

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Built)



Property and Energy
Services Ltd.

Property Reference	3573-1	Issued on Date	18/03/2021
Assessment Reference	3473-1br	Prop Type Ref	
Property	FLAT 1, 379 OXFORD ROAD, READING, READING, RG30 1HA		
SAP Rating	79 C	DER	N/A
Environmental	81 B	% DER<TER	N/A
CO ₂ Emissions (t/year)	1.33	DFEE	N/A
General Requirements Compliance	N/A	% DFEE<TFEE	N/A
Assessor Details	Mr. Ian Lloyd, Property and Energy Services Limited, Tel: 01367240212, ianl@propertyandenergy.co.uk		Assessor ID
Client	Keen Partnership, Keen		

CALCULATION OF HEAT DEMAND 09 Jan 2014

SAP 2012 WORKSHEET FOR Conversion (As Built) (Version 9.92, January 2014)
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1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	58.9100 (1b)	x 2.4800 (2b)	= 146.0968 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	58.9100		
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 146.0968 (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										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)+(7a)+(7b)+(7c) =									20.0000 / (5) =	0.1369 (8)		
Pressure test												No	
Measured/design AP50												15.0000	
Infiltration rate												0.8869 (18)	
Number of sides sheltered												3 (19)	
Shelter factor												(20) = 1 - [0.075 x (19)] =	0.7750 (20)
Infiltration rate adjusted to include shelter factor												(21) = (18) x (20) =	0.6873 (21)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Wind speed	4.4000	4.1000	4.1000	3.9000	3.9000	3.4000	3.4000	3.3000	3.4000	3.8000	3.7000	4.0000 (22)	
Wind factor	1.1000	1.0250	1.0250	0.9750	0.9750	0.8500	0.8500	0.8250	0.8500	0.9500	0.9250	1.0000 (22a)	
Adj infilt rate	0.7561	0.7045	0.7045	0.6702	0.6702	0.5842	0.5842	0.5671	0.5842	0.6530	0.6358	0.6873 (22b)	
Effective ac	0.7858	0.7482	0.7482	0.7246	0.7246	0.6707	0.6707	0.6608	0.6707	0.7132	0.7021	0.7362 (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					
W-1.6 (Uw = 1.60)			10.0900	1.5038	15.1729		(27)					
Velux (Uw = 1.50)			1.7200	1.4151	2.4340		(27a)					
Orig upgd			22.4100	0.1700	3.8097		(28a)					
New floor			36.5000	0.2200	8.0300		(28a)					
Original wall	17.5300	3.6400	13.8900	0.3000	4.1670		(29a)					
New wall	45.5700	6.4500	39.1200	0.2800	10.9536		(29a)					
Sk ceiling	18.7900	1.7200	17.0700	0.1800	3.0726		(30)					
Total net area of external elements Aum(A, m2)			140.8000				(31)					
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		47.6398		(33)					
Party Wall old			17.2200	0.0000	0.0000		(32)					
Thermal mass parameter (TMP = Cm / TFA) in kJ/m2K							250.0000 (35)					
Thermal bridges (Default value 0.150 * total exposed area)							21.1200 (36)					
Total fabric heat loss						(33) + (36) =	68.7598 (37)					
Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan 37.8863	Feb 36.0712	Mar 36.0712	Apr 34.9323	May 34.9323	Jun 32.3343	Jul 32.3343	Aug 31.8574	Sep 32.3343	Oct 34.3842	Nov 33.8504	Dec 35.4946 (38)
Heat transfer coeff												

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Average =	Sum(39)m / 12 =	106.6461	104.8310	104.8310	103.6921	103.6921	101.0941	101.0941	100.6172	101.0941	103.1440	102.6102	104.2544 (39)
													103.1334 (39)
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP (average)	1.8103	1.7795	1.7795	1.7602	1.7602	1.7161	1.7161	1.7080	1.7161	1.7509	1.7418	1.7697 (40)	1.7507 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)	

