

Calculated by Lambda Calculation Engine SAP Engine version v94.0.1.1 RRN: 3825-9977-

1153-9900-9073

### 1. Overall dwelling dimensions

Ground floor(main)	100.26	2.14	214.5564	(1b)-	(3b)
First floor(main)	88.22	2.31	203.7882	(1c)-	(3c)
Room(s)-in-roof	36.65	2.45	89.7925		
Ground floor (extension 1)	31.72	2.37	75.1764	(1b)-	(3b)
Ground floor (extension 2)	17.62	2.41	42.4642	(1b)-	(3b)
First floor (extension 2)	17.62	2.58	45.4596	(1c)-	(3c)
Ground floor (extension 3)	12.27	4.7	57.669	(1b)-	(3b)
Total floor area	304.3600		(4)		
Dwelling volume (m³)			728.9063		(5)

## 2. Ventilation rate

Number of chimneys	80	(6a) Number of open flues	40
(6b) Number of intermittent fans	0	(7a) Number of passive vents	0
(7b) Number of flueless gas fires 0 (7c)			
ach			
Infiltration due to chimneys, flues and fans .....		0.1646	(8)
Number of storeys	3	(9) Additional infiltration .....	0.2000 (10)
Structural infiltration .....		0.3500	(11)
Floor infiltration .....		0.0000	(12)
0.05 if no draught lobby.....		0.0500	(13)
% of windows and doors draught proofed	100	(14) Window infiltration.....	0.0500 (15)
Infiltration rate.....		0.8146	(18)
Number of sides sheltered	2	(19) Shelter factor .....	0.8500 (20)
Infiltration rate incorporating shelter factor .....		0.6924	(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	0.8829	0.8655	0.8482	0.7617	0.7444	0.6578	0.6578	0.6405	0.6924	0.7444	0.7790	0.8136	(22b)
Effective ach	0.8897	0.8746	0.8598	0.7901	0.7770	0.7164	0.7164	0.7051	0.7397	0.7770	0.8034	0.8310	(25)

### 3. Heat losses and heat loss parameter

Element Net U-value A x U K-value A xK				
Element (26)			(Main) Doors	3.7000 3.0000 11.1000
Windows(1)	0.0000	4.0268	0.0000	(27)
Windows(2)	32.5500	1.8519	60.2778	(27)
Ground Floor	100.2600	0.3700	37.0962	(28a)
Walls	106.2300	1.2000	127.4760	(29a)
Roof	63.6100	0.2100	13.3581	(30)
Roofroom flat ceiling	36.6500	0.4000	14.6600	(30a)
Roofroom walls	54.3700	0.4000	21.7480	(30e)
Element (extension 1)				
Windows(1)	0.0000	4.0268	0.0000	(27)
Windows(2)	4.5900	1.8519	8.5000	(27)
Ground Floor	31.7200	0.3000	9.5160	(28a)
Walls	10.2000	1.2000	12.2400	(29a)
Alternative wall	0.0000	0.0000	0.0000	(29b)
Roof	36.6300	2.3000	84.2490	(30)
Element (extension 2)				
Windows(1)	0.0000	4.0268	0.0000	(27)
Windows(2)	5.1000	1.8519	9.4444	(27)
Ground Floor	17.6200	0.2900	5.1098	(28a)
Walls	39.3800	1.2000	47.2560	(29a)
Roof	17.6200	0.2100	3.7002	(30)
Element (extension 3)				
Windows(1)	0.0000	4.0268	0.0000	(27)
Windows(2)	1.7700	1.8519	3.2778	(27)
Ground Floor	12.2700	0.4900	6.0123	(28a)
Walls	23.3800	1.2000	28.0560	(29a)
Roof	14.1700	2.3000	32.5910	(30)

Total area of elements (whole dwelling) .....	611.8200	(31)
Party wall (main) .....	0.0000	(32)
Fabric heat loss .....	535.6686	(33)
Thermal mass parameter .....	250.0000	(35)
Thermal bridges (0.15 × total area) .....	91.7730 (36)	
Total fabric heat loss .....	627.4416	(37)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Vent loss	214.0117	210.3716	206.8035	190.0445	186.9090	172.3125	172.3125	169.6094	177.9348	186.9090	193.2522	.....	199.8837	(38)
Heat transfer coeff	841.4533	837.8132	834.2451	817.4861	814.3506	799.7541	799.7541	797.0510	805.3764	814.3506	820.6938	.....	827.3253	(39)
Heat transfer coeff (average).....												817.4711		(39)
HLP	2.7647	2.7527	2.7410	2.6859	2.6756	2.6277	2.6277	2.6188	2.6461	2.6756	2.6965	.....	2.7182	(40)
HLP (average).....												2.6859		(40)



