use (litres/day) 59.1870 (43)

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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	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	112.8981	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	102.0977	113.0367	102.0977	105.5010	102.0977	105.5010	102.0977	102.0977	105.5010	102.0977	105.5010	102.0977	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	198.4380	200.4971	195.3081	184.2613	170.3166	157.2106	148.4550	146.3959	151.5849	162.6317	176.5764	189.6824	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	34.2898	(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)	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	-90.3185	(71)
Water heating gains (Table 5)	45.9145	44.7582	42.9732	39.6471	37.4536	35.2020	34.0966	35.4461	36.9634	39.4379	42.6528	45.5420	(72)
Total internal gains	403.3196	415.1616	397.2484	386.2788	366.7374	354.7831	341.5188	340.8091	350.9187	361.0367	381.5996	394.1915	(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					10.4000	11.2829	0.6300	0.7000			0.7700			35.8614 (75)
Southeast					2.3900	36.7938	0.6300	0.7000			0.7700			26.8748 (77)
Solar gains	62.7362	118.7746	194.1523	293.5970	377.2591	395.8231	372.7549	307.0840	228.0764	139.8022	77.3127			52.2854 (83)
Total gains	466.0558	533.9362	591.4007	679.8758	743.9965	750.6062	714.2737	647.8931	578.9951	500.8389	458.9123			446.4770 (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	46.6763	46.8275	46.9766	47.6902	47.8261	48.4692	48.4692	48.5902	48.2195	47.8261	47.5520	47.2687	
alpha	4.1118	4.1218	4.1318	4.1793	4.1884	4.2313	4.2313	4.2393	4.2146	4.1884	4.1701	4.1512	
util living area	0.9888	0.9796	0.9596	0.8951	0.7659	0.5785	0.4331	0.4925	0.7415	0.9314	0.9796	0.9905	(86)
MIT	19.4224	19.6450	19.9808	20.4479	20.7868	20.9512	20.9886	20.9809	20.8632	20.4143	19.8534	19.3964	(87)
Th 2	20.0382	20.0410	20.0438	20.0567	20.0591	20.0705	20.0705	20.0726	20.0661	20.0591	20.0542	20.0491	(88)
util rest of house	0.9862	0.9749	0.9500	0.8711	0.7172	0.5052	0.3452	0.3995	0.6726	0.9102	0.9741	0.9883	(89)
MIT 2	18.6027	18.8246	19.1561	19.6108	19.9110	20.0453	20.0667	20.0656	19.9850	19.5907	19.0426	18.5850	(90)
Living area fraction	18.9773	19.1995	19.5330	19.9933	20.3112	20.4592	20.4879	20.4839	20.3863	19.9671	19.4131	18.9557	(92)
MIT	18.9773	19.1995	19.5330	19.9933	20.3112	20.4592	20.4879	20.4839	20.3863	19.9671	19.4131	18.9557	(93)
Temperature adjustment												0.0000	
adjusted MIT	18.9773	19.1995	19.5330	19.9933	20.3112	20.4592	20.4879	20.4839	20.3863	19.9671	19.4131	18.9557	(93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9824	0.9697	0.9439	0.8692	0.7310	0.5367	0.3852	0.4415	0.6978	0.9078	0.9693	0.9850	(94)
Useful gains	457.8646	517.7341	558.1966	590.9723	543.8768	402.8496	275.1274	286.0743	404.0289	454.6603	444.8406	439.7788	(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	1090.9527	1059.4407	962.5381	807.0249	624.6756	419.4040	278.2981	291.5935	452.3017	679.5092	898.3698	1083.0399	(97)
Space heating kWh	471.0175	364.0268	300.8301	155.5579	60.1143	0.0000	0.0000	0.0000	0.0000	167.2875	326.5410	478.5863	(98a)
Space heating requirement - total per year (kWh/year)												2323.9615	
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	471.0175	364.0268	300.8301	155.5579	60.1143	0.0000	0.0000	0.0000	0.0000	167.2875	326.5410	478.5863	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												2323.9615	
Space heating per m ²												32.9687	(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	672.8506	529.6909	542.6523	0.0000	0.0000	0.0000	0.0000	(100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.8858	0.9325	0.9044	0.0000	0.0000	0.0000	0.0000	(101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	595.9871	493.9345	490.7634	0.0000	0.0000	0.0000	0.0000	(102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	837.3933	796.9764	721.3885	0.0000	0.0000	0.0000	0.0000	(103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	173.8124	225.4631	171.5851	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	43.4531	56.3658	42.8963	0.0000	0.0000	0.0000	0.0000	(107)
Space cooling requirement												142.7152	(107)
Energy for space heating												32.9687	(99)
Energy for space cooling												2.0246	(108)
Total												34.9933	(109)
Fabric Energy Efficiency (TFEE)												35.0	(109)