4. Water heating energy requirements (kWh/year)

Assumed occupancy													1.9507 (42)
Average daily hot water use (litres/day)													80.5280 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Energy content (annual)	88.5808	85.3597	82.1386	78.9175	75.6963	72.4752	72.4752	75.6963	78.9175	82.1386	85.3597	88.5808 (44)	
Distribution loss (46)m = 0.15 x (45)m	131.3628	114.8907	118.5570	103.3608	99.1772	85.5824	79.3046	91.0032	92.0901	92.3221	117.1505	127.2179 (45)	1267.0193 (45)
Water storage loss:	19.7044	17.2336	17.7835	15.5041	14.8766	12.8374	11.8957	13.6505	13.8135	16.0983	17.5726	19.0827 (46)	
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)	
Combi loss	43.3043	39.0960	43.2569	41.8298	43.2011	41.7810	43.1571	43.1856	41.8076	43.2338	41.8759	43.2952 (61)	
Total heat required for water heating calculated for each month	174.6671	153.9868	161.8138	145.1906	142.3783	127.3633	122.4618	134.1889	133.8977	150.5559	159.0264	170.5130 (62)	
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 (63)	
Output from w/h	174.6671	153.9868	161.8138	145.1906	142.3783	127.3633	122.4618	134.1889	133.8977	150.5559	159.0264	170.5130 (64)	
RHI water heating demand													1776.0437 (64)
Heat gains from water heating, kWh/month	54.5042	47.9752	50.2344	44.8249	43.7767	38.9014	37.1581	41.0550	41.0719	46.4931	49.4215	53.1237 (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	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392 (66)	
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	38.0850	33.8267	27.5097	20.8266	15.5682	13.1433	14.2018	18.4600	24.7770	31.4601	36.7186	39.1435 (67)	
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	254.0146	256.6505	250.0082	235.8674	218.0173	201.2407	190.0329	187.3970	194.0394	208.1801	226.0302	242.8068 (68)	
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546 (69)	
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000 (70)	
Losses e.g. evaporation (negative values) (Table 5)	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261 (71)	
Water heating gains (Table 5)	73.2584	71.3916	67.5194	62.2568	58.8396	54.0297	49.9436	55.1814	57.0442	62.4907	68.6410	71.4029 (72)	
Total internal gains	456.0256	452.5365	435.7049	409.6186	383.0927	359.0813	344.8460	351.7061	366.5283	392.7985	422.0574	444.0208 (73)	

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			
South				8.6600	54.0600	0.6300	0.7000	0.7700	143.0757 (78)			
West				1.4300	23.7835	0.6300	0.7000	0.7700	10.3940 (80)			
East				1.7200	32.2889	0.6300	0.7000	1.0000	22.0426 (82)			
Solar gains	175.5123	260.7257	352.9401	442.1377	480.7993	504.0340	481.5178	451.2170	406.7229	308.9092	206.9829	151.1451 (83)
Total gains	631.5379	713.2622	788.6450	851.7563	863.8920	863.1154	826.3638	802.9231	773.2512	701.7077	629.0404	595.1659 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Thl (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	38.3603	39.0245	39.0245	39.4531	39.4531	40.4670	40.4670	40.6588	40.4670	39.6627	39.8691	39.2403	
alpha	3.5574	3.6016	3.6016	3.6302	3.6302	3.6978	3.6978	3.7106	3.6978	3.6442	3.6579	3.6160	
util living area	0.9818	0.9704	0.9444	0.8888	0.7825	0.5841	0.4063	0.4379	0.6980	0.8959	0.9667	0.9847 (86)	
MIT	19.4389	19.6660	20.0112	20.4050	20.7351	20.9397	20.9885	20.9846	20.8741	20.4805	19.9259	19.4350 (87)	
Th 2	19.4628	19.4844	19.4844	19.4980	19.4980	19.5293	19.5293	19.5351	19.5293	19.5046	19.5110	19.4913 (88)	
util rest of house	0.9754	0.9602	0.9244	0.8472	0.6983	0.4458	0.2352	0.2661	0.5738	0.8475	0.9530	0.9793 (89)	
MIT 2	18.1293	18.3672	18.7002	19.0757	19.3522	19.5113	19.5283	19.5334	19.4796	19.1579	18.6444	18.1470 (90)	
Living area fraction	18.5935	18.8275	19.1649	19.5469	19.8424	20.0176	20.0458	20.0478	19.9739	19.6267	19.0986	18.6035 (92)	
Temperature adjustment												0.0000	

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adjusted MIT 18.5935 18.8275 19.1649 19.5469 19.8424 20.0176 20.0458 20.0478 19.9739 19.6267 19.0986 18.6035 (93)