Fraction of space heat from secondary .....	0.1000	(201)
Fraction of space heat from main system .....	0.9000	(202)
Fraction of total space heat from main system 1 .....	0.9000	(204)
Efficiency of main heating system 1 .....	86.4000	(206)
Efficiency of secondary heating system.....	60.0000	(208)
Space heating requirement .....	38878.0551	(211)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Space heating requirement		
6547.8972 5476.1969 5056.6135 3481.1947 2154.0936 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3176.0900 4881.5500 6549.2970	(98) Space heating efficiency (main heating system)	
86.4000 86.4000 86.4000 86.4000 86.4000 0.0000 0.0000 0.0000 0.0000 0.0000 86.4000 86.4000 86.4000	(210) Space heating fuel (main heating system)	
6820.7262 5704.3718 5267.3057 3626.2445 2243.8475 0.0000 0.0000 0.0000 0.0000 0.0000 529.3483 813.5917 1091.5495	(211) Space heating fuel (secondary)	
1091.3162 912.6995 842.7689 580.1991 359.0156 0.0000 0.0000 0.0000 0.0000 0.0000 529.3483 813.5917 1091.5495	(215) Water heating requirement	
275.5832 243.5711 257.3845 232.9212 229.8435 187.0759 180.3363 196.9614 196.3242 241.4185 252.5180 269.6927	(64) Efficiency of water heater 85.7996	(216)
85.7996 85.7674 85.6816 85.4736 84.9891 74.7000 74.7000 74.7000 74.7000 85.3588 85.6707 85.8119	(217) Water heating fuel	
321.1938 283.9904 300.3964 272.5066 270.4389 250.4363 241.4141 263.6699 262.8169 282.8279 294.7543 314.2834	(219) Space cooling fuel 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)	

Annual totals: kWh/year

Space heating fuel - main system .....	38878.0551	(211)
Space heating fuel - secondary .....	6220.4888	(215)
Water heating fuel .....	3358.7288	(219)
central heating pump .....	120.0000	(230c)
oil boiler pump .....	100.0000	(230d)
Electricity for pumps and fans .....	220.0000	(231)
Electricity for lighting .....	976.6220	(232)
Total delivered energy for all uses .....	49653.8946	(238)

10. Fuel costs

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year		
Space heating - main system		38878.0551	5.4400	2114.9662	(240)
Space heating - secondary		6220.4888	4.2300	263.1267	(242)
Water heating	3358.7288		5.4400	182.7148	(247)
Pumps and fans for heating		0.0000	220.0000	29.0180	(249)
Electricity for lighting	976.6220		13.1900	128.8164	(250)
Additional standing charges .....				0.0000	(251)
Total energy cost .....				2718.6422	(255)

11. SAP rating

Energy cost deflator .....	0.4200	(256)
Energy cost factor (ECF) .....	3.2683	(257)
SAP value 54.4066		
SAP rating	54	(258) SAP BAND E

12. Carbon dioxide emissions

	Energy kWh/year	Emission factor	Emissions kg/year		
Space heating - main system		38878.0551	0.2980	11585.6604	(261)
Space heating - secondary		6220.4888	0.0190	118.1893	(263)
Water heating	3358.7288		0.2980	1000.9012	(264)
Space and water heating .....				12704.7509	(265)
Pumps and fans	0.5190	220.0000		114.1800	(267)
Energy for lighting	976.6220	0.5190		506.8668	(268)
Total kg/year .....				13325.7977	(272)

	kg/m2/year	
CO2 emissions per m2 .....	43.78	(273)
EI value 49.7651		
EI rating	50	(274) EI band E

SAP 2012 WORKSHEET (Version 9.94, September 2019)  
CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 02 Dec 2020

Calculated by Lambda Calculation Engine SAP Engine version v94.0.1.1 RRN: 3825-9977-

