

Summary for Input Data

Plot Reference	A 907	Issued on Date	19/03/2026
Assessment Reference	Be Green	Plot Type Ref	
Plot Address		SAP Version	10.2

SAP Rating	82 B	DER	5.27	TER	14.75
Environmental	96 A	% DER < TER			64.27
CO ₂ Emissions (t/year)	0.34	DFEE	37.07	TFEE	38.19
Compliance Check	See BREL	% DFEE < TFEE			2.92
% DPER < TPER	30.25	DPER	55.59	TPER	79.71

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

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

Orientation	Northwest	
Property Tenture	1	
Transaction Type	6	
Terrain Type	Suburban	
1.0 Property Type	Flat, End-Terrace	
Position of Flat	Top-floor flat	
Which Floor	9	
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	160.25	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:	29.02 m	72.92 m ²	2.80 m

8.0 Living Area	36.09	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	49.35	35.90	0.00	None	13.45	Enter Gross Area
Corridor wall	Cavity Wall	Cavity wall : dense plaster, AAC block, filled cavity, any outside structure	0.22	70.00	31.89	29.47	0.70	Stairwell Access Corridor 3	2.42	Enter Gross Area

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)	Shelter Res	Shelter
Party Wall 1	Filled Cavity with Edge Sealing	Single plasterboard on dabs on both sides, dense blocks, cavity or cavity fill	0.00	70.00	30.76	0.00	None

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall 1	Plasterboard on timber frame	9.00	153.66

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Code	Shelter Factor	Calculation Type	Openings
External Roof 1	External Flat Roof	Plasterboard, insulated flat roof	0.10	9.00	72.92	72.92	None	0.00	Enter Gross Area	0.00

11.1 Party Floors

Summary for Input Data



Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor 1	Lowest occupied	Precast concrete planks floor, screed, carpeted	40.00	72.92

12.0 Opening Types

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

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Door	Door	Corridor wall	North West	2.42	
NE windows	Window	External Wall 1	North East	2.73	
SE windows	Window	External Wall 1	South East	10.72	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported
E1 Steel lintel with perforated steel base plate	Independently assessed	8.49	0.05	0.05	No
E3 Sill	Independently assessed	4.99	0.04	0.04	No
E4 Jamb	Independently assessed	21.60	0.04	0.04	No
E7 Party floor between dwellings (in blocks of flats)	Independently assessed	13.27	0.05	0.05	No
E7 Party floor between dwellings (in blocks of flats)	Independently assessed	11.39	0.04	0.04	No
E9 Balcony between dwellings, wall insulation continuous	Independently assessed	4.36	0.05	0.05	No
E16 Corner (normal)	Independently assessed	5.60	0.05	0.05	No
E16 Corner (normal)	Independently assessed	2.80	0.04	0.04	No
E18 Party wall between dwellings	Independently assessed	2.80	0.05	0.05	No
E25 Staggered party wall between dwellings	Independently assessed	2.80	0.04	0.04	No
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	Table K1 - Default	10.99	0.00	0.00	No
E14 Flat roof	Independently assessed	29.02	0.05	0.05	No
P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	10.99	0.05	0.05	No

Y-value W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation

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

20.0 Fans, Open Fireplaces, Flues

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

Summary for Input Data

Number of flueless gas fires

0

21.0 Fixed Cooling System

No

22.0 Pressure Testing

Yes

Designed AP₅₀

3.00

m³/(h.m²) @ 50 Pa

Test Method

Blower Door

22.0 Lighting

No Fixed Lighting

No

Name	Efficacy	Power	Capacity	Count
Lighting 1	75.00	15.00	1125.00	7

24.0 Main Heating 1

None

25.0 Main Heating 2

None

26.0 Heat Networks

Space Community Heating

Space and Water Combined

Distribution Loss

Calculated

Distribution Loss Value

1.50

SAP Code

2306

	Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical	Fuel Factor	Efficiency type
Heat source 1	Heat pump	Electricity	Space and Water	232.00	100.00					
Heat source 2	None									
Heat source 3	None									
Heat source 4	None									
Heat source 5	None									

27.0 Secondary Heating

None

28.0 Water Heating

Water Heating

Community Heating

SAP Code

901

Flue Gas Heat Recovery System

No

Waste Water Heat Recovery Instantaneous System 1

No

Waste Water Heat Recovery Instantaneous System 2

No

Waste Water Heat Recovery Storage System

No

Solar Panel

No

Water use <= 125 litres/person/day

Yes

Cold Water Source

From header tank

Bath Count

1

28.1 Showers

Description

Shower Type

Flow Rate
[l/min]

Rated Power
[kW]

Connected

Connected To

Shower 1

Combi boiler or unvented hot water system

8.00

No

Shower 2

Combi boiler or unvented hot water system

8.00

No

28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder

Internal Store

Insulation Type

Measured Loss

Cylinder Volume

180.00

L

Loss

1.20

kWh/day

32.0 Photovoltaic Unit

Multiple Dwellings – Not Connected

Export Capable Meter?

No

Connected To Dwelling

Yes

Diverter

No

Battery Capacity [kWh]

0.00

Summary for Input Data



PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Overshading Factor	MCS Certificate Reference	Panel Manufacturer
0.35	South 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

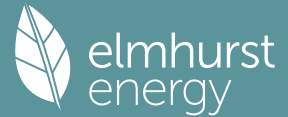
Lower cost measures

None

Further measures to achieve even higher standards

None

Full SAP Calculation Printout



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Environmental	96 A	% DER < TER				64.27	
CO ₂ Emissions (t/year)	0.34	DFEE	37.07	TFEE	38.19		
Compliance Check	See BREL	% DFEE < TFEE				2.92	
% DPER < TPER	30.25	DPER	55.59	TPER	79.71		
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	72.9200 (1b)	2.8000 (2b)	204.1760 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	72.9200		204.1760 (4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	204.1760 (5)

