Appendices to RETROFIT REPORT

RESIDENTIAL DWELLING

tecs
PUTTING ENERGY INTO COMMUNITIES

critical mass
architects + passivhaus designers

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SAMPLE

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1 Photographs

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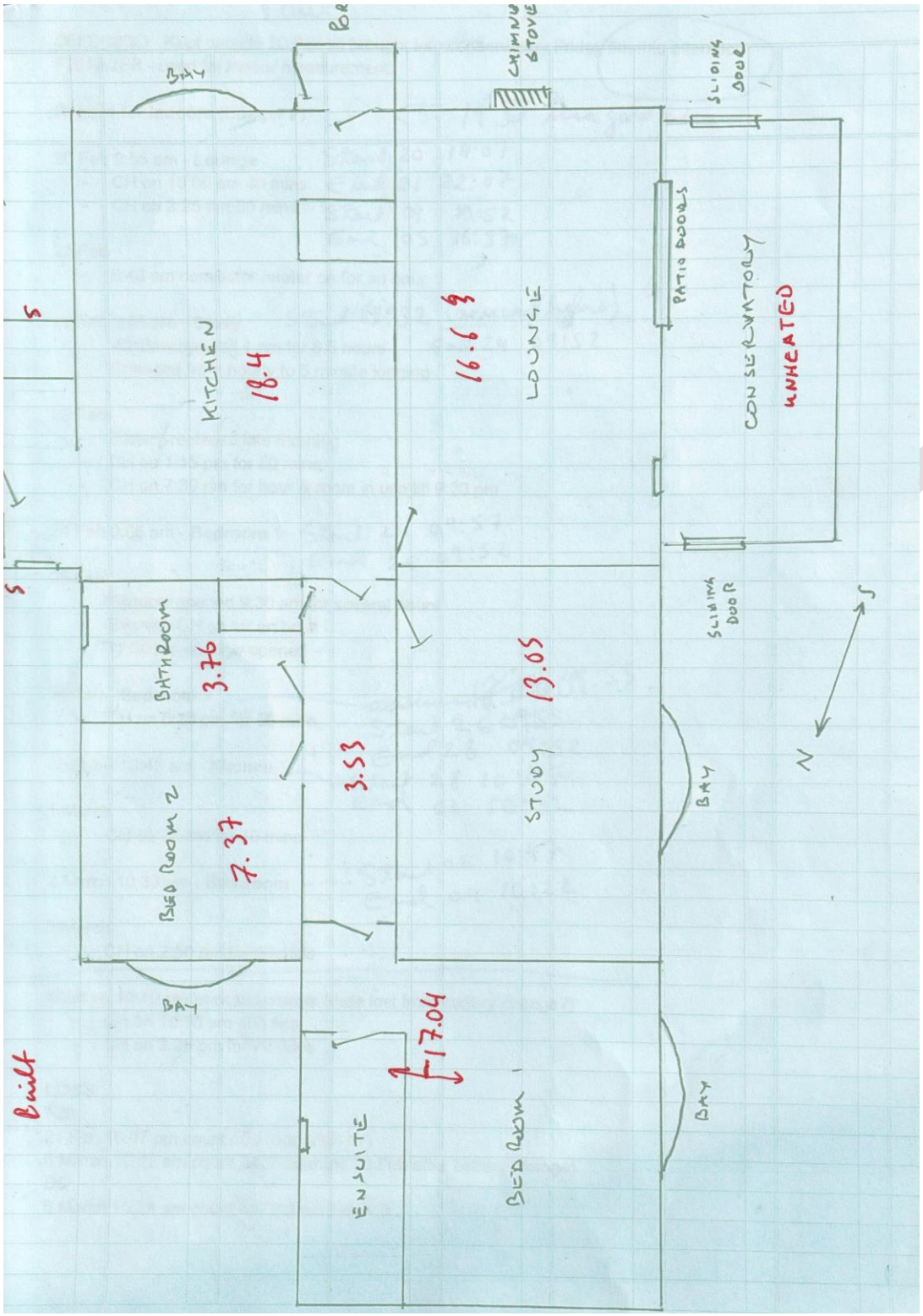
2 Plans



