Summary for Input Data

elmhurst energy

Property Reference	Apt 5	**Issued on Date**	28/02/2024
Assessment Reference	Proposed v2	**Prop Type Ref**	
Property	80, Church Street, Edmonton, N9 9PB		

SAP Rating	97 A	**DER**	8.64	**TER**	13.39
Environmental	94 A	**% DER < TER**			35.47
CO_2 Emissions (t/year)	0.41	**DFEE**	30.19	**TFEE**	30.25
Compliance Check	See BREL	**% DFEE < TFEE**			0.21
% DPER < TPER	35.14	**DPER**	45.86	**TPER**	70.71

Assessor Details	Mr. Joe Cantwell Dillon	**Assessor ID**	BL89-0001
Client			

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

Orientation	Northeast	
Property Tenture	ND	
Transaction Type	5	
Terrain Type	Suburban	
1.0 Property Type	Flat, Semi-Detached	
Position of Flat	Top-floor flat	
Which Floor	2	
2.0 Number of Storeys	1	
3.0 Date Built	2024	
3.0 Property Age Band	L	
4.0 Sheltered Sides	2	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	N/A	kJ/m²K
7.0 Electricity Tariff	Standard	
Smart electricity meter fitted	No	
Smart gas meter fitted	No	

7.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Basement:	0.00 m	0.00 m²	0.00 m
Ground floor:	17.98 m	56.34 m²	2.41 m
1st Storey:	0.00 m	0.00 m²	0.00 m
2nd Storey:	0.00 m	0.00 m²	0.00 m
3rd Storey:	0.00 m	0.00 m²	0.00 m
4th Storey:	0.00 m	0.00 m²	0.00 m
5th Storey:	0.00 m	0.00 m²	0.00 m
6th Storey:	0.00 m	0.00 m²	0.00 m
7th Storey:	0.00 m	0.00 m²	0.00 m

8.0 Living Area	27.64	m²

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Res	Shelter	Openings	Area Calculation Type
Dormer	Timber Frame	Timber framed wall (two layers of plasterboard)	0.15	18.00	15.67	9.44	0.00	None	6.23	Enter Gross Area
Ashlar	Timber Frame	Timber framed wall (two layers of plasterboard)	0.11	18.00	15.34	15.34	0.00	None	0.00	Enter Gross Area

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)	Shelter Res	Shelter
Party Wall 1	Solid Wall	Other	0.00	0.00	35.11	0.00	None

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Wall 1	Plasterboard on timber frame	9.00	65.38

10.0 External Roofs

Summary for Input Data

elmhurst energy

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Code	Shelter Factor	Calculation Type	Openings
Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.14	9.00	47.70	47.70	None	0.00	Enter Gross Area	0.00
Sloped Roof	External Slope Roof	Plasterboard, insulated slope	0.15	9.00	15.06	12.75	None	0.00	Enter Gross Area	2.31

11.1 Party Floors

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor 1	Lowest occupied	Other	0.00	56.34

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Window	Manufacturer	Window	Double Low-E Soft 0.1		Air Filled	0.63	Wood	0.70	1.20
Roof lights	Manufacturer	Roof Light	Double Low-E Soft 0.1		Air Filled	0.63	Wood	0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
RW	Window	Dormer	South West	6.23	0
RSR	Roof lights	Sloped Roof	North West	2.31	55

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	
17.0 Thermal Bridging	User Input	

17.1 List of Bridges

Bridge Type	Source Type	Length	Psi	Adjusted	Reference:	Imported
E2 Other lintels (including other steel lintels)	Gov Approved Scheme	2.96	0.08	0.08	ROI	No
E3 Sill	Gov Approved Scheme	2.96	0.15	0.15	ROI	No
E4 Jamb	Gov Approved Scheme	4.20	0.03	0.03	ROI	No
E7 Party floor between dwellings (in blocks of flats)	Gov Approved Scheme	6.39	0.13	0.13	ROI	No
E14 Flat roof	Gov Approved Scheme	5.73	0.08	0.08	ROI	No
E17 Corner (inverted – internal area greater than external area)	Gov Approved Scheme	2.50	-0.01	-0.01	ROI	No
E18 Party wall between dwellings	Independently assessed	5.00	0.12	0.12		No
P3 Party wall - Intermediate floor between dwellings (in blocks of flats)	Table K1 - Default	14.09	0.00	0.00		No
P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	13.68	0.24	0.24		No
R6 Flat ceiling	Table K1 - Default	9.59	0.12	0.12		No
P5 Party wall - Roof (insulation at rafter level)	Independently assessed	0.72	0.24	0.24		No
E13 Gable (insulation at rafter level)	Gov Approved Scheme	1.15	0.02	0.02	ROI	No
R1 Head of roof window	Table K1 - Default	2.34	0.24	0.24		No
R2 Sill of roof window	Table K1 - Default	2.34	0.24	0.24		No
R3 Jamb of roof window	Table K1 - Default	5.88	0.24	0.24		No
R4 Ridge (vaulted ceiling)	Table K1 - Default	1.33	0.12	0.12		No
R8 Roof to wall (rafter)	Table K1 - Default	11.28	0.12	0.12		No