2. Ventilation rate

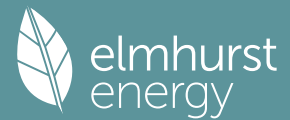
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
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			13.4500	1.1450	15.4008		(27)
External Wall 1	49.3500	13.4500	35.9000	0.1500	5.3850	70.0000	2512.9999 (29a)
Corridor wall	31.8900	2.4200	29.4700	0.1900	5.5993	70.0000	2062.9000 (29a)
External Roof 1	72.9200		72.9200	0.1000	7.2920	9.0000	656.2800 (30)
Total net area of external elements Aum(A, m ²)			154.1600				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	36.0971		(33)
Main dwelling							
Party Wall 1			30.7600	0.0000	0.0000	70.0000	2153.2000 (32)
Party Floor 1			72.9200			40.0000	2916.8000 (32d)
Internal Wall 1			153.6600			9.0000	1382.9400 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	11685.1199 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							160.2458 (35)
List of Thermal Bridges							

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K1 Element	Length	Psi-value	Total
E1 Steel lintel with perforated steel base plate	8.4900	0.0500	0.4245
E3 Sill	4.9900	0.0400	0.1996
E4 Jamb	21.6000	0.0400	0.8640
E7 Party floor between dwellings (in blocks of flats)	13.2700	0.0500	0.6635
E7 Party floor between dwellings (in blocks of flats)	11.3900	0.0390	0.4442
E9 Balcony between dwellings, wall insulation continuous	4.3600	0.0500	0.2180
E16 Corner (normal)	5.6000	0.0500	0.2800
E16 Corner (normal)	2.8000	0.0390	0.1092
E18 Party wall between dwellings	2.8000	0.0500	0.1400
E25 Staggered party wall between dwellings	2.8000	0.0390	0.1092
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	10.9900	0.0000	0.0000
E14 Flat roof	29.0200	0.0500	1.4510
P4 Party wall - Roof (insulation at ceiling level)	10.9900	0.0500	0.5495
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			5.4527 (36)
Point Thermal bridges			0.0000 (36a) =
Total fabric heat loss		(33) + (36) + (36a) =	41.5498 (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	17.6573	17.4425	17.2277	16.1539	15.9391	14.8653	14.8653	14.6505	15.2948	15.9391	16.3687	16.7982	(38)
Average = Sum(39)m / 12 =	59.2070	58.9923	58.7775	57.7037	57.4889	56.4151	56.4151	56.2003	56.8446	57.4889	57.9184	58.3480	(39)
												57.6500	
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP (average)	0.8119	0.8090	0.8061	0.7913	0.7884	0.7737	0.7737	0.7707	0.7795	0.7884	0.7943	0.8002	(40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31	

4. Water heating energy requirements (kWh/year)													
Assumed occupancy													2.3149 (42)
Hot water usage for mixer showers													
	61.4400	60.4994	59.1132	56.9806	55.0699	52.3969	50.2827	52.7543	53.9974	56.6450	59.4021	61.3846	(42a)
Hot water usage for baths													
	26.6223	26.2204	25.6487	24.7925	24.0209	22.9587	22.1528	23.1382	23.6554	24.7079	25.8022	26.6012	(42b)
Hot water usage for other uses													
	38.3367	36.9426	35.5485	34.1545	32.7604	31.3664	31.3664	32.7604	34.1545	35.5485	36.9426	38.3367	(42c)
Average daily hot water use (litres/day)													116.1796 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	126.3990	123.6624	120.3104	115.9276	111.8513	106.7219	103.8019	108.6530	111.8073	116.9014	122.1469	126.3225	(44)
Energy conte	186.0812	163.6304	171.9211	151.4304	144.1317	123.4204	114.7041	127.8866	129.6909	150.6393	165.0856	185.5138	(45)
Energy content (annual)										Total =	Sum(45)m =	1814.1355	
Distribution loss (46)m = 0.15 x (45)m													
	27.9122	24.5446	25.7882	22.7146	21.6197	18.5131	17.2056	19.1830	19.4536	22.5959	24.7628	27.8271	(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													
	241.3580	213.5578	227.1979	204.9241	199.4085	176.9140	169.9809	183.1634	183.1846	205.9161	218.5793	240.7906	(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													
	241.3580	213.5578	227.1979	204.9241	199.4085	176.9140	169.9809	183.1634	183.1846	205.9161	218.5793	240.7906	(64)
12Total per year (kWh/year)													2464.9752 (64)
Electric shower(s)													2465 (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)
													0.0000 (64a)
Heat gains from water heating, kWh/month													
	106.0934	94.3491	101.3852	93.1456	92.1452	83.8322	82.3606	86.7437	85.9172	94.3090	97.6859	105.9048	(65)

5. Internal gains (see Table 5 and 5a)													
Metabolic gains (Table 5), Watts													
(66)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	(66)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	104.7039	115.9221	104.7039	108.1940	104.7039	108.1940	104.7039	104.7039	108.1940	104.7039	108.1940	104.7039	(67)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	204.0140	206.1310	200.7962	189.4389	175.1025	161.6282	152.6265	150.5095	155.8444	167.2016	181.5381	195.0123	(68)
Pumps, fans	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	(69)
Losses e.g. evaporation (negative values) (Table 5)	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)
Water heating gains (Table 5)	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	(71)
Total internal gains	142.5987	140.4004	136.2704	129.3688	123.8511	116.4336	110.6997	116.5910	119.3294	126.7594	135.6749	142.3451	(72)
	509.0397	520.1767	499.4936	484.7249	461.3806	443.9790	425.7533	429.5276	441.0909	456.3881	483.1301	499.7845	(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								

