SAP WorkSheet: New dwelling design stage

North	0.9x	0.77	x	0.36	x	24.19	x	0.63	x	0.7	=	5.32	(74)
North	0.9x	0.77	x	0.8	x	24.19	x	0.63	x	0.7	=	11.83	(74)
North	0.9x	0.77	x	0.64	x	24.19	x	0.63	x	0.7	=	9.46	(74)
North	0.9x	0.77	x	14.11	x	24.19	x	0.63	x	0.7	=	104.31	(74)
North	0.9x	0.77	x	1.61	x	13.12	x	0.63	x	0.7	=	6.45	(74)
North	0.9x	0.77	x	0.36	x	13.12	x	0.63	x	0.7	=	2.89	(74)
North	0.9x	0.77	x	0.8	x	13.12	x	0.63	x	0.7	=	6.41	(74)
North	0.9x	0.77	x	0.64	x	13.12	x	0.63	x	0.7	=	5.13	(74)
North	0.9x	0.77	x	14.11	x	13.12	x	0.63	x	0.7	=	56.57	(74)
North	0.9x	0.77	x	1.61	x	8.86	x	0.63	x	0.7	=	4.36	(74)
North	0.9x	0.77	x	0.36	x	8.86	x	0.63	x	0.7	=	1.95	(74)
North	0.9x	0.77	x	0.8	x	8.86	x	0.63	x	0.7	=	4.33	(74)
North	0.9x	0.77	x	0.64	x	8.86	x	0.63	x	0.7	=	3.47	(74)
North	0.9x	0.77	x	14.11	x	8.86	x	0.63	x	0.7	=	38.23	(74)
South	0.9x	0.77	x	1.61	x	46.75	x	0.63	x	0.7	=	23	(78)
South	0.9x	0.77	x	8.72	x	46.75	x	0.63	x	0.7	=	124.59	(78)
South	0.9x	0.77	x	30.79	x	46.75	x	0.63	x	0.7	=	439.93	(78)
South	0.9x	0.77	x	3.97	x	46.75	x	0.63	x	0.7	=	56.72	(78)
South	0.9x	0.77	x	2.66	x	46.75	x	0.63	x	0.7	=	38.01	(78)
South	0.9x	0.77	x	6.08	x	46.75	x	0.63	x	0.7	=	86.87	(78)
South	0.9x	0.77	x	8.39	x	46.75	x	0.63	x	0.7	=	119.88	(78)
South	0.9x	0.77	x	0.25	x	46.75	x	0.63	x	0.7	=	3.57	(78)
South	0.9x	0.77	x	0.64	x	46.75	x	0.63	x	0.7	=	18.29	(78)
South	0.9x	0.77	x	0.72	x	46.75	x	0.63	x	0.7	=	10.29	(78)
South	0.9x	0.77	x	1.61	x	76.57	x	0.63	x	0.7	=	37.67	(78)
South	0.9x	0.77	x	8.72	x	76.57	x	0.63	x	0.7	=	204.05	(78)
South	0.9x	0.77	x	30.79	x	76.57	x	0.63	x	0.7	=	720.49	(78)
South	0.9x	0.77	x	3.97	x	76.57	x	0.63	x	0.7	=	92.9	(78)
South	0.9x	0.77	x	2.66	x	76.57	x	0.63	x	0.7	=	62.24	(78)
South	0.9x	0.77	x	6.08	x	76.57	x	0.63	x	0.7	=	142.27	(78)
South	0.9x	0.77	x	8.39	x	76.57	x	0.63	x	0.7	=	196.33	(78)
South	0.9x	0.77	x	0.25	x	76.57	x	0.63	x	0.7	=	5.85	(78)
South	0.9x	0.77	x	0.64	x	76.57	x	0.63	x	0.7	=	29.95	(78)
South	0.9x	0.77	x	0.72	x	76.57	x	0.63	x	0.7	=	16.85	(78)
South	0.9x	0.77	x	1.61	x	97.53	x	0.63	x	0.7	=	47.99	(78)
South	0.9x	0.77	x	8.72	x	97.53	x	0.63	x	0.7	=	259.92	(78)
South	0.9x	0.77	x	30.79	x	97.53	x	0.63	x	0.7	=	917.78	(78)
South	0.9x	0.77	x	3.97	x	97.53	x	0.63	x	0.7	=	118.34	(78)
South	0.9x	0.77	x	2.66	x	97.53	x	0.63	x	0.7	=	79.29	(78)
South	0.9x	0.77	x	6.08	x	97.53	x	0.63	x	0.7	=	181.23	(78)
South	0.9x	0.77	x	8.39	x	97.53	x	0.63	x	0.7	=	250.09	(78)