Y-value	0.07	W/m²K
Description	TBC	
18.0 Pressure Testing	Yes	
Designed AP_{50}	4.00	m³/(h.m²) @ 50 Pa
Property Tested?	Yes	
Test Method	Blower Door	
As Built AP_{50}	6.00	m³/(h.m²) @ 50 Pa
19.0 Mechanical Ventilation		
Mechanical Ventilation		
Mechanical Ventilation System Present	No	
20.0 Fans, Open Fireplaces, Flues		
21.0 Fixed Cooling System	No	
22.0 Lighting		
No Fixed Lighting	No	

Name	Efficacy	Power	Capacity	Count
Lighting 1	80.00	5	400	10

24.0 Main Heating 1	Database

Summary for Input Data

elmhurst energy

Percentage of Heat	100.00	%
Database Ref. No.	17955	
Fuel Type	Mains gas	
SAP Code	0	
In Winter	89.00	
In Summer	87.30	
Model Name	LOGIC COMBI	
Manufacturer	Ideal Boilers	
System Type	Combi boiler	
Controls SAP Code	2110	
Delayed Start Stat	Yes	
Burner Control	Modulating	
HETAS approved System	No	
Oil Pump Inside	No	
FI Case	0.00	
Flue Type	Balanced	
Fan Assisted Flue	Yes	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Radiators	
Flow Temperature	Unknown	
Boiler Interlock	Yes	
Combi boiler type	Standard Combi	
Combi keep hot type	None	

25.0 Main Heating 2 — None

26.0 Heat Networks — None

	Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical	Fuel Factor	Efficiency type
Heat source 1	None									
Heat source 2	None									
Heat source 3	None									
Heat source 4	None									
Heat source 5	None									

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
Summer Immersion	No
Cold Water Source	From mains
Bath Count	1
Supplementary Immersion	No
Immersion Only Heating Hot Water	No

28.1 Showers

Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
s1	Vented hot water system	7.00		No	

Summary for Input Data

elmhurst energy

28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder	None
Cylinder Stat	No
Cylinder In Heated Space	No
Independent Time Control	No
In Airing Cupboard	No
31.0 Thermal Store	None
32.0 Photovoltaic Unit	One Dwelling
Export Capable Meter?	Yes
Connected To Dwelling	Yes
Diverter	No
Battery Capacity [kWh]	0.00

PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Overshading Factor	MCS Certificate Reference	Panel Manufacturer
3.70	South West	30°	Modest	No	No	0.80		

34.0 Small-scale Hydro	None	
Electricity Generated	0.00	
Apportioned	0.00	kWh/Year
Connected to dwelling's electricity meter	Yes	
Electricity Generation	Annual	

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

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

Full SAP Calculation Printout

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Assessment Reference	Proposed v2	**Prop Type Ref**	
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Compliance Check	See BREL	**% DFEE < TFEE**			0.21
% DPER < TPER	35.14	**DPER**	45.86	**TPER**	70.71

Assessor Details	Mr. Joe Cantwell Dillon	**Assessor ID**	BL89-0001
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 (m2)		Storey height (m)		Volume (m3)	
Ground floor	56.3400	(1b)	x 2.4100	(2b) =	135.7794	(1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	56.3400					(4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n) =		135.7794	(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	0 * 10 =	0.0000 (7a)
Number of passive vents	0 * 10 =	0.0000 (7b)
Number of flueless gas fires	0 * 40 =	0.0000 (7c)

