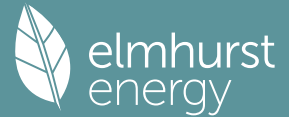


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Property Reference	Dryham				Issued on Date	28/08/2025
Assessment Reference	Proposed		Prop Type Ref			
Property						
SAP Rating	85 B	DER	3.37	TER	11.32	
Environmental	97 A	% DER < TER				70.23
CO ₂ Emissions (t/year)	0.36	DFEE	40.45	TFEE	42.15	
Compliance Check	See BREL	% DFEE < TFEE				4.02
% DPER < TPER	40.55	DPER	35.28	TPER	59.35	
Assessor Details	Mr. Michael Woodbridge				Assessor ID	M818-0001
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	54.2600 (1b)	x 2.3900 (2b)	= 129.6814 (1b) - (3b)
First floor	54.2600 (1c)	x 2.6500 (2c)	= 143.7890 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	108.5200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 273.4704 (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	4 * 10 = 40.0000 (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) =	40.0000 / (5) = 0.1463 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	4.0000 (17)
Infiltration rate	0.3463 (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) = 0.2943 (21)

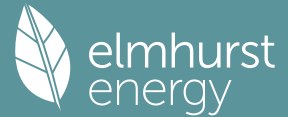
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.3753	0.3679	0.3606	0.3238	0.3164	0.2796	0.2796	0.2723	0.2943	0.3164	0.3311	0.3458 (22b)
Effective ac	0.5704	0.5677	0.5650	0.5524	0.5501	0.5391	0.5391	0.5371	0.5433	0.5501	0.5548	0.5598 (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							
Patio Doors			10.0800	1.1000	11.0880		(26a)
Windows			11.8100	1.0536	12.4435		(27)
Front Door			4.4600	1.2000	5.3520		(26)
Ground Floor			54.2600	0.1200	6.5112	75.0000	4069.5000 (28a)
External Wall Stone	151.1000	26.3500	124.7500	0.1800	22.4550	9.0000	1122.7501 (29a)
Plane Ceiling	54.2600		54.2600	0.0800	4.3408	9.0000	488.3400 (30)
Total net area of external elements Aum(A, m ²)			259.6200				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		62.1905		(33)
Main dwelling							
Internal Wall			208.7200			9.0000	1878.4800 (32c)
Internal Floor			54.2600			18.0000	976.6800 (32d)
Internal Ceiling			54.2600			9.0000	488.3400 (32e)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	9024.0901 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							83.1560 (35)
List of Thermal Bridges							
K1 Element				Length	Psi-value	Total	
E2 Other lintels (including other steel lintels)				17.2600	0.1830	3.1586	
E3 Sill				9.9700	0.0330	0.3290	

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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	19.5397	19.5774	19.6144	19.7904	19.8236	19.9800	19.9800	20.0092	19.9195	19.8236	19.7565	19.6867	
alpha	2.3026	2.3052	2.3076	2.3194	2.3216	2.3320	2.3320	2.3339	2.3280	2.3216	2.3171	2.3124	
util living area	0.9343	0.9106	0.8792	0.8168	0.7220	0.5875	0.4646	0.5028	0.6764	0.8348	0.9098	0.9398 (86)	
Living	18.0967	18.4356	18.9268	19.5981	20.2060	20.6617	20.8606	20.8276	20.4970	19.7262	18.8121	18.0387	
Non living	16.5539	16.9801	17.5973	18.4318	19.1613	19.6767	19.8704	19.8456	19.5095	18.6049	17.4663	16.4845	
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	19.5148	18.4356	18.9268	19.5981	20.2060	20.6617	20.8606	20.8276	20.4970	19.7262	18.8121	18.4529 (87)	
Th 2	19.9343	19.9361	19.9379	19.9463	19.9479	19.9553	19.9553	19.9566	19.9524	19.9479	19.9447	19.9414 (88)	
util rest of house	0.9259	0.8993	0.8633	0.7913	0.6802	0.5206	0.3727	0.4115	0.6159	0.8066	0.8965	0.9320 (89)	
MIT 2	18.5865	16.9801	17.5973	18.4318	19.1613	19.6767	19.8704	19.8456	19.5095	18.6049	17.4663	17.1074 (90)	
Living area fraction									FLA = Living area / (4) =				0.1905 (91)
MIT	18.7633	17.2574	17.8505	18.6539	19.3603	19.8643	20.0590	20.0326	19.6976	18.8185	17.7227	17.3637 (92)	
Temperature adjustment												0.0000	
adjusted MIT	18.7633	17.2574	17.8505	18.6539	19.3603	19.8643	20.0590	20.0326	19.6976	18.8185	17.7227	17.3637 (93)	

