

FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

Property Reference	010560			Issued on Date	10/02/2022
Assessment Reference	B06-TY-03_3	Prop Type Ref	B06-TY-03		
Property	London				
SAP Rating	84 B	DER	15.21	TER	14.74
Environmental	87 B	% DER<TER	-3.21		
CO ₂ Emissions (t/year)	1.31	DFEE	44.91	TFEE	41.89
General Requirements Compliance	Fail	% DFEE<TFEE	-7.22		
Assessor Details	Miss Emma Jolly, Emma Jolly, Tel: 01454806691, emmajolly@hoarelea.com			Assessor ID	T689-0001
Client					

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REGULATIONS COMPLIANCE REPORT - Approved Document L1A, 2013 Edition, England

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DWELLING AS DESIGNED

Mid-floor flat, total floor area 101 m²

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating:Mains gas (c)
Fuel factor:1.00 (mains gas)
Target Carbon Dioxide Emission Rate (TER) 14.74 kgCO₂/m²
Dwelling Carbon Dioxide Emission Rate (DER) 15.21 kgCO₂/m²Fail
Excess emissions =0.47 kgCO₂/m² (3.2%)

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)41.9 kWh/m²/yr
Dwelling Fabric Energy Efficiency (DFEE)44.9 kWh/m²/yrFail
Excess energy =3.0 kWh/m²/yr (7.2%)

2 Fabric U-values

Element	Average	Highest	
External wall	0.16 (max. 0.30)	0.20 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	(no floor)		
Roof	(no roof)		
Openings	1.44 (max. 2.00)	2.00 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals: 3.00 (design value)
Maximum 10.0 OK

4 Heating efficiency

Main heating system: Community heating scheme -
Secondary heating system: None

5 Cylinder insulation

Hot water storage No cylinder

6 Controls

Space heating controls: Charging system linked to use of community heating, TRVsOK
Hot water controls: No cylinder

7 Low energy lights

Percentage of fixed lights with low-energy fittings:100%
Minimum 75% OK

8 Mechanical ventilation

Continuous supply and extract system
Specific fan power: 0.63
Maximum 1.5 OK
MVHR efficiency: 90%
Minimum: 70% OK

9 Summertime temperature

Overheating risk (Thames Valley): High Fail
Based on:
Overshading: Average
Windows facing South East: 16.50 m², No overhang
Windows facing North West: 16.50 m², No overhang
Air change rate: 2.00 ach
Blinds/curtains: Dark-coloured curtain or roller blind, closed 100% of daylight hours

10 Key features

External wall U-value 0.12 W/m²K
Party wall U-value 0.00 W/m²K
Air permeability 3.0 m³/m²h

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CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