	Air changes per hour	
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		4.0000 (17)
Infiltration rate		0.2000 (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) =	0.1700 (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	0.2167	0.2125	0.2083	0.1870	0.1827	0.1615	0.1615	0.1573	0.1700	0.1827	0.1913	0.1998	(22b)
Effective ac	0.5235	0.5226	0.5217	0.5175	0.5167	0.5130	0.5130	0.5124	0.5144	0.5167	0.5183	0.5200	(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	
Window (Uw = 1.20)			6.2300	1.1450	7.1336			(27)
RSR			2.3100	1.2357	2.8546			(27a)
Dormer	15.6700	6.2300	9.4400	0.1500	1.4160	18.0000	169.9200	(29a)
Ashlar	15.3400		15.3400	0.1100	1.6874	18.0000	276.1200	(29a)
Flat Roof	47.7000		47.7000	0.1400	6.6780	9.0000	429.3000	(30)
Sloped Roof	15.0600	2.3100	12.7500	0.1500	1.9125	9.0000	114.7500	(30)
Total net area of external elements Aum(A, m2)			93.7700					(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		21.6821			(33)
Party Wall 1			35.1100	0.0000	0.0000	0.0000	0.0000	(32)
Party Floor 1			56.3400			0.0000	0.0000	(32d)
Internal Wall 1			65.3800			9.0000	588.4200	(32c)

Heat capacity Cm = Sum(A x k)	(28)...(30) + (32) + (32a)...(32e) =	1578.5100 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K		28.0176 (35)
Thermal bridges (User defined value 0.075 * total exposed area)		7.0328 (36)
Point Thermal bridges	(36a) =	0.0000
Total fabric heat loss	(33) + (36) + (36a) =	28.7148 (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	23.4561	23.4153	23.3752	23.1870	23.1518	22.9879	22.9879	22.9576	23.0511	23.1518	23.2230	23.2975	(38)
Heat transfer coeff													
	52.1709	52.1301	52.0900	51.9018	51.8666	51.7027	51.7027	51.6724	51.7659	51.8666	51.9378	52.0123	(39)
Average = Sum(39)m / 12 =												51.9017	

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP	0.9260	0.9253	0.9246	0.9212	0.9206	0.9177	0.9177	0.9172	0.9188	0.9206	0.9219	0.9232	(40)
HLP (average)												0.9212	
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31	

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4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.8765	(42)
Hot water usage for mixer showers													
	55.6823	54.8455	53.6261	51.2930	49.5713	47.6512	46.5599	47.7700	49.0966	51.1581	53.5413	55.4689	(42a)
Hot water usage for baths													
	24.0684	23.7110	23.2076	22.2795	21.5845	20.8139	20.3977	20.8975	21.4418	22.2663	23.2136	23.9871	(42b)
Hot water usage for other uses													
	33.8472	32.6164	31.3856	30.1548	28.9240	27.6932	27.6932	28.9240	30.1548	31.3856	32.6164	33.8472	(42c)
Average daily hot water use (litres/day)												104.4226	(43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use													
	113.5979	111.1729	108.2193	103.7273	100.0798	96.1584	94.6508	97.5916	100.6932	104.8101	109.3713	113.3032	(44)
Energy conte	179.9114	158.3087	166.3291	141.9976	134.7267	118.2379	114.4719	120.8387	124.1647	142.2263	155.8195	177.4055	(45)
Energy content (annual)										Total = Sum(45)m =		1734.4379	
Distribution loss (46)m = 0.15 x (45)m													
	26.9867	23.7463	24.9494	21.2996	20.2090	17.7357	17.1708	18.1258	18.6247	21.3339	23.3729	26.6108	(46)
Water storage 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	(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	16.3787	14.7761	16.3217	15.7155	16.1889	15.5966	16.0781	16.1184	15.6406	16.2204	15.7735	16.3682	(61)
Total heat required for water heating calculated for each month													
	196.2900	173.0847	182.6507	157.7130	150.9156	133.8346	130.5500	136.9571	139.8053	158.4467	171.5930	193.7736	(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													
	196.2900	173.0847	182.6507	157.7130	150.9156	133.8346	130.5500	136.9571	139.8053	158.4467	171.5930	193.7736	(64)
										Total per year (kWh/year) = Sum(64)m =		1925.6146	(64)
12Total per year (kWh/year)												1926	(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													
	63.9152	56.3317	59.3848	51.1431	48.8439	43.2133	42.0814	44.2085	45.1949	51.3454	55.7534	63.0794	(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	
(66)m	93.8250	93.8250	93.8250	93.8250	93.8250	93.8250	93.8250	93.8250	93.8250	93.8250	93.8250	93.8250	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5													
	86.1077	95.3336	86.1077	88.9780	86.1077	88.9780	86.1077	86.1077	88.9780	86.1077	88.9780	86.1077	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5													
	163.6315	165.3295	161.0507	151.9415	140.4427	129.6356	122.4157	120.7177	124.9966	134.1058	145.6045	156.4117	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5													
	32.3825	32.3825	32.3825	32.3825	32.3825	32.3825	32.3825	32.3825	32.3825	32.3825	32.3825	32.3825	(69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.0000	3.0000	3.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)													
	-75.0600	-75.0600	-75.0600	-75.0600	-75.0600	-75.0600	-75.0600	-75.0600	-75.0600	-75.0600	-75.0600	-75.0600	(71)
Water heating gains (Table 5)													
	85.9075	83.8269	79.8183	71.0320	65.6503	60.0184	56.5611	59.4200	62.7707	69.0126	77.4352	84.7841	(72)
Total internal gains													
	389.7943	398.6374	381.1242	366.0990	346.3483	329.7795	316.2320	317.3930	327.8928	343.3736	366.1652	381.4510	(73)

