Project Information

Building type End-terrace house

Reference Date Project 327 Greystoke Avenue Bristol BS10 6BD

SAP 2009 worksheet for New extension to existing dwelling - calculation of energy ratings

1. Overall dwelling dimensions

Area	Av. Storey	Volume	
(m²)	height (m)	(m³)	
41.00	2.40	98.40	(3a)
20.00	2.40	48.00	(3b)
41.00	2.70	110.70	(3c)
24.00	1.80	43.20	(3d)
126.00			(4)
		300.30	Ì5)
	Area (m²) 41.00 20.00 41.00 24.00 126.00	AreaAv. Storey(m²)height (m)41.002.4020.002.4041.002.7024.001.80126.00	Area Av. Storey Volume (m²) height (m) (m³) 41.00 2.40 98.40 20.00 2.40 48.00 41.00 2.70 110.70 24.00 1.80 43.20 126.00 300.30

2. Ventilation rate

											m³ per ho	our
							main + s heating	seonda	ry + othe	r		
Numbe Numbe	r of chim r of oper	neys n flues					0 + 0 + 0 0 + 0 + 0)	x 40 x 20		0.00 0.00	(6a) (6b)
Numbe	r of inter	mittent fa	ans				3		x 10		30.00	(7a)
Numbe	r of pass	ive vent	S				0		x 10		0.00	(7b)
Numbe	r of fluel	ess gas i	tires				0		x 40		0.00	(7c)
											Air chang	jes per hour
Pressu	re test, a	ssumed	q50						15.00		0.10	(8) (17)
Air perr	neability										0.85	(18)
											2.00	(19)
Infiltrati Infiltrati	on rate i on rate r	ncorpora nodified	ting she for mont	lter facto hly wind	or speed						0.85 0.72	(20) (21)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Monthly	average	e wind s	beed from	n Table	7							
5.40	5.10	5.10	4.50	4.10	3.90	3.70	3.70	4.20	4.50	4.80	5.10	
Wind F	actor					•					54.10	(22)
1.35	1.27	1.27	1.13	1.02	0.97	0.93	0.93	1.05	1.13	1.20	1.27	
				_					_	_	13.53	(22a)
Adjuste	d infiltrat	tion rate	(allowing	g for she	lter and	wind sp	beed)					()
0.98	0.92	0.92	0.81	0.74	0.70	0.67	0.67	0.76	0.81	0.87	0.92	
											9.77	(22b)
Ventilat Effectiv	tion : nati e air cha	ural vent inge rate	ilation, ir e	ntermitte	nt extrac	ct fans						
0.98	0.92	0.92	0.83	0.77	0.75	0.72	0.72	0.79	0.83	0.88	0.92	(25)

3. Heat losses and heat lo	ss paramete	r					
Element Gross	Openings	Net area	U-value	AxU	kappa-valu	eAxK	
area, m ²	m²	A, m ²	W/m²K	W/K	kJ/m²K	kJ/K	(07)
window - Double-glazed,		1.730	1.50 (1.60)	2.60			(27)
all-lilled, low-E, Ell=0.1,							
da							
Window - Double-glazed.		1.730	1.50 (1.60)	2.60			(27)
air-filled, low-E, En=0.1,							(=.)
soft coat (South)							
dg							
Window - Double-glazed,		1.260	1.50 (1.60)	1.89			(27)
air-filled, low-E, En=0.1,							
soft coat (North)							
ug Window Double glazad		1 260	1 50 (1 60)	1 90			(27)
air-filled low-E En=0.1		1.200	1.50 (1.60)	1.09			(27)
soft coat (North)							
da							
Window - Double-glazed,		0.630	1.94 (2.10)	1.22			(27)
air-filled, low-E, En=0.1,							. ,
soft coat (East)							
dg							()
Window - Double-glazed,		0.660	1.94 (2.10)	1.28			(27)
alr-filled, IOW-E, En=0.1,							
da							
Window - Double-glazed		1 880	1 94 (2 10)	3 64			(27)
air-filled, low-E, En=0.1.		1.000	1.54 (2.10)	0.04			(27)
soft coat (North)							
dg							
Window - Double-glazed,		1.880	1.94 (2.10)	3.64			(27)
air-filled, low-E, En=0.1,							
soft coat (North)							
ag Window Double glazad		4 050	4 0 4 (2 4 0)	2 4 2			(07)
vindow - Double-glazed,		1.250	1.94 (2.10)	2.42			(27)
soft coat (South)							
da							
Window - Double-glazed,		1.880	1.94 (2.10)	3.64			(27)
air-filled, low-E, En=0.1,			()				()
soft coat (South)							
dg							()
Window - Double-glazed,		3.700	1.94 (2.10)	7.17			(27)
alr-filled, IOW-E, En=0.1,							
da							
Solid door		1 890	2 10	3 97			(26)
da		1.000	2.10	0.07			(20)
Full glazed door -		3.670	2.10	7.71			(26)
Double-glazed, air-filled,			-				× /
low-E, En=0.1, soft coat							
(North)							
Og Ditabad reafa inculated betw	voon loista	27.00	0.46	E 00	0.00	222.00	(20)
Filched roots insulated betw	veen joists	37.00	0.16	5.92	9.00	333.00	(30)

