

Summary for Input Data



Plot Reference	Be Green 2512002		Issued on Date	30/06/2026
Assessment Reference	00001	Plot Type Ref		
Plot Address	94a, Christchurch Road		SAP Version	10.2

SAP Rating	79 C	DER	5.99	TER	12.58
Environmental	96 A	% DER < TER			52.38
CO ₂ Emissions (t/year)	0.29	DFEE	49.06	TFEE	50.65
Compliance Check	See BREL	% DFEE < TFEE			3.14
% DPER < TPER	5.26	DPER	63.66	TPER	67.19

Assessor Details	Mr. Matthew Haskell	Assessor ID	6443-0001
Client			

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

Orientation	North
Property Tenture	ND
Transaction Type	6
Terrain Type	Urban
1.0 Property Type	Bungalow, Detached
2.0 Number of Storeys	1
3.0 Date Built	2025
4.0 Sheltered Sides	0
5.0 Sunlight/Shade	Average or unknown
6.0 Thermal Mass Parameter	Precise calculation
Thermal Mass	95.11 kJ/m²K

7.0 Electricity Tariff	Standard
Smart electricity meter fitted	Yes
Smart gas meter fitted	No

7.0 Measurements	Ground floor:	Heat Loss Perimeter 28.90 m	Internal Floor Area 52.00 m²	Average Storey Height 2.57 m
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8.0 Living Area	25.00 m²
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Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Res	Shelter	Openings	Area Calculation Type
External Wall 1	Timber Frame	Timber framed wall (one layer of plasterboard)	0.18	9.00	74.41	55.91	0.00	None	18.50	Enter Gross Area
Roof Light Tunnel	Timber Frame	Timber framed wall (one layer of plasterboard)	0.18	9.00	8.31	8.31	0.00	None	0.00	Enter Gross Area

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Code	Shelter Factor	Calculation Type	Openings
External Roof 1	External Flat Roof	Plasterboard, insulated flat roof	0.13	9.00	52.00	52.00	None	0.00	Enter Gross Area	0.00

Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
Heatloss Floor 1	Ground Floor - Solid	Lowest occupied	Suspended concrete floor, carpeted	0.18	None	0.00	75.00	52.00

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Entrance	Manufacturer	Solid Door				0.00			1.00
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.20
Roof Light	Manufacturer	Roof Light	Double Low-E Soft 0.05			0.63		0.70	1.30

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Entrance	Entrance	External Wall 1	North	1.89	
Windows	Window	External Wall 1	North	3.92	
Windows	Window	External Wall 1	East	5.04	
Windows	Window	External Wall 1	South	7.65	

Summary for Input Data

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	

17.0 Thermal Bridging	Calculate Bridges
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17.1 List of Bridges

Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported
E2 Other lintels (including other steel lintels)	Independently assessed	10.18	0.03	0.03 ECD	No
E3 Sill	Independently assessed	2.70	0.04	0.04 ACD	No
E4 Jamb	Independently assessed	29.36	0.05	0.05 ACD	No
E5 Ground floor (normal)	Independently assessed	28.90	0.03	0.03 ECD	No
E16 Corner (normal)	Independently assessed	10.30	0.09	0.09 ACD	No
E14 Flat roof	Independently assessed	28.90	0.04	0.04 ACD	No

Y-value	0.02	W/m²K
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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	500519
Configuration	2
Manufacturer SFP	0.71
Duct Type	Rigid
MVHR Efficiency	76.00
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

21.0 Fixed Cooling System	No
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22.0 Pressure Testing	Yes	
Designed AP ₅₀	2.50	m³/(h.m²) @ 50 Pa
Test Method	Blower Door	

22.0 Lighting

No Fixed Lighting	No				
	Name	Efficacy	Power	Capacity	Count
	Lighting 1	105.00	6.00	630.00	15

24.0 Main Heating 1

	Database	
Percentage of Heat	100.00	%
Database Ref. No.	104421	
Fuel Type	Electricity	

Summary for Input Data

In Winter	301.48											
In Summer	169.86											
Model Name	aroTHERM plus 5kW + AI											
Manufacturer	Vaillant Group UK Ltd											
System Type	Heat Pump											
Controls SAP Code	2207											
Controls description	Time and temperature zone control by arrangement											
Is MHS Pumped	Pump in heated space											
Heating Pump Age	2013 or later											
Heat Emitter	Underfloor											
Underfloor Heating	Yes - Pipes in thin screed											
Flow Temperature	Enter value											
Flow Temperature Value	35.00											