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South	0.9x	0.77	x	0.25	x	97.53	x	0.63	x	0.7	=	7.45	(78)
South	0.9x	0.77	x	0.64	x	97.53	x	0.63	x	0.7	=	38.15	(78)
South	0.9x	0.77	x	0.72	x	97.53	x	0.63	x	0.7	=	21.46	(78)
South	0.9x	0.77	x	1.61	x	110.23	x	0.63	x	0.7	=	54.24	(78)
South	0.9x	0.77	x	8.72	x	110.23	x	0.63	x	0.7	=	293.77	(78)
South	0.9x	0.77	x	30.79	x	110.23	x	0.63	x	0.7	=	1037.29	(78)
South	0.9x	0.77	x	3.97	x	110.23	x	0.63	x	0.7	=	133.75	(78)
South	0.9x	0.77	x	2.66	x	110.23	x	0.63	x	0.7	=	89.61	(78)
South	0.9x	0.77	x	6.08	x	110.23	x	0.63	x	0.7	=	204.83	(78)
South	0.9x	0.77	x	8.39	x	110.23	x	0.63	x	0.7	=	282.65	(78)
South	0.9x	0.77	x	0.25	x	110.23	x	0.63	x	0.7	=	8.42	(78)
South	0.9x	0.77	x	0.64	x	110.23	x	0.63	x	0.7	=	43.12	(78)
South	0.9x	0.77	x	0.72	x	110.23	x	0.63	x	0.7	=	24.26	(78)
South	0.9x	0.77	x	1.61	x	114.87	x	0.63	x	0.7	=	56.52	(78)
South	0.9x	0.77	x	8.72	x	114.87	x	0.63	x	0.7	=	306.13	(78)
South	0.9x	0.77	x	30.79	x	114.87	x	0.63	x	0.7	=	1080.92	(78)
South	0.9x	0.77	x	3.97	x	114.87	x	0.63	x	0.7	=	139.37	(78)
South	0.9x	0.77	x	2.66	x	114.87	x	0.63	x	0.7	=	93.38	(78)
South	0.9x	0.77	x	6.08	x	114.87	x	0.63	x	0.7	=	213.45	(78)
South	0.9x	0.77	x	8.39	x	114.87	x	0.63	x	0.7	=	294.54	(78)
South	0.9x	0.77	x	0.25	x	114.87	x	0.63	x	0.7	=	8.78	(78)
South	0.9x	0.77	x	0.64	x	114.87	x	0.63	x	0.7	=	44.94	(78)
South	0.9x	0.77	x	0.72	x	114.87	x	0.63	x	0.7	=	25.28	(78)
South	0.9x	0.77	x	1.61	x	110.55	x	0.63	x	0.7	=	54.39	(78)
South	0.9x	0.77	x	8.72	x	110.55	x	0.63	x	0.7	=	294.6	(78)
South	0.9x	0.77	x	30.79	x	110.55	x	0.63	x	0.7	=	1040.24	(78)
South	0.9x	0.77	x	3.97	x	110.55	x	0.63	x	0.7	=	134.13	(78)
South	0.9x	0.77	x	2.66	x	110.55	x	0.63	x	0.7	=	89.87	(78)
South	0.9x	0.77	x	6.08	x	110.55	x	0.63	x	0.7	=	205.41	(78)
South	0.9x	0.77	x	8.39	x	110.55	x	0.63	x	0.7	=	283.45	(78)
South	0.9x	0.77	x	0.25	x	110.55	x	0.63	x	0.7	=	8.45	(78)
South	0.9x	0.77	x	0.64	x	110.55	x	0.63	x	0.7	=	43.24	(78)
South	0.9x	0.77	x	0.72	x	110.55	x	0.63	x	0.7	=	24.33	(78)
South	0.9x	0.77	x	1.61	x	108.01	x	0.63	x	0.7	=	53.15	(78)
South	0.9x	0.77	x	8.72	x	108.01	x	0.63	x	0.7	=	287.85	(78)
South	0.9x	0.77	x	30.79	x	108.01	x	0.63	x	0.7	=	1016.37	(78)
South	0.9x	0.77	x	3.97	x	108.01	x	0.63	x	0.7	=	131.05	(78)
South	0.9x	0.77	x	2.66	x	108.01	x	0.63	x	0.7	=	87.81	(78)
South	0.9x	0.77	x	6.08	x	108.01	x	0.63	x	0.7	=	200.7	(78)
South	0.9x	0.77	x	8.39	x	108.01	x	0.63	x	0.7	=	276.95	(78)
South	0.9x	0.77	x	0.25	x	108.01	x	0.63	x	0.7	=	8.25	(78)

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South	0.9x	0.77	x	0.64	x	108.01	x	0.63	x	0.7	=	42.25	(78)
South	0.9x	0.77	x	0.72	x	108.01	x	0.63	x	0.7	=	23.77	(78)
South	0.9x	0.77	x	1.61	x	104.89	x	0.63	x	0.7	=	51.61	(78)
South	0.9x	0.77	x	8.72	x	104.89	x	0.63	x	0.7	=	279.54	(78)
South	0.9x	0.77	x	30.79	x	104.89	x	0.63	x	0.7	=	987.04	(78)
South	0.9x	0.77	x	3.97	x	104.89	x	0.63	x	0.7	=	127.27	(78)
South	0.9x	0.77	x	2.66	x	104.89	x	0.63	x	0.7	=	85.27	(78)
South	0.9x	0.77	x	6.08	x	104.89	x	0.63	x	0.7	=	194.91	(78)
South	0.9x	0.77	x	8.39	x	104.89	x	0.63	x	0.7	=	268.96	(78)
South	0.9x	0.77	x	0.25	x	104.89	x	0.63	x	0.7	=	8.01	(78)
South	0.9x	0.77	x	0.64	x	104.89	x	0.63	x	0.7	=	41.03	(78)
South	0.9x	0.77	x	0.72	x	104.89	x	0.63	x	0.7	=	23.08	(78)
South	0.9x	0.77	x	1.61	x	101.89	x	0.63	x	0.7	=	50.13	(78)
South	0.9x	0.77	x	8.72	x	101.89	x	0.63	x	0.7	=	271.52	(78)
South	0.9x	0.77	x	30.79	x	101.89	x	0.63	x	0.7	=	958.73	(78)
South	0.9x	0.77	x	3.97	x	101.89	x	0.63	x	0.7	=	123.62	(78)
South	0.9x	0.77	x	2.66	x	101.89	x	0.63	x	0.7	=	82.83	(78)
South	0.9x	0.77	x	6.08	x	101.89	x	0.63	x	0.7	=	189.32	(78)
South	0.9x	0.77	x	8.39	x	101.89	x	0.63	x	0.7	=	261.24	(78)
South	0.9x	0.77	x	0.25	x	101.89	x	0.63	x	0.7	=	7.78	(78)
South	0.9x	0.77	x	0.64	x	101.89	x	0.63	x	0.7	=	39.86	(78)
South	0.9x	0.77	x	0.72	x	101.89	x	0.63	x	0.7	=	22.42	(78)
South	0.9x	0.77	x	1.61	x	82.59	x	0.63	x	0.7	=	40.64	(78)
South	0.9x	0.77	x	8.72	x	82.59	x	0.63	x	0.7	=	220.09	(78)
South	0.9x	0.77	x	30.79	x	82.59	x	0.63	x	0.7	=	777.12	(78)
South	0.9x	0.77	x	3.97	x	82.59	x	0.63	x	0.7	=	100.2	(78)
South	0.9x	0.77	x	2.66	x	82.59	x	0.63	x	0.7	=	67.14	(78)
South	0.9x	0.77	x	6.08	x	82.59	x	0.63	x	0.7	=	153.45	(78)
South	0.9x	0.77	x	8.39	x	82.59	x	0.63	x	0.7	=	211.76	(78)
South	0.9x	0.77	x	0.25	x	82.59	x	0.63	x	0.7	=	6.31	(78)
South	0.9x	0.77	x	0.64	x	82.59	x	0.63	x	0.7	=	32.31	(78)
South	0.9x	0.77	x	0.72	x	82.59	x	0.63	x	0.7	=	18.17	(78)
South	0.9x	0.77	x	1.61	x	55.42	x	0.63	x	0.7	=	27.27	(78)
South	0.9x	0.77	x	8.72	x	55.42	x	0.63	x	0.7	=	147.68	(78)
South	0.9x	0.77	x	30.79	x	55.42	x	0.63	x	0.7	=	521.47	(78)
South	0.9x	0.77	x	3.97	x	55.42	x	0.63	x	0.7	=	67.24	(78)
South	0.9x	0.77	x	2.66	x	55.42	x	0.63	x	0.7	=	45.05	(78)
South	0.9x	0.77	x	6.08	x	55.42	x	0.63	x	0.7	=	102.97	(78)
South	0.9x	0.77	x	8.39	x	55.42	x	0.63	x	0.7	=	142.09	(78)
South	0.9x	0.77	x	0.25	x	55.42	x	0.63	x	0.7	=	4.23	(78)
South	0.9x	0.77	x	0.64	x	55.42	x	0.63	x	0.7	=	21.68	(78)