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4. Wate Assume Annual a	r heatin g d occupa average	g energy ancy, N hot wate	/ require r usade i	e ments in litres p	oer dav ∖	/d.avera	ae				kWh/year 2.88 108.10	(42) (43)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	(10)
Hot wate	er usage	in litres	per day f	for each	month		1	I	1			
118.90	114.58	110.26	105.93	101.61	97.29	97.29	101.61	105.93	110.26	114.58	118.90	(44)
Energy	content o	of hot wa	ter used	1	1	1	1	1	1	1	11	
176.75	154.59	159.52	139.08	133.45	115.15	106.71	122.45	123.91	144.41	157.63	171.18	
Energy of Distribut	content (tion loss	annual)				1	1		1	1	1704.83	(45)
26.51	23.19	23.93	20.86	20.02	17.27	16.01	18.37	18.59	21.66	23.64	25.68	(46)
Cylinder Manufac Tempera Energy I Total sto	volume, cturer's d ature Fa lost from brage los	l leclared ctor hot wate	cylinder er cylinde	loss fact er (kWh/o	or (kWh/ day)	′day)	210.00 1.91 0.5400				1.03	(47) (47) (48) (55)
31.97	28.88	31.97	30.94	31.97	30.94	31.97	31.97	30.94	31.97	30.94	31.97	(56)
Net stor	age loss	1	1	1	1		1	1	1			
31.97	28.88	31.97	30.94	31.97	30.94	31.97	31.97	30.94	31.97	30.94	31.97	(57)
Primary Primary	circuit lo loss	ss (annu	ial)								360.00	(58)
30.58	27.62	30.58	29.59	30.58	29.59	30.58	30.58	29.59	30.58	29.59	30.58	(59)
Total he	at requir	ed for wa	ater heat	ing calcu	lated for	r each m	onth	1	1	1	1]	
239.30	211.09	222.07	199.61	196.00	175.69	169.26	185.00	184.44	206.96	218.16	233.73	(62)
Output f	rom wate	er heater	for each	n month,	kWh/mo	onth						
239.30	211.09	222.07	199.61	196.00	175.69	169.26	185.00	184.44	206.96	218.16	233.73	(64)
Heat ga	ins from	water he	eating, k\	Wh/mont	h						2441.29	(64)
108.81	96.60	103.08	94.67	94.41	86.71	85.52	90.75	89.63	98.05	100.84	106.96	(65)