1153-9900-9073

1. Overall dwelling dimensions

Ground floor(main)	100.26	2.14	214.5564	(1b)-	(3b)
First floor(main)	88.22	2.31	203.7882	(1c)-	(3c)
Room(s)-in-roof	36.65		2.45 89.7925		
Ground floor (extension 1)	31.72	2.37	75.1764	(1b)-	(3b)
Ground floor (extension 2)	17.62	2.41	42.4642	(1b)-	(3b)
First floor (extension 2)	17.62	2.58	45.4596	(1c)-	(3c)
Ground floor (extension 3)	12.27	4.7	57.669	(1b)-	(3b)
Total floor area .....	304.3600		(4)		
Dwelling volume (m³) .....			728.9063		(5)

2. Ventilation rate

Number of chimneys	80	(6a) Number of open flues	20
(6b) Number of intermittent fans	0	(7a) Number of passive vents	0
(7b) Number of flueless gas fires 0 (7c)			
	ach		
Infiltration due to chimneys, flues and fans .....		0.1372	(8)
Number of storeys	3	(9) Additional infiltration .....	0.2000 (10)
Structural infiltration .....		0.3500	(11)
Floor infiltration .....		0.0000	(12)
0.05 if no draught lobby.....		0.0500	(13)
% of windows and doors draught proofed	100	(14) Window infiltration.....	0.0500 (15)
Infiltration rate.....		0.7872	(18)
Number of sides sheltered	2	(19) Shelter factor .....	0.8500 (20)
Infiltration rate incorporating shelter factor .....		0.6691	(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	0.8531	0.8364	0.8197	0.7360	0.7193	0.6357	0.6357	0.6189	0.6691	0.7193	0.7528	.....	0.7862	(22b)
Effective ach	0.8639	0.8498	0.8359	0.7709	0.7587	0.7020	0.7020	0.6915	0.7239	0.7587	0.7833	.....	0.8091	(25)

3. Heat losses and heat loss parameter

Element Net U-value A x U K-value A xK

Element		(Main) Doors	3.7000	3.0000	11.1000
(26)					
Windows(1)	0.0000	4.0268	.....	0.0000	(27)
Windows(2)	32.5500	1.8519	.....	60.2778	(27)
Ground Floor	100.2600	0.3700	.....	37.0962	(28a)
Walls	106.2300	0.3000	.....	31.8690	(29a)
Roof	63.6100	0.2100	.....	13.3581	(30)
Roofroom flat ceiling	36.6500	0.4000	.....	14.6600	(30a)
Roofroom walls	54.3700	0.4000	.....	21.7480	(30e)
Element (extension 1)					
Windows(1)	0.0000	4.0268	.....	0.0000	(27)
Windows(2)	4.5900	1.8519	.....	8.5000	(27)
Ground Floor	31.7200	0.3000	.....	9.5160	(28a)
Walls	10.2000	0.3000	.....	3.0600	(29a)
Alternative wall	0.0000	0.0000	.....	0.0000	(29b)
Roof	36.6300	0.1800	.....	6.5934	(30)
Element (extension 2)					
Windows(1)	0.0000	4.0268	.....	0.0000	(27)
Windows(2)	5.1000	1.8519	.....	9.4444	(27)
Ground Floor	17.6200	0.2900	.....	5.1098	(28a)
Walls	39.3800	0.3000	.....	11.8140	(29a)
Roof	17.6200	0.2100	.....	3.7002	(30)
Element (extension 3)					
Windows(1)	0.0000	4.0268	.....	0.0000	(27)
Windows(2)	1.7700	1.8519	.....	3.2778	(27)
Ground Floor	12.2700	0.4900	.....	6.0123	(28a)
Walls	23.3800	0.3000	.....	7.0140	(29a)
Roof	14.1700	0.1800	.....	2.5506	(30)