8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.9706	0.9545	0.9191	0.8488	0.7201	0.4945	0.2968	0.3281	0.6151	0.8523	0.9481	0.9750	(94)
Useful gains	612.9625	680.7915	724.8812	723.0103	622.0631	426.8463	245.2538	263.4262	475.6114	598.0617	596.4112	580.2664	(95)
Ext temp.	4.9000	5.5000	7.3000	9.7000	12.7000	15.6000	17.6000	17.4000	14.8000	11.4000	7.8000	4.9000	(96)
Heat loss rate W													
	1460.3568	1397.1396	1243.8064	1021.0438	740.6066	446.5903	247.2608	266.4120	523.0461	848.5367	1159.3548	1428.6553	(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													
	630.4614	481.3859	386.0804	214.5841	88.1963	0.0000	0.0000	0.0000	0.0000	186.3534	405.3194	631.2014	(98)
Space heating												3023.5823	(98)
RHI space heating demand												3024	(98)

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CALCULATION OF ENERGY RATINGS 09 Jan 2014

SAP 2012 WORKSHEET FOR Conversion (As Built) (Version 9.92, January 2014)
CALCULATION OF ENERGY RATINGS 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	58.9100 (1b)	x 2.4800 (2b)	= 146.0968 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	58.9100		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 146.0968 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ per hour
Number of chimneys	0	+	0	=	0 * 40 = 0.0000 (6a)
Number of open flues	0	+	0	=	0 * 20 = 0.0000 (6b)
Number of intermittent fans					2 * 10 = 20.0000 (7a)
Number of passive vents					0 * 10 = 0.0000 (7b)
Number of flueless gas fires					0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans	= (6a)+(6b)+(7a)+(7b)+(7c) =				Air changes per hour
Pressure test					20.0000 / (5) = 0.1369 (8)
Measured/design AP50					No
Infiltration rate					15.0000
Number of sides sheltered					0.8869 (18)
					3 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] =				0.7750 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =				0.6873 (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	0.8764	0.8592	0.8420	0.7561	0.7389	0.6530	0.6530	0.6358	0.6873	0.7389	0.7733	0.8076 (22b)
Effective ac	0.8840	0.8691	0.8545	0.7858	0.7730	0.7132	0.7132	0.7021	0.7362	0.7730	0.7990	0.8261 (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
W-1.6 (Uw = 1.60)			10.0900	1.5038	15.1729		(27)
Velux (Uw = 1.50)			1.7200	1.4151	2.4340		(27a)
Orig upgd			22.4100	0.1700	3.8097		(28a)
New floor			36.5000	0.2200	8.0300		(28a)
Original wall	17.5300	3.6400	13.8900	0.3000	4.1670		(29a)
New wall	45.5700	6.4500	39.1200	0.2800	10.9536		(29a)
Skeiling	18.7900	1.7200	17.0700	0.1800	3.0726		(30)
Total net area of external elements Aum(A, m ²)			140.8000				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		47.6398		(33)
Party Wall old			17.2200	0.0000	0.0000		(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							250.0000 (35)
Thermal bridges (Default value 0.150 * total exposed area)							21.1200 (36)
Total fabric heat loss						(33) + (36) =	68.7598 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	42.6197	41.9008	41.1961	37.8863	37.2670	34.3842	34.3842	33.8504	35.4946	37.2670	38.5198	39.8295 (38)
Heat transfer coeff	111.3795	110.6606	109.9559	106.6461	106.0268	103.1440	103.1440	102.6102	104.2544	106.0268	107.2796	108.5892 (39)
Average = Sum(39)m / 12 =												106.6431 (39)
HLP	1.8907	1.8785	1.8665	1.8103	1.7998	1.7509	1.7509	1.7418	1.7697	1.7998	1.8211	1.8433 (40)
HLP (average)												1.8103 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.9507 (42)
Average daily hot water use (litres/day)												80.5280 (43)
Daily hot water use	88.5808	85.3597	82.1386	78.9175	75.6963	72.4752	72.4752	75.6963	78.9175	82.1386	85.3597	88.5808 (44)
Energy conte	131.3628	114.8907	118.5570	103.3608	99.1772	85.5824	79.3046	91.0032	92.0901	107.3221	117.1505	127.2179 (45)
Energy content (annual)										Total = Sum(45)m =		1267.0193 (45)
Distribution loss (46)m = 0.15 x (45)m	19.7044	17.2336	17.7835	15.5041	14.8766	12.8374	11.8957	13.6505	13.8135	16.0983	17.5726	19.0827 (46)
Water storage loss:												
Total storage loss												