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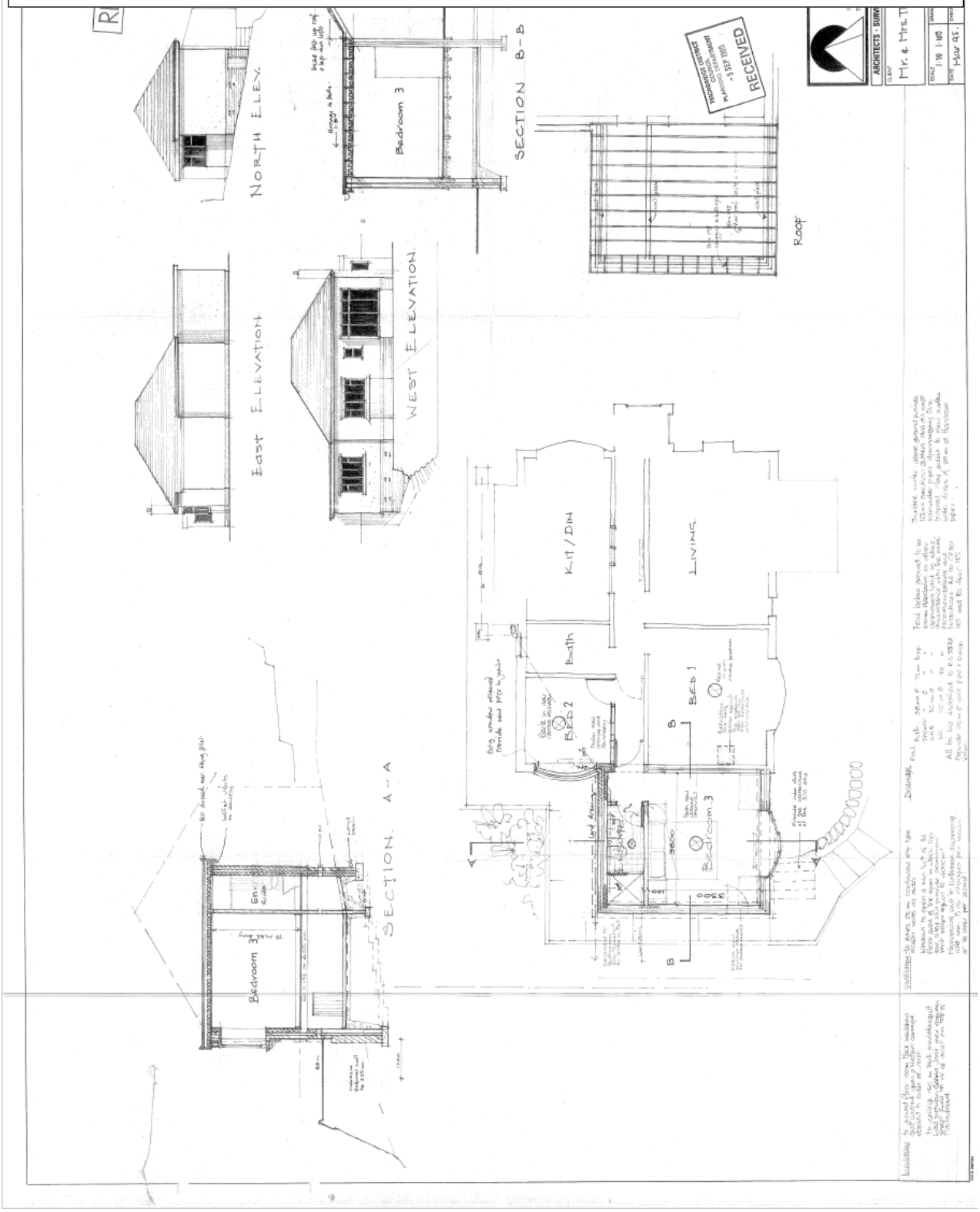