25.0 Main Heating 2	None											
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26.0 Heat Networks	None											
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27.0 Secondary Heating	None											
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28.0 Water Heating												
Water Heating	Main Heating 1											
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 mains											
Bath Count	0											
Immersion Only Heating Hot Water	No											

28.1 Showers												
Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To							
Shower	Instantaneous electric shower		9.30	No								

28.3 Waste Water Heat Recovery System												
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29.0 Hot Water Cylinder	Hot Water Cylinder											
Cylinder Stat	Yes											
Cylinder In Heated Space	Yes											
Independent Time Control	Yes											
Insulation Type	Measured Loss											
Cylinder Volume	150.00										L	
Loss	1.86										kWh/day	
Pipes insulation	Fully insulated primary pipework											

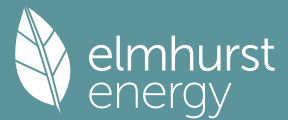
31.0 Thermal Store	None											
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34.0 Small-scale Hydro	None											
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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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Recommendations												
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				52.38
CO ₂ Emissions (t/year)	0.29		DFEE	49.06		TFEE	50.65
Compliance Check	See BREL		% DFEE < TFEE				3.14
% DPER < TPER	5.26		DPER	63.66		TPER	67.19
Assessor Details	Mr. Matthew Haskell				Assessor ID	6443-0001	
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	52.0000 (1b)	2.5700 (2b)	133.6400 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	52.0000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	133.6400 (5)

2. Ventilation rate

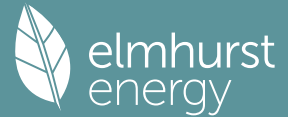
	m ³ per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
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	2.5000 (17)
Infiltration rate	0.1250 (18)
Number of sides sheltered	0 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 1.0000 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.1250 (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	0.1594	0.1562	0.1531	0.1375	0.1344	0.1187	0.1187	0.1156	0.1250	0.1344	0.1406	0.1469 (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) =												68.4000 (23c)
Effective ac	0.3174	0.3142	0.3111	0.2955	0.2924	0.2767	0.2767	0.2736	0.2830	0.2924	0.2986	0.3049 (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							
Entrance			1.8900	1.0000	1.8900		(26)
Window			16.6100	1.1450	19.0191		(27)
Heatloss Floor 1			52.0000	0.1800	9.3600	75.0000	3900.0000 (28a)
External Wall 1	74.4100	18.5000	55.9100	0.1800	10.0638	9.0000	503.1900 (29a)
Roof Light Tunnel	8.3100		8.3100	0.1800	1.4958	9.0000	74.7900 (29a)
External Roof 1	52.0000		52.0000	0.1300	6.7600	9.0000	468.0000 (30)
Total net area of external elements Aum(A, m ²)			186.7200				(31)
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) =	48.5887	(33)
Heat capacity Cm = Sum(A x k)					(28)...(30) + (32) + (32a)...(32e) =	4945.9800 (34)	
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							95.1150 (35)
List of Thermal Bridges							
K1 Element				Length	Psi-value	Total	
E2 Other lintels (including other steel lintels)				10.1770	0.0250	0.2544	
E3 Sill				2.7000	0.0400	0.1080	