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation	0.9148	0.8606	0.8226	0.7532	0.6535	0.5142	0.3824	0.4187	0.5993	0.7688	0.8583	0.9063 (94)
Useful gains	721.2978	775.9023	796.3258	790.9746	718.6722	560.8580	399.3952	411.1281	555.3420	646.7275	669.4002	684.8671 (95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	14.4000	14.1000	10.6000	7.1000	4.2000 (96)
Heat loss rate W	1855.4543	1582.2369	1450.5778	1235.4524	968.6432	660.4622	433.9631	455.0823	704.4134	1039.2247	1347.8004	1676.1262 (97)
Space heating kWh	843.8125	541.8569	486.7635	320.0240	185.9784	0.0000	0.0000	0.0000	0.0000	292.0179	488.4482	737.4968 (98a)
Space heating requirement - total per year (kWh/year)												3896.3981
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	843.8125	541.8569	486.7635	320.0240	185.9784	0.0000	0.0000	0.0000	0.0000	292.0179	488.4482	737.4968 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												3896.3981
Space heating per m2										(98c) / (4) =		35.9049 (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 %)												331.7882 (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	843.8125	541.8569	486.7635	320.0240	185.9784	0.0000	0.0000	0.0000	0.0000	292.0179	488.4482	737.4968 (98)
Space heating efficiency (main heating system 1)	331.7882	331.7882	331.7882	331.7882	331.7882	0.0000	0.0000	0.0000	0.0000	331.7882	331.7882	331.7882 (210)
Space heating fuel (main heating system)	254.3226	163.3141	146.7091	96.4543	56.0534	0.0000	0.0000	0.0000	0.0000	88.0133	147.2169	222.2794 (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	288.5140	255.2268	271.1279	238.1079	230.6807	207.6980	204.7579	212.9074	215.2860	240.2818	255.8002	285.3069 (64)
Efficiency of water heater	296.9418	296.9418	296.9418	296.9418	296.9418	296.9418	296.9418	296.9418	296.9418	296.9418	296.9418	296.9418 (216)
Fuel for water heating, kWh/month	97.1618	85.9518	91.3067	80.1867	77.6855	69.9457	68.9556	71.7001	72.5011	80.9188	86.1449	96.0818 (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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (231)
Lighting	39.8803	31.9935	28.8066	21.1049	16.3021	13.3189	14.8713	19.3302	25.1081	32.9432	37.2092	40.9887 (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												1174.3631 (211)
Space heating fuel - main system 2												0.0000 (213)
Space heating fuel - secondary												0.0000 (215)
Efficiency of water heater												296.9418
Water heating fuel used												978.5405 (219)
Space cooling fuel												0.0000 (221)
Electricity for pumps and fans:												
Total electricity for the above, kWh/year												0.0000 (231)
Electricity for lighting (calculated in Appendix L)												321.8569 (232)

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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	2474.7606 (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	1174.3631	0.1547	181.6545 (261)
Total CO2 associated with community systems			0.0000 (273)
Water heating (other fuel)	978.5405	0.1409	137.8780 (264)
Space and water heating			319.5325 (265)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (267)
Energy for lighting	321.8569	0.1443	46.4539 (268)
Total CO2, kg/year			365.9864 (272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			3.3700 (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	1174.3631	1.5726	1846.8227 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	978.5405	1.5210	1488.3636 (278)
Space and water heating			3335.1863 (279)
Pumps, fans and electric keep-hot	0.0000	0.0000	0.0000 (281)
Energy for lighting	321.8569	1.5338	493.6749 (282)
Total Primary energy kWh/year			3828.8612 (286)
Dwelling Primary energy Rate (DPER)			35.2800 (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			
Ground floor	54.2600 (1b)	x 2.3900 (2b)	= 129.6814 (1b) - (3b)
First floor	54.2600 (1c)	x 2.6500 (2c)	= 143.7890 (1c) - (3c)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	108.5200		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =	273.4704 (5)