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3 Electrical Energy Consumption

Enter your monthly/quarterly readings and associated dates below

Month	Imported grid kWh	Generated on-site kWh
Jan	341	
Feb	327	
Mar	186	
Apr	56	
May	35	
Jun	25	
Jul	20	
Aug	20	
Sep	30	
Oct	60	
Nov	200	
Dec	257	3790
Totals	1557	3790

Enter the actual or estimated percentage of on-site PV consumption that you

Estimated/Measured on-site PV consumption	46.04	%	?
Emissions			
Actual emissions	0.449	t CO_2e	?
Emissions without PV	0.951	t CO_2e	?
Base load			
Base load	140	Watts	?
Annual base load	1.226	MWh	?
Calculated base load	1.235	MWh	?
Water heating			
Electricity used for water heating	183.8	kWh	?
Space heating			
Electricity used for heating	131.7	kWh	?
Heating efficiency	90	%	?
Heat generated	118.52999999999999	kWh	?
Electricity totals			
Consumption from electric items	2.915	MWh	?
Total electricity consumption	3.231	MWh	?
Metered electricity consumption	3.302	MWh	?

Name	Standby consumption (W)	Per run/day consumption (kWh)	Period	Runs / week	Energy use (kWh/yr)	Base load?	Base load
Coffee machine		0.03	Run	14	21.84	☐	
EVs		888	Year		888	☐	
Halogen oven		92.16	Year		92.16	☐	
Main oven		106.5	Year		106.5	☐	
2 Hobs		188.31	Year		188.31	☐	
Microwave		27.37	Year		27.37	☐	
Toaster		19.79	Year		19.79	☐	
Washing Mc	0.38	33.75	Year		37.079	☑	3.329
Rice maker		26.4	Year		26.4	☐	
Mac Mini & screen		50	Year		50	☐	
Lighting		41.5	Year		41.5	☐	
Mac Air		40.5	Year		40.5	☐	
Unrecorded base load	140		Select period		1226.4	☑	1226.4
Bread maker	0.59		Select period		5.168	☑	5.168
Dishwasher		32.4	Year		32.4	☐	
Other kit		112	Year		112	☐	
			Select period			☐	
Totals	140.97				2915.417		1234.897

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4 Simple Heat Energy Comparison

We have assumed a lower average temperature (12^{O}C) than that calculated by your assessment (13.5^{O}C). This is to partially compensate for your specific situation where you are not heating for prolonged and regular morning/evening period.

For this simple comparison we have also assumed that you are only heating about 50% of your space, hence the smaller floor area.

Heat energy used	1868.6	kWh	?
Average indoor temperature	12	C	?
Post code	TQ14 9JH		?
Location	293439E 73446N		?
Weather station	Torquay		?
Heating degree days	857	HDD	?
Floor area	From building 40	m^2	?
Envelope area	From building 284.52	m^2	?

A comparison of your home if heated to 21^{O}C during a morning and evening heating cycle is given below. Note that we are currently unable to provide heat energy consumption at 11^{O}C.

Comparison buildings at 17.5C

This represents a thermostat set at 21C for some of the time, reduced by 3.5C to give a daily average

	Energy usage KwH	kWh m^2/year	U Value	
Your Usage	4921	123.03	0.319	?
If it were an eqUK - Average UK house	5400	135	0.95	?
If it met current TFEE	3600	90	0.44	?
EnerPHit - retrofitted Passive house	1000	25	0.18	?
PH - Passive House	600	15	0.11	?