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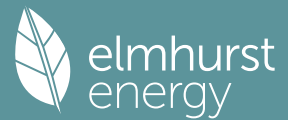
E4 Jamb						29.3600	0.0500	1.4680				
E5 Ground floor (normal)						28.9000	0.0260	0.7514				
E16 Corner (normal)						10.3000	0.0900	0.9270				
E14 Flat roof						28.9000	0.0400	1.1560				
Thermal bridges (Sum(L x Psi) calculated using Appendix K)											4.6648 (36)	
Point Thermal bridges										(36a) =	0.0000	
Total fabric heat loss										(33) + (36) + (36a) =	53.2535 (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	13.9966	13.8588	13.7210	13.0319	12.8941	12.2050	12.2050	12.0672	12.4806	12.8941	13.1697	13.4454 (38)
Average = Sum(39)m / 12 =	67.2501	67.1123	66.9745	66.2854	66.1476	65.4585	65.4585	65.3207	65.7341	66.1476	66.4232	66.6989 (39)
												66.2510
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	1.2933	1.2906	1.2880	1.2747	1.2721	1.2588	1.2588	1.2562	1.2641	1.2721	1.2774	1.2827 (40)
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)												
Assumed occupancy												1.7491 (42)
Hot water usage for mixer showers												0.0000 (42a)
Hot water usage for baths												0.0000 (42b)
Hot water usage for other uses												32.5422 (42c)
Average daily hot water use (litres/day)												29.5839 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	32.5422	31.3589	30.1755	28.9922	27.8088	26.6255	26.6255	27.8088	28.9922	30.1755	31.3589	32.5422 (44)
Energy conte	51.5389	44.6546	46.3787	39.6888	37.4360	32.7391	32.2012	34.4331	35.7502	40.9479	44.6765	50.9533 (45)
Energy content (annual)												491.3984
Distribution loss (46)m = 0.15 x (45)m												7.6430 (46)
Water storage loss (or HIU loss):												150.0000 (47)
Store volume												1.8600 (48)
a) If manufacturer declared loss factor is known (kWh/day):												0.5400 (49)
Temperature factor from Table 2b												1.0044 (55)
Enter (49) or (54) in (55)												
Total storage loss												31.1364 (56)
If cylinder contains dedicated solar storage												31.1364 (57)
Primary loss												23.2624 (59)
Combi loss												0.0000 (61)
Total heat required for water heating calculated for each month												
WWHRS	105.9377	93.7890	100.7775	92.3328	91.8348	85.3831	86.6000	88.8319	88.3942	95.3467	97.3205	105.3521 (62)
PV diverter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63a)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63b)
FGHRS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63c)
Output from w/h	105.9377	93.7890	100.7775	92.3328	91.8348	85.3831	86.6000	88.8319	88.3942	95.3467	97.3205	105.3521 (64)
12Total per year (kWh/year)												1131.9004 (64)
Electric shower(s)	55.0370	49.0384	53.5480	51.1002	52.0591	49.6593	51.3147	52.0591	51.1002	53.5480	52.5411	55.0370 (64a)
Total Energy used by instantaneous electric shower(s) (kWh/year) = Sum(64a)m =												626.0423 (64a)
Heat gains from water heating, kWh/month	74.4150	66.4148	72.3270	68.0868	68.9813	65.4158	67.0546	67.9828	66.7772	70.5212	70.1054	74.2202 (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	87.4535	87.4535	87.4535	87.4535	87.4535	87.4535	87.4535	87.4535	87.4535	87.4535	87.4535	87.4535 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	76.8814	85.1187	76.8814	79.4441	76.8814	79.4441	76.8814	76.8814	79.4441	76.8814	79.4441	76.8814 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	152.4259	154.0076	150.0218	141.5364	130.8251	120.7580	114.0326	112.4509	116.4367	124.9221	135.6334	145.7005 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	31.7454	31.7454	31.7454	31.7454	31.7454	31.7454	31.7454	31.7454	31.7454	31.7454	31.7454	31.7454 (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)	-69.9628	-69.9628	-69.9628	-69.9628	-69.9628	-69.9628	-69.9628	-69.9628	-69.9628	-69.9628	-69.9628	-69.9628 (71)
Water heating gains (Table 5)	100.0201	98.8315	97.2137	94.5650	92.7168	90.8553	90.1272	91.3748	92.7461	94.7866	97.3686	99.7584 (72)
Total internal gains	378.5635	387.1939	373.3529	364.7816	349.6594	340.2935	330.2772	329.9431	337.8630	345.8262	361.6822	371.5763 (73)