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5. Internal gains

JanFebMarAprMayJunJulAugSepOctNovDecMetabolic gains, Watts173.03<		-										
Metabolic gains, Watts Instant <thinstant< th=""> Instant <thi< td=""><td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td><td>May</td><td>Jun</td><td>Jul</td><td>Aug</td><td>Sep</td><td>Oct</td><td>Nov</td><td>Dec</td></thi<></thinstant<>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
173.03 173.03	Metabol	ic gains,	Watts							•		
Lighting gains 69.83 62.02 50.44 38.19 28.54 24.10 26.04 33.85 45.43 57.68 67.32 71.77 Appliances gains 437.06 441.60 430.17 405.84 375.12 346.26 326.97 322.44 333.87 358.20 388.91 417.78 Cooking gains 55.19	173.03	173.03	173.03	173.03	173.03	173.03	173.03	173.03	173.03	173.03	173.03	173.03
69.83 62.02 50.44 38.19 28.54 24.10 26.04 33.85 45.43 57.68 67.32 71.77 Appliances gains 437.06 441.60 430.17 405.84 375.12 346.26 326.97 322.44 333.87 358.20 388.91 417.78 Cooking gains 55.19	Lighting	gains				•				•		
Appliances gains 437.06 441.60 430.17 405.84 375.12 346.26 326.97 322.44 333.87 358.20 388.91 417.78 Cooking gains 55.19	69.83	62.02	50.44	38.19	28.54	24.10	26.04	33.85	45.43	57.68	67.32	71.77
437.06 441.60 430.17 405.84 375.12 346.26 326.97 322.44 333.87 358.20 388.91 417.78 Cooking gains 55.19 51.10 55.19 55.19 55.19 55	Applianc	ces gains	5									
Cooking gains 55.19 55.15 51	437.06	441.60	430.17	405.84	375.12	346.26	326.97	322.44	333.87	358.20	388.91	417.78
55.19 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 <td< td=""><td>Cooking</td><td>gains</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Cooking	gains										
Pumps and fans gains 10.00 115.35 115.35	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19	55.19
10.00	Pumps a	and fans	gains									
Losses e.g. evaporation (negative values) -115.35	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
-115.35 -115.35	Losses	e.g. evap	oration	(negative	e values)							
Water heating gains 146.25 143.75 138.55 131.48 126.90 120.44 114.95 121.98 124.48 131.79 140.05 143.76 Total internal gains 776.00 770.23 742.02 698.37 653.43 613.66 590.82 601.13 626.64 670.54 719.15 756.17	-115.35	-115.35	-115.35	-115.35	-115.35	-115.35	-115.35	-115.35	-115.35	-115.35	-115.35	-115.35
146.25 143.75 138.55 131.48 126.90 120.44 114.95 121.98 124.48 131.79 140.05 143.76 Total internal gains 776.00 770.23 742.02 698.37 653.43 613.66 590.82 601.13 626.64 670.54 719.15 756.17	Water h	eating ga	ains									
Total internal gains 776.00 770.23 742.02 698.37 653.43 613.66 590.82 601.13 626.64 670.54 719.15 756.17	146.25	143.75	138.55	131.48	126.90	120.44	114.95	121.98	124.48	131.79	140.05	143.76
776.00 770.23 742.02 698.37 653.43 613.66 590.82 601.13 626.64 670.54 719.15 756.17	Total int	ernal gai	ns			-	•		•	•		
	776.00	770.23	742.02	698.37	653.43	613.66	590.82	601.13	626.64	670.54	719.15	756.17

6. Solar gains (calculation for January)

0	•	Area & Flux	g & FF	Shading	Gains
Window - Double-glazed, En=0.1, soft coat (North) dg	air-filled, low-E,	0.9 x 1.730 10.73	0.63 x 0.70	0.77	5.6712
Window - Double-glazed, En=0.1, soft coat (South) dq	air-filled, low-E,	0.9 x 1.730 47.32	0.63 x 0.70	0.77	25.0203
Window - Double-glazed, En=0.1, soft coat (North) dq	air-filled, low-E,	0.9 x 1.260 10.73	0.63 x 0.70	0.77	4.1304
Window - Double-glazed, En=0.1, soft coat (North) da	air-filled, low-E,	0.9 x 1.260 10.73	0.63 x 0.70	0.77	4.1304
Window - Double-glazed, En=0.1, soft coat (East) dq	air-filled, low-E,	0.9 x 0.630 19.87	0.63 x 0.70	0.77	3.8262
Window - Double-glazed, En=0.1, soft coat (North)	air-filled, low-E,	0.9 x 0.660 10.73	0.63 x 0.70	0.77	2.1636
Window - Double-glazed, En=0.1, soft coat (North) da	air-filled, low-E,	0.9 x 1.880 10.73	0.63 x 0.70	0.77	6.1629
Window - Double-glazed, En=0.1, soft coat (North) da	air-filled, low-E,	0.9 x 1.880 10.73	0.63 x 0.70	0.77	6.1629
Window - Double-glazed, En=0.1, soft coat (South) dg	air-filled, low-E,	0.9 x 1.250 47.32	0.63 x 0.70	0.77	18.0783
Lighting calculations		Aroo	a	EE v Shadir	a
		AICa	У		iy