2. Ventilation rate

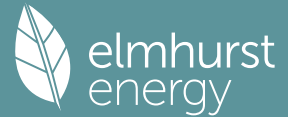
	m3 per hour
Number of open chimneys	0 * 80 = 0.0000 (6a)
Number of open flues	0 * 20 = 0.0000 (6b)
Number of chimneys / flues attached to closed fire	0 * 10 = 0.0000 (6c)
Number of flues attached to solid fuel boiler	0 * 20 = 0.0000 (6d)
Number of flues attached to other heater	0 * 35 = 0.0000 (6e)
Number of blocked chimneys	0 * 20 = 0.0000 (6f)
Number of intermittent extract fans	4 * 10 = 40.0000 (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) =	40.0000 / (5) = 0.1463 (8)
Pressure test	Yes
Pressure Test Method	Blower Door
Measured/design AP50	5.0000 (17)
Infiltration rate	0.3963 (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) = 0.3368 (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	0.4295	0.4210	0.4126	0.3705	0.3621	0.3200	0.3200	0.3116	0.3368	0.3621	0.3789	0.3958 (22b)
Effective ac	0.5922	0.5886	0.5851	0.5686	0.5656	0.5512	0.5512	0.5485	0.5567	0.5656	0.5718	0.5783 (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							

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TER Opaque door			4.4600	1.0000	4.4600	(26)
TER Semi-glazed door			10.0800	1.0000	10.0800	(26a)
TER Opening Type			11.8100	1.1450	13.5229	(27)
Ground Floor			54.2600	0.1300	7.0538	(28a)
External Wall Stone	151.1000	26.3500	124.7500	0.1800	22.4550	(29a)
Plane Ceiling	54.2600		54.2600	0.1100	5.9686	(30)
Total net area of external elements Aum(A, m2)			259.6200			(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =	63.5403		(33)

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

83.1560 (35)

List of Thermal Bridges

K1 Element	Length	Psi-value	Total
E2 Other lintels (including other steel lintels)	17.2600	0.0500	0.8630
E3 Sill	9.9700	0.0500	0.4985
E4 Jamb	34.4000	0.0500	1.7200
E5 Ground floor (normal)	29.9800	0.1600	4.7968
E6 Intermediate floor within a dwelling	29.9800	0.0000	0.0000
E10 Eaves (insulation at ceiling level)	17.6800	0.0600	1.0608
E16 Corner (normal)	20.2000	0.0900	1.8180
E12 Gable (insulation at ceiling level)	12.1600	0.0600	0.7296
Thermal bridges (Sum(L x Psi) calculated using Appendix K)			11.4867 (36)
Point Thermal bridges			(36a) = 0.0000
Total fabric heat loss			(33) + (36) + (36a) = 75.0270 (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	53.4447	53.1215	52.8048	51.3170	51.0386	49.7428	49.7428	49.5028	50.2419	51.0386	51.6017	52.1904 (38)
Heat transfer coeff	128.4717	128.1485	127.8318	126.3440	126.0656	124.7698	124.7698	124.5298	125.2689	126.0656	126.6287	127.2174 (39)
Average = Sum(39)m / 12 =												126.3426

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP	1.1839	1.1809	1.1780	1.1642	1.1617	1.1497	1.1497	1.1475	1.1543	1.1617	1.1669	1.1723 (40)
HLP (average)												1.1642
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31