Total area of elements (whole dwelling) .....	611.8200	(31)
Party wall (main)	0.0000 0.0000 .....	0.0000 (32)
Fabric heat loss .....	266.7016	(33)
Thermal mass parameter .....	250.0000	(35)
Thermal bridges (0.15 × total area)	91.7730 (36)	
Total fabric heat loss.....	358.4746	(37)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Vent loss	207.8032	204.4042	201.0724	185.4234	182.4955	168.8657	168.8657	166.3417	174.1157	182.4955	188.4186	.....	194.6109	(38)
Heat transfer coeff	566.2778	562.8788	559.5470	543.8980	540.9701	527.3403	527.3403	524.8163	532.5903	540.9701	546.8932	.....	553.0855	(39)
Heat transfer coeff (average).....												.....	543.8840	(39)
HLP	1.8606	1.8494	1.8384	1.7870	1.7774	1.7326	1.7326	1.7243	1.7499	1.7774	1.7969	.....	1.8172	(40)
HLP (average).....												.....	1.7870	(40)
Days in month	31.0000	28.0000	31.0000	30.0000	31.0000	30.0000	31.0000	31.0000	30.0000	31.0000	30.0000	.....	31.0000	(41)

4. Water heating energy requirements

Assumed occupancy .....													3.1376	(42)
Average daily hot water use (litres/day) .....													114.4399	(43)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec														
Daily hot water use	125.8839	121.3063	116.7287	112.1512	107.5736	102.9960	102.9960	107.5736	112.1512	116.7287	121.3063	.....	125.8839	(44)
Energy content	186.6823	163.2735	168.4836	146.8881	140.9426	121.6228	112.7014	129.3265	130.8710	152.5176	166.4849	.....	180.7918	(45)
Energy content(annual) .....													1800.5860	(45)
Distribution loss	28.0023	24.4910	25.2725	22.0332	21.1414	18.2434	16.9052	19.3990	19.6307	22.8776	24.9727	.....	27.1188	(46)
Cylinder volume .....													160.0000	(47)
Cylinder loss factor (kWh/litre/day) .....													0.0152	(51)
Volume factor .....													0.9086	(52)
Temperature factor .....													0.5400	(53)
Energy lost from cylinder in kWh/day .....													1.1920	(55)
Total storage loss	36.9530	33.3769	36.9530	35.7609	36.9530	35.7609	36.9530	36.9530	35.7609	36.9530	35.7609	.....	36.9530	(56)
Net storage loss	24.7123	22.3208	24.7123	23.9151	24.7123	23.9151	24.7123	24.7123	23.9151	24.7123	23.9151	.....	24.7123	(57)
Primary loss	64.5792	58.3296	60.7044	43.7472	29.0606	18.4430	19.0578	20.7903	31.8562	60.7044	62.4960	.....	64.5792	(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	275.9737	243.9239	253.9004	214.5504	194.7156	163.9809	156.4715	174.8291	186.6423	237.9343	252.8960	.....	270.0833	(62)
WW heat rec.	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	.....	0.0000	(G10)
Solar input	26.3469	43.9654	74.8781	100.3515	123.9758	121.8879	120.2772	105.0868	82.3040	56.2039	31.2512	.....	22.0479	(63)

Solar input(sum of months) .....	908.5766	(63)
Flue gas heat rec. 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 .....	0.0000	(G6)
Fghrs PV 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000.....	0.0000	
Output from w/h 249.6268 199.9585 179.0222 114.1990 70.7398 42.0930 36.1943 69.7424 104.3383 181.7304 221.6448 .....	248.0354	(64)
Output from water heater(annual) .....	1717.3248	(64)
Heat gains (kWh) 133.5050 118.8087 124.3542 102.9702 89.8818 74.3261 72.4893 79.4032 88.1317 119.0455 124.4851 .....	131.5465	(65)

5. Internal gains

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec		
Metabolic 188.2559 188.2559 188.2559 188.2559 188.2559 188.2559 188.2559 188.2559 188.2559 188.2559 188.2559 188.2559 .....	188.2559	(66)
Lighting 138.2509 122.7933 99.8622 75.6021 56.5135 47.7110 51.5535 67.0111 89.9422 114.2023 133.2910.....	142.0934	(67)
Appliances 689.2322 696.3842 678.3612 639.9924 591.5587 546.0378 515.6270 508.4750 526.4980 564.8668 613.3005.....	658.8214	(68)
Cooking 56.9632 56.9632 56.9632 56.9632 56.9632 56.9632 56.9632 56.9632 56.9632 56.9632 56.9632.....	56.9632	(69)
Pumps, fans 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000 10.0000.....	10.0000	(70)
Losses -125.5039 -125.5039 -125.5039 -125.5039 -125.5039 -125.5039 -125.5039 -125.5039 -125.5039 -125.5039 -125.5039.....	125.5039	(71)
Water heating 179.4423 176.7987 167.1427 143.0141 120.8088 103.2307 97.4318 106.7247 122.4051 160.0074 172.8960.....	176.8098	(72)
Total internal 1136.6405 1125.6914 1075.0813 988.3238 898.5961 826.6947 794.3275 811.9259 868.5604 968.7916 1049.2026.....	1107.4397	(73)