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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	
Southwest	6.2300	36.7938	0.6300	0.7000	0.7700	70.0543	(79)
Northwest	2.3100	15.4796	0.6300	0.7000	1.0000	14.1923	(82)

Solar gains	84.2466	148.1060	215.5260	289.7068	345.9526	353.0957	336.3929	292.8198	240.8893	167.0985	101.7304	71.5740	(83)
Total gains	474.0409	546.7435	596.6502	655.8058	692.3009	682.8752	652.6250	610.2128	568.7822	510.4721	467.8956	453.0250	(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	8.4046	8.4112	8.4176	8.4482	8.4539	8.4807	8.4807	8.4857	8.4704	8.4539	8.4423	8.4302	
alpha	1.5603	1.5607	1.5612	1.5632	1.5636	1.5654	1.5654	1.5657	1.5647	1.5636	1.5628	1.5620	
util living area													
	0.7766	0.7320	0.6793	0.5966	0.4979	0.3894	0.3018	0.3299	0.4661	0.6266	0.7337	0.7880	(86)
MIT	17.4243	17.8776	18.5097	19.3107	20.0173	20.5348	20.7817	20.7394	20.3416	19.4328	18.2997	17.3184	(87)
Th 2	20.1455	20.1461	20.1467	20.1495	20.1500	20.1525	20.1525	20.1529	20.1515	20.1500	20.1490	20.1478	(88)
util rest of house													
	0.7641	0.7176	0.6619	0.5741	0.4684	0.3500	0.2525	0.2798	0.4266	0.6007	0.7170	0.7760	(89)
MIT 2	16.1025	16.6408	17.3930	18.3370	19.1531	19.7311	19.9871	19.9494	19.5327	18.4999	17.1589	15.9774	(90)

Living area fraction										fLA = Living area / (4) =		0.4906	(91)
MIT	16.7510	17.2475	17.9408	18.8147	19.5771	20.1254	20.3769	20.3370	19.9295	18.9576	17.7186	16.6353	(92)
Temperature adjustment												-0.1500	
adjusted MIT	16.6010	17.0975	17.7908	18.6647	19.4271	19.9754	20.2269	20.1870	19.7795	18.8076	17.5686	16.4853	(93)