4. Water heating energy requirements (kWh/year)

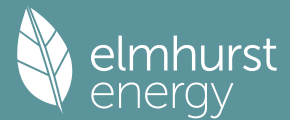
Assumed occupancy													2.8056 (42)
Hot water usage for mixer showers													
71.2612	70.1903	68.6298	65.6440	63.4405	60.9833	59.5865	61.1353	62.8330	65.4713	68.5213	70.9882	70.9882 (42a)	
Hot water usage for baths													
30.7679	30.3109	29.6675	28.4810	27.5926	26.6075	26.0754	26.7144	27.4101	28.4642	29.6751	30.6639	30.6639 (42b)	
Hot water usage for other uses													
43.3626	41.7858	40.2090	38.6321	37.0553	35.4785	35.4785	37.0553	38.6321	40.2090	41.7858	43.3626	43.3626 (42c)	
Average daily hot water use (litres/day)													133.6477 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use													
145.3917	142.2870	138.5062	132.7571	128.0884	123.0693	121.1404	124.9050	128.8752	134.1445	139.9821	145.0147	145.0147 (44)	
Energy content (annual)	230.2650	202.6148	212.8789	181.7379	172.4317	151.3280	146.5089	154.6584	158.9160	182.0328	199.4302	227.0579	227.0579 (45)
Distribution loss (46)m = 0.15 x (45)m													
34.5397	30.3922	31.9318	27.2607	25.8648	22.6992	21.9763	23.1988	23.8374	27.3049	29.9145	34.0587	34.0587 (46)	
Water storage loss:													
Store volume													250.0000 (47)
a) If manufacturer declared loss factor is known (kWh/day):													1.8903 (48)
Temperature factor from Table 2b													0.5400 (49)
Enter (49) or (54) in (55)													1.0208 (55)
Total storage loss													
31.6444	28.5820	31.6444	30.6236	31.6444	30.6236	31.6444	31.6444	30.6236	31.6444	30.6236	31.6444	31.6444 (56)	
If cylinder contains dedicated solar storage													
31.6444	28.5820	31.6444	30.6236	31.6444	30.6236	31.6444	31.6444	30.6236	31.6444	30.6236	31.6444	31.6444 (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													
285.1717	252.2081	267.7857	234.8735	227.3385	204.4636	201.4157	209.5652	212.0516	236.9396	252.5658	281.9647	281.9647 (62)	
WWHRS	-32.5777	-28.8120	-30.1702	-24.9821	-23.2824	-19.9230	-18.6746	-19.8586	-20.6131	-24.3005	-27.5295	-31.9744 (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													
252.5941	223.3961	237.6155	209.8913	204.0560	184.5407	182.7411	189.7067	191.4386	212.6391	225.0363	249.9904	249.9904 (64)	
12Total per year (kWh/year)													
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													
120.4885	107.0440	114.7077	102.9363	101.2590	92.8250	92.6396	95.3494	95.3481	104.4513	108.8190	119.4222	119.4222 (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	140.2822	140.2822	140.2822	140.2822	140.2822	140.2822	140.2822	140.2822	140.2822	140.2822	140.2822	140.2822 (66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	154.1004	170.6112	154.1004	159.2371	154.1004	159.2371	154.1004	154.1004	159.2371	154.1004	159.2371	154.1004 (67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	269.4123	272.2079	265.1630	250.1651	231.2329	213.4394	201.5522	198.7565	205.8015	220.7994	239.7315	257.5251 (68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	37.0282	37.0282	37.0282	37.0282	37.0282	37.0282	37.0282	37.0282	37.0282	37.0282	37.0282	37.0282 (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)	-112.2258	-112.2258	-112.2258	-112.2258	-112.2258	-112.2258	-112.2258	-112.2258	-112.2258	-112.2258	-112.2258	-112.2258 (71)
Water heating gains (Table 5)	161.9469	159.2917	154.1770	142.9671	136.1008	128.9237	124.5156	128.1577	132.4279	140.3916	151.1375	160.5137 (72)
Total internal gains	653.5443	670.1955	641.5250	620.4540	589.5188	566.6848	545.2529	546.0994	562.5511	583.3761	618.1909	640.2239 (73)