6. Solar gains (calculation for January)	Area & Flux	a & FF	Shading	Gains	
Window - Double-glazed, air-filled, low-E, En=0.1, soft coat (South)	0.9 x 1.880 47.32	0.63 x 0.70	0.77	27.1897	
Window - Double-glazed, air-filled, low-E, En=0.1, soft coat (South)	0.9 x 3.700 47.32	0.63 x 0.70	0.77	53.5117	
Solid door	0.9 x 1.890 0.00	0.00 x 0.70	0.77	0.0000	
Full glazed door - Double-glazed, air-filled, low-E, En=0.1, soft coat (North)	0.9 x 3.670 10.73	0.63 x 0.70	0.77	12.0307	
Total solar gains, January				168.08	(83-1)
Solar gains					()
168.08 286.11 384.02 498.64 589.04 62 Total gains	24.35 600.34 522.8	81 430.70 325.	74 201.29	143.86	(83)
944.08 1056.34 1126.04 1197.01 1242.47 12	238.00 1191.17 1123	.94 1057.34 996.	28 920.44 9	900.03	(84)
Lighting colorians					
Lighting calculations	Area	a	FF x Shadii	na	
Window - Double-glazed, air-filled, low-E, En=0.1, soft coat (North)	0.9 x 1.73	0.80	0.70 x 0.83	0.72	
Window - Double-glazed, air-filled, low-E, En=0.1, soft coat (South)	0.9 x 1.73	0.80	0.70 x 0.83	0.72	
Window - Double-glazed, air-filled, low-E, En=0.1, soft coat (North) dg	0.9 x 1.26	0.80	0.70 x 0.83	0.53	
Window - Double-glazed, air-filled, low-E, En=0.1, soft coat (North)	0.9 x 1.26	0.80	0.70 x 0.83	0.53	
Window - Double-glazed, air-filled, low-E, En=0.1, soft coat (East)	0.9 x 0.63	0.80	0.70 x 0.83	0.26	
Window - Double-glazed, air-filled, low-E, En=0.1, soft coat (North)	0.9 x 0.66	0.80	0.70 x 0.83	0.28	
Window - Double-glazed, air-filled, low-E, En=0.1, soft coat (North)	0.9 x 1.88	0.80	0.70 x 0.83	0.79	
Window - Double-glazed, air-filled, low-E, En=0.1, soft coat (North)	0.9 x 1.88	0.80	0.70 x 0.83	0.79	
Window - Double-glazed, air-filled, low-E, En=0.1, soft coat (South)	0.9 x 1.25	0.80	0.70 x 0.83	0.52	
Window - Double-glazed, air-filled, low-E, En=0.1, soft coat (South) dg	0.9 x 1.88	0.80	0.70 x 0.83	0.79	

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Lighting calculations

5 5	Area	g	FF x Shading	
Window - Double-glazed, air-filled, low-E,	0.9 x 3.70	Ŏ.80	0.70 x 0.83 ັ	1.55
En=0.1, soft coat (South)				
dg				
GL = 7.47 / 126.00 = 0.059				
C1 = 0.500				
C2 = 1.027				
EI = 493				

7. Mean internal temperature

Temperature during heating periods in the living area, Th1 (°C)

Heating system responsiveness 1.00 Feb Sep Jan Mar Apr May Jun Jul Aug Oct Nov Dec tau 11.97 12.18 12.18 12.59 12.85 12.97 13.09 13.09 12.79 12.59 12.39 12.18 alpha 1.80 1.81 1.81 1.84 1.86 1.86 1.87 1.87 1.85 1.84 1.83 1.81 Utilisation factor for gains for living area 0.96 0.95 0.93 0.90 0.84 0.75 0.62 0.64 0.81 0.90 0.95 0.96 (86) Mean internal temperature in living area T1 17.09 17.37 17.94 18.59 19.45 20.17 20.63 20.61 19.98 19.00 17.85 17.20 (87) Temperature during heating periods in rest of dwelling Th2 19.25 19.26 19.14 19.16 19.16 19.21 19.24 19.26 19.23 19.21 19.19 19.16 (88) Utilisation factor for gains for rest of dwelling 0.88 (89) 0.95 0.93 0.91 0.80 0.66 0.44 0.46 0.73 0.93 0.95 0.87 Mean internal temperature in the rest of dwelling T2 15.76 17.28 18.13 18.78 19.15 17.69 15.89 (90) 16.05 16.61 19.14 18.62 16.55 Living area fraction (24.00 / 126.00) 0.19 (91) Mean internal temperature (for the whole dwelling) 16.01 16.30 16.86 17.53 18.38 19.05 19.43 19.42 18.88 17.94 16.80 16.14 (92) Apply adjustment to the mean internal temperature, where appropriate 16.01 16.30 16.86 17.53 18.38 19.43 19.42 16.80 (93)19.05 18.88 17.94 16.14