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8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.6981	0.6547	0.6052	0.5301	0.4413	0.3414	0.2570	0.2819	0.4079	0.5538	0.6548	0.7096	(94)
Useful gains	330.9134	357.9646	361.0745	347.6206	305.5228	233.1085	167.7417	172.0006	232.0175	282.7191	306.3872	321.4846	(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													
	641.7522	635.8584	588.1388	506.8048	400.7776	277.9233	187.5198	195.6815	294.0065	425.6994	543.7165	638.9873	(97)
Space heating kWh													
	231.2640	186.7446	168.9358	114.6126	70.8696	0.0000	0.0000	0.0000	0.0000	106.3773	170.8771	236.2220	(98a)
Space heating requirement - total per year (kWh/year)												1285.9031	
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													
	231.2640	186.7446	168.9358	114.6126	70.8696	0.0000	0.0000	0.0000	0.0000	106.3773	170.8771	236.2220	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1285.9031	
Space heating per m2											(98c) / (4) =	22.8240	(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 %)												89.0000	(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													
	231.2640	186.7446	168.9358	114.6126	70.8696	0.0000	0.0000	0.0000	0.0000	106.3773	170.8771	236.2220	(98)
Space heating efficiency (main heating system 1)													
	89.0000	89.0000	89.0000	89.0000	89.0000	0.0000	0.0000	0.0000	0.0000	89.0000	89.0000	89.0000	(210)
Space heating fuel (main heating system)													
	259.8472	209.8254	189.8155	128.7782	79.6287	0.0000	0.0000	0.0000	0.0000	119.5251	191.9968	265.4180	(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													
	196.2900	173.0847	182.6507	157.7130	150.9156	133.8346	130.5500	136.9571	139.8053	158.4467	171.5930	193.7736	(64)
Efficiency of water heater												87.3000	(216)
(217)m	88.2114	88.1741	88.1087	88.0075	87.8361	87.3000	87.3000	87.3000	87.3000	87.9750	88.1400	88.2258	(217)
Fuel for water heating, kWh/month													
	222.5224	196.2989	207.3017	179.2041	171.8150	153.3042	149.5418	156.8810	160.1436	180.1043	194.6823	219.6338	(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	20.6511	16.5671	14.9168	10.9287	8.4417	6.8969	7.7008	10.0097	13.0017	17.0589	19.2680	21.2251	(232)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233a)m	-37.8446	-52.4985	-74.1680	-80.9506	-84.6542	-78.0881	-77.1614	-74.1863	-68.0900	-59.1684	-41.2380	-32.7281	(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	-27.3960	-59.3435	-122.9250	-190.6925	-255.8994	-258.3778	-254.1903	-212.3084	-151.2773	-85.7301	-36.7640	-21.4337	(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	1444.8350	(211)
Space heating fuel - main system 2	0.0000	(213)
Space heating fuel - secondary	0.0000	(215)
Efficiency of water heater	87.3000	
Water heating fuel used	2191.4329	(219)
Space cooling fuel	0.0000	(221)
Electricity for pumps and fans:		
central heating pump	41.0000	(230c)
main heating flue fan	45.0000	(230e)
Total electricity for the above, kWh/year	86.0000	(231)
Electricity for lighting (calculated in Appendix L)	166.6665	(232)
Energy saving/generation technologies (Appendices M ,N and Q)		
PV generation	-2437.1141	(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	1451.8203	(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	1444.8350	0.2100	303.4153	(261)

Total CO2 associated with community systems			0.0000	(373)
Water heating (other fuel)	2191.4329	0.2100	460.2009	(264)
Space and water heating			763.6163	(265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293	(267)
Energy for lighting	166.6665	0.1443	24.0551	(268)
Energy saving/generation technologies				
PV Unit electricity used in dwelling	-760.7762	0.1352	-102.8263	
PV Unit electricity exported	-1676.3379	0.1251	-209.7688	
Total			-312.5951	(269)
Total CO2, kg/year			487.0056	(272)
EPC Dwelling Carbon Dioxide Emission Rate (DER)			8.6400	(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	1444.8350	1.1300	1632.6635	(275)
Total CO2 associated with community systems			0.0000	(473)
Water heating (other fuel)	2191.4329	1.1300	2476.3192	(278)
Space and water heating			4108.9827	(279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008	(281)
Energy for lighting	166.6665	1.5338	255.6387	(282)
Energy saving/generation technologies				
PV Unit electricity used in dwelling	-760.7762	1.4996	-1140.8319	
PV Unit electricity exported	-1676.3379	0.4593	-769.9473	
Total			-1910.7793	(283)
Total Primary energy kWh/year			2583.9429	(286)
Dwelling Primary energy Rate (DPER)			45.8600	(287)

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

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1. Overall dwelling characteristics

	Area (m2)		Storey height (m)		Volume (m3)	
Ground floor	56.3400	(1b)	x 2.4100	(2b)	= 135.7794	(1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	56.3400					(4)
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)...(3n)		= 135.7794	(5)

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2. Ventilation rate

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		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)
	Air changes per hour		
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(6c)+(6d)+(6e)+(6f)+(6g)+(7a)+(7b)+(7c) =	20.0000 / (5) =	0.1473	(8)
Pressure test		Yes	
Pressure Test Method		Blower Door	
Measured/design AP50		5.0000	(17)
Infiltration rate		0.3973	(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) =	0.3377	(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	0.4306	0.4221	0.4137	0.3715	0.3630	0.3208	0.3208	0.3124	0.3377	0.3630	0.3799	0.3968	(22b)
Effective ac	0.5927	0.5891	0.5856	0.5690	0.5659	0.5515	0.5515	0.5488	0.5570	0.5659	0.5722	0.5787	(25)