6. Solar gains

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[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			
North	7.6200				10.6334	0.6300	0.7000	0.7700	24.7627 (74)			
South	4.1900				46.7521	0.6300	0.7000	0.7700	59.8669 (78)			
Solar gains	84.6296	145.3694	205.3070	270.3213	321.0903	327.8261	312.2159	272.2906	227.1490	162.0841	101.5107	72.3739 (83)
Total gains	738.1739	815.5649	846.8320	890.7752	910.6091	894.5110	857.4688	818.3899	789.7001	745.4601	719.7015	712.5978 (84)
7. Mean internal temperature (heating season)												
Temperature during heating periods in the living area from Table 9, Th1 (C)												21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)												
tau	19.5116	19.5608	19.6093	19.8402	19.8840	20.0905	20.0905	20.1292	20.0105	19.8840	19.7956	19.7040
alpha	2.3008	2.3041	2.3073	2.3227	2.3256	2.3394	2.3394	2.3419	2.3340	2.3256	2.3197	2.3136
util living area	0.9420	0.9253	0.9037	0.8573	0.7817	0.6599	0.5354	0.5692	0.7310	0.8630	0.9217	0.9461 (86)
MIT	18.0068	18.2960	18.7486	19.4088	20.0413	20.5645	20.8121	20.7760	20.4007	19.6100	18.7215	17.9668 (87)
Th 2	19.9329	19.9353	19.9377	19.9487	19.9508	19.9604	19.9604	19.9622	19.9567	19.9508	19.9466	19.9422 (88)
util rest of house	0.9344	0.9155	0.8903	0.8356	0.7443	0.5939	0.4374	0.4741	0.6739	0.8381	0.9099	0.9390 (89)
MIT 2	16.4407	16.8065	17.3793	18.2099	18.9828	19.5913	19.8417	19.8129	19.4170	18.4709	17.3558	16.3948 (90)
Living area fraction	16.7390	17.0902	17.6401	18.4382	19.1844	19.7766	20.0265	19.9963	19.6044	18.6879	17.6159	16.6942 (92)
MIT	16.7390	17.0902	17.6401	18.4382	19.1844	19.7766	20.0265	19.9963	19.6044	18.6879	17.6159	16.6942 (93)
Temperature adjustment												0.0000
adjusted MIT	16.7390	17.0902	17.6401	18.4382	19.1844	19.7766	20.0265	19.9963	19.6044	18.6879	17.6159	16.6942 (93)
8. Space heating requirement												
Utilisation	0.9013	0.8790	0.8511	0.7960	0.7116	0.5807	0.4442	0.4776	0.6513	0.7994	0.8733	0.9073 (94)
Useful gains	665.2994	716.8475	720.7724	709.0550	648.0074	519.4745	380.8826	390.8387	514.3532	595.9304	628.5216	646.5294 (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	1598.0627	1562.1544	1424.0595	1205.0983	943.5298	645.8865	427.5273	447.8527	689.5274	1019.5998	1331.6169	1589.4844 (97)
Space heating kWh	693.9759	568.0463	523.2456	357.1512	219.8687	0.0000	0.0000	0.0000	0.0000	315.2100	506.2286	701.5585 (98a)
Space heating requirement - total per year (kWh/year)												3885.2848
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	693.9759	568.0463	523.2456	357.1512	219.8687	0.0000	0.0000	0.0000	0.0000	315.2100	506.2286	701.5585 (98c)
Space heating requirement after solar contribution - total per year (kWh/year)												3885.2848
Space heating per m2										(98c) / (4) =		35.8025 (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	693.9759	568.0463	523.2456	357.1512	219.8687	0.0000	0.0000	0.0000	0.0000	315.2100	506.2286	701.5585 (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)	751.8698	615.4347	566.8966	386.9460	238.2109	0.0000	0.0000	0.0000	0.0000	341.5060	548.4600	760.0851 (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	252.5941	223.3961	237.6155	209.8913	204.0560	184.5407	182.7411	189.7067	191.4386	212.6391	225.0363	249.9904 (64)
Efficiency of water heater (217)m	86.2056	86.0603	85.7787	85.2415	84.2275	79.8000	79.8000	79.8000	79.8000	84.9409	85.8214	79.8000 (216)
Fuel for water heating, kWh/month	293.0137	259.5809	277.0097	246.2315	242.2677	231.2540	228.9988	237.7277	239.8980	250.3378	262.2147	289.8621 (219)
Space cooling fuel requirement (221)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (221)
Pumps and Fa	7.3041	6.5973	7.3041	7.0685	7.3041	7.0685	7.3041	7.3041	7.0685	7.3041	7.0685	7.3041 (231)
Lighting	32.0190	25.6869	23.1282	16.9447	13.0886	10.6935	11.9398	15.5198	20.1587	26.4493	29.8745	32.9089 (232)
Electricity generated by PVs (Appendix M) (negative quantity) (233a)m	-49.3230	-68.7863	-97.7781	-108.6281	-115.9804	-107.7829	-106.4165	-101.0287	-91.3439	-78.0358	-53.9476	-42.7284 (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	-30.1243	-63.1222	-125.0347	-187.1990	-246.9834	-248.0180	-245.1280	-207.8073	-152.6407	-90.0984	-40.1586	-23.8421 (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												4209.4093 (211)

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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	3058.3964	(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)	258.4119	(232)

Energy saving/generation technologies (Appendices M ,N and Q)		
PV generation	-2681.9364	(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	4930.2812	(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	4209.4093	0.2100	883.9759 (261)
Total CO2 associated with community systems			0.0000 (373)
Water heating (other fuel)	3058.3964	0.2100	642.2632 (264)
Space and water heating			1526.2392 (265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293 (267)
Energy for lighting	258.4119	0.1443	37.2968 (268)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-1021.7797	0.1348	-137.7778
PV Unit electricity exported	-1660.1567	0.1260	-209.1565
Total			-346.9342 (269)
Total CO2, kg/year			1228.5310 (272)
EPC Target Carbon Dioxide Emission Rate (TER)			11.3200 (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	4209.4093	1.1300	4756.6325 (275)
Total CO2 associated with community systems			0.0000 (473)
Water heating (other fuel)	3058.3964	1.1300	3455.9880 (278)
Space and water heating			8212.6204 (279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008 (281)
Energy for lighting	258.4119	1.5338	396.3608 (282)
Energy saving/generation technologies			
PV Unit electricity used in dwelling	-1021.7797	1.4984	-1530.9977
PV Unit electricity exported	-1660.1567	0.4625	-767.7542
Total			-2298.7520 (283)
Total Primary energy kWh/year			6440.3301 (286)
Target Primary Energy Rate (TPER)			59.3500 (287)