6. Solar gains												
[Jan]												
	Area											
	m2											
	Solar flux											
	Table 6a											
	W/m2											
	Specific data											
	or Table 6b											
	Specific data											
	or Table 6c											
	Access											
	factor											
	Table 6d											
	Gains											
	W											
North	3.9200											12.7388 (74)
East	5.0400											30.2517 (76)
South	7.6500											109.3035 (78)
Solar gains	152.2940	262.5343	366.8545	466.3060	532.2668	532.5969	511.7561	462.0426	401.2881	292.2797	182.9972	129.9455 (83)
Total gains	530.8575	649.7281	740.2074	831.0876	881.9262	872.8903	842.0333	791.9857	739.1512	638.1059	544.6794	501.5219 (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	20.4295	20.4714	20.5135	20.7268	20.7700	20.9886	20.9886	21.0329	20.9006	20.7700	20.6838	20.5983
alpha	2.3620	2.3648	2.3676	2.3818	2.3847	2.3992	2.3992	2.4022	2.3934	2.3847	2.3789	2.3732
util living area	0.9023	0.8539	0.7914	0.6917	0.5707	0.4332	0.3244	0.3556	0.5226	0.7305	0.8595	0.9122 (86)
Living	19.0140	19.3540	19.7581	20.2127	20.5471	20.7537	20.8294	20.8178	20.6765	20.2280	19.5525	18.9530
Non living	17.5593	17.9788	18.4730	19.0201	19.3995	19.6218	19.6873	19.6816	19.5495	19.0563	18.2417	17.4895
24 / 16	0	0	0	0	0	0	0	0	0	0	0	0
24 / 9	3	0	0	0	0	0	0	0	0	0	0	0
16 / 9	28	0	0	0	0	0	0	0	0	0	0	10
MIT	19.9840	19.3540	19.7581	20.2127	20.5471	20.7537	20.8294	20.8178	20.6765	20.2280	19.5525	19.2393 (87)
Th 2	19.8461	19.8482	19.8503	19.8607	19.8628	19.8732	19.8732	19.8753	19.8690	19.8628	19.8586	19.8544 (88)
util rest of house	0.8894	0.8358	0.7662	0.6557	0.5213	0.3685	0.2473	0.2763	0.4566	0.6901	0.8390	0.9004 (89)
MIT 2	18.9345	17.9788	18.4730	19.0201	19.3995	19.6218	19.6873	19.6816	19.5495	19.0563	18.2417	17.9156 (90)
Living area fraction									fLA = Living area / (4) =			
MIT	19.4391	18.6399	19.0908	19.5934	19.9513	20.1660	20.2364	20.2278	20.0913	19.6196	18.8719	18.5520 (92)
Temperature adjustment												0.0000
adjusted MIT	19.4391	18.6399	19.0908	19.5934	19.9513	20.1660	20.2364	20.2278	20.0913	19.6196	18.8719	18.5520 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8842	0.8135	0.7474	0.6465	0.5253	0.3859	0.2728	0.3019	0.4703	0.6805	0.8180	0.8843 (94)
Useful gains	469.4076	528.5630	553.2047	537.2988	463.2974	336.8393	229.6791	239.0938	347.5984	434.2482	445.5345	443.4747 (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	1018.1040	922.1176	843.2657	708.8187	545.8007	364.3409	238.0325	250.0362	393.8335	596.6267	781.9276	957.2643 (97)
Space heating kWh	408.2301	264.4687	215.8054	123.4943	61.3824	0.0000	0.0000	0.0000	0.0000	120.8096	242.2030	382.2594 (98a)
Space heating requirement - total per year (kWh/year)												1818.6529
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	408.2301	264.4687	215.8054	123.4943	61.3824	0.0000	0.0000	0.0000	0.0000	120.8096	242.2030	382.2594 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1818.6529
Space heating per m2										(98c) / (4) =		34.9741 (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 %)												301.4795 (206)
Efficiency of main space heating system 2 (in %)												0.0000 (207)
Efficiency of secondary/supplementary heating system, %												0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Space heating requirement	408.2301	264.4687	215.8054	123.4943	61.3824	0.0000	0.0000	0.0000	0.0000	120.8096	242.2030	382.2594 (98)
Space heating efficiency (main heating system 1)	301.4795	301.4795	301.4795	301.4795	301.4795	0.0000	0.0000	0.0000	0.0000	301.4795	301.4795	301.4795 (210)
Space heating fuel (main heating system)	135.4089	87.7236	71.5821	40.9628	20.3604	0.0000	0.0000	0.0000	0.0000	40.0722	80.3381	126.7945 (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	105.9377	93.7890	100.7775	92.3328	91.8348	85.3831	86.6000	88.8319	88.3942	95.3467	97.3205	105.3521 (64)
Efficiency of water heater	169.8600	169.8600	169.8600	169.8600	169.8600	169.8600	169.8600	169.8600	169.8600	169.8600	169.8600	169.8600 (216)
(217)m	169.8600	169.8600	169.8600	169.8600	169.8600	169.8600	169.8600	169.8600	169.8600	169.8600	169.8600	169.8600 (217)
Fuel for water heating, kWh/month	62.3677	55.2155	59.3297	54.3582	54.0650	50.2668	50.9832	52.2971	52.0395	56.1325	57.2945	62.0229 (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	12.2895	11.1002	12.2895	11.8930	12.2895	11.8930	12.2895	12.2895	11.8930	12.2895	11.8930	12.2895 (231)
Lighting	14.6528	11.7551	10.5841	7.7544	5.9897	4.8936	5.4640	7.1023	9.2252	12.1040	13.6714	15.0601 (232)
Electricity generated by PVs (Appendix M) (negative quantity)												
(233a)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 (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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (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												603.2426 (211)
Space heating fuel - main system 2												0.0000 (213)
Space heating fuel - secondary												0.0000 (215)
Efficiency of water heater												169.8600
Water heating fuel used												666.3726 (219)
Space cooling fuel												0.0000 (221)
Electricity for pumps and fans:												
(BalancedWithHeatRecovery, Database: in-use factor = 1.2500, SFP = 0.8875)												
mechanical ventilation fans (SFP = 0.8875)												144.6987 (230a)
Total electricity for the above, kWh/year												144.6987 (231)