6. Solar gains

(calculation for January)		
Orientation Area Gains[W]		
East/West(1)(main) 0.0000 .....	0.0000	(76)
East/West(2)(main) 32.5500 .....	223.2863	(76)
East/West(1)(extn 1) 0.0000 .....	0.0000	(76)
East/West(2)(extn 1) 4.5900 .....	31.4865	(76)
East/West(1)(extn 2) 0.0000 .....	0.0000	(76)
East/West(2)(extn 2) 5.1000 .....	34.9850	(76)
East/West(1)(extn 3) 0.0000 .....	0.0000	(76)
East/West(2)(extn 3) 1.7700 .....	12.1418	(76)
total:.....	301.8995	(83-1)
Solar gains 301.8995 590.5795 972.6004 1418.4797 1738.4001 1779.5619 1694.2154 1455.3060 1131.1745 700.7724 376.4332 .....	248.2675	(83)
Total gains 1438.5401 1716.2709 2047.6817 2406.8035 2636.9962 2606.2565 2488.5429 2267.2320 1999.7349 1669.5640 1425.6359.....	1355.7072	(84)

7. Mean internal temperature

Living room temperature during heating periods Th1 .....	21.0000	(85)
Heating system responsiveness 1.0000		
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec tau 37.3246 37.5500 37.7736 38.8604 39.0708 40.0806		
40.0806 40.2734 39.6855 39.0708.....	38.6476	38.2149
alpha 3.4883 3.5033 3.5182 3.5907 3.6047 3.6720 3.6720 3.6849 3.6457 3.6047 3.5765.....	3.5477	
external 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	
util living area 0.9988 0.9976 0.9941 0.9827 0.9511 0.8742 0.7576 0.8105 0.9473 0.9912 0.9980.....	0.9991	(86)
MIT 1 18.8089 18.9882 19.3335 19.8343 20.3014 20.6941 20.8787 20.8390 20.5047 19.9003 19.2943.....	18.8162	(87)
th2 (88) util rest 0.9984 0.9967 0.9915 0.9741 0.9218 0.7840 0.5731 0.6454 0.9009 0.9855		
0.9970 .....	0.9987	(89)
MIT 2 17.4798 17.6644 18.0142 18.5364 18.9926 19.3641 19.4862 19.4743 19.2056 18.6103 17.9968.....	17.5087	(90)
Living area fraction =.....	0.1000	(91)
MIT 17.6127 17.7968 18.1461 18.6662 19.1235 19.4971 19.6255 19.6108 19.3355 18.7393 18.1265 .....	17.6394	(92)
Temperature adjustment 0.0000		
adjusted MIT 17.6127 17.7968 18.1461 18.6662 19.1235 19.4971 19.6255 19.6108 19.3355 18.7393 18.1265 .....	17.6394	(93)

8. Space heating requirement

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec		
Utilisation 0.9975 0.9951 0.9883 0.9673 0.9119 0.7823 0.5897 0.6581 0.8930 0.9810 0.9956 .....	0.9980	(94)
Useful gains W 1434.9358 1707.8780 2023.6404 2328.0125 2404.7332 2038.9831 1467.4974 1492.0389 1785.7449 1637.7633 1419.3643.....	1353.0577	(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 7538.7055 7259.3543 6516.5485 5311.8243 4015.9051 2582.4612 1595.4514 1685.0731 2788.3985 4403.1316 6030.3317 .....	7433.1534	(97)
Month fraction 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 4541.2047 3730.5921 3342.7236 2148.3444 1198.7119 0.0000 0.0000 0.0000 0.0000 2057.4340 3319.8966 .....	4523.5912	(98)
Space heating.....	24862.4984	(98)
Space heating per m2 .....	81.6878	(99)