SAP 10 Online 2.26.14 Page 3 of 7

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Electricity for lighting (calculated in Appendix L)	181.0379 (332)
Energy saving/generation technologies (Appendices M ,N and Q)	
PV generation	-155.0244 (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	5692.4070 (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	2360.5426	0.1564	119.9202 (367)
Electrical energy for heat distribution (space & water)	17.7900	0.0000	7.9889 (372)
Overall CO2 factor for heat network			0.0643 (386)
Total CO2 associated with community systems			352.3383 (373)
Space and water heating			352.3383 (376)
Pumps, fans and electric keep-hot	189.9347	0.1387	26.3463 (378)
Energy for lighting	181.0379	0.1443	26.1294 (379)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-155.0244	0.1305	-20.2356
PV Unit electricity exported	0.0000	0.0000	0.0000
Total			-20.2356 (380)
Total CO2, kg/year			384.5784 (383)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			5.2700 (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	2360.5426	1.5790	1210.7659 (467)
Electrical energy for heat distribution (space & water)	17.7900	0.0000	84.3169 (472)
Overall CO2 factor for heat network			0.6790 (486)
Total CO2 associated with community systems			3718.6669 (473)
Space and water heating			3718.6669 (476)
Pumps, fans and electric keep-hot	189.9347	1.5128	287.3332 (478)
Energy for lighting	181.0379	1.5338	277.6819 (479)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-155.0244	1.4822	-229.7750
PV Unit electricity exported	0.0000	0.0000	0.0000
Total			-229.7750 (480)
Total Primary energy kWh/year			4053.9070 (483)
Dwelling Primary energy Rate (DPER)			55.5900 (484)

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

1. Overall dwelling characteristics

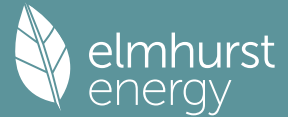
	Area (m2)	Storey height (m)	Volume (m3)
Main dwelling	72.9200 (1b)	2.8000 (2b)	204.1760 (1b) - (3b)
Ground floor			
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	72.9200		204.1760 (4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	204.1760 (5)

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) = 0.1469 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	5.0000 (17)
Infiltration rate	0.3969 (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) = 0.3374 (21)

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

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Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate												
	0.4302	0.4217	0.4133	0.3711	0.3627	0.3205	0.3205	0.3121	0.3374	0.3627	0.3796	0.3964 (22b)
Effective ac	0.5925	0.5889	0.5854	0.5689	0.5658	0.5514	0.5514	0.5487	0.5569	0.5658	0.5720	0.5786 (25)

3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K
Main dwelling							
TER Opaque door			2.4200	1.0000	2.4200		(26)
TER Opening Type			13.4500	1.1450	15.4008		(27)
External Wall 1	49.3500	13.4500	35.9000	0.1800	6.4620		(29a)
Corridor wall	31.8900	2.4200	29.4700	0.1800	5.3046		(29a)
External Roof 1	72.9200		72.9200	0.1100	8.0212		(30)
Total net area of external elements Aum(A, m2)			154.1600				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	37.6086		(33)
Main dwelling							
Party Wall 1			30.7600	0.0000	0.0000		(32)

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

160.2458 (35)

List of Thermal Bridges

K1 Element	Length	Psi-value	Total
E1 Steel lintel with perforated steel base plate	8.4900	0.0500	0.4245
E3 Sill	4.9900	0.0500	0.2495
E4 Jamb	21.6000	0.0500	1.0800
E7 Party floor between dwellings (in blocks of flats)	13.2700	0.0700	0.9289
E7 Party floor between dwellings (in blocks of flats)	11.3900	0.0700	0.7973
E9 Balcony between dwellings, wall insulation continuous	4.3600	0.0200	0.0872
E16 Corner (normal)	5.6000	0.0900	0.5040
E16 Corner (normal)	2.8000	0.0900	0.2520
E18 Party wall between dwellings	2.8000	0.0600	0.1680
E25 Staggered party wall between dwellings	2.8000	0.0600	0.1680
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	10.9900	0.0000	0.0000
E14 Flat roof	29.0200	0.0800	2.3216
P4 Party wall - Roof (insulation at ceiling level)	10.9900	0.1200	1.3188

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

8.2998 (36)

Point Thermal bridges

(36a) = 0.0000

Total fabric heat loss

(33) + (36) + (36a) = 45.9084 (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
	39.9232	39.6811	39.4438	38.3293	38.1208	37.1501	37.1501	36.9703	37.5240	38.1208	38.5426	38.9837 (38)
Heat transfer coeff	85.8316	85.5895	85.3522	84.2377	84.0292	83.0584	83.0584	82.8787	83.4323	84.0292	84.4510	84.8920 (39)
Average = Sum(39)m / 12 =												84.2367

HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	1.1771	1.1737	1.1705	1.1552	1.1523	1.1390	1.1390	1.1366	1.1442	1.1523	1.1581	1.1642 (40)
HLP (average)												1.1552
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.3149 (42)
Hot water usage	for mixer showers											
	63.0326	62.0853	60.7050	58.0639	56.1149	53.9414	52.7060	54.0759	55.5775	57.9112	60.6090	62.7911 (42a)
Hot water usage	for baths											
	27.2293	26.8249	26.2554	25.2054	24.4192	23.5474	23.0765	23.6420	24.2577	25.1905	26.2622	27.1372 (42b)
Hot water usage	for other uses											
	38.3367	36.9426	35.5485	34.1545	32.7604	31.3664	31.3664	32.7604	34.1545	35.5485	36.9426	38.3367 (42c)
Average daily hot water use (litres/day)												118.2113 (43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	128.5985	125.8528	122.5089	117.4238	113.2945	108.8552	107.1488	110.4783	113.9897	118.6503	123.8138	128.2650 (44)
Energy conte	203.6686	179.2127	188.2917	160.7474	152.5162	133.8501	129.5872	136.7952	140.5607	161.0074	176.3954	200.8319 (45)
Energy content (annual)										Total = Sum(45)m =		1963.4644

Water storage loss (or HIU loss):

Store volume												180.0000 (47)
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a) If manufacturer declared loss factor is known (kWh/day):

Temperature factor from Table 2b												1.5520 (48)
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Enter (49) or (54) in (55)												0.5400 (49)
Total storage loss												0.8381 (55)

25.9803	23.4661	25.9803	25.1422	25.9803	25.1422	25.9803	25.9803	25.9803	25.1422	25.9803	25.1422	25.9803 (56)
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If cylinder contains dedicated solar storage												
25.9803	23.4661	25.9803	25.1422	25.9803	25.1422	25.9803	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)

HPV 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)