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	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)
Combi loss	43.3043	39.0960	43.2569	41.8298	43.2011	41.7810	43.1571	43.1856	41.8076	43.2338	41.8759	43.2952 (61)
Total heat required for water heating calculated for each month	174.6671	153.9868	161.8138	145.1906	142.3783	127.3633	122.4618	134.1889	133.8977	150.5559	159.0264	170.5130 (62)
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 (63)
Output from w/h	174.6671	153.9868	161.8138	145.1906	142.3783	127.3633	122.4618	134.1889	133.8977	150.5559	159.0264	170.5130 (64)
Heat gains from water heating, kWh/month	54.5042	47.9752	50.2344	44.8249	43.7767	38.9014	37.1581	41.0550	41.0719	46.4931	49.4215	53.1237 (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	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	38.0850	33.8267	27.5097	20.8266	15.5682	13.1433	14.2018	18.4600	24.7770	31.4601	36.7186	39.1435	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	254.0146	256.6505	250.0082	235.8674	218.0173	201.2407	190.0329	187.3970	194.0394	208.1801	226.0302	242.8068	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	(69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	(71)
Water heating gains (Table 5)	73.2584	71.3916	67.5194	62.2568	58.8396	54.0297	49.9436	55.1814	57.0442	62.4907	68.6410	71.4029	(72)
Total internal gains	456.0256	452.5365	435.7049	409.6186	383.0927	359.0813	344.8460	351.7061	366.5283	392.7985	422.0574	444.0208	(73)

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
South			8.6600		46.7521		0.6300		0.7000		0.7700		123.7344 (78)
West			1.4300		19.6403		0.6300		0.7000		0.7700		8.5833 (80)
East			1.7200		26.4634		0.6300		0.7000		1.0000		18.0657 (82)
Solar gains	150.3835	255.8252	348.3620	427.5596	474.2541	468.5325	452.6874	418.3653	375.9576	282.3670	180.0830	128.7136	(83)
Total gains	606.4090	708.3617	784.0669	837.1782	857.3468	827.6138	797.5334	770.0714	742.4858	675.1655	602.1404	572.7344	(84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)													21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	36.7300	36.9687	37.2056	38.3603	38.5843	39.6627	39.6627	39.8691	39.2403	38.5843	38.1338	37.6738	
alpha	3.4487	3.4646	3.4804	3.5574	3.5723	3.6442	3.6442	3.6579	3.6160	3.5723	3.5423	3.5116	
util living area	0.9858	0.9749	0.9552	0.9125	0.8324	0.6887	0.5351	0.5688	0.7708	0.9248	0.9756	0.9882	(86)
MIT	19.2269	19.4644	19.8077	20.2507	20.6117	20.8705	20.9612	20.9511	20.7893	20.3182	19.7162	19.2189	(87)
Th 2	19.4072	19.4156	19.4238	19.4628	19.4701	19.5046	19.5046	19.5110	19.4913	19.4701	19.4553	19.4398	(88)
util rest of house	0.9809	0.9664	0.9392	0.8795	0.7655	0.5673	0.3690	0.4047	0.6641	0.8893	0.9657	0.9841	(89)
MIT 2	17.8791	18.1182	18.4583	18.9075	19.2312	19.4523	19.4969	19.5001	19.3924	18.9854	18.3984	17.8952	(90)
Living area fraction	18.3568	18.5953	18.9366	19.3836	19.7205	19.9549	20.0159	20.0144	19.8876	19.4578	18.8655	18.3644	(91)
MIT	18.3568	18.5953	18.9366	19.3836	19.7205	19.9549	20.0159	20.0144	19.8876	19.4578	18.8655	18.3644	(92)
Temperature adjustment												0.0000	
adjusted MIT	18.3568	18.5953	18.9366	19.3836	19.7205	19.9549	20.0159	20.0144	19.8876	19.4578	18.8655	18.3644	(93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Useful gains	0.9764	0.9605	0.9329	0.8774	0.7781	0.6073	0.4289	0.4638	0.6960	0.8890	0.9606	0.9802	(94)
Ext temp.	592.0927	680.3670	731.4446	734.5799	667.0994	502.6497	342.0809	357.1371	516.7353	600.2136	578.4323	561.4065	(95)
Heat loss rate W	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)
Month fracti	1565.6405	1515.5350	1367.4768	1118.0352	850.3903	552.3296	352.3301	370.8743	603.3778	939.1662	1262.1927	1538.0971	(97)
Space heating kWh	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	724.3196	561.2329	473.2080	276.0878	136.3684	0.0000	0.0000	0.0000	0.0000	252.1808	492.3075	726.6578	(98)
Space heating per m2												3642.3628	(98)
												61.8293	(99)

8c. Space cooling requirement

Not applicable

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Built)



Property and Energy
Services Ltd.