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South	0.9x	0.77	x	0.72	x	55.42	x	0.63	x	0.7	=	12.19	(78)
South	0.9x	0.77	x	1.61	x	40.4	x	0.63	x	0.7	=	19.88	(78)
South	0.9x	0.77	x	8.72	x	40.4	x	0.63	x	0.7	=	107.66	(78)
South	0.9x	0.77	x	30.79	x	40.4	x	0.63	x	0.7	=	380.14	(78)
South	0.9x	0.77	x	3.97	x	40.4	x	0.63	x	0.7	=	49.01	(78)
South	0.9x	0.77	x	2.66	x	40.4	x	0.63	x	0.7	=	32.84	(78)
South	0.9x	0.77	x	6.08	x	40.4	x	0.63	x	0.7	=	75.06	(78)
South	0.9x	0.77	x	8.39	x	40.4	x	0.63	x	0.7	=	103.58	(78)
South	0.9x	0.77	x	0.25	x	40.4	x	0.63	x	0.7	=	3.09	(78)
South	0.9x	0.77	x	0.64	x	40.4	x	0.63	x	0.7	=	15.8	(78)
South	0.9x	0.77	x	0.72	x	40.4	x	0.63	x	0.7	=	8.89	(78)
West	0.9x	0.77	x	8.18	x	19.64	x	0.63	x	0.7	=	49.1	(80)
West	0.9x	0.77	x	9.63	x	19.64	x	0.63	x	0.7	=	57.8	(80)
West	0.9x	0.77	x	11.5	x	19.64	x	0.63	x	0.7	=	69.03	(80)
West	0.9x	0.77	x	5.75	x	19.64	x	0.63	x	0.7	=	34.51	(80)
West	0.9x	0.77	x	5.7	x	19.64	x	0.63	x	0.7	=	34.21	(80)
West	0.9x	0.77	x	2.45	x	19.64	x	0.63	x	0.7	=	14.71	(80)
West	0.9x	0.77	x	9.52	x	19.64	x	0.63	x	0.7	=	57.14	(80)
West	0.9x	0.77	x	10.42	x	19.64	x	0.63	x	0.7	=	62.54	(80)
West	0.9x	0.77	x	11.33	x	19.64	x	0.63	x	0.7	=	68.01	(80)
West	0.9x	0.77	x	2.8	x	19.64	x	0.63	x	0.7	=	16.81	(80)
West	0.9x	0.77	x	8.18	x	38.42	x	0.63	x	0.7	=	96.05	(80)
West	0.9x	0.77	x	9.63	x	38.42	x	0.63	x	0.7	=	113.07	(80)
West	0.9x	0.77	x	11.5	x	38.42	x	0.63	x	0.7	=	135.03	(80)
West	0.9x	0.77	x	5.75	x	38.42	x	0.63	x	0.7	=	67.52	(80)
West	0.9x	0.77	x	5.7	x	38.42	x	0.63	x	0.7	=	66.93	(80)
West	0.9x	0.77	x	2.45	x	38.42	x	0.63	x	0.7	=	28.77	(80)
West	0.9x	0.77	x	9.52	x	38.42	x	0.63	x	0.7	=	111.78	(80)
West	0.9x	0.77	x	10.42	x	38.42	x	0.63	x	0.7	=	122.35	(80)
West	0.9x	0.77	x	11.33	x	38.42	x	0.63	x	0.7	=	133.03	(80)
West	0.9x	0.77	x	2.8	x	38.42	x	0.63	x	0.7	=	32.88	(80)
West	0.9x	0.77	x	8.18	x	63.27	x	0.63	x	0.7	=	158.18	(80)
West	0.9x	0.77	x	9.63	x	63.27	x	0.63	x	0.7	=	186.22	(80)
West	0.9x	0.77	x	11.5	x	63.27	x	0.63	x	0.7	=	222.38	(80)
West	0.9x	0.77	x	5.75	x	63.27	x	0.63	x	0.7	=	111.19	(80)
West	0.9x	0.77	x	5.7	x	63.27	x	0.63	x	0.7	=	110.22	(80)
West	0.9x	0.77	x	2.45	x	63.27	x	0.63	x	0.7	=	47.38	(80)
West	0.9x	0.77	x	9.52	x	63.27	x	0.63	x	0.7	=	184.09	(80)
West	0.9x	0.77	x	10.42	x	63.27	x	0.63	x	0.7	=	201.49	(80)
West	0.9x	0.77	x	11.33	x	63.27	x	0.63	x	0.7	=	219.09	(80)
West	0.9x	0.77	x	2.8	x	63.27	x	0.63	x	0.7	=	54.14	(80)