WWHRS	-28.8159	-25.4850	-26.6864	-22.0974	-20.5940	-17.6224	-16.5182	-17.5655	-18.2328	-21.4945	-24.3507	-28.2822 (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	224.0954	198.2050	210.8479	186.3042	181.1649	163.8819	162.3117	168.4724	169.9821	188.7555	199.6989	221.7924 (64)
Total per year (kWh/year) = Sum(64)m =												2275.5123 (64)

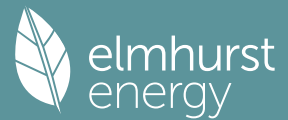
12Total per year (kWh/year)												2276 (64)
Electric shower(s)												
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												0.0000 (64a)

Heat gains from water heating, kWh/month	107.1139	95.1700	102.0011	91.5719	90.1058	82.6285	82.4819	84.8785	84.8598	92.9291	96.7748	106.1708 (65)
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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

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(66)m	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	104.7039	115.9221	104.7039	108.1940	104.7039	108.1940	104.7039	104.7039	108.1940	104.7039	108.1940	104.7039	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	204.0140	206.1310	200.7962	189.4389	175.1025	161.6282	152.6265	150.5095	155.8444	167.2016	181.5381	195.0123	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	(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)	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	(71)
Water heating gains (Table 5)	143.9704	141.6221	137.0983	127.1831	121.1099	114.7618	110.8627	114.0840	117.8608	124.9047	134.4095	142.7026	(72)
Total internal gains	513.4114	524.3984	503.3215	485.5392	461.6394	442.3072	425.9163	427.0206	439.6223	457.5333	484.8647	503.1420	(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				2.7300	11.2829	0.6300	0.7000			0.7700			9.4136 (75)
Southeast				10.7200	36.7938	0.6300	0.7000			0.7700			120.5429 (77)
Solar gains	129.9565	224.4909	315.4636	404.7958	466.1116	468.3301	449.1943	402.5954	346.2661	250.3496	156.2274	110.8472	(83)
Total gains	643.3679	748.8892	818.7851	890.3350	927.7510	910.6373	875.1106	829.6160	785.8884	707.8829	641.0921	613.9892	(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	37.8167	37.9237	38.0291	38.5322	38.6279	39.0793	39.0793	39.1641	38.9042	38.6279	38.4349	38.2352		
alpha	3.5211	3.5282	3.5353	3.5688	3.5752	3.6053	3.6053	3.6109	3.5936	3.5752	3.5623	3.5490		
util living area	0.9663	0.9433	0.9072	0.8306	0.7101	0.5457	0.4070	0.4441	0.6484	0.8554	0.9438	0.9708	(86)	
MIT	19.3452	19.6298	19.9896	20.4266	20.7484	20.9286	20.9808	20.9737	20.8640	20.4495	19.8349	19.3021	(87)	
Th 2	19.9384	19.9411	19.9437	19.9560	19.9583	19.9691	19.9691	19.9711	19.9649	19.9583	19.9536	19.9488	(88)	
util rest of house	0.9595	0.9323	0.8891	0.7984	0.6572	0.4699	0.3162	0.3512	0.5743	0.8205	0.9310	0.9648	(89)	
MIT 2	18.0419	18.3986	18.8446	19.3759	19.7366	19.9215	19.9608	19.9588	19.8648	19.4173	18.6693	17.9947	(90)	
Living area fraction									fLA = Living area / (4) =			0.4949	(91)	
MIT	18.6869	19.0080	19.4113	19.8959	20.2373	20.4199	20.4656	20.4611	20.3594	19.9281	19.2462	18.6418	(92)	
Temperature adjustment												0.0000		
adjusted MIT	18.6869	19.0080	19.4113	19.8959	20.2373	20.4199	20.4656	20.4611	20.3594	19.9281	19.2462	18.6418	(93)	

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Useful gains	0.9491	0.9205	0.8785	0.7963	0.6722	0.5040	0.3606	0.3963	0.6039	0.8194	0.9204	0.9552	(94)	
Ext temp.	610.6214	689.3215	719.3026	708.9827	623.5988	458.9503	315.5480	328.7574	474.6120	580.0368	590.0521	586.4682	(95)	
Heat loss rate W	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)	
Space heating kWh	1234.8544	1207.4945	1102.0090	926.2704	717.3842	483.3950	321.0745	336.5770	522.2325	783.8354	1025.7578	1225.9919	(97)	
Space heating requirement - total per year (kWh/year)	464.4294	348.2122	284.7336	156.4471	69.7764	0.0000	0.0000	0.0000	0.0000	151.6262	313.7082	475.8057	(98a)	
Solar heating kWh												2264.7386		
Solar heating contribution - total per year (kWh/year)	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)	
Space heating kWh	464.4294	348.2122	284.7336	156.4471	69.7764	0.0000	0.0000	0.0000	0.0000	151.6262	313.7082	475.8057	(98c)	
Space heating requirement after solar contribution - total per year (kWh/year)												2264.7386		
Space heating per m2										(98c) / (4) =		31.0579	(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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Space heating efficiency (main heating system 1)	464.4294	348.2122	284.7336	156.4471	69.7764	0.0000	0.0000	0.0000	0.0000	151.6262	313.7082	475.8057	(98)	
Space heating fuel (main heating system)	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 efficiency (main heating system 2)	503.1737	377.2614	308.4871	169.4985	75.5974	0.0000	0.0000	0.0000	0.0000	164.2754	339.8788	515.4991	(211)	
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	(212)	
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	(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	224.0954	198.2050	210.8479	186.3042	181.1649	163.8819	162.3117	168.4724	169.9821	188.7555	199.6989	221.7924	(64)	
Efficiency of water heater (217)m	85.6558	85.3100	84.7341	83.6707	82.1141	79.8000	79.8000	79.8000	79.8000	83.5732	85.0682	85.7261	(216)	
Fuel for water heating, kWh/month	261.6232	232.3351	248.8347	222.6635	220.6258	205.3658	203.3981	211.1183	213.0101	225.8567	234.7516	258.7222	(219)	
Space cooling fuel requirement (221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(221)	