CALCULATION OF ENERGY RATINGS 09 Jan 2014

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 %)													90.5000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													4024.7103 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	724.3196	561.2329	473.2080	276.0878	136.3684	0.0000	0.0000	0.0000	0.0000	252.1808	492.3075	726.6578	(98)
Space heating efficiency (main heating system 1)	90.5000	90.5000	90.5000	90.5000	90.5000	0.0000	0.0000	0.0000	0.0000	90.5000	90.5000	90.5000	(210)
Space heating fuel (main heating system)	800.3531	620.1468	522.8817	305.0694	150.6834	0.0000	0.0000	0.0000	0.0000	278.6528	543.9862	802.9368	(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	174.6671	153.9868	161.8138	145.1906	142.3783	127.3633	122.4618	134.1889	133.8977	150.5559	159.0264	170.5130	(64)
Efficiency of water heater (217)m	89.8600	89.7914	89.6625	89.3710	88.8367	87.3000	87.3000	87.3000	87.3000	89.2767	89.6972	87.3000	(216)
Fuel for water heating, kWh/month	194.3769	171.4939	180.4699	162.4584	160.2696	145.8916	140.2769	153.7101	153.3765	168.6398	177.2924	189.7248	(217)
Water heating fuel used												1997.9806	(219)
Annual totals kWh/year													
Space heating fuel - main system												4024.7103	(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)												269.0370	(232)
Total delivered energy for all uses												6366.7278	(238)

10a. Fuel costs - using Table 12 prices

	Fuel	Fuel price	Fuel cost
	kWh/year	p/kWh	£/year
Space heating - main system 1	4024.7103	3.4800	140.0599 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	1997.9806	3.4800	69.5297 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	269.0370	13.1900	35.4860 (250)
Additional standing charges			120.0000 (251)
Total energy cost			374.9681 (255)

11a. SAP rating - Individual heating systems

Energy cost deflator (Table 12):	0.4200 (256)
Energy cost factor (ECF)	1.5156 (257)
SAP value	78.8573
SAP rating (Section 12)	79 (258)
SAP band	C

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy	Emission factor	Emissions
	kWh/year	kg CO2/kWh	kg CO2/year
Space heating - main system 1	4024.7103	0.2160	869.3374 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	1997.9806	0.2160	431.5638 (264)
Space and water heating			1300.9012 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	269.0370	0.5190	139.6302 (268)
Total kg/year			1479.4564 (272)
CO2 emissions per m2			25.1100 (273)
EI value			80.9213
EI rating			81 (274)
EI band			B

Calculation of stars for heating and DHW

Main heating energy efficiency	$3.48 \times (1 + 0.29 \times 0.00) / 0.9050 = 3.845$, stars = 4
Main heating environmental impact	$0.216 \times (1 + 0.29 \times 0.00) / 0.9050 = 0.2387$, stars = 4
Water heating energy efficiency	$3.48 / 0.8880 = 3.919$, stars = 4
Water heating environmental impact	$0.216 / 0.8880 = 0.2433$, stars = 4

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Built)



Property and Energy
Services Ltd.

CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

SAP 2012 WORKSHEET FOR Conversion (As Built) (Version 9.92, January 2014)
CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	58.9100 (1b)	x 2.4800 (2b)	= 146.0968 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	58.9100		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 146.0968 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ per hour
Number of chimneys	0	+	0	=	0 * 40 = 0.0000 (6a)
Number of open flues	0	+	0	=	0 * 20 = 0.0000 (6b)
Number of intermittent fans					2 * 10 = 20.0000 (7a)
Number of passive vents					0 * 10 = 0.0000 (7b)
Number of flueless gas fires					0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans	= (6a)+(6b)+(7a)+(7b)+(7c) =				Air changes per hour
Pressure test					20.0000 / (5) = 0.1369 (8)
Measured/design AP50					No
Infiltration rate					15.0000
Number of sides sheltered					0.8869 (18)
					3 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] =				0.7750 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =				0.6873 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	4.4000	4.1000	4.1000	3.9000	3.9000	3.4000	3.4000	3.3000	3.4000	3.8000	3.7000	4.0000 (22)
Wind factor	1.1000	1.0250	1.0250	0.9750	0.9750	0.8500	0.8500	0.8250	0.8500	0.9500	0.9250	1.0000 (22a)
Adj infilt rate	0.7561	0.7045	0.7045	0.6702	0.6702	0.5842	0.5842	0.5671	0.5842	0.6530	0.6358	0.6873 (22b)
Effective ac	0.7858	0.7482	0.7482	0.7246	0.7246	0.6707	0.6707	0.6608	0.6707	0.7132	0.7021	0.7362 (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
W-1.6 (Uw = 1.60)			10.0900	1.5038	15.1729		(27)
Velux (Uw = 1.50)			1.7200	1.4151	2.4340		(27a)
Orig upgd			22.4100	0.1700	3.8097		(28a)
New floor			36.5000	0.2200	8.0300		(28a)
Original wall	17.5300	3.6400	13.8900	0.3000	4.1670		(29a)
New wall	45.5700	6.4500	39.1200	0.2800	10.9536		(29a)
Skeiling	18.7900	1.7200	17.0700	0.1800	3.0726		(30)
Total net area of external elements Aum(A, m ²)			140.8000				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =		47.6398		(33)
Party Wall old			17.2200	0.0000	0.0000		(32)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							250.0000 (35)
Thermal bridges (Default value 0.150 * total exposed area)							21.1200 (36)
Total fabric heat loss						(33) + (36) =	68.7598 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	37.8863	36.0712	36.0712	34.9323	34.9323	32.3343	32.3343	31.8574	32.3343	34.3842	33.8504	35.4946 (38)
Heat transfer coeff	106.6461	104.8310	104.8310	103.6921	103.6921	101.0941	101.0941	100.6172	101.0941	103.1440	102.6102	104.2544 (39)
Average = Sum(39)m / 12 =												103.1334 (39)
HLP	1.8103	1.7795	1.7795	1.7602	1.7602	1.7161	1.7161	1.7080	1.7161	1.7509	1.7418	1.7697 (40)
HLP (average)												1.7507 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.9507 (42)
Average daily hot water use (litres/day)												80.5280 (43)
Daily hot water use	88.5808	85.3597	82.1386	78.9175	75.6963	72.4752	72.4752	75.6963	78.9175	82.1386	85.3597	88.5808 (44)
Energy conte	131.3628	114.8907	118.5570	103.3608	99.1772	85.5824	79.3046	91.0032	92.0901	107.3221	117.1505	127.2179 (45)
Energy content (annual)												Total = Sum(45)m = 1267.0193 (45)
Distribution loss (46)m = 0.15 x (45)m	19.7044	17.2336	17.7835	15.5041	14.8766	12.8374	11.8957	13.6505	13.8135	16.0983	17.5726	19.0827 (46)
Water storage loss:												
Total storage loss												

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Built)



Property and Energy
Services Ltd.

CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

	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)
Combi loss	43.3043	39.0960	43.2569	41.8298	43.2011	41.7810	43.1571	43.1856	41.8076	43.2338	41.8759	43.2952 (61)
Total heat required for water heating calculated for each month	174.6671	153.9868	161.8138	145.1906	142.3783	127.3633	122.4618	134.1889	133.8977	150.5559	159.0264	170.5130 (62)
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 (63)
Output from w/h	174.6671	153.9868	161.8138	145.1906	142.3783	127.3633	122.4618	134.1889	133.8977	150.5559	159.0264	170.5130 (64)
Heat gains from water heating, kWh/month	54.5042	47.9752	50.2344	44.8249	43.7767	38.9014	37.1581	41.0550	41.0719	46.4931	49.4215	53.1237 (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	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	117.0392	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	38.0850	33.8267	27.5097	20.8266	15.5682	13.1433	14.2018	18.4600	24.7770	31.4601	36.7186	39.1435	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	254.0146	256.6505	250.0082	235.8674	218.0173	201.2407	190.0329	187.3970	194.0394	208.1801	226.0302	242.8068	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	48.6546	(69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	-78.0261	(71)
Water heating gains (Table 5)	73.2584	71.3916	67.5194	62.2568	58.8396	54.0297	49.9436	55.1814	57.0442	62.4907	68.6410	71.4029	(72)
Total internal gains	456.0256	452.5365	435.7049	409.6186	383.0927	359.0813	344.8460	351.7061	366.5283	392.7985	422.0574	444.0208	(73)