SAP 2012 WORKSHEET FOR New Build (As Designed) (Version 9.92, January 2014)
 CALCULATION OF DWELLING EMISSIONS FOR REGULATIONS COMPLIANCE 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	100.5000 (1b)	x 2.6000 (2b)	= 261.3000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	100.5000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 261.3000 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ per hour
Number of chimneys	0	0	0	0 * 40 =	0.0000 (6a)
Number of open flues	0	0	0	0 * 20 =	0.0000 (6b)
Number of intermittent 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)+(7a)+(7b)+(7c) =				0.0000 / (5) =	0.0000 (8)
Pressure test				Yes	
Measured/design AP50				3.0000	
Infiltration rate				0.1500	(18)
Number of sides sheltered				2	(19)
Shelter factor			(20) = 1 - [0.075 x (19)] =		0.8500 (20)
Infiltration rate adjusted to include shelter factor			(21) = (18) x (20) =		0.1275 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate	0.1626	0.1594	0.1562	0.1403	0.1371	0.1211	0.1211	0.1179	0.1275	0.1371	0.1434	0.1498 (22b)
Balanced mechanical ventilation with heat recovery												0.5000 (23a)
If mechanical ventilation:												76.5000 (23c)
If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) =												
Effective ac	0.2801	0.2769	0.2737	0.2578	0.2546	0.2386	0.2386	0.2354	0.2450	0.2546	0.2609	0.2673 (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
Opening Type 1 (Uw = 1.40)			33.0000	1.3258	43.7500		(27)
Opening Type 5			2.3000	2.0000	4.6000		(26)
External wall	59.6000	33.0000	26.6000	0.1200	3.1920		(29a)
Sheltered to corr	36.4000	2.3000	34.1000	0.2000	6.8200		(29a)
Total net area of external elements Aum(A, m ²)			96.0000				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	58.3620		(33)
Party wall			21.5000	0.0000	0.0000		(32)
Party Floor 1			1.0000				(32d)
Party Ceiling 1			1.0000				(32b)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							100.0000 (35)
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							9.3234 (36)
Total fabric heat loss						(33) + (36) =	67.6854 (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	24.1495	23.8747	23.5998	22.2255	21.9507	20.5764	20.5764	20.3015	21.1261	21.9507	22.5004	23.0501 (38)
Heat transfer coeff	91.8349	91.5601	91.2852	89.9109	89.6361	88.2618	88.2618	87.9869	88.8115	89.6361	90.1858	90.7355 (39)
Average = Sum(39)m / 12 =												89.8422 (39)
HLP	0.9138	0.9110	0.9083	0.8946	0.8919	0.8782	0.8782	0.8755	0.8837	0.8919	0.8974	0.9028 (40)
HLP (average)												0.8940 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Assumed occupancy												2.7441 (42)
Average daily hot water use (litres/day)												99.3725 (43)
Daily hot water use	109.3098	105.3349	101.3600	97.3851	93.4102	89.4353	89.4353	93.4102	97.3851	101.3600	105.3349	109.3098 (44)
Energy conte	162.1032	141.7765	146.3007	127.5485	122.3858	105.6096	97.8629	112.2991	113.6403	132.4368	144.5651	156.9883 (45)
Energy content (annual)												Total = Sum(45)m = 1563.5168 (45)
Distribution loss (46)m = 0.15 x (45)m												

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 8c. Space cooling requirement

Not applicable

 9b. Energy requirements

Fraction of space heat from secondary/supplementary system (Table 11)	0.0000	(301)
Fraction of space heat from community system	1.0000	(302)
Fraction of heat from community Boilers	1.0000	(303a)
Fraction of total space heat from community Boilers	1.0000	(304a)
Factor for control and charging method (Table 4c(3)) for community space heating	1.0000	(305)
Factor for control and charging method (Table 4c(3)) for community water heating	1.0000	(305a)
Distribution loss factor (Table 12c) for community heating system	1.0500	(306)
Space heating:		
Annual space heating requirement	2652.4276	(98)
Space heat from Boilers = (98) x 1.00 x 1.00 x 1.05	2785.0490	(307a)
Efficiency of secondary/supplementary heating system in % (from Table 4a or Appendix E)	0.0000	(308)
Space heating fuel for secondary/supplementary system	0.0000	(309)
Water heating		
Annual water heating requirement	2214.3566	(64)
Water heat from Boilers = (64) x 1.00 x 1.00 x 1.05	2325.0744	(310a)
Electricity used for heat distribution	51.1012	(313)
Annual totals kWh/year		
Electricity for pumps and fans:		
(BalancedWithHeatRecovery, Database: in-use factor = 1.2500, SFP = 0.7875)		
mechanical ventilation fans (SFP = 0.7875)	251.0440	(330a)
Total electricity for the above, kWh/year	251.0440	(331)
Electricity for lighting (calculated in Appendix L)	404.8387	(332)
Total delivered energy for all uses	5766.0061	(338)

 12b. Carbon dioxide emissions - Community heating scheme

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year
Efficiency of heat source Boilers			95.0000 (367a)
Space heating from Boilers	5379.0773	0.2160	1161.8807 (367)
Electrical energy for heat distribution	51.1012	0.5190	26.5215 (372)
Total CO2 associated with community systems (negative value allowed since DFEE <= TFEE)			1188.4022 (373)
Space and water heating			1188.4022 (376)
Pumps and fans	251.0440	0.5190	130.2918 (378)
Energy for lighting	404.8387	0.5190	210.1113 (379)
Total CO2, kg/year			1528.8054 (383)
Dwelling Carbon Dioxide Emission Rate (DER)			15.2100 (384)