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Pumps and Fa	7.3041	6.5973	7.3041	7.0685	7.3041	7.0685	7.3041	7.0685	7.3041	7.0685	7.3041	(231)
Lighting	21.7554	17.4530	15.7145	11.5131	8.8930	7.2657	8.1125	10.5450	13.6969	17.9711	20.2983	(232)
Electricity generated by PVs (Appendix M) (negative quantity)												
(233a)m	-9.6457	-14.8496	-23.2825	-28.6310	-33.1004	-31.7254	-31.3410	-28.4609	-23.8190	-18.0033	-11.0388	(233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)												
(234a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234a)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)												
(235a)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235a)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)												
(235c)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235c)
Electricity generated by PVs (Appendix M) (negative quantity)												
(233b)m	-2.2175	-4.8473	-9.9883	-15.5425	-21.0982	-21.4036	-21.1524	-17.6552	-12.6133	-7.1028	-3.0134	(233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)												
(234b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(234b)
Electricity generated by hydro-electric generators (Appendix M) (negative quantity)												
(235b)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235b)
Electricity used or net electricity generated by micro-CHP (Appendix N) (negative if net generation)												
(235d)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(235d)
Annual totals kWh/year												
Space heating fuel - main system 1											2453.6713	(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											2738.3050	(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)											175.5785	(232)
Energy saving/generation technologies (Appendices M ,N and Q)												
PV generation											-400.4726	(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											5053.0822	(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	2453.6713	0.2100	515.2710	(261)
Total CO2 associated with community systems			0.0000	(373)
Water heating (other fuel)	2738.3050	0.2100	575.0441	(264)
Space and water heating			1090.3150	(265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293	(267)
Energy for lighting	175.5785	0.1443	25.3414	(268)
Energy saving/generation technologies				
PV Unit electricity used in dwelling	-262.0977	0.1328	-34.8053	
PV Unit electricity exported	-138.3749	0.1249	-17.2798	
Total			-52.0850	(269)
Total CO2, kg/year			1075.5007	(272)
EPC Target Carbon Dioxide Emission Rate (TER)			14.7500	(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	2453.6713	1.1300	2772.6485	(275)
Total CO2 associated with community systems			0.0000	(473)
Water heating (other fuel)	2738.3050	1.1300	3094.2847	(278)
Space and water heating			5866.9332	(279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008	(281)
Energy for lighting	175.5785	1.5338	269.3082	(282)
Energy saving/generation technologies				
PV Unit electricity used in dwelling	-262.0977	1.4907	-390.7050	
PV Unit electricity exported	-138.3749	0.4583	-63.4216	
Total			-454.1266	(283)
Total Primary energy kWh/year			5812.2156	(286)
Target Primary Energy Rate (TPER)			79.7100	(287)

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Plot Reference	A 907			Issued on Date	19/03/2026
Assessment Reference	Be Green	Plot Type Ref			
Plot Address				SAP Version	10.2
SAP Rating	82 B	DER	5.27	TER	14.75
Environmental	96 A	% DER < TER			64.27
CO ₂ Emissions (t/year)	0.34	DFEE	37.07	TFEE	38.19
Compliance Check	See BREL	% DFEE < TFEE			2.92
% DPER < TPER	30.25	DPER	55.59	TPER	79.71
Assessor Details	Mr. Robert Tanner			Assessor ID	W344-0001
Client					

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

1. Overall dwelling characteristics

	Area (m ²)	Storey height (m)	Volume (m ³)
Main dwelling			
Ground floor	72.9200 (1b)	2.8000 (2b)	204.1760 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	72.9200		204.1760 (4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	204.1760 (5)

2. Ventilation rate

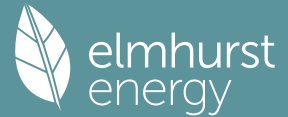
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
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) = 0.1469 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	3.0000 (17)
Infiltration rate	0.2969 (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) = 0.2524 (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	0.3218	0.3155	0.3092	0.2776	0.2713	0.2398	0.2398	0.2335	0.2524	0.2713	0.2839	0.2966 (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	0.5518	0.5498	0.5478	0.5385	0.5368	0.5287	0.5287	0.5273	0.5319	0.5368	0.5403	0.5440 (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			13.4500	1.1450	15.4008		(27)
External Wall 1	49.3500	13.4500	35.9000	0.1500	5.3850	70.0000	2512.9999 (29a)
Corridor wall	31.8900	2.4200	29.4700	0.1900	5.5993	70.0000	2062.9000 (29a)
External Roof 1	72.9200		72.9200	0.1000	7.2920	9.0000	656.2800 (30)
Total net area of external elements A _{um} (A, m ²)			154.1600				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 36.0971		(33)
Main dwelling							
Party Wall 1			30.7600	0.0000	0.0000	70.0000	2153.2000 (32)
Party Floor 1			72.9200			40.0000	2916.8000 (32a)
Internal Wall 1			153.6600			9.0000	1382.9400 (32c)
Heat capacity C _m = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	11685.1199 (34)
Thermal mass parameter (TMP = C _m / TFA) in kJ/m ² K							160.2458 (35)
List of Thermal Bridges							
K1 Element					Length	Psi-value	Total
E1 Steel lintel with perforated steel base plate					8.4900	0.0500	0.4245
E3 Sill					4.9900	0.0400	0.1996