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
South					8.6600	54.0600	0.6300	0.7000			0.7700			143.0757 (78)
West					1.4300	23.7835	0.6300	0.7000			0.7700			10.3940 (80)
East					1.7200	32.2889	0.6300	0.7000			1.0000			22.0426 (82)
Solar gains	175.5123	260.7257	352.9401	442.1377	480.7993	504.0340	481.5178	451.2170	406.7229	308.9092	206.9829	151.1451	(83)	
Total gains	631.5379	713.2622	788.6450	851.7563	863.8920	863.1154	826.3638	802.9231	773.2512	701.7077	629.0404	595.1659	(84)	

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)													21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	38.3603	39.0245	39.0245	39.4531	39.4531	40.4670	40.4670	40.6588	40.4670	39.6627	39.8691	39.2403	
alpha	3.5574	3.6016	3.6016	3.6302	3.6302	3.6978	3.6978	3.7106	3.6978	3.6442	3.6579	3.6160	
util living area	0.9818	0.9704	0.9444	0.8888	0.7825	0.5841	0.4063	0.4379	0.6980	0.8959	0.9667	0.9847	(86)
MIT	19.4389	19.6660	20.0112	20.4050	20.7351	20.9397	20.9885	20.9846	20.8741	20.4805	19.9259	19.4350	(87)
Th 2	19.4628	19.4844	19.4844	19.4980	19.4980	19.5293	19.5293	19.5351	19.5293	19.5046	19.5110	19.4913	(88)
util rest of house	0.9754	0.9602	0.9244	0.8472	0.6983	0.4458	0.2352	0.2661	0.5738	0.8475	0.9530	0.9793	(89)
MIT 2	18.1293	18.3672	18.7002	19.0757	19.3522	19.5113	19.5283	19.5334	19.4796	19.1579	18.6444	18.1470	(90)
Living area fraction	18.5935	18.8275	19.1649	19.5469	19.8424	20.0176	20.0458	20.0478	19.9739	19.6267	19.0986	18.6035	(91)
MIT	18.5935	18.8275	19.1649	19.5469	19.8424	20.0176	20.0458	20.0478	19.9739	19.6267	19.0986	18.6035	(92)
Temperature adjustment												0.0000	
adjusted MIT	18.5935	18.8275	19.1649	19.5469	19.8424	20.0176	20.0458	20.0478	19.9739	19.6267	19.0986	18.6035	(93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	0.9706	0.9545	0.9191	0.8488	0.7201	0.4945	0.2968	0.3281	0.6151	0.8523	0.9481	0.9750	(94)
Useful gains	612.9625	680.7915	724.8812	723.0103	622.0631	426.8463	245.2538	263.4262	475.6114	598.0617	596.4112	580.2664	(95)
Ext temp.	4.9000	5.5000	7.3000	9.7000	12.7000	15.6000	17.6000	17.4000	14.8000	11.4000	7.8000	4.9000	(96)
Heat loss rate W	1460.3568	1397.1396	1243.8064	1021.0438	740.6066	446.5903	247.2608	266.4120	523.0461	848.5367	1159.3548	1428.6553	(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	630.4614	481.3859	386.0804	214.5841	88.1963	0.0000	0.0000	0.0000	0.0000	186.3534	405.3194	631.2014	(98)
Space heating												3023.5823	(98)
Space heating per m2												51.3255	(99)

8c. Space cooling requirement

Not applicable

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Built)



Property and Energy
Services Ltd.

CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

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 %)													90.5000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													3340.9749 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	630.4614	481.3859	386.0804	214.5841	88.1963	0.0000	0.0000	0.0000	0.0000	186.3534	405.3194	631.2014	(98)
Space heating efficiency (main heating system 1)	90.5000	90.5000	90.5000	90.5000	90.5000	0.0000	0.0000	0.0000	0.0000	90.5000	90.5000	90.5000	(210)
Space heating fuel (main heating system)	696.6424	531.9181	426.6081	237.1095	97.4545	0.0000	0.0000	0.0000	0.0000	205.9154	447.8668	697.4601	(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	174.6671	153.9868	161.8138	145.1906	142.3783	127.3633	122.4618	134.1889	133.8977	150.5559	159.0264	170.5130	(64)
Efficiency of water heater (217)m	89.7860	89.7031	89.5308	89.1808	88.4969	87.3000	87.3000	87.3000	87.3000	89.0415	89.5748	87.3000	(216)
Fuel for water heating, kWh/month	194.5371	171.6627	180.7354	162.8049	160.8850	145.8916	140.2769	153.7101	153.3765	169.0852	177.5348	189.8810	(219)
Water heating fuel used												2000.3811	(219)
Annual totals kWh/year													
Space heating fuel - main system												3340.9749	(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)												269.0370	(232)
Total delivered energy for all uses												5685.3930	(238)

10a. Fuel costs - using BEDF prices (473)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	3340.9749	3.8700	129.2957 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	2000.3811	3.8700	77.4147 (247)
Pumps and fans for heating	75.0000	18.9000	14.1750 (249)
Energy for lighting	269.0370	18.9000	50.8480 (250)
Additional standing charges			93.0000 (251)
Total energy cost			364.7335 (255)

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	3340.9749	0.2160	721.6506 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	2000.3811	0.2160	432.0823 (264)
Space and water heating			1153.7329 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	269.0370	0.5190	139.6302 (268)
Total kg/year			1332.2881 (272)

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	3340.9749	1.2200	4075.9894 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	2000.3811	1.2200	2440.4650 (264)
Space and water heating			6516.4543 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	269.0370	3.0700	825.9435 (268)
Primary energy kWh/year			7572.6478 (272)
Primary energy kWh/m2/year			128.5461 (273)

SAP 2012 EPC IMPROVEMENTS

Current energy efficiency rating: C 79
Current environmental impact rating: B 81

(For testing purposes):

A Not considered
B Not considered

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Built)



Property and Energy
Services Ltd.

CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

C		Not considered
D		Not considered
E	Low energy lighting	Already installed
F		Not considered
G		Not considered
H		Not considered
I		Not considered
J		Not considered
K		Not considered
M		Not considered
N	Solar water heating	Not applicable
O		Not considered
P		Not considered
R		Not considered
S		Not considered
T		Not considered
U	Solar photovoltaic panels	Not applicable
A2		Not considered
A3		Not considered
T2		Not considered
W		Not considered
X		Not considered
Y		Not considered
J2		Not considered
Q2		Not considered
Z1		Not considered
Z2		Not considered
Z3		Not considered
Z4		Not considered
Z5		Not considered
V2	Wind turbine	Not applicable
L2		Not considered
Q3		Not considered
O3		Not considered

Recommended measures: (none)	SAP change	Cost change	CO2 change
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Recommended measures (none)	Typical annual savings	Energy efficiency	Environmental impact
	Total Savings £0		0.00 kg/m²

Potential energy efficiency rating: C 79
 Potential environmental impact rating: B 81

Fuel prices for cost data on this page from database revision number 473 TEST (26 Feb 2021)
 Recommendation texts revision number 4.9c (22 Feb 2014)

Typical heating and lighting costs of this home (per year, Thames Valley):

	Current	Potential	Saving
Electricity	£65	£65	£0
Mains gas	£300	£300	£0
Space heating	£236	£236	£0
Water heating	£77	£77	£0
Lighting	£51	£51	£0
Total cost of fuels	£365	£365	£0
Total cost of uses	£364	£364	£0
Delivered energy	97 kWh/m²	97 kWh/m²	0 kWh/m²
Carbon dioxide emissions	1.3 tonnes	1.3 tonnes	0.0 tonnes
CO2 emissions per m²	23 kg/m²	23 kg/m²	0 kg/m²
Primary energy	129 kWh/m²	129 kWh/m²	0 kWh/m²

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Built)



Property and Energy
Services Ltd.

CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

SAP 2012 WORKSHEET FOR Conversion (As Built) (Version 9.92, January 2014)
CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

No improvements selected / applicable

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Built)



Property and Energy
Services Ltd.

CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY FOR IMPROVED DWELLING 09 Jan 2014

SAP 2012 WORKSHEET FOR Conversion (As Built) (Version 9.92, January 2014)
CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY FOR IMPROVED DWELLING 09 Jan 2014

No improvements selected / applicable