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21.00 (85)

8. Space heating requirement

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisatio	on factor	for gains	5									
0.92	0.91	0.88	0.84	0.76	0.64	0.46	0.48	0.70	0.84	0.91	0.93	(
Useful g	jains				•				•			
872.96	959.06	992.12	1008.77	949.98	793.16	550.19	539.06	743.57	833.67	834.31	834.09	(
Monthly	average	externa	tempera	ature								
4.50	5.00	6.80	8.70	11.70	14.60	16.90	16.90	14.30	10.80	7.00	4.90	(
Heat los	s rate fo	r mean i	nternal te	emperati	ire							
3365.2	3246.5	2891.2	2453.7	1819.07	1199.74	676.22	673.22	1254.07	1984.89	2767.4	3228.3	
Space h	eating re	equireme	ent for ea	ch mont	h, kWh/r	nonth						
1854.1	91537.19	1412.92	1040.32	646.60	-	-	-	-	856.50	1391.86	1781.28	
Total sp	ace heat	ting requ	irement	per year	(kWh/ye	ar) (Octo	ober to N	/lay)			10520.87	7
Space h	neating re	equireme	ent per m	² (kWh/r	n²/year)						83.50)

8c. Space cooling requirement - not applicable

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9a. Energy requirements

	5 7 7										kWh/year	
No seco Fraction Efficience	ondary he of space cy of mai	eating sy e heat fro n heating	stem sel om main g system	ected system((s)			89	1.0000 9.70%		-	(202) (206)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space h	eating re	equireme	ent									
1854.19	91537.19	1412.92	1040.32	646.60	-	-	-	-	856.50	1391.86	1781.28	(98)
Append	ix Q - mo	onthly en	ergy sav	ed (mair	heating	system	1)				,	
0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00	(210)
Space h	eating fu	iel (main	heating	system	1)						·,	
2067.1	1713.70	1575.16	1159.77	720.85	-	-	-	-	954.85	1551.68	31985.82	(211)
Append	ix Q - mo	onthly en	ergy sav	ed (mair	heating	system	2)				·,	
0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00	(212)
Space h	eating fu	iel (main	heating	system	2)						·,	
0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00	(213)
Append	ix Q - mo	onthly en	ergy sav	ed (secc	ondary he	eating sy	stem)				·,	
0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00	(214)
Space h	eating fu	iel (seco	ndary)								·,	
0.00	0.00	0.00	0.00	0.00	-	-	-	-	0.00	0.00	0.00	(215)
Water h	eating										·,	
Water h	eating re	quireme	nt	1	1							<i>(</i> - .)
239.30	211.09	222.07	199.61	196.00	175.69	169.26	185.00	184.44	206.96	218.16	233.73	(64)
Efficienc	cy of wate	er heate	r		1		1				79.00	(216)
88.33	88.26	88.08	87.79	86.96	79.00	79.00	79.00	79.00	87.40	88.08	88.31	(217)
Water h	eating fu	el		1	1		1	1				
270.91	239.17	252.13	227.38	225.39	222.39	214.25	234.17	233.47	236.80	247.68	264.66	(219)
Annual f Space h Space h Water h	totals neating fu neating fu neating fu	iel used, iel (seco iel	main sy ndary) s and ele	stem 1	en-hot						kWh/year 11728.95 0.00 2868.39	(211) (215) (219)
central boiler v Total ele	heating with a far ectricity for	pump n-assiste or the ab	d flue ove, kW	h/year	ep-not						130.00 45.00 175.00	(230c) (230e) (231)
Energy Appendi Energ Energ	saving/ge ix Q - y saved () y used ()	or generation	ated ():	ogies	1						0.000 0.000	(236a) (236a) (237a)
Total de	livered e	nergy fo	r all uses	6							15265.63	(238)