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E4 Jamb	21.6000	0.0400	0.8640
E7 Party floor between dwellings (in blocks of flats)	13.2700	0.0500	0.6635
E7 Party floor between dwellings (in blocks of flats)	11.3900	0.0390	0.4442
E9 Balcony between dwellings, wall insulation continuous	4.3600	0.0500	0.2180
E16 Corner (normal)	5.6000	0.0500	0.2800
E16 Corner (normal)	2.8000	0.0390	0.1092
E18 Party wall between dwellings	2.8000	0.0500	0.1400
E25 Staggered party wall between dwellings	2.8000	0.0390	0.1092
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	10.9900	0.0000	0.0000
E14 Flat roof	29.0200	0.0500	1.4510
P4 Party wall - Roof (insulation at ceiling level)	10.9900	0.0500	0.5495
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			5.4527 (36)
Point Thermal Bridges			0.0000
Total fabric heat loss		(33) + (36) + (36a) =	41.5498 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Heat transfer coeff	37.1777	37.0422	36.9095	36.2858	36.1691	35.6259	35.6259	35.5253	35.8351	36.1691	36.4051	36.6519 (38)
Average = Sum(39)m / 12 =	78.7275	78.5920	78.4592	77.8355	77.7188	77.1756	77.1756	77.0750	77.3849	77.7188	77.9549	78.2017 (39)
												77.8350
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.0796	1.0778	1.0760	1.0674	1.0658	1.0584	1.0584	1.0570	1.0612	1.0658	1.0690	1.0724 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy												2.3149 (42)
Hot water usage for mixer showers	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (42a)
Hot water usage for baths	26.6223	26.2204	25.6487	24.7925	24.0209	22.9587	22.1528	23.1382	23.6554	24.7079	25.8022	26.6012 (42b)
Hot water usage for other uses	38.3367	36.9426	35.5485	34.1545	32.7604	31.3664	31.3664	32.7604	34.1545	35.5485	36.9426	38.3367 (42c)
Average daily hot water use (litres/day)												59.5367 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy content (annual)	64.9589	63.1630	61.1972	58.9470	56.7813	54.3250	53.5192	55.8987	57.8099	60.2564	62.7448	64.9378 (44)
Distribution loss (46)m = 0.15 x (45)m	95.6308	83.5774	87.4496	76.9995	73.1685	62.8251	59.1403	65.7938	67.0566	77.6465	84.8017	95.3660 (45)
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 (46)
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 (56)
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 (57)
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 (59)
Total heat required for water heating calculated for each month	81.2862	71.0408	74.3321	65.4496	62.1932	53.4013	50.2692	55.9247	56.9981	65.9995	72.0814	81.0611 (62)
WWHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63b)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63d)
Output from w/h	81.2862	71.0408	74.3321	65.4496	62.1932	53.4013	50.2692	55.9247	56.9981	65.9995	72.0814	81.0611 (64)
12Total per year (kWh/year)												790.0373 (64)
Electric shower(s)	50.4786	44.9768	49.1130	46.8679	47.7474	45.5464	47.0646	47.7474	46.8679	49.1130	48.1895	50.4786 (64a)
Heat gains from water heating, kWh/month	32.9412	29.0044	30.8613	28.0794	27.4851	24.7369	24.3334	25.9180	25.9665	28.7781	30.0677	32.8849 (65)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m = 574.1908 (64a)												

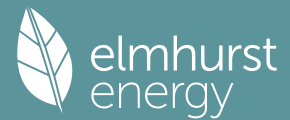
5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	104.7039	115.9221	104.7039	108.1940	104.7039	108.1940	104.7039	104.7039	108.1940	104.7039	108.1940	104.7039 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	204.0140	206.1310	200.7962	189.4389	175.1025	161.6282	152.6265	150.5095	155.8444	167.2016	181.5381	195.0123 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744 (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)	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951 (71)
Water heating gains (Table 5)	44.2758	43.1613	41.4802	38.9991	36.9424	34.3568	32.7062	34.8360	36.0646	38.6803	41.7607	44.2001 (72)
Total internal gains	410.7168	422.9376	404.7034	394.3552	374.4719	361.9022	347.7598	347.7726	357.8261	368.3089	389.2160	401.6395 (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				2.7300	11.2829		0.3500		0.7000		0.7700		5.2298 (75)
Southeast				10.7200	36.7938		0.3500		0.7000		0.7700		66.9683 (77)
Solar gains	72.1981	124.7171	175.2576	224.8866	258.9509	260.1834	249.5524	223.6641	192.3701	139.0831	86.7930		61.5818 (83)
Total gains	482.9149	547.6548	579.9610	619.2418	633.4228	622.0856	597.3122	571.4367	550.1962	507.3920	476.0089		463.2213 (84)

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7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
tau	41.2291	41.3002	41.3701	41.7016	41.7642	42.0582	42.0582	42.1131	41.9445	41.7642	41.6377	41.5063
alpha	3.7486	3.7533	3.7580	3.7801	3.7843	3.8039	3.8039	3.8075	3.7963	3.7843	3.7758	3.7671
util living area	0.9851	0.9751	0.9594	0.9189	0.8397	0.6924	0.5378	0.5779	0.7795	0.9284	0.9744	0.9872 (86)
MIT	19.2464	19.4708	19.7840	20.2184	20.5996	20.8673	20.9615	20.9489	20.7793	20.2926	19.7011	19.2065 (87)
Th 2	20.0175	20.0190	20.0205	20.0275	20.0289	20.0350	20.0350	20.0361	20.0326	20.0289	20.0262	20.0234 (88)
util rest of house	0.9819	0.9698	0.9503	0.8996	0.7995	0.6165	0.4324	0.4733	0.7147	0.9075	0.9680	0.9844 (89)
MIT 2	18.4223	18.6449	18.9543	19.3796	19.7333	19.9595	20.0206	20.0155	19.8943	19.4576	18.8801	18.3872 (90)
Living area fraction									fLA = Living area / (4) =			0.4949 (91)
MIT	18.8301	19.0537	19.3649	19.7947	20.1621	20.4088	20.4863	20.4775	20.3323	19.8709	19.2864	18.7927 (92)
Temperature adjustment												0.0000
adjusted MIT	18.8301	19.0537	19.3649	19.7947	20.1621	20.4088	20.4863	20.4775	20.3323	19.8709	19.2864	18.7927 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9768	0.9632	0.9429	0.8943	0.8056	0.6476	0.4832	0.5230	0.7365	0.9035	0.9619	0.9798 (94)
Useful gains	471.7199	527.5057	546.8391	553.7736	510.2655	402.8636	288.6482	298.8860	405.2106	458.4399	457.8611	453.8774 (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	1143.9220	1112.3646	1009.3730	847.9966	657.6615	448.2955	299.9261	314.2713	482.2851	720.5241	949.9921	1141.1721 (97)
Space heating kWh	500.1184	393.0252	344.1253	211.8405	109.6626	0.0000	0.0000	0.0000	0.0000	194.9906	354.3343	511.3473 (98a)
Space heating requirement - total per year (kWh/year)												2619.4442
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	500.1184	393.0252	344.1253	211.8405	109.6626	0.0000	0.0000	0.0000	0.0000	194.9906	354.3343	511.3473 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												2619.4442
Space heating per m2										(98c) / (4) =		35.9222 (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	725.4509	571.0996	585.7702	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.7694	0.8447	0.8205	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	558.1351	482.4104	480.6427	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	686.3663	659.5923	631.2715	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh												
	0.0000	0.0000	0.0000	0.0000	0.0000	92.3265	131.8234	112.0678	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	23.0816	32.9558	28.0170	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement												84.0544 (107)
Energy for space heating												35.9222 (99)
Energy for space cooling												1.1527 (108)
Total												37.0749 (109)
Fabric Energy Efficiency (DFEE)												37.1 (109)