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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	
TER Opening Type (Uw = 1.20)			6.2300	1.1450	7.1336			(27)
RSR			2.3100	1.8519	4.2778			(27a)
Dormer	15.6700	6.2300	9.4400	0.1800	1.6992			(29a)
Ashlar	15.3400		15.3400	0.1800	2.7612			(29a)
Flat Roof	47.7000		47.7000	0.1100	5.2470			(30)
Sloped Roof	15.0600	2.3100	12.7500	0.1100	1.4025			(30)
Total net area of external elements Aum(A, m2)			93.7700					(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		22.5213			(33)
Party Wall 1			35.1100	0.0000	0.0000			(32)

Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K 28.0176 (35)

List of Thermal Bridges

	K1 Element	Length	Psi-value	Total
E2	Other lintels (including other steel lintels)	2.9600	0.0500	0.1480
E3	Sill	2.9600	0.0500	0.1480
E4	Jamb	4.2000	0.0500	0.2100
E7	Party floor between dwellings (in blocks of flats)	6.3900	0.0700	0.4473
E14	Flat roof	5.7300	0.0800	0.4584
E17	Corner (inverted - internal area greater than external area)	2.5000	-0.0900	-0.2250
E18	Party wall between dwellings	5.0000	0.0600	0.3000
P3	Party wall - Intermediate floor between dwellings (in blocks of flats)	14.0900	0.0000	0.0000
P4	Party wall - Roof (insulation at ceiling level)	13.6800	0.1200	1.6416
R6	Flat ceiling	9.5900	0.0600	0.5754
P5	Party wall - Roof (insulation at rafter level)	0.7200	0.0800	0.0576
E13	Gable (insulation at rafter level)	1.1500	0.0800	0.0920
R1	Head of roof window	2.3400	0.0800	0.1872
R2	Sill of roof window	2.3400	0.0600	0.1404
R3	Jamb of roof window	5.8800	0.0800	0.4704
R4	Ridge (vaulted ceiling)	1.3300	0.0800	0.1064
R8	Roof to wall (rafter)	11.2800	0.0600	0.6768

Thermal bridges (Sum(L x Psi) calculated using Appendix K) 5.4345 (36)

Point Thermal bridges (36a) = 0.0000

Total fabric heat loss (33) + (36) + (36a) = 27.9558 (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	26.5570	26.3958	26.2377	25.4951	25.3562	24.7095	24.7095	24.5897	24.9586	25.3562	25.6373	25.9311	(38)

Heat transfer coeff

	54.5128	54.3515	54.1934	53.4509	53.3120	52.6652	52.6652	52.5455	52.9143	53.3120	53.5930	53.8868	(39)

Average = Sum(39)m / 12 = 53.4502

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP	0.9676	0.9647	0.9619	0.9487	0.9463	0.9348	0.9348	0.9326	0.9392	0.9463	0.9512	0.9565	(40)
HLP (average)												0.9487	
Days in mont	31	28	31	30	31	30	31	31	30	31	30	31	

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4. Water heating energy requirements (kWh/year)

Assumed occupancy 1.8765 (42)

Hot water usage for mixer showers

55.6823	54.8455	53.6261	51.2930	49.5713	47.6512	46.5599	47.7700	49.0966	51.1581	53.5413	55.4689	(42a)

Hot water usage for baths

24.0684	23.7110	23.2076	22.2795	21.5845	20.8139	20.3977	20.8975	21.4418	22.2663	23.2136	23.9871	(42b)

Hot water usage for other uses

33.8472	32.6164	31.3856	30.1548	28.9240	27.6932	27.6932	28.9240	30.1548	31.3856	32.6164	33.8472	(42c)

Average daily hot water use (litres/day) 104.4226 (43)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	113.5979	111.1729	108.2193	103.7273	100.0798	96.1584	94.6508	97.5916	100.6932	104.8101	109.3713	113.3032	(44)
Energy conte	179.9114	158.3087	166.3291	141.9976	134.7267	118.2379	114.4719	120.8387	124.1647	142.2263	155.8195	177.4055	(45)

Energy content (annual) Total = Sum(45)m = 1734.4379

Distribution loss (46)m = 0.15 x (45)m

26.9867	23.7463	24.9494	21.2996	20.2090	17.7357	17.1708	18.1258	18.6247	21.3339	23.3729	26.6108	(46)

Water storage 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	(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	50.9589	46.0274	50.9589	49.3151	50.9589	47.4206	48.2330	49.7316	49.3151	50.9589	49.3151	50.9589	(61)

Total heat required for water heating calculated for each month

230.8703	204.3361	217.2880	191.3126	185.6856	165.6585	162.7049	170.5703	173.4798	193.1852	205.1345	228.3644	(62)