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Electricity for lighting (calculated in Appendix L)	118.2569 (232)
Energy saving/generation technologies (Appendices M ,N and Q)	
PV generation	0.0000 (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	2158.6130 (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	603.2426	0.1556	93.8531 (261)
Total CO2 associated with community systems			0.0000 (273)
Water heating (other fuel)	666.3726	0.1400	93.2801 (264)
Energy for instantaneous electric shower(s)	626.0423	0.1391	87.0963 (264a)
Space and water heating			187.1332 (265)
Pumps, fans and electric keep-hot	144.6987	0.1387	20.0715 (267)
Energy for lighting	118.2569	0.1443	17.0681 (268)
Total CO2, kg/year			311.3692 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			5.9900 (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	603.2426	1.5759	950.6722 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	666.3726	1.5176	1011.2576 (278)
Energy for instantaneous electric shower(s)	626.0423	1.5143	948.0372 (278a)
Space and water heating			1961.9298 (279)
Pumps, fans and electric keep-hot	144.6987	1.5128	218.9002 (281)
Energy for lighting	118.2569	1.5338	181.3863 (282)
Total Primary energy kWh/year			3310.2535 (286)
Dwelling Primary energy Rate (DPER)			63.6600 (287)

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	52.0000 (1b)	2.5700 (2b)	133.6400 (1b) - (3b)
Ground floor			(4)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	52.0000		(5)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	133.6400

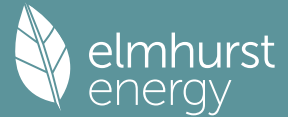
2. Ventilation rate

	m3 per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	2 * 10 = 20.0000 (7a)
Number of passive vents	0 * 10 = 0.0000 (7b)
Number of flueless gas fires	0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	20.0000 / (5) = 0.1497 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	5.0000 (17)
Infiltration rate	0.3997 (18)
Number of sides sheltered	0 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] = 1.0000 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) = 0.3997 (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	0.5096	0.4996	0.4896	0.4396	0.4296	0.3797	0.3797	0.3697	0.3997	0.4296	0.4496	0.4696 (22b)
Effective ac	0.6298	0.6248	0.6198	0.5966	0.5923	0.5721	0.5721	0.5683	0.5799	0.5923	0.6011	0.6103 (25)

3. Heat losses and heat loss parameter

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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			1.8900	1.0000	1.8900		(26)
TER Opening Type			11.1100	1.1450	12.7214		(27)
Heatloss Floor 1			52.0000	0.1300	6.7600		(28a)
External Wall 1	74.4100	13.0000	61.4100	0.1800	11.0538		(29a)
Roof Light Tunnel	8.3100		8.3100	0.1800	1.4958		(29a)
External Roof 1	52.0000		52.0000	0.1100	5.7200		(30)
Total net area of external elements Aum(A, m2)			186.7200				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		39.6410		(33)