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

1. Overall dwelling characteristics

Main dwelling	Area (m2)	Storey height (m)	Volume (m3)
Ground floor	72.9200 (1b)	x 2.8000 (2b)	= 204.1760 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	72.9200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	204.1760 (5)

2. Ventilation rate

	m3 per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	3 * 10 = 30.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)

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Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) = 30.0000 / (5) = 0.1469 (8)
Pressure test Yes
Pressure Test Method Blower Door
Measured/design AP50 5.0000 (17)
Infiltration rate 0.3969 (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) = 0.3374 (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	0.4302	0.4217	0.4133	0.3711	0.3627	0.3205	0.3205	0.3121	0.3374	0.3627	0.3796	0.3964	(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	0.5925	0.5889	0.5854	0.5689	0.5658	0.5514	0.5514	0.5487	0.5569	0.5658	0.5720	0.5786	(25)

3. Heat losses and heat loss parameter

Element	Gross m2	Openings m2	NetArea m2	U-value W/m2K	A x U W/K	K-value kJ/m2K	A x K kJ/K	
Main dwelling								
TER Opaque door			2.4200	1.0000	2.4200			(26)
TER Opening Type			13.4500	1.1450	15.4008			(27)
External Wall 1	49.3500	13.4500	35.9000	0.1800	6.4620			(29a)
Corridor wall	31.8900	2.4200	29.4700	0.1800	5.3046			(29a)
External Roof 1	72.9200		72.9200	0.1100	8.0212			(30)
Total net area of external elements Aum(A, m2)			154.1600					(31)
Fabric heat loss, W/K = Sum (A x U)					37.6086			(32)
Main dwelling								
Party Wall 1			30.7600	0.0000	0.0000			(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							160.2458	(35)

List of Thermal Bridges

K1 Element	Length	Psi-value	Total	
E1 Steel lintel with perforated steel base plate	8.4900	0.0500	0.4245	
E3 Sill	4.9900	0.0500	0.2495	
E4 Jamb	21.6000	0.0500	1.0800	
E7 Party floor between dwellings (in blocks of flats)	13.2700	0.0700	0.9289	
E7 Party floor between dwellings (in blocks of flats)	11.3900	0.0700	0.7973	
E9 Balcony between dwellings, wall insulation continuous	4.3600	0.0200	0.0872	
E16 Corner (normal)	5.6000	0.0900	0.5040	
E16 Corner (normal)	2.8000	0.0900	0.2520	
E18 Party wall between dwellings	2.8000	0.0600	0.1680	
E25 Staggered party wall between dwellings	2.8000	0.0600	0.1680	
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	10.9900	0.0000	0.0000	
E14 Flat roof	29.0200	0.0800	2.3216	
P4 Party wall - Roof (insulation at ceiling level)	10.9900	0.1200	1.3188	
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			8.2998	(36)
Point Thermal bridges			0.0000	(36a)
Total fabric heat loss			45.9084	(33) + (36) + (36a) = (37)

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(38)m	39.9232	39.6811	39.4438	38.3293	38.1208	37.1501	37.1501	36.9703	37.5240	38.1208	38.5426	38.9837	(38)
Heat transfer coeff	85.8316	85.5895	85.3522	84.2377	84.0292	83.0584	83.0584	82.8787	83.4323	84.0292	84.4510	84.8920	(39)
Average = Sum(39)m / 12 =												84.2367	

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP	1.1771	1.1737	1.1705	1.1552	1.1523	1.1390	1.1390	1.1366	1.1442	1.1523	1.1581	1.1642	(40)
HLP (average)												1.1552	
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31	

4. Water heating energy requirements (kWh/year)

Assumed occupancy													2.3149	(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	0.0000	(42a)
Hot water usage for baths														
27.2293	26.8249	26.2554	25.2054	24.4192	23.5474	23.0765	23.6420	24.2577	25.1905	26.2622	27.1372	27.1372	27.1372	(42b)
Hot water usage for other uses														
38.3367	36.9426	35.5485	34.1545	32.7604	31.3664	31.3664	32.7604	34.1545	35.5485	36.9426	38.3367	38.3367	38.3367	(42c)
Average daily hot water use (litres/day)													60.0974	(43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Daily hot water use	65.5660	63.7675	61.8040	59.3599	57.1796	54.9138	54.4429	56.4024	58.4122	60.7391	63.2048	65.4739	(44)	
Energy conte	103.8404	90.8041	94.9904	81.2607	76.9748	67.5229	65.8439	69.8380	72.0280	82.4224	90.0468	102.5163	(45)	
Energy content (annual)													998.0887	
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	0.0000	(46)	
Water storage loss (or HIU loss):														
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(56)	
If cylinder contains dedicated solar storage														
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(57)	
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(59)	
Combi loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(61)	
Total heat required for water heating calculated for each month														
88.2644	77.1835	80.7418	69.0716	65.4285	57.3944	55.9673	59.3623	61.2238	70.0590	76.5398	87.1389	87.1389	(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														
88.2644	77.1835	80.7418	69.0716	65.4285	57.3944	55.9673	59.3623	61.2238	70.0590	76.5398	87.1389	87.1389	(64)	
Total per year (kWh/year)													848.3754	(64)
Electric shower(s)													848	(64)
50.4786	44.9768	49.1130	46.8679	47.7474	45.5464	47.0646	47.7474	46.8679	49.1130	48.1895	50.4786	50.4786	(64a)	