16 CO2 EMISSIONS ASSOCIATED WITH APPLIANCES AND COOKING AND SITE-WIDE ELECTRICITY GENERATION TECHNOLOGIES

DER		15.2100	ZC1
Total Floor Area		TFA 100.5000	
Assumed number of occupants		N 2.7441	
CO2 emission factor in Table 12 for electricity displaced from grid		EF 0.5190	
CO2 emissions from appliances, equation (L14)		15.1614	ZC2
CO2 emissions from cooking, equation (L16)		1.8394	ZC3
Total CO2 emissions		32.2108	ZC4
Residual CO2 emissions offset from biofuel CHP		0.0000	ZC5
Additional allowable electricity generation, kWh/m ² /year		0.0000	ZC6
Resulting CO2 emissions offset from additional allowable electricity generation		0.0000	ZC7
Net CO2 emissions		32.2108	ZC8

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 CALCULATION OF TARGET EMISSIONS 09 Jan 2014

1. Overall dwelling dimensions

	Area (m2)	Storey height (m)	Volume (m3)
Ground floor	100.5000 (1b)	x 2.6000 (2b)	= 261.3000 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	100.5000		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 261.3000 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m3 per hour
Number of chimneys	0	0	0	0 * 40 =	0.0000 (6a)
Number of open flues	0	0	0	0 * 20 =	0.0000 (6b)
Number of intermittent 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)
Air changes per hour					
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =				40.0000 / (5) =	0.1531 (8)
Pressure test				Yes	
Measured/design AP50					5.0000
Infiltration rate					0.4031 (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) =		0.3426 (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	0.4368	0.4283	0.4197	0.3769	0.3683	0.3255	0.3255	0.3169	0.3426	0.3683	0.3854	0.4026 (22b)
Effective ac	0.5954	0.5917	0.5881	0.5710	0.5678	0.5530	0.5530	0.5502	0.5587	0.5678	0.5743	0.5810 (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					
TER Opaque door			2.3000	1.0000	2.3000		(26)					
TER Opening Type (Uw = 1.40)			22.8200	1.3258	30.2538		(27)					
External wall	59.6000	22.8200	36.7800	0.1800	6.6204		(29a)					
Sheltered to corr	36.4000	2.3000	34.1000	0.1800	6.1380		(29a)					
Total net area of external elements Aum(A, m2)			96.0000				(31)					
Fabric heat loss, W/K = Sum (A x U)					(26)...(30) + (32) = 45.3122		(33)					
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							250.0000 (35)					
Thermal bridges (Sum(L x Psi) calculated using Appendix K)							5.3744 (36)					
Total fabric heat loss						(33) + (36) =	50.6866 (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	51.3420	51.0225	50.7093	49.2384	48.9632	47.6821	47.6821	47.4449	48.1756	48.9632	49.5200	50.1020 (38)
Average = Sum(39)m / 12 =	102.0285	101.7091	101.3959	99.9250	99.6498	98.3687	98.3687	98.1315	98.8622	99.6498	100.2065	100.7886 (39)
HLP	1.0152	1.0120	1.0089	0.9943	0.9915	0.9788	0.9788	0.9764	0.9837	0.9915	0.9971	1.0029 (40)
HLP (average)												0.9943 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Assumed occupancy												2.7441 (42)
Average daily hot water use (litres/day)												99.3725 (43)
Daily hot water use	109.3098	105.3349	101.3600	97.3851	93.4102	89.4353	89.4353	93.4102	97.3851	101.3600	105.3349	109.3098 (44)
Energy conte	162.1032	141.7765	146.3007	127.5485	122.3858	105.6096	97.8629	112.2991	113.6403	132.4368	144.5651	156.9883 (45)
Energy content (annual)												Total = Sum(45)m = 1563.5168 (45)
Distribution loss (46)m = 0.15 x (45)m	24.3155	21.2665	21.9451	19.1323	18.3579	15.8414	14.6794	16.8449	17.0460	19.8655	21.6848	23.5483 (46)
Water storage loss:												
Store volume												150.0000 (47)
a) If manufacturer declared loss factor is known (kWh/day):												1.3938 (48)
Temperature factor from Table 2b												0.5400 (49)
Enter (49) or (54) in (55)												0.7527 (55)
Total storage loss												