8c. Space cooling requirement

- not applicable

9. Energy requirements

Fraction of space heat from secondary .....	0.1000	(201)
Fraction of space heat from main system .....	0.9000	(202)
Fraction of total space heat from main system 1 .....	0.9000	(204)
Efficiency of main heating system 1 .....	92.0000	(206)
Efficiency of secondary heating system.....	60.0000	(208)
Space heating requirement .....	24322.0093	(211)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Space heating requirement		
4541.2047 3730.5921 3342.7236 2148.3444 1198.7119 0.0000 0.0000 0.0000 0.0000 2057.4340 3319.8966 4523.5912 (98) Space heating efficiency (main heating system)		
92.0000 92.0000 92.0000 92.0000 92.0000 0.0000 0.0000 0.0000 0.0000 92.0000 92.0000 92.0000 (210) Space heating fuel (main heating system)		
4442.4829 3649.4923 3270.0557 2101.6413 1172.6529 0.0000 0.0000 0.0000 0.0000 2012.7072 3247.7249 4425.2522 (211) Space heating fuel (secondary)		
756.8675 621.7653 557.1206 358.0574 199.7853 0.0000 0.0000 0.0000 0.0000 342.9057 553.3161 753.9319 (215) Water heating requirement		
249.6268 199.9585 179.0222 114.1990 70.7398 42.0930 36.1943 69.7424 104.3383 181.7304 221.6448 248.0354 (64) Efficiency of water heater 91.2348 (216)		
91.2348 91.2527 91.2532 91.2585 91.1825 80.3000 80.3000 80.3000 80.3000 90.8174 91.0835 91.2366 (217) Water heating fuel		
273.6092 219.1261 196.1818 125.1379 77.5805 52.4197 45.0739 86.8523 129.9357 200.1053 243.3423 271.8595 (219) Space cooling fuel 0.0000 0.0000 0.0000 0.0000		
0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 (221)		

Annual totals: kWh/year

Space heating fuel - main system .....	24322.0093	(211)
Space heating fuel - secondary .....	4143.7497	(215)
Water heating fuel.....	1921.2240	(219)
central heating pump .....	120.0000	(230c)
oil boiler pump.....	100.0000	(230d)
pump for solar water heating .....	50.0000	(230g)
Electricity for pumps and fans .....	270.0000	(231)
Electricity for lighting .....	976.6220	(232)
PV generation .....	1727.2394	(233)
Wind generation .....	3575.5408	(234)
Total delivered energy for all uses.....	26330.8249	(238)

10. Fuel costs

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year	
Space heating - main system		24322.0093	5.4400 .....	1323.1173 (240)
Space heating - secondary		4143.7497	4.2300 .....	175.2806 (242)
Water heating	1921.2240		5.4400 .....	104.5146 (247)
Pumps and fans for heating		0.0000	270.0000 .....	35.6130 (249)
Electricity for lighting	976.6220		13.1900 .....	128.8164 (250)
Additional standing charges .....				0.0000 (251)
Electricity generated - PVs		-1727.2394	13.1900 .....	227.8229 (252)
Electricity generated - wind		-3575.5408	13.1900 .....	471.6138 (252)
Total energy cost .....				1067.9052 (255)

11. SAP rating

Energy cost deflator .....	0.4200	(256)
Energy cost factor (ECF) .....	1.2838	(257)
SAP value 82.0905		
SAP rating	82	(258) SAP BAND B

12. Carbon dioxide emissions

	Energy kWh/year	Emission factor	Emissions kg/year	
Space heating - main system		24322.0093	0.2980 .....	7247.9588 (261)
Space heating - secondary		4143.7497	0.0190 .....	78.7312 (263)
Water heating	1921.2240		0.2980 .....	572.5248 (264)
Space and water heating .....				7899.2148 (265)
Pumps and fans		0.5190	270.0000 .....	140.1300 (267)
Energy for lighting	976.6220		0.5190 .....	506.8668 (268)
Electricity generated - PVs		-1727.2394	0.5190 .....	896.4372 (269)
Electricity generated - wind		-3575.5408	0.5190 .....	1855.7056 (269)
Total kg/year .....				5794.0687 (272)

	kg/m2/year	
CO2 emissions per m2 .....	19.04	(273)
EI value 77.7764		
EI rating	78	(274) EI band C