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West	0.9x	0.77	x	8.18	x	92.28	x	0.63	x	0.7	=	230.69	(80)
West	0.9x	0.77	x	9.63	x	92.28	x	0.63	x	0.7	=	271.59	(80)
West	0.9x	0.77	x	11.5	x	92.28	x	0.63	x	0.7	=	324.32	(80)
West	0.9x	0.77	x	5.75	x	92.28	x	0.63	x	0.7	=	162.16	(80)
West	0.9x	0.77	x	5.7	x	92.28	x	0.63	x	0.7	=	160.75	(80)
West	0.9x	0.77	x	2.45	x	92.28	x	0.63	x	0.7	=	69.09	(80)
West	0.9x	0.77	x	9.52	x	92.28	x	0.63	x	0.7	=	268.48	(80)
West	0.9x	0.77	x	10.42	x	92.28	x	0.63	x	0.7	=	293.86	(80)
West	0.9x	0.77	x	11.33	x	92.28	x	0.63	x	0.7	=	319.53	(80)
West	0.9x	0.77	x	2.8	x	92.28	x	0.63	x	0.7	=	78.97	(80)
West	0.9x	0.77	x	8.18	x	113.09	x	0.63	x	0.7	=	282.72	(80)
West	0.9x	0.77	x	9.63	x	113.09	x	0.63	x	0.7	=	332.84	(80)
West	0.9x	0.77	x	11.5	x	113.09	x	0.63	x	0.7	=	397.47	(80)
West	0.9x	0.77	x	5.75	x	113.09	x	0.63	x	0.7	=	198.73	(80)
West	0.9x	0.77	x	5.7	x	113.09	x	0.63	x	0.7	=	197.01	(80)
West	0.9x	0.77	x	2.45	x	113.09	x	0.63	x	0.7	=	84.68	(80)
West	0.9x	0.77	x	9.52	x	113.09	x	0.63	x	0.7	=	329.04	(80)
West	0.9x	0.77	x	10.42	x	113.09	x	0.63	x	0.7	=	360.14	(80)
West	0.9x	0.77	x	11.33	x	113.09	x	0.63	x	0.7	=	391.59	(80)
West	0.9x	0.77	x	2.8	x	113.09	x	0.63	x	0.7	=	96.78	(80)
West	0.9x	0.77	x	8.18	x	115.77	x	0.63	x	0.7	=	289.42	(80)
West	0.9x	0.77	x	9.63	x	115.77	x	0.63	x	0.7	=	340.72	(80)
West	0.9x	0.77	x	11.5	x	115.77	x	0.63	x	0.7	=	406.88	(80)
West	0.9x	0.77	x	5.75	x	115.77	x	0.63	x	0.7	=	203.44	(80)
West	0.9x	0.77	x	5.7	x	115.77	x	0.63	x	0.7	=	201.67	(80)
West	0.9x	0.77	x	2.45	x	115.77	x	0.63	x	0.7	=	86.68	(80)
West	0.9x	0.77	x	9.52	x	115.77	x	0.63	x	0.7	=	336.83	(80)
West	0.9x	0.77	x	10.42	x	115.77	x	0.63	x	0.7	=	368.67	(80)
West	0.9x	0.77	x	11.33	x	115.77	x	0.63	x	0.7	=	400.87	(80)
West	0.9x	0.77	x	2.8	x	115.77	x	0.63	x	0.7	=	99.07	(80)
West	0.9x	0.77	x	8.18	x	110.22	x	0.63	x	0.7	=	275.54	(80)
West	0.9x	0.77	x	9.63	x	110.22	x	0.63	x	0.7	=	324.38	(80)
West	0.9x	0.77	x	11.5	x	110.22	x	0.63	x	0.7	=	387.37	(80)
West	0.9x	0.77	x	5.75	x	110.22	x	0.63	x	0.7	=	193.68	(80)
West	0.9x	0.77	x	5.7	x	110.22	x	0.63	x	0.7	=	192	(80)
West	0.9x	0.77	x	2.45	x	110.22	x	0.63	x	0.7	=	82.53	(80)
West	0.9x	0.77	x	9.52	x	110.22	x	0.63	x	0.7	=	320.67	(80)
West	0.9x	0.77	x	10.42	x	110.22	x	0.63	x	0.7	=	350.99	(80)
West	0.9x	0.77	x	11.33	x	110.22	x	0.63	x	0.7	=	381.64	(80)
West	0.9x	0.77	x	2.8	x	110.22	x	0.63	x	0.7	=	94.32	(80)
West	0.9x	0.77	x	8.18	x	94.68	x	0.63	x	0.7	=	236.68	(80)

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West	0.9x	0.77	x	9.63	x	94.68	x	0.63	x	0.7	=	278.64	(80)
West	0.9x	0.77	x	11.5	x	94.68	x	0.63	x	0.7	=	332.74	(80)
West	0.9x	0.77	x	5.75	x	94.68	x	0.63	x	0.7	=	166.37	(80)
West	0.9x	0.77	x	5.7	x	94.68	x	0.63	x	0.7	=	164.92	(80)
West	0.9x	0.77	x	2.45	x	94.68	x	0.63	x	0.7	=	70.89	(80)
West	0.9x	0.77	x	9.52	x	94.68	x	0.63	x	0.7	=	275.45	(80)
West	0.9x	0.77	x	10.42	x	94.68	x	0.63	x	0.7	=	301.49	(80)
West	0.9x	0.77	x	11.33	x	94.68	x	0.63	x	0.7	=	327.82	(80)
West	0.9x	0.77	x	2.8	x	94.68	x	0.63	x	0.7	=	81.02	(80)
West	0.9x	0.77	x	8.18	x	73.59	x	0.63	x	0.7	=	183.97	(80)
West	0.9x	0.77	x	9.63	x	73.59	x	0.63	x	0.7	=	216.58	(80)
West	0.9x	0.77	x	11.5	x	73.59	x	0.63	x	0.7	=	258.63	(80)
West	0.9x	0.77	x	5.75	x	73.59	x	0.63	x	0.7	=	129.32	(80)
West	0.9x	0.77	x	5.7	x	73.59	x	0.63	x	0.7	=	128.19	(80)
West	0.9x	0.77	x	2.45	x	73.59	x	0.63	x	0.7	=	55.1	(80)
West	0.9x	0.77	x	9.52	x	73.59	x	0.63	x	0.7	=	214.1	(80)
West	0.9x	0.77	x	10.42	x	73.59	x	0.63	x	0.7	=	234.34	(80)
West	0.9x	0.77	x	11.33	x	73.59	x	0.63	x	0.7	=	254.81	(80)
West	0.9x	0.77	x	2.8	x	73.59	x	0.63	x	0.7	=	62.97	(80)
West	0.9x	0.77	x	8.18	x	45.59	x	0.63	x	0.7	=	113.97	(80)
West	0.9x	0.77	x	9.63	x	45.59	x	0.63	x	0.7	=	134.17	(80)
West	0.9x	0.77	x	11.5	x	45.59	x	0.63	x	0.7	=	160.23	(80)
West	0.9x	0.77	x	5.75	x	45.59	x	0.63	x	0.7	=	80.11	(80)
West	0.9x	0.77	x	5.7	x	45.59	x	0.63	x	0.7	=	79.42	(80)
West	0.9x	0.77	x	2.45	x	45.59	x	0.63	x	0.7	=	34.13	(80)
West	0.9x	0.77	x	9.52	x	45.59	x	0.63	x	0.7	=	132.64	(80)
West	0.9x	0.77	x	10.42	x	45.59	x	0.63	x	0.7	=	145.18	(80)
West	0.9x	0.77	x	11.33	x	45.59	x	0.63	x	0.7	=	157.86	(80)
West	0.9x	0.77	x	2.8	x	45.59	x	0.63	x	0.7	=	39.01	(80)
West	0.9x	0.77	x	8.18	x	24.49	x	0.63	x	0.7	=	61.22	(80)
West	0.9x	0.77	x	9.63	x	24.49	x	0.63	x	0.7	=	72.07	(80)
West	0.9x	0.77	x	11.5	x	24.49	x	0.63	x	0.7	=	86.07	(80)
West	0.9x	0.77	x	5.75	x	24.49	x	0.63	x	0.7	=	43.03	(80)
West	0.9x	0.77	x	5.7	x	24.49	x	0.63	x	0.7	=	42.66	(80)
West	0.9x	0.77	x	2.45	x	24.49	x	0.63	x	0.7	=	18.34	(80)
West	0.9x	0.77	x	9.52	x	24.49	x	0.63	x	0.7	=	71.25	(80)
West	0.9x	0.77	x	10.42	x	24.49	x	0.63	x	0.7	=	77.99	(80)
West	0.9x	0.77	x	11.33	x	24.49	x	0.63	x	0.7	=	84.8	(80)
West	0.9x	0.77	x	2.8	x	24.49	x	0.63	x	0.7	=	20.96	(80)
West	0.9x	0.77	x	8.18	x	16.15	x	0.63	x	0.7	=	40.38	(80)
West	0.9x	0.77	x	9.63	x	16.15	x	0.63	x	0.7	=	47.53	(80)