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10a. Fuel costs using Table 12 prices

	kWh/year	Fuel price p/kWh	£/year	
Space heating - main system 1	11728.950	3.100	363.60	(240)
Space heating - main system 2	0.000	0.000	0.00	(241)
Water heating cost	2868.39	3.100	88.92	(247)
Mech vent fans cost	0.000	11.460	0.00	(249)
Pump/fan energy cost	175.000	11.460	20.05	(249)
Energy for lighting	493.286	11.460	56.53	(250)
Additional standing charges			106.00	(251)
Electricity generated - PVs	0.000	0.000	0.00	(252)
Appendix Q -				. ,
Energy saved or generated ():	0.000	0.000	0.00	(253)
Energy used ():	0.000	0.000	0.00	(254)
Total energy cost			635.10	(255)

11a. SAP rating

J	0.47	(256)
	1.75	(257)
SAP value	75.65	. ,
	76	(258)
SAP band	С	

12a. Carbon dioxide emissions

	Energy	Emission factor	Emissions	
	kWh/year	kg CO2/kWh	kg CO2/y	ear
Space heating, main system 1	11728.95	0.198	2322.33	(261)
Space heating, main system 2	0.00	0.000	0.00	(262)
Space heating, secondary	0.00	0.517	0.00	(263)
Water heating	2868.39	0.198	567.94	(264)
Space and water heating			2890.27	(265)
Electricity for pumps and fans	175.00	0.517	90.48	(267)
Electricity for lighting	493.29	0.517	255.03	(268)
Electricity generated - PVs	0.00	0.529	0.00	(269)
Electricity generated - µCHP	0.00	0.000	0.00	(269)
Appendix Q -				, ,
Energy saved ():	0.00	0.000	0.00	(270)
Energy used ():	0.00	0.000	0.00	(271)
Total ČO2, kg/year			3235.78	(272)
			kg/m²/yea	r
CO2 emissions per m ²			25.68	(273)
El value			74.64	(273a)
El rating			75	(274)
El band			С	. ,