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If cylinder contains dedicated solar storage	23.3325	21.0745	23.3325	22.5798	23.3325	22.5798	23.3325	23.3325	22.5798	23.3325	22.5798	23.3325 (56)
Primary loss	23.3325	21.0745	23.3325	22.5798	23.3325	22.5798	23.3325	23.3325	22.5798	23.3325	22.5798	23.3325 (57)
Total heat required for water heating calculated for each month	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)
Solar input	208.6982	183.8623	192.8956	172.6403	168.9807	150.7015	144.4578	158.8940	158.7321	179.0317	189.6569	203.5832 (62)
Output from w/h	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63)
Heat gains from water heating, kWh/month	Solar input (sum of months) = Sum(63)m = 0.0000 (63)											
	208.6982	183.8623	192.8956	172.6403	168.9807	150.7015	144.4578	158.8940	158.7321	179.0317	189.6569	203.5832 (64)
	Total per year (kWh/year) = Sum(64)m = 2112.1342 (64)											
	91.1753	80.8093	85.9209	78.4833	77.9692	71.1887	69.8153	74.6154	73.8589	81.3112	84.1414	89.4745 (65)

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

Metabolic gains (Table 5), Watts (66)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	137.2053	137.2053	137.2053	137.2053	137.2053	137.2053	137.2053	137.2053	137.2053	137.2053	137.2053	137.2053 (66)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	22.9190	20.3564	16.5550	12.5332	9.3687	7.9095	8.5464	11.1090	14.9105	18.9323	22.0967	23.5560 (67)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	257.1336	259.8018	253.0779	238.7636	220.6943	203.7117	192.3663	189.6980	196.4219	210.7363	228.8056	245.7881 (68)
Pumps, fans	36.7205	36.7205	36.7205	36.7205	36.7205	36.7205	36.7205	36.7205	36.7205	36.7205	36.7205	36.7205 (69)
Losses e.g. evaporation (negative values) (Table 5)	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000 (70)
Water heating gains (Table 5)	-109.7643	-109.7643	-109.7643	-109.7643	-109.7643	-109.7643	-109.7643	-109.7643	-109.7643	-109.7643	-109.7643	-109.7643 (71)
Total internal gains	122.5474	120.2519	115.4851	109.0046	104.7973	98.8732	93.8378	100.2895	102.5818	109.2892	116.8630	120.2615 (72)
	469.7615	467.5717	452.2796	427.4630	402.0219	377.6559	361.9121	368.2581	381.0757	406.1193	434.9269	456.7672 (73)

6. Solar gains

[Jan]	Area m2	Solar flux Table 6a W/m2	Specific data or Table 6b g	FF Specific data or Table 6c	Access factor Table 6d	Gains W						
Southeast	11.4100	36.7938	0.6300	0.7000	0.7700	128.3017 (77)						
Northwest	11.4100	11.2829	0.6300	0.7000	0.7700	39.3441 (81)						
Solar gains	167.6458	298.6314	443.3129	607.4693	733.5232	751.5787	714.8807	617.2676	499.5981	339.4107	203.1810	141.9299 (83)
Total gains	637.4074	766.2031	895.5924	1034.9323	1135.5451	1129.2346	1076.7928	985.5256	880.6738	745.5300	638.1079	598.6971 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Thl (C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Utilisation factor for gains for living area, nil,m (see Table 9a)	21.0000 (85)											
tau	68.4041	68.6189	68.8309	69.8440	70.0369	70.9490	70.9490	71.1206	70.5949	70.0369	69.6478	69.2456
alpha	5.5603	5.5746	5.5887	5.6563	5.6691	5.7299	5.7299	5.7414	5.7063	5.6691	5.6432	5.6164
util living area	0.9974	0.9922	0.9745	0.9073	0.7522	0.5487	0.4007	0.4552	0.7250	0.9512	0.9933	0.9981 (86)
MIT	19.9767	20.1591	20.4270	20.7403	20.9302	20.9904	20.9987	20.9973	20.9579	20.6851	20.2704	19.9479 (87)
Th 2	20.0707	20.0733	20.0759	20.0881	20.0904	20.1010	20.1010	20.1030	20.0969	20.0904	20.0858	20.0809 (88)
util rest of house	0.9965	0.9897	0.9664	0.8805	0.6970	0.4755	0.3195	0.3680	0.6485	0.9309	0.9908	0.9975 (89)
MIT 2	18.7042	18.9713	19.3580	19.7969	20.0274	20.0951	20.1006	20.1020	20.0662	19.7356	19.1438	18.6698 (90)
Living area fraction	fLA = Living area / (4) = 0.3463 (91)											
MIT	19.1448	19.3826	19.7282	20.1236	20.3400	20.4051	20.4115	20.4120	20.3750	20.0644	19.5339	19.1123 (92)
Temperature adjustment	0.0000											
adjusted MIT	19.1448	19.3826	19.7282	20.1236	20.3400	20.4051	20.4115	20.4120	20.3750	20.0644	19.5339	19.1123 (93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Useful gains	634.3964	756.4539	862.1141	912.4847	809.5064	565.3089	374.3569	392.4824	592.9082	693.4871	630.8911	596.6441 (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	1514.5939	1473.0111	1341.2804	1121.5164	860.9760	571.0418	374.9365	393.7032	620.3563	943.1279	1245.9605	1502.9931 (97)
Month fracti	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000 (97a)
Space heating kWh	654.8670	481.5265	356.4997	150.5029	38.2934	0.0000	0.0000	0.0000	0.0000	185.7327	442.8500	674.3237 (98)
Space heating per m2	(98) / (4) = 29.6975 (99)											