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West	0.9x	0.77	x	11.5	x	16.15	x	0.63	x	0.7	=	56.76	(80)
West	0.9x	0.77	x	5.75	x	16.15	x	0.63	x	0.7	=	28.38	(80)
West	0.9x	0.77	x	5.7	x	16.15	x	0.63	x	0.7	=	28.14	(80)
West	0.9x	0.77	x	2.45	x	16.15	x	0.63	x	0.7	=	12.09	(80)
West	0.9x	0.77	x	9.52	x	16.15	x	0.63	x	0.7	=	46.99	(80)
West	0.9x	0.77	x	10.42	x	16.15	x	0.63	x	0.7	=	51.43	(80)
West	0.9x	0.77	x	11.33	x	16.15	x	0.63	x	0.7	=	55.93	(80)
West	0.9x	0.77	x	2.8	x	16.15	x	0.63	x	0.7	=	13.82	(80)
Rooflights	0.9x	1	x	21.7	x	26	x	0.63	x	0.8	=	255.92	(82)
Rooflights	0.9x	1	x	4.42	x	26	x	0.63	x	0.8	=	52.13	(82)
Rooflights	0.9x	1	x	2.38	x	26	x	0.63	x	0.8	=	28.07	(82)
Rooflights	0.9x	1	x	1.08	x	26	x	0.63	x	0.8	=	12.74	(82)
Rooflights	0.9x	1	x	21.7	x	54	x	0.63	x	0.8	=	531.53	(82)
Rooflights	0.9x	1	x	4.42	x	54	x	0.63	x	0.8	=	108.27	(82)
Rooflights	0.9x	1	x	2.38	x	54	x	0.63	x	0.8	=	58.3	(82)
Rooflights	0.9x	1	x	1.08	x	54	x	0.63	x	0.8	=	26.45	(82)
Rooflights	0.9x	1	x	21.7	x	96	x	0.63	x	0.8	=	944.94	(82)
Rooflights	0.9x	1	x	4.42	x	96	x	0.63	x	0.8	=	192.47	(82)
Rooflights	0.9x	1	x	2.38	x	96	x	0.63	x	0.8	=	103.64	(82)
Rooflights	0.9x	1	x	1.08	x	96	x	0.63	x	0.8	=	47.03	(82)
Rooflights	0.9x	1	x	21.7	x	150	x	0.63	x	0.8	=	1476.47	(82)
Rooflights	0.9x	1	x	4.42	x	150	x	0.63	x	0.8	=	300.74	(82)
Rooflights	0.9x	1	x	2.38	x	150	x	0.63	x	0.8	=	161.94	(82)
Rooflights	0.9x	1	x	1.08	x	150	x	0.63	x	0.8	=	73.48	(82)
Rooflights	0.9x	1	x	21.7	x	192	x	0.63	x	0.8	=	1889.88	(82)
Rooflights	0.9x	1	x	4.42	x	192	x	0.63	x	0.8	=	384.94	(82)
Rooflights	0.9x	1	x	2.38	x	192	x	0.63	x	0.8	=	207.28	(82)
Rooflights	0.9x	1	x	1.08	x	192	x	0.63	x	0.8	=	94.06	(82)
Rooflights	0.9x	1	x	21.7	x	200	x	0.63	x	0.8	=	1968.62	(82)
Rooflights	0.9x	1	x	4.42	x	200	x	0.63	x	0.8	=	400.98	(82)
Rooflights	0.9x	1	x	2.38	x	200	x	0.63	x	0.8	=	215.91	(82)
Rooflights	0.9x	1	x	1.08	x	200	x	0.63	x	0.8	=	97.98	(82)
Rooflights	0.9x	1	x	21.7	x	189	x	0.63	x	0.8	=	1860.35	(82)
Rooflights	0.9x	1	x	4.42	x	189	x	0.63	x	0.8	=	378.93	(82)
Rooflights	0.9x	1	x	2.38	x	189	x	0.63	x	0.8	=	204.04	(82)
Rooflights	0.9x	1	x	1.08	x	189	x	0.63	x	0.8	=	92.59	(82)
Rooflights	0.9x	1	x	21.7	x	157	x	0.63	x	0.8	=	1545.37	(82)
Rooflights	0.9x	1	x	4.42	x	157	x	0.63	x	0.8	=	314.77	(82)
Rooflights	0.9x	1	x	2.38	x	157	x	0.63	x	0.8	=	169.49	(82)
Rooflights	0.9x	1	x	1.08	x	157	x	0.63	x	0.8	=	76.91	(82)
Rooflights	0.9x	1	x	21.7	x	115	x	0.63	x	0.8	=	1131.96	(82)

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Rooflights 0.9x	1	x	4.42	x	115	x	0.63	x	0.8	=	230.56	(82)
Rooflights 0.9x	1	x	2.38	x	115	x	0.63	x	0.8	=	124.15	(82)
Rooflights 0.9x	1	x	1.08	x	115	x	0.63	x	0.8	=	56.34	(82)
Rooflights 0.9x	1	x	21.7	x	66	x	0.63	x	0.8	=	649.65	(82)
Rooflights 0.9x	1	x	4.42	x	66	x	0.63	x	0.8	=	132.32	(82)
Rooflights 0.9x	1	x	2.38	x	66	x	0.63	x	0.8	=	71.25	(82)
Rooflights 0.9x	1	x	1.08	x	66	x	0.63	x	0.8	=	32.33	(82)
Rooflights 0.9x	1	x	21.7	x	33	x	0.63	x	0.8	=	324.82	(82)
Rooflights 0.9x	1	x	4.42	x	33	x	0.63	x	0.8	=	66.16	(82)
Rooflights 0.9x	1	x	2.38	x	33	x	0.63	x	0.8	=	35.63	(82)
Rooflights 0.9x	1	x	1.08	x	33	x	0.63	x	0.8	=	16.17	(82)
Rooflights 0.9x	1	x	21.7	x	21	x	0.63	x	0.8	=	206.71	(82)
Rooflights 0.9x	1	x	4.42	x	21	x	0.63	x	0.8	=	42.1	(82)
Rooflights 0.9x	1	x	2.38	x	21	x	0.63	x	0.8	=	22.67	(82)
Rooflights 0.9x	1	x	1.08	x	21	x	0.63	x	0.8	=	10.29	(82)