13a. Primary energy

kWh/year factor (kWh/year) Space heating, main 11728.95 1.020 11963.53 (261) Space heating, main system 2 0.00 0.000 0.00 (262) Space heating, secondary 0.00 2.920 0.00 (263) Water heating 2868.39 1.020 2925.76 (264) Space and water heating 14889.29 (265) Electricity for pumps/fans 175.00 2.920 511.00 (267) Electricity for lighting 493.29 2.920 1440.40 (268) Electricity generated - PV 0.00 2.920 0.00 (269) Electricity generated - µCHP 0.00 0.00 (269) Electricity generated - wind 0.00 0.00 (269) New energy-saving technology :		Energy	Primary	P. Energy	
Space heating, main 11728.95 1.020 11963.53 (261) Space heating, main system 2 0.00 0.000 0.00 (262) Space heating, secondary 0.00 2.920 0.00 (263) Water heating 2868.39 1.020 2925.76 (264) Space and water heating 14889.29 (265) Electricity for pumps/fans 175.00 2.920 511.00 (267) Electricity for lighting 493.29 2.920 1440.40 (268) Electricity generated - PV 0.00 2.920 0.00 (269) Electricity generated - wind 0.00 0.000 0.00 (269) Electricity generated - wind 0.00 2.920 0.00 (269) New energy-saving technology : Energy saved (): 0.00 0.00 (270) Energy used (): 0.00 0.000 0.00 (271) Primary energy kWh/year 16840.68 (272) Primary energy kWh/m²/year 133.66 (273)		kWh/year	factor	(kWh/year	⁻)
Space heating, main system 2 0.00 0.000 2.920 0.00 (262) Space heating, secondary 0.00 2.920 0.00 (263) Water heating 2868.39 1.020 2925.76 (264) Space and water heating 14889.29 (265) Electricity for pumps/fans 175.00 2.920 511.00 (267) Electricity for lighting 493.29 2.920 1440.40 (268) Electricity generated - PV 0.00 2.920 0.00 (269) Electricity generated - wind 0.00 0.000 0.00 (269) Electricity generated - wind 0.00 2.920 0.00 (269) New energy-saving technology : Ε Ε Ε Ε Energy saved (): 0.00 0.000 0.00 (270) Energy used (): 0.00 0.000 0.00 (271) Primary energy kWh/year 16840.68 (272) Primary energy kWh/m²/year 133.66 (273)	Space heating, main	11728.95	1.020	11963.53	(261)
Space heating, secondary 0.00 2.920 0.00 (263) Water heating 2868.39 1.020 2925.76 (264) Space and water heating 14889.29 (265) Electricity for pumps/fans 175.00 2.920 511.00 (267) Electricity for lighting 493.29 2.920 1440.40 (268) Electricity generated - PV 0.00 2.920 0.00 (269) Electricity generated - µCHP 0.00 0.000 0.00 (269) Electricity generated - wind 0.00 0.000 0.00 (269) New energy-saving technology : Energy saved (): 0.00 0.000 0.00 (270) Energy used (): 0.00 0.000 0.00 (271) Primary energy kWh/year 16840.68 (272) Primary energy kWh/m²/year 133.66 (273)	Space heating, main system 2	0.00	0.000	0.00	(262)
Water heating2868.391.0202925.76(264)Space and water heating14889.29(265)Electricity for pumps/fans175.002.920511.00(267)Electricity for lighting493.292.9201440.40(268)Electricity generated - PV0.002.9200.00(269)Electricity generated - μ CHP0.000.0000.00(269)Electricity generated - wind0.002.9200.00(269)New energy-saving technology : Energy used ():0.000.0000.00(270)Primary energy kWh/year0.000.0000.00(271)Primary energy kWh/m²/year133.66(273)	Space heating, secondary	0.00	2.920	0.00	(263)
Space and water heating 14889.29 (265) Electricity for pumps/fans 175.00 2.920 511.00 (267) Electricity for lighting 493.29 2.920 1440.40 (268) Electricity generated - PV 0.00 2.920 0.00 (269) Electricity generated - µCHP 0.00 0.000 0.00 (269) Electricity generated - wind 0.00 2.920 0.00 (269) New energy-saving technology : Energy saved (): 0.00 0.000 0.00 (270) Energy used (): 0.00 0.000 0.00 (271) Primary energy kWh/year 16840.68 (272) Primary energy kWh/m²/year 133.66 (273)	Water heating	2868.39	1.020	2925.76	(264)
Electricity for pumps/fans 175.00 2.920 511.00 (267) Electricity for lighting 493.29 2.920 1440.40 (268) Electricity generated - PV 0.00 2.920 0.00 (269) Electricity generated - µCHP 0.00 0.000 0.00 (269) Electricity generated - wind 0.00 2.920 0.00 (269) New energy-saving technology : Εnergy saved (): 0.00 0.000 0.00 (270) Energy used (): 0.00 0.000 0.00 (271) Primary energy kWh/year 16840.68 (272) Primary energy kWh/m²/year 133.66 (273)	Space and water heating			14889.29	(265)
Electricity for lighting 493.29 2.920 1440.40 (268) Electricity generated - PV 0.00 2.920 0.00 (269) Electricity generated - µCHP 0.00 0.000 0.00 (269) Electricity generated - wind 0.00 2.920 0.00 (269) New energy-saving technology : Energy saved (): 0.00 0.000 0.00 (270) Energy used (): 0.00 0.000 0.00 (271) Primary energy kWh/year 16840.68 (272) Primary energy kWh/m²/year 133.66 (273)	Electricity for pumps/fans	175.00	2.920	511.00	(267)
Electricity generated - PV 0.00 2.920 0.00 (269) Electricity generated - μCHP 0.00 0.000 0.00 (269) Electricity generated - wind 0.00 2.920 0.00 (269) New energy-saving technology : 0.00 2.920 0.00 (269) Energy saved (): 0.00 0.000 0.00 (270) Energy used (): 0.00 0.000 0.00 (271) Primary energy kWh/year 16840.68 (272) Primary energy kWh/m²/year 133.66 (273)	Electricity for lighting	493.29	2.920	1440.40	(268)
Electricity generated - μCHP 0.00 0.000 0.00 (269) Electricity generated - wind 0.00 2.920 0.00 (269) New energy-saving technology : 0.00 0.000 0.00 (270) Energy saved (): 0.00 0.000 0.00 (271) Primary energy kWh/year 16840.68 (272) Primary energy kWh/m²/year 133.66 (273)	Electricity generated - PV	0.00	2.920	0.00	(269)
Electricity generated - wind 0.00 2.920 0.00 (269) New energy-saving technology : 0.00 0.000 0.00 (270) Energy saved (): 0.00 0.000 0.00 (271) Primary energy kWh/year 16840.68 (272) Primary energy kWh/m²/year 133.66 (273)	Electricity generated - µCHP	0.00	0.000	0.00	(269)
New energy-saving technology : 0.00 0.000 0.00 (270) Energy saved (): 0.00 0.000 0.00 (271) Primary energy kWh/year 16840.68 (272) Primary energy kWh/m²/year 133.66 (273)	Electricity generated - wind	0.00	2.920	0.00	(269)
Energy saved (): 0.00 0.000 0.00 (270) Energy used (): 0.00 0.000 0.00 (271) Primary energy kWh/year 16840.68 (272) Primary energy kWh/m²/year 133.66 (273)	New energy-saving technology :				
Energy used (): 0.00 0.00 (271) Primary energy kWh/year 16840.68 (272) Primary energy kWh/m²/year 133.66 (273)	Energy saved ():	0.00	0.000	0.00	(270)
Primary energy kWh/year 16840.68 (272) Primary energy kWh/m²/year 133.66 (273)	Energy used ():	0.00	0.000	0.00	(271)
Primary energy kWh/m²/year 133.66 (273)	Primary energy kWh/year			16840.68	(272)
	Primary energy kWh/m²/year			133.66	(273)