WWHRS	-25.4556	-22.5131	-23.5745	-19.5206	-18.1925	-15.5674	-14.5920	-15.5171	-16.1067	-18.9880	-21.5111	-24.9842	(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

205.4146	181.8229	193.7135	171.7920	167.4931	150.0911	148.1129	155.0532	157.3731	174.1972	183.6234	203.3802	(64)

Total per year (kWh/year) = Sum(64)m = 2092.0673 (64)

12Total per year (kWh/year) 2092 (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

72.5603	64.1445	68.0441	59.5430	57.5364	51.1693	50.1202	52.6118	53.6135	60.0300	64.1387	71.7270	(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	
(66)m	93.8250	93.8250	93.8250	93.8250	93.8250	93.8250	93.8250	93.8250	93.8250	93.8250	93.8250	93.8250	(66)

Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5

86.1077	95.3336	86.1077	88.9780	86.1077	88.9780	86.1077	86.1077	88.9780	86.1077	88.9780	86.1077	(67)

Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5

163.6315	165.3295	161.0507	151.9415	140.4427	129.6356	122.4157	120.7177	124.9966	134.1058	145.6045	156.4117	(68)

Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5

32.3825	32.3825	32.3825	32.3825	32.3825	32.3825	32.3825	32.3825	32.3825	32.3825	32.3825	32.3825	(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)

-75.0600	-75.0600	-75.0600	-75.0600	-75.0600	-75.0600	-75.0600	-75.0600	-75.0600	-75.0600	-75.0600	-75.0600	(71)

Water heating gains (Table 5)

97.5272	95.4531	91.4572	82.6985	77.3338	71.0684	67.3658	70.7148	74.4632	80.6855	89.0816	96.4073	(72)

Total internal gains

401.4140	410.2637	392.7631	377.7655	358.0318	340.8295	327.0367	328.6877	339.5853	355.0465	377.8116	393.0742	(73)

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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