Solar gains in watts, calculated for each month (83)m = Sum(74)m ...(82)m

(83)m=	1854.69	3374.08	5095.02	6964.21	8285.82	8410.25	8033.81	7038.91	5751.07	3867	2262.86	1559.25	(83)

Total gains – internal and solar (84)m = (73)m + (83)m , watts

(84)m=	3316.91	4827.25	6491.53	8271.03	9496.61	9538.34	9115.89	8134.97	6900.85	5106.74	3602.62	2978.72	(84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (°C) 21 (85)

Utilisation factor for gains for living area, h1,m (see Table 9a)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(86)m=	1	0.99	0.97	0.87	0.7	0.52	0.38	0.44	0.71	0.95	1	1	(86)

Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c)

(87)m=	19.47	19.77	20.19	20.64	20.89	20.98	21	20.99	20.92	20.49	19.87	19.42	(87)

Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C)

(88)m=	19.81	19.81	19.81	19.82	19.82	19.83	19.83	19.83	19.83	19.82	19.82	19.82	(88)

Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a)

(89)m=	1	0.99	0.95	0.84	0.64	0.43	0.28	0.33	0.62	0.93	0.99	1	(89)

Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c)

(90)m=	17.79	18.22	18.83	19.43	19.73	19.82	19.83	19.83	19.77	19.25	18.37	17.71	(90)

fLA = Living area ÷ (4) = 0.1 (91)

Mean internal temperature (for the whole dwelling) = fLA × T1 + (1 – fLA) × T2

(92)m=	17.95	18.38	18.96	19.55	19.85	19.93	19.94	19.94	19.88	19.37	18.51	17.88	(92)

Apply adjustment to the mean internal temperature from Table 4e, where appropriate

(93)m=	17.95	18.38	18.96	19.55	19.85	19.93	19.94	19.94	19.88	19.37	18.51	17.88	(93)

8. Space heating requirement

Set Ti to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains using Table 9a

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

Utilisation factor for gains, hm:

(94)m=	1	0.98	0.94	0.83	0.64	0.44	0.29	0.34	0.62	0.92	0.99	1	(94)

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Useful gains, hmGm , W = (94)m x (84)m

(95)m=	3305.63	4752.91	6123.46	6841.79	6049.34	4149.18	2631.76	2778.09	4304.75	4694.11	3568.03	2972.17	(95)

Monthly average external temperature from Table 8

(96)m=	4.3	4.9	6.5	8.9	11.7	14.6	16.6	16.4	14.1	10.6	7.1	4.2	(96)

Heat loss rate for mean internal temperature, Lm , W =[(39)m x [(93)m– (96)m]

(97)m=	10949.77	10792.94	9966.59	8464.17	6466.05	4208.58	2638.61	2792.94	4574.12	6964.22	9082.76	10912.66	(97)

Space heating requirement for each month, kWh/month = 0.024 x [(97)m – (95)m] x (41)m

(98)m=	5687.24	4058.9	2859.29	1168.11	310.03	0	0	0	0	1688.96	3970.61	5907.73	

Total per year (kWh/year) = Sum(98)$_{5,9,12}$ = 25650.86 (98)

Space heating requirement in kWh/m²/year 42.79 (99)

8c. Space cooling requirement

Calculated for June, July and August. See Table 10b

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Heat loss rate Lm (calculated using 25°C internal temperature and external temperature from Table 10)													
(100)m=	0	0	0	0	0	7420.04	5841.31	5992.76	0	0	0	0	(100)
Utilisation factor for loss hm													
(101)m=	0	0	0	0	0	0.93	0.96	0.94	0	0	0	0	(101)
Useful loss, hmLm (Watts) = (100)m x (101)m													
(102)m=	0	0	0	0	0	6888.77	5618.75	5632	0	0	0	0	(102)
Gains (solar gains calculated for applicable weather region, see Table 10)													
(103)m=	0	0	0	0	0	10505.19	10044.1	8967.71	0	0	0	0	(103)

Space cooling requirement for month, whole dwelling, continuous (kWh) = 0.024 x [(103)m – (102)m] x (41)m
set (104)m to zero if (104)m < 3 × (98)m

(104)m=	0	0	0	0	0	2603.83	3292.46	2481.77	0	0	0	0	

Total = Sum(104) = 8378.05 (104)

Cooled fraction f C = cooled area ÷ (4) = 0.67 (105)

Intermittency factor (Table 10b)

(106)m=	0	0	0	0	0	0.25	0.25	0.25	0	0	0	0	

Total = Sum(104) = 0 (106)

Space cooling requirement for month = (104)m × (105) × (106)m

(107)m=	0	0	0	0	0	434.38	549.26	414.02	0	0	0	0	

Total = Sum(107) = 1397.67 (107)

Space cooling requirement in kWh/m²/year (107) ÷ (4) = 2.33 (108)

9b. Energy requirements – Community heating scheme

This part is used for space heating, space cooling or water heating provided by a community scheme.

Fraction of space heat from secondary/supplementary heating (Table 11) '0' if none 0 (301)

Fraction of space heat from community system 1 – (301) = 1 (302)

The community scheme may obtain heat from several sources. The procedure allows for CHP and up to four other heat sources; the latter includes boilers, heat pumps, geothermal and waste heat from power stations. See Appendix C.

Fraction of heat from Community CHP 0.87 (303a)

Fraction of community heat from heat source 2 0.13 (303b)

Fraction of total space heat from Community CHP (302) x (303a) = 0.87 (304a)

Fraction of total space heat from community heat source 2 (302) x (303b) = 0.13 (304b)

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Factor for control and charging method (Table 4c(3)) for community heating system		1	(305)
Distribution loss factor (Table 12c) for community heating system		1.05	(306)
Space heating		**kWh/year**	
Annual space heating requirement		25650.86	
Space heat from Community CHP	(98) x (304a) x (305) x (306) =	23432.06	(307a)
Space heat from heat source 2	(98) x (304b) x (305) x (306) =	3501.34	(307b)
Efficiency of secondary/supplementary heating system in % (from Table 4a or Appendix E)		0	(308
Space heating requirement from secondary/supplementary system	(98) x (301) x 100 ÷ (308) =	0	(309)
Water heating			
Annual water heating requirement		2894.26	
If DHW from community scheme:			
Water heat from Community CHP	(64) x (303a) x (305) x (306) =	2643.91	(310a)
Water heat from heat source 2	(64) x (303b) x (305) x (306) =	395.07	(310b)
Electricity used for heat distribution	0.01 × [(307a)...(307e) + (310a)...(310e)] =	299.72	(313)
Cooling System Energy Efficiency Ratio		4.32	(314)
Space cooling (if there is a fixed cooling system, if not enter 0)	= (107) ÷ (314) =	323.53	(315)
Electricity for pumps and fans within dwelling (Table 4f):			
mechanical ventilation - balanced, extract or positive input from outside		0	(330a)
warm air heating system fans		0	(330b)
pump for solar water heating		0	(330g)
Total electricity for the above, kWh/year	=(330a) + (330b) + (330g) =	0	(331)
Energy for lighting (calculated in Appendix L)		1056.62	(332)