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

95.1150 (35)

List of Thermal Bridges

	Length	Psi-value	Total
K1 Element	10.1770	0.0500	0.5089
E2 Other lintels (including other steel lintels)	2.7000	0.0500	0.1350
E3 Sill	29.3600	0.0500	1.4680
E4 Jamb	28.9000	0.1600	4.6240
E5 Ground floor (normal)	10.3000	0.0900	0.9270
E16 Corner (normal)	28.9000	0.0800	2.3120
E14 Flat roof			

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

9.9748 (36)

Point Thermal bridges

(36a) = 0.0000

Total fabric heat loss

(33) + (36) + (36a) = 49.6158 (37)

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(38)m	27.7761	27.5538	27.3358	26.3123	26.1207	25.2292	25.2292	25.0641	25.5726	26.1207	26.5082	26.9132
Heat transfer coeff	77.3919	77.1696	76.9517	75.9281	75.7366	74.8451	74.8451	74.6800	75.1885	75.7366	76.1240	76.5290
Average = Sum(39)m / 12 =												

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.4883	1.4840	1.4798	1.4602	1.4565	1.4393	1.4393	1.4362	1.4459	1.4565	1.4639	1.4717
HLP (average)												
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

Assumed occupancy

1.7491 (42)

Hot water usage for mixer showers

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Hot water usage for mixer showers	68.7246	67.6918	66.1868	63.3073	61.1823	58.8125	57.4655	58.9591	60.5964	63.1408	66.0822	68.4613
Hot water usage for baths	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hot water usage for other uses	32.5422	31.3589	30.1755	28.9922	27.8088	26.6255	26.6255	27.8088	28.9922	30.1755	31.3589	32.5422
Average daily hot water use (litres/day)												

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily hot water use	101.2669	99.0507	96.3624	92.2995	88.9911	85.4380	84.0910	86.7679	89.5885	93.3163	97.4411	101.0035
Energy conte	160.3819	141.0469	148.1054	126.3534	119.7991	105.0559	101.7007	107.4368	110.4716	126.6294	138.8227	158.1471
Energy content (annual)												
Distribution loss (46)m = 0.15 x (45)m	24.0573	21.1570	22.2158	18.9530	17.9699	15.7584	15.2551	16.1155	16.5707	18.9944	20.8234	23.7221

Water storage loss (or HIU loss): 150.0000 (47)

Store volume 1.3938 (48)

a) If manufacturer declared loss factor is known (kWh/day): 0.5400 (49)

Enter (49) or (54) in (55) 0.7527 (55)

Total storage loss 23.3325 21.0745 23.3325 22.5798 23.3325 22.5798 23.3325 23.3325 23.3325 22.5798 23.3325 22.5798 23.3325 (56)

If cylinder contains dedicated solar storage 23.3325 21.0745 23.3325 22.5798 23.3325 22.5798 23.3325 23.3325 23.3325 22.5798 23.3325 22.5798 23.3325 (57)

Primary loss 23.2624 21.0112 23.2624 22.5120 23.2624 22.5120 23.2624 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 0.0000 (61)

Total heat required for water heating calculated for each month 206.9768 183.1326 194.7003 171.4452 166.3940 150.1478 148.2956 154.0317 155.5635 173.2243 183.9145 204.7420 (62)

WWHRS -31.4180 -27.7864 -29.0963 -24.0929 -22.4537 -19.2138 -18.0099 -19.1517 -19.8793 -23.4355 -26.5496 -30.8362 (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 175.5588 155.3462 165.6040 147.3524 143.9404 130.9340 130.2858 134.8800 135.6841 149.7888 157.3649 173.9058 (64)

Total per year (kWh/year) = Sum(64)m = 1800.6452 (64)

12Total per year (kWh/year) 1801 (64)

Electric shower(s) 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 (64a)

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

Heat gains from water heating, kWh/month 90.6029 80.5667 86.5210 78.0860 77.1091 71.0046 71.0914 72.9987 72.8053 79.3802 82.2320 89.8598 (65)