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Project Information

Building type End-terrace house

Reference Date Project 327 Greystoke Avenue Bristol **BS10 6BD**

REGULATION COMPLIANCE REPORT - Approved Document L1A, 2010 Edition assessed by program JPA Designer version 5.04x, printed on 11/02/2022 at 12:05:07

New extension to existing dwelling

1 TER and DER

Fuel for main heating system: Gas (mains) (fuel factor = 1.00)		
Target Carbon Dioxide Emission Rate	TER = 16.34	
Dwelling Carbon Dioxide Emission Rate	DER = 26.82	Fail
Excess emissions = 10.48kg/m ² (64.2%)		

2a Thermal bridging

Thermal bridging calculated using default y-value of 0.15

2h	Fab	ric	U-va	lues
Z N	i av	110	U-va	nucə

	Element	<u>Average</u>	<u>Highest</u>	
	Wall	0.82 (max. 0.30)	1.20 (max. 0.70)	Fail
	Floor	0.32 (max. 0.25)	0.35 (max. 0.70)	Fail
	Roof	0.17 (max. 0.20)	0.18 (max. 0.35)	OK
	Openings	1.96 (max. 2.00)	2.10 (max. 3.30)	OK
3 Air permeability				
	Air permeability at 50 pascals:		15.00	Fail
	Maximum :		10.00	

4 Heating efficiency Main heating syste

Main heating system.	
	Boiler and radiators, mains gas Worcester GREENSTAR
Source of efficiency:	from boiler database
	Worcester GREENSTAR 24Ri ErP+
	Efficiency: 89.7% SEDBUK2009
	Minimum: 88.0%
Secondary heating sys	stem:
	None -

OK

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5 Cylinder insulation		
Manufacturer	r's declared cylinder loss factor (kWb/day) 1 91	
Permitted by	DBSCG 2.30	ОК
Primary pipework insulated	No	Fail
6 Controls		
(Also refer to "Domestic Building Se	ervices Compliance Guide" by the DCLG)	
Space heating controls	Programmer + roomstat + TRVs	OK
	Cylinderstat - Yes	OK
Deilen Interleek	Independent timer for DHW - Yes	OK
	Yes	OK
7 Low energy lights		
	Percentage of fixed lights with low-energy fittings: 100.0% Minimum: 75.0%	ОК
8 Mechanical ventilation		
	Not applicable	
9 Summertime temperature		
Overheating risk (Severn Valley):		OK
	Not significant	OK
Based on:		
Thermal mass parameter :	100.00	
Overshading :	Average or unknown (20-60 % sky blocked)	
Orientation : South	0.00	
Ventilation rate :	8.00	
None with blinds/shutters closed () 00% of daylight hours	
None with billings/shutters closed t	5.00% of dayight hours	
10 Kov foaturos		
iu ney iealuies		

Party wall U-value 0.00 W/m²K

Predicted Energy Assessment

327 Greystoke Avenue Bristol BS10 6BD Dwelling type: Date of assessment: Produced by Total floor area: End-terrace house 11 February 2022 Complete Energy Consultancy Ltd 126 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2009 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO_2) emissions.



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.