10b Fuel costs – Community heating scheme

		Fuel kWh/year		Fuel Price (Table 12)		Fuel Cost £/year	
Space heating from CHP	(307a)	x		2.97	x 0.01 =	695.93	(340a)
Space heating from heat source 2	(307b)	x		4.24	x 0.01 =	148.46	(340b)
Water heating from CHP	(310a)	x		2.97	x 0.01 =	78.52	(342a)
Water heating from heat source 2	(310b)	x		4.24	x 0.01 =	16.75	(342b)
				Fuel Price			
Space cooling (community cooling system)	(315)			13.19	x 0.01 =	42.67	(348)
Pumps and fans	(331)			13.19	x 0.01 =	0	(349)
Energy for lighting	(332)			13.19	x 0.01 =	139.37	(350)
Additional standing charges (Table 12)						120	(351)
Total energy cost	= (340a)...(342e) + (345)...(354) =					1241.71	(355)

11b SAP rating - Community heating scheme

SAP WorkSheet: New dwelling design stage

Energy cost deflator (Table 12)					0.42	(356)
Energy cost factor (ECF)	[(355) x (356)] ÷ [(4) + 45.0] =				0.81	(357)
SAP rating (section12)					88.71	(358)

12b CO2 Emissions – Community heating scheme

Electrical efficiency of CHP unit					27.2	(361)
Heat efficiency of CHP unit					66.8	(362)
		Energy kWh/year		**Emission factor kg CO2/kWh**	**Emissions kg CO2/year**	
Space heating from CHP)	(307a) × 100 ÷ (362) =	35077.94	x	0.22	7576.83	(363)
less credit emissions for electricity	–(307a) × (361) ÷ (362) =	9541.2	x	0.52	-4951.88	(364)
Water heated by CHP	(310a) × 100 ÷ (362) =	3957.94	x	0.22	854.92	(365)
less credit emissions for electricity	–(310a) × (361) ÷ (362) =	1076.56	x	0.52	-558.73	(366)
Efficiency of heat source 2 (%)	If there is CHP using two fuels repeat (363) to (366) for the second fuel				90	(367b)
CO2 associated with heat source 2	[(307b)+(310b)] x 100 ÷ (367b) x			0.22 =	935.14	(368)
Electrical energy for heat distribution	[(313) x			0.52 =	155.56	(372)
Total CO2 associated with community systems	(363)...(366) + (368)...(372)			=	4011.83	(373)
CO2 associated with space heating (secondary)	(309) x			0 =	0	(374)
CO2 associated with water from immersion heater or instantaneous heater	(312) x			0.22 =	0	(375)
Total CO2 associated with space and water heating	(373) + (374) + (375) =				4011.83	(376)
CO2 associated with space cooling	(315) x			0.52 =	167.91	(377)
CO2 associated with electricity for pumps and fans within dwelling	(331)) x			0.52 =	0	(378)
CO2 associated with electricity for lighting	(332))) x			0.52 =	548.39	(379)
Total CO2, kg/year	sum of (376)...(382) =				4728.13	(383)
Dwelling CO2 Emission Rate	(383) ÷ (4) =				7.89	(384)
EI rating (section 14)					90.17	(385)

13b Primary Energy – Community heating scheme

Electrical efficiency of CHP unit					27.2	(361)
Heat efficiency of CHP unit					66.8	(362)
		Energy kWh/year		**Primary factor**	**P.Energy kWh/year**	
Space heating from CHP)	(307a) × 100 ÷ (362) =	35077.94	x	1.22	42795.08	(363)
less credit emissions for electricity	–(307a) × (361) ÷ (362) =	9541.2	x	3.07	-29291.48	(364)
Water heated by CHP	(310a) × 100 ÷ (362) =	3957.94	x	1.22	4828.69	(365)
less credit emissions for electricity	–(310a) × (361) ÷ (362) =	1076.56	x	3.07	-3305.04	(366)
Efficiency of heat source 2 (%)	If there is CHP using two fuels repeat (363) to (366) for the second fuel				90	(367b)
Energy associated with heat source 2	[(307b)+(310b)] x 100 ÷ (367b) x			1.22 =	5281.8	(368)
Electrical energy for heat distribution	[(313) x			=	920.15	(372)

SAP WorkSheet: New dwelling design stage

Total Energy associated with community systems	(363)...(366) + (368)...(372)		=	21229.2	(373)
if it is negative set (373) to zero (unless specified otherwise, see C7 in Appendix C)				21229.2	(373)
Energy associated with space heating (secondary)	(309) x	0	=	0	(374)
Energy associated with water from immersion heater or instantaneous heater	(312) x	1.22	=	0	(375)
Total Energy associated with space and water heating	(373) + (374) + (375) =			21229.2	(376)
Energy associated with space cooling	(315) x	3.07	=	993.25	(377)
Energy associated with electricity for pumps and fans within dwelling	(331)) x	3.07	=	0	(378)
Energy associated with electricity for lighting	(332))) x	3.07	=	3243.82	(379)
Total Primary Energy, kWh/year	sum of (376)...(382) =			25466.28	(383)

APPENDIX (vi)

PEA – PREDICTED ENERGY ASSESSMENT (PRE-EPC)