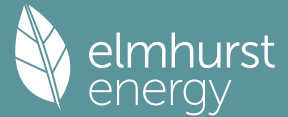
5. Internal gains (see Table 5 and 5a)

Metabolic gains (Table 5), Watts

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(66)m	87.4535	87.4535	87.4535	87.4535	87.4535	87.4535	87.4535	87.4535	87.4535	87.4535	87.4535	87.4535
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	77.0079	85.2588	77.0079	79.5748	77.0079	79.5748	77.0079	77.0079	79.5748	77.0079	79.5748	77.0079
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	152.4259	154.0076	150.0218	141.5364	130.8251	120.7580	114.0326	112.4509	116.4367	124.9221	135.6334	145.7005
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	31.7454	31.7454	31.7454	31.7454	31.7454	31.7454	31.7454	31.7454	31.7454	31.7454	31.7454	31.7454
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000
Losses e.g. evaporation (negative values) (Table 5)	-69.9628	-69.9628	-69.9628	-69.9628	-69.9628	-69.9628	-69.9628	-69.9628	-69.9628	-69.9628	-69.9628	-69.9628
Water heating gains (Table 5)	121.7781	119.8909	116.2916	108.4527	103.6413	98.6175	95.5530	98.1165	101.1185	106.6938	114.2111	120.7794
Total internal gains	403.4480	411.3933	395.5574	381.8000	363.7104	348.1864	335.8296	336.8113	346.3661	360.8599	381.6554	395.7238