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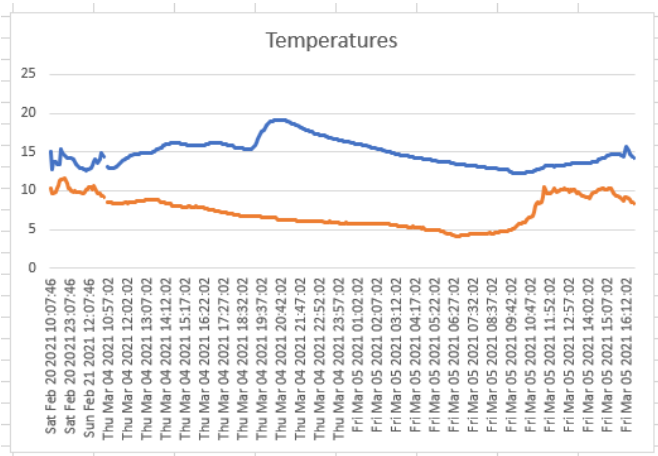
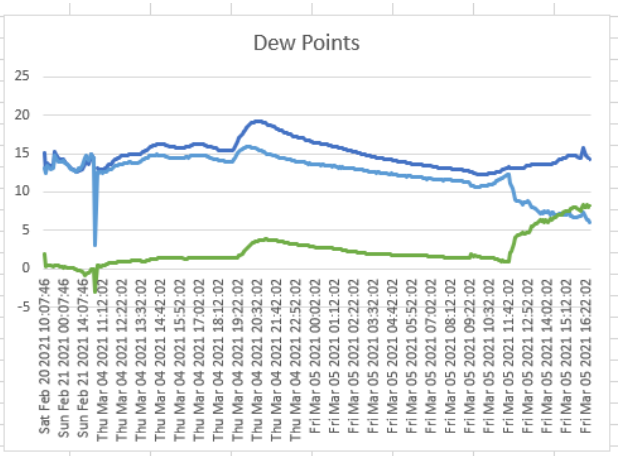
5 Heat Energy Consumption

All recordings over a 48hr period, on different days in Feb/Mar.

Lounge temperature and dew points:

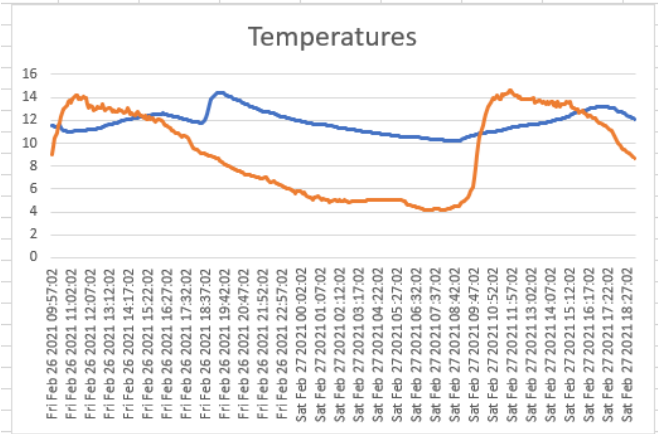


blue= internal temp
orange= external temp

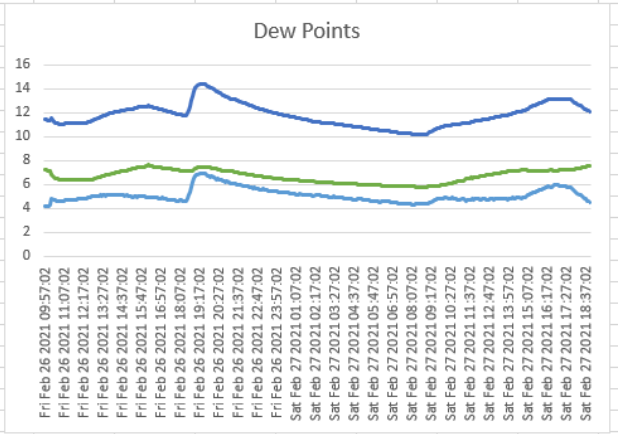


dark blue= internal temp
light blue= safe dew point
green= diff between temp & safe dew point

Bedroom 2 (original 1930's build):



blue= internal temp
orange= external temp



dark blue= internal temp
light blue= safe dew point
green= diff between temp & safe dew point

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