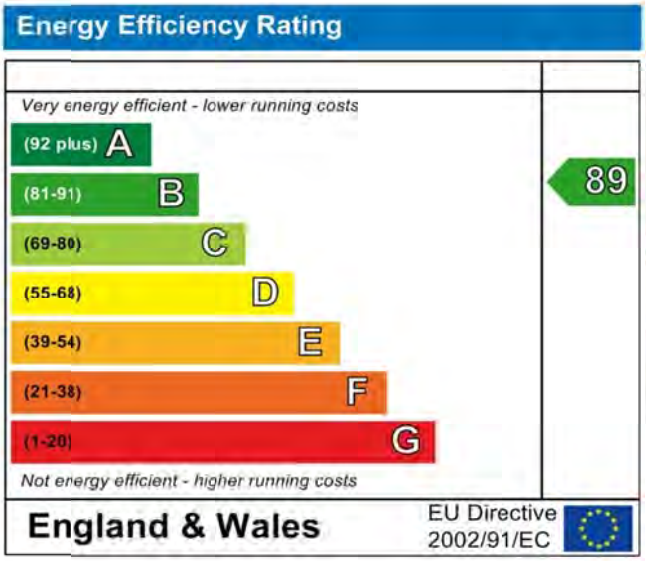
Predicted Energy Assessment

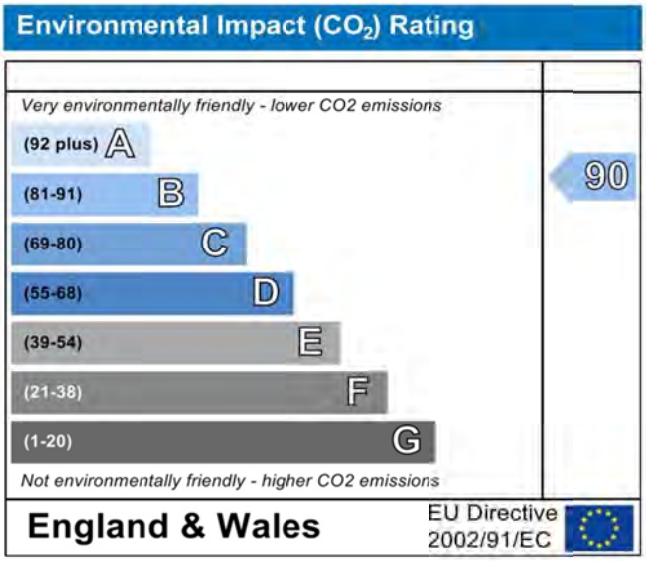
17, Branch Hill
LONDON
NW3 7NA

Dwelling type: Detached House
Date of assessment: 18 September 2014
Produced by: Ondrej Gajdos
Total floor area: 599.4 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 2012 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 (CO2) emissions.



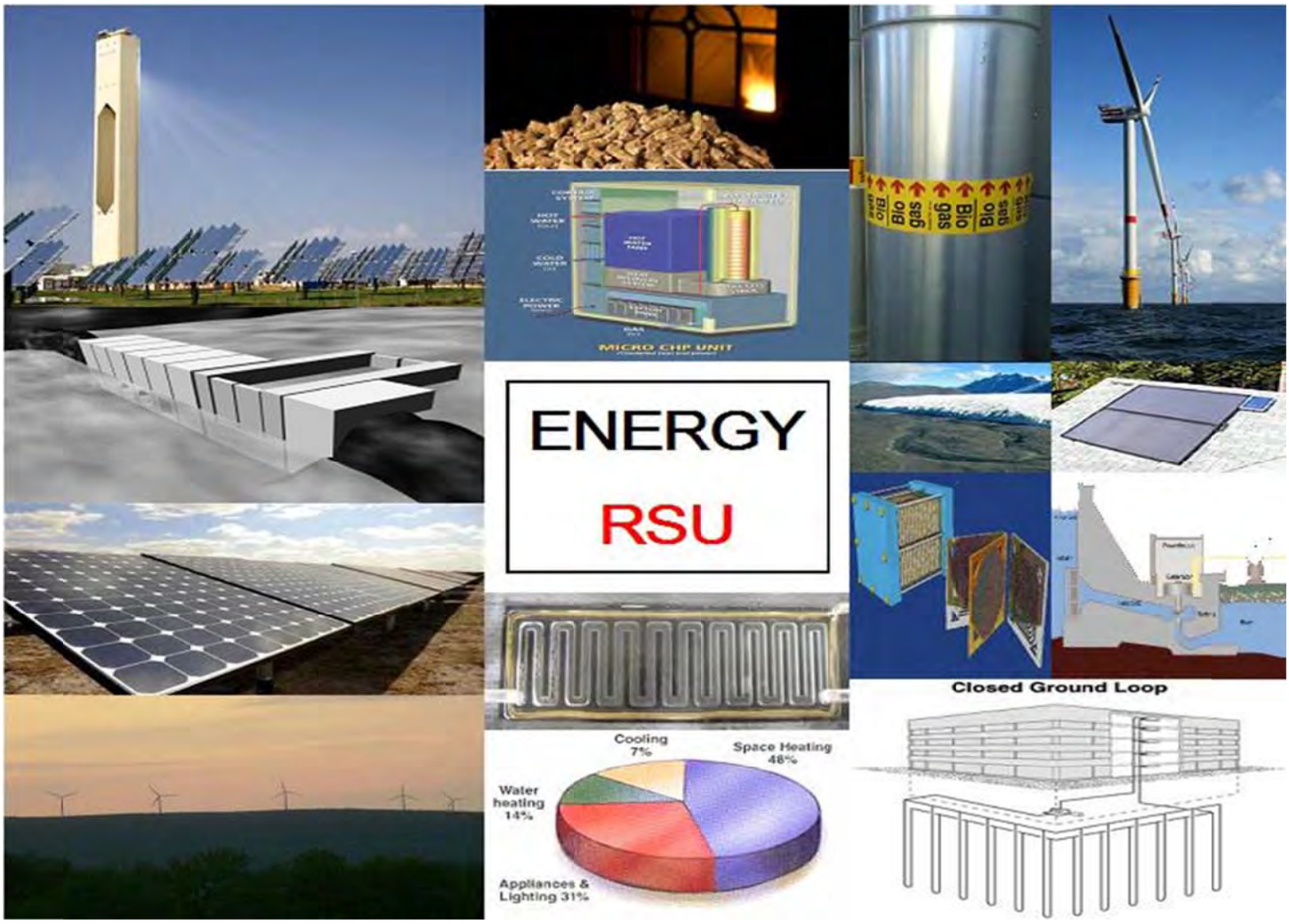


The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

The environmental impact rating is a measure of a home's impact on the environment in terms of carbonn dioxide (CO2) emissions. The higher the rating the less impact it has on the environment.

APPENDIX (vii)

ENERGY RSU – RENEWABLES & SUSTAINABILITY UNIT



ENERGY RSU is an integrated energy sustainability unit able to provide the following:

- SAP Calculations & Certificates - L1A&B New/Existing Buildings (NHER certified)
- SBEM Calculations & Certificates - L2A&B New/Existing Buildings (BRE certified)
- EPC & DEC Certificates – New Build (CIBSE certified)
- Rd SAP Survey EPC Certificates – Existing Buildings (NHER certified)
- Commercial EPC Survey certificates – Existing Buildings (BRE certified) - Level 3, 4 & 5
- Energy Statements & Renewable Reports for Planning
- LEED/BREEAM assessments (USGBC/BRE certified)
- Low/Zero Carbon (LZC) and Sustainability Appraisals/designs (CIBSE Low Carbon Consultant)
- Renewable Energy Appraisals and Designs
- Carbon Rating assessments
- 2D/3D CFD and Dynamic Thermal Simulations
- EPBD Air Conditioning Inspections (Article 20) and EPBD Asset Ratings & Certificates
- Energy Usage (Running Costs)
- Utility/Bill Analysis and Recommendations
- Advice on Green and Environmental Issues Relating to M&E Building Services
- Code for Sustainable Homes New Build and Refurbishment (BRE certified)
- Solar Shading/Sun Studies

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M&E Consultants Energy Consultants

Section 5.0

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ME7 October 2014