6. Solar gains

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[Jan]	Area m2				Solar flux Table 6a W/m2	Specific data or Table 6b	Specific data or Table 6c	FF	Access factor Table 6d	Gains W		
North	2.6200				10.6334	0.6300	0.7000		0.7700	8.5142 (74)		
East	3.3700				19.6403	0.6300	0.7000		0.7700	20.2278 (76)		
South	5.1200				46.7521	0.6300	0.7000		0.7700	73.1548 (78)		
Solar gains	101.8968	175.6497	245.4296	311.9395	356.0445	356.2570	342.3199	309.0796	268.4577	195.5465	122.4384	86.9447 (83)
Total gains	505.3448	587.0430	640.9869	693.7395	719.7549	704.4434	678.1495	645.8909	614.8238	556.4064	504.0939	482.6685 (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	17.7523	17.8034	17.8538	18.0945	18.1403	18.3564	18.3564	18.3969	18.2725	18.1403	18.0480	17.9524
alpha	2.1835	2.1869	2.1903	2.2063	2.2094	2.2238	2.2238	2.2265	2.2182	2.2094	2.2032	2.1968
util living area	0.9175	0.8873	0.8476	0.7780	0.6809	0.5503	0.4301	0.4617	0.6290	0.7974	0.8873	0.9241 (86)
MIT	18.0122	18.3953	18.9307	19.6215	20.2197	20.6654	20.8621	20.8338	20.5175	19.7472	18.7807	17.9570 (87)
Th 2	19.6963	19.6995	19.7027	19.7175	19.7203	19.7333	19.7333	19.7357	19.7283	19.7203	19.7147	19.7088 (88)
util rest of house	0.9053	0.8712	0.8252	0.7440	0.6283	0.4704	0.3238	0.3559	0.5544	0.7590	0.8685	0.9129 (89)
MIT 2	16.3081	16.7843	17.4481	18.2950	18.9962	19.4853	19.6631	19.6453	19.3426	18.4678	17.2828	16.2447 (90)
Living area fraction	fLA = Living area / (4) = 0.4808 (91)											
MIT	17.1274	17.5588	18.1609	18.9327	19.5844	20.0526	20.2396	20.2167	19.9075	19.0829	18.0030	17.0679 (92)
Temperature adjustment	0.0000											
adjusted MIT	17.1274	17.5588	18.1609	18.9327	19.5844	20.0526	20.2396	20.2167	19.9075	19.0829	18.0030	17.0679 (93)
8. Space heating requirement												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.8728	0.8368	0.7922	0.7196	0.6221	0.4919	0.3683	0.3983	0.5659	0.7363	0.8359	0.8814 (94)
Useful gains	441.0549	491.2158	507.8116	499.2442	447.7885	346.5106	249.7637	257.2815	347.9191	409.6807	421.3682	425.4338 (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	992.7373	976.8753	897.3254	761.7644	597.1399	408.1023	272.4029	285.0312	436.6535	642.4643	829.9769	984.7703 (97)
Space heating kWh	410.4517	326.3632	289.7983	189.0145	111.1175	0.0000	0.0000	0.0000	0.0000	173.1910	294.1983	416.1464 (98a)
Space heating requirement - total per year (kWh/year)												2210.2808
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	410.4517	326.3632	289.7983	189.0145	111.1175	0.0000	0.0000	0.0000	0.0000	173.1910	294.1983	416.1464 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												2210.2808
Space heating per m2	(98c) / (4) =											42.5054 (99)
9a. Energy requirements - Individual heating systems, including micro-CHP												
Fraction of space heat from secondary/supplementary system (Table 11)												0.0000 (201)
Fraction of space heat from main system(s)												1.0000 (202)
Efficiency of main space heating system 1 (in %)												92.3000 (206)
Efficiency of main space heating system 2 (in %)												0.0000 (207)
Efficiency of secondary/supplementary heating system, %												0.0000 (208)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Space heating requirement	410.4517	326.3632	289.7983	189.0145	111.1175	0.0000	0.0000	0.0000	0.0000	173.1910	294.1983	416.1464 (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)	444.6931	353.5896	313.9743	204.7828	120.3873	0.0000	0.0000	0.0000	0.0000	187.6392	318.7414	450.8628 (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	175.5588	155.3462	165.6040	147.3524	143.9404	130.9340	130.2858	134.8800	135.6841	149.7888	157.3649	173.9058 (64)
Water heating requirement	175.5588	155.3462	165.6040	147.3524	143.9404	130.9340	130.2858	134.8800	135.6841	149.7888	157.3649	173.9058 (64)
Efficiency of water heater (217)m	85.8977	85.6836	85.3016	84.6193	83.4863	79.8000	79.8000	79.8000	79.8000	84.3862	85.4419	79.8000 (216)
Fuel for water heating, kWh/month	204.3812	181.3022	194.1394	174.1357	172.4120	164.0777	163.2654	169.0226	170.0303	177.5039	184.1778	202.3497 (219)
Space cooling fuel requirement	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)
(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	16.0007	12.8364	11.5577	8.4677	6.5407	5.3438	5.9666	7.7557	10.0738	13.2174	14.9290	16.4454 (232)
Electricity generated by PVs (Appendix M) (negative quantity)	-41.2062	-54.6795	-74.0883	-78.4579	-80.8496	-74.2768	-73.4297	-71.1311	-66.5602	-60.2088	-44.1068	-36.0494 (233a)
Electricity generated by wind turbines (Appendix M) (negative quantity)	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)	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)	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)
(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)	-34.9321	-71.7349	-139.4440	-205.0477	-266.9963	-266.7045	-263.4725	-224.8415	-167.2623	-100.9223	-46.0797	-27.7484 (233b)
Electricity generated by wind turbines (Appendix M) (negative quantity)	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)	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)	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)
(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												

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Space heating fuel - main system 1	2394.6705	(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	2156.7978	(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)	129.1350	(232)
Energy saving/generation technologies (Appendices M ,N and Q)		
PV generation	-2570.2303	(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	2196.3730	(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	2394.6705	0.2100	502.8808 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	2156.7978	0.2100	452.9275 (264)
Space and water heating			955.8083 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	129.1350	0.1443	18.6382 (268)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-755.0442	0.1358	-102.5680
PV Unit electricity exported	-1815.1861	0.1265	-229.6943
Total			-332.2622 (269)
Total CO2, kg/year			654.1135 (272)
EPC Target Carbon Dioxide Emission Rate (TER)			12.5800 (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	2394.6705	1.1300	2705.9776 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	2156.7978	1.1300	2437.1816 (278)
Space and water heating			5143.1592 (279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008 (281)
Energy for lighting	129.1350	1.5338	198.0716 (282)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-755.0442	1.5021	-1134.1694
PV Unit electricity exported	-1815.1861	0.4645	-843.1894
Total			-1977.3588 (283)
Total Primary energy kWh/year			3493.9728 (286)
Target Primary Energy Rate (TPER)			67.1900 (287)