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Heat gains from water heating, kWh/month
 34.6857 30.5401 32.4637 28.9849 28.2940 25.7352 25.7580 26.7774 27.0229 29.7930 31.1823 34.4044 (65)

Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m = 574.1908 (64a)

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

Metabolic gains (Table 5), Watts	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439	115.7439 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	104.7039	115.9221	104.7039	108.1940	104.7039	108.1940	104.7039	104.7039	108.1940	104.7039	108.1940	104.7039 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	204.0140	206.1310	200.7962	189.4389	175.1025	161.6282	152.6265	150.5095	155.8444	167.2016	181.5381	195.0123 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744	34.5744 (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)	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951	-92.5951 (71)
Water heating gains (Table 5)	46.6206	45.4465	43.6340	40.2568	38.0295	35.7433	34.6209	35.9911	37.5319	40.0444	43.3088	46.2424 (72)
Total internal gains	413.0616	425.2228	406.8572	395.6129	375.5590	363.2887	349.6745	348.9277	359.2934	369.6730	390.7640	403.6818 (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					2.7300	11.2829	0.6300	0.7000			0.7700	9.4136 (75)
Southeast					10.7200	36.7938	0.6300	0.7000			0.7700	120.5429 (77)
Solar gains	129.9565	224.4909	315.4636	404.7958	466.1116	468.3301	449.1943	402.5954	346.2661	250.3496	156.2274	110.8472 (83)
Total gains	543.0182	649.7137	722.3208	800.4087	841.6706	831.6188	798.8688	751.5231	705.5595	620.0226	546.9914	514.5290 (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	37.8167	37.9237	38.0291	38.5322	38.6279	39.0793	39.0793	39.1641	38.9042	38.6279	38.4349	38.2352
alpha	3.5211	3.5282	3.5353	3.5688	3.5752	3.6053	3.6053	3.6109	3.5936	3.5752	3.5623	3.5490
util living area	0.9794	0.9615	0.9320	0.8645	0.7516	0.5866	0.4423	0.4848	0.6969	0.8925	0.9637	0.9827 (86)
MIT	19.1621	19.4630	19.8475	20.3289	20.6945	20.9099	20.9750	20.9651	20.8273	20.3424	19.6753	19.1172 (87)
Th 2	19.9384	19.9411	19.9437	19.9560	19.9583	19.9691	19.9691	19.9711	19.9649	19.9583	19.9536	19.9488 (88)
util rest of house	0.9750	0.9535	0.9178	0.8361	0.7007	0.5084	0.3451	0.3855	0.6234	0.8636	0.9548	0.9790 (89)
MIT 2	18.2813	18.5785	18.9543	19.4187	19.7446	19.9214	19.9605	19.9581	19.8632	19.4435	18.8000	18.2446 (90)
Living area fraction	18.7172	19.0163	19.3964	19.8692	20.2148	20.4106	20.4626	20.4565	20.3404	19.8884	19.2332	18.6765 (91)
MIT	18.7172	19.0163	19.3964	19.8692	20.2148	20.4106	20.4626	20.4565	20.3404	19.8884	19.2332	18.6765 (92)
Temperature adjustment	18.7172	19.0163	19.3964	19.8692	20.2148	20.4106	20.4626	20.4565	20.3404	19.8884	19.2332	18.6765 (93)
adjusted MIT	18.7172	19.0163	19.3964	19.8692	20.2148	20.4106	20.4626	20.4565	20.3404	19.8884	19.2332	18.6765 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	0.9684	0.9449	0.9090	0.8335	0.7141	0.5431	0.3925	0.4335	0.6517	0.8613	0.9472	0.9730 (94)
Ext temp.	525.8400	613.9028	656.5873	667.1101	601.0352	451.6120	313.5535	325.7667	459.8092	534.0470	518.0875	500.6542 (95)
Heat loss rate W	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000 (96)
Space heating kWh	1237.4538	1208.2034	1100.7356	924.0202	715.4881	482.6201	320.8204	336.1981	520.6495	780.4976	1024.6578	1228.9359 (97)
Space heating requirement - total per year (kWh/year)	529.4407	399.3700	330.4463	184.9753	85.1529	0.0000	0.0000	0.0000	0.0000	183.3593	364.7306	541.8416 (98a)
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)	529.4407	399.3700	330.4463	184.9753	85.1529	0.0000	0.0000	0.0000	0.0000	183.3593	364.7306	541.8416 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)	529.4407	399.3700	330.4463	184.9753	85.1529	0.0000	0.0000	0.0000	0.0000	183.3593	364.7306	541.8416 (98c)
Space heating per m 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 (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	780.7493	614.6324	629.8779	0.0000	0.0000	0.0000	0.0000 (100)
Utilisation	0.0000	0.0000	0.0000	0.0000	0.0000	0.8460	0.9017	0.8801	0.0000	0.0000	0.0000	0.0000 (101)
Useful loss	0.0000	0.0000	0.0000	0.0000	0.0000	660.4786	554.2421	554.3742	0.0000	0.0000	0.0000	0.0000 (102)
Total gains	0.0000	0.0000	0.0000	0.0000	0.0000	931.0412	894.8547	841.5671	0.0000	0.0000	0.0000	0.0000 (103)
Space cooling kWh	0.0000	0.0000	0.0000	0.0000	0.0000	194.8051	253.4158	213.6715	0.0000	0.0000	0.0000	0.0000 (104)
Cooled fraction	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)
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	48.7013	63.3540	53.4179	0.0000	0.0000	0.0000	0.0000 (107)
Space cooling requirement	0.0000	0.0000	0.0000	0.0000	0.0000	48.7013	63.3540	53.4179	0.0000	0.0000	0.0000	0.0000 (107)
Energy for space heating	0.0000	0.0000	0.0000	0.0000	0.0000	48.7013	63.3540	53.4179	0.0000	0.0000	0.0000	0.0000 (107)
Energy for space cooling	0.0000	0.0000	0.0000	0.0000	0.0000	48.7013	63.3540	53.4179	0.0000	0.0000	0.0000	0.0000 (107)

Total
Fabric Energy Efficiency (TFEE)

38.1897 (109)
38.2 (109)