8c. Space cooling requirement

Not applicable



FULL SAP CALCULATION PRINTOUT

Calculation Type: New Build (As Designed)

CALCULATION OF TARGET EMISSIONS 09 Jan 2014

9a. Energy requirements - Individual heating systems, including micro-CHP

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
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 %)													93.5000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													3192.0811 (211)
Space heating requirement	654.8670	481.5265	356.4997	150.5029	38.2934	0.0000	0.0000	0.0000	0.0000	185.7327	442.8500	674.3237	(98)
Space heating efficiency (main heating system 1)	93.5000	93.5000	93.5000	93.5000	93.5000	0.0000	0.0000	0.0000	0.0000	93.5000	93.5000	93.5000	(210)
Space heating fuel (main heating system)	700.3925	515.0016	381.2831	160.9657	40.9555	0.0000	0.0000	0.0000	0.0000	198.6446	473.6363	721.2018	(211)
Water heating 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	(215)
Water heating requirement	208.6982	183.8623	192.8956	172.6403	168.9807	150.7015	144.4578	158.8940	158.7321	179.0317	189.6569	203.5832	(64)
Efficiency of water heater (217)m	87.6594	87.2667	86.4310	84.4504	81.5820	79.8000	79.8000	79.8000	79.8000	84.9119	87.0020	87.7709	(217)
Fuel for water heating, kWh/month	238.0783	210.6901	223.1787	204.4282	207.1299	188.8490	181.0248	199.1152	198.9124	210.8441	217.9914	231.9485	(219)
Water heating fuel used													2512.1906 (219)
Annual totals kWh/year													
Space heating fuel - main system													3192.0811 (211)
Space heating fuel - secondary													0.0000 (215)
Electricity for pumps and fans:													
central heating pump													30.0000 (230c)
main heating flue fan													45.0000 (230e)
Total electricity for the above, kWh/year													75.0000 (231)
Electricity for lighting (calculated in Appendix L)													404.7566 (232)
Total delivered energy for all uses													6184.0284 (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	3192.0811	0.2160	689.4895 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	2512.1906	0.2160	542.6332 (264)
Space and water heating			1232.1227 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	404.7566	0.5190	210.0687 (268)
Total CO2, kg/m2/year			1481.1164 (272)
Emissions per m2 for space and water heating			12.2599 (272a)
Fuel factor (mains gas)			1.0000
Emissions per m2 for lighting			2.0902 (272b)
Emissions per m2 for pumps and fans			0.3873 (272c)
Target Carbon Dioxide Emission Rate (TER) = (12.2599 * 1.00) + 2.0902 + 0.3873, rounded to 2 d.p.			14.7400 (273)