Southwest				6.2300		36.7938		0.6300		0.7000	0.7700	70.0543	(79)
Northwest				2.3100		15.4796		0.6300		0.7000	1.0000	14.1923	(82)
Solar gains	84.2466	148.1060	215.5260	289.7068	345.9526	353.0957	336.3929	292.8198	240.8893	167.0985	101.7304	71.5740	(83)
Total gains	485.6606	558.3697	608.2890	667.4723	703.9844	693.9252	663.4297	621.5075	580.4747	522.1449	479.5420	464.6482	(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, ni1,m (see Table 9a)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	8.0435	8.0674	8.0909	8.2033	8.2247	8.3257	8.3257	8.3447	8.2865	8.2247	8.1816	8.1370	
alpha	1.5362	1.5378	1.5394	1.5469	1.5483	1.5550	1.5550	1.5563	1.5524	1.5483	1.5454	1.5425	
util living area	0.7770	0.7334	0.6814	0.5978	0.4994	0.3892	0.3018	0.3289	0.4652	0.6257	0.7324	0.7869	(86)
MIT	17.3378	17.7939	18.4371	19.2715	19.9918	20.5274	20.7776	20.7363	20.3317	19.4081	18.2591	17.2588	(87)
Th 2	20.1104	20.1128	20.1152	20.1263	20.1284	20.1380	20.1380	20.1398	20.1343	20.1284	20.1242	20.1198	(88)
util rest of house	0.7641	0.7185	0.6634	0.5748	0.4692	0.3493	0.2517	0.2782	0.4250	0.5992	0.7153	0.7746	(89)
MIT 2	15.9881	16.5291	17.2939	18.2791	19.1105	19.7121	19.9709	19.9353	19.5097	18.4596	17.1007	15.8975	(90)
Living area fraction										fLA = Living area / (4) =		0.4906	(91)
MIT	16.6503	17.1496	17.8547	18.7660	19.5429	20.1121	20.3666	20.3283	19.9129	18.9249	17.6690	16.5654	(92)
Temperature adjustment												0.0000	
adjusted MIT	16.6503	17.1496	17.8547	18.7660	19.5429	20.1121	20.3666	20.3283	19.9129	18.9249	17.6690	16.5654	(93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.7005	0.6582	0.6097	0.5348	0.4475	0.3480	0.2654	0.2897	0.4140	0.5576	0.6567	0.7108	(94)
Useful gains	340.1901	367.5321	370.8744	356.9580	314.9981	241.4806	176.0768	180.0390	240.3446	291.1720	314.9382	330.2562	(95)
Ext temp.	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Heat loss rate W	673.2472	665.7849	615.3523	527.3464	418.1178	290.2952	198.3708	206.4124	307.5876	443.8180	566.4252	666.3300	(97)
Space heating kWh	247.7945	200.4258	181.8915	122.6797	76.7211	0.0000	0.0000	0.0000	0.0000	113.5686	181.0707	250.0390	(98a)
Space heating requirement - total per year (kWh/year)												1374.1908	
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	247.7945	200.4258	181.8915	122.6797	76.7211	0.0000	0.0000	0.0000	0.0000	113.5686	181.0707	250.0390	(98c)
Space heating requirement after solar contribution - total per year (kWh/year)												1374.1908	
Space heating per m2											(98c) / (4) =	24.3910	(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 %)												92.4000	(206)
Efficiency of main space heating system 2 (in %)												0.0000	(207)
Efficiency of secondary/supplementary heating system, %												0.0000	(208)
Space heating requirement	247.7945	200.4258	181.8915	122.6797	76.7211	0.0000	0.0000	0.0000	0.0000	113.5686	181.0707	250.0390	(98)
Space heating efficiency (main heating system 1)	92.4000	92.4000	92.4000	92.4000	92.4000	0.0000	0.0000	0.0000	0.0000	92.4000	92.4000	92.4000	(210)
Space heating fuel (main heating system)	268.1758	216.9111	196.8523	132.7702	83.0315	0.0000	0.0000	0.0000	0.0000	122.9098	195.9639	270.6049	(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	205.4146	181.8229	193.7135	171.7920	167.4931	150.0911	148.1129	155.0532	157.3731	174.1972	183.6234	203.3802	(64)
Efficiency of water heater												80.3000	(216)
(217)m	84.7844	84.5907	84.2467	83.6721	82.8169	80.3000	80.3000	80.3000	80.3000	83.4874	84.3514	84.8251	(217)
Fuel for water heating, kWh/month	242.2788	214.9444	229.9361	205.3157	202.2452	186.9129	184.4494	193.0924	195.9815	208.6509	217.6886	239.7641	(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	17.8915	14.3532	12.9235	9.4683	7.3136	5.9753	6.6717	8.6721	11.2642	14.7793	16.6932	18.3887	(232)
Electricity generated by PVs (Appendix M) (negative quantity)													
(233a)m	-19.3304	-28.2180	-41.9890	-48.9424	-54.2992	-51.2634	-50.6625	-47.0901	-41.0194	-33.0609	-21.6016	-16.6033	(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	-8.1672	-17.4370	-35.1290	-53.4467	-71.3267	-71.8833	-71.0110	-59.8015	-43.4265	-25.1323	-10.9696	-6.4375	(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												1487.2195	(211)
Space heating fuel - main system 2												0.0000	(213)
Space heating fuel - secondary												0.0000	(215)
Efficiency of water heater												80.3000	
Water heating fuel used												2521.2599	(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)	144.3946	(232)
Energy saving/generation technologies (Appendices M ,N and Q)		
PV generation	-928.2486	(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	3310.6254	(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	1487.2195	0.2100	312.3161	(261)
Total CO2 associated with community systems			0.0000	(373)
Water heating (other fuel)	2521.2599	0.2100	529.4646	(264)
Space and water heating			841.7807	(265)
Pumps, fans and electric keep-hot	86.0000	0.1387	11.9293	(267)
Energy for lighting	144.3946	0.1443	20.8406	(268)
Energy saving/generation technologies				
PV Unit electricity used in dwelling	-454.0802	0.1338	-60.7744	
PV Unit electricity exported	-474.1684	0.1255	-59.5213	
Total			-120.2957	(269)
Total CO2, kg/year			754.2549	(272)
EPC Target Carbon Dioxide Emission Rate (TER)			13.3900	(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	1487.2195	1.1300	1680.5581	(275)
Total CO2 associated with community systems			0.0000	(473)
Water heating (other fuel)	2521.2599	1.1300	2849.0237	(278)
Space and water heating			4529.5818	(279)
Pumps, fans and electric keep-hot	86.0000	1.5128	130.1008	(281)
Energy for lighting	144.3946	1.5338	221.4772	(282)
Energy saving/generation technologies				
PV Unit electricity used in dwelling	-454.0802	1.4946	-678.6728	
PV Unit electricity exported	-474.1684	0.4608	-218.4761	
Total			-897.1489	(283)
Total Primary energy kWh/year			3984.0108	(286)
Target Primary Energy Rate (TPER)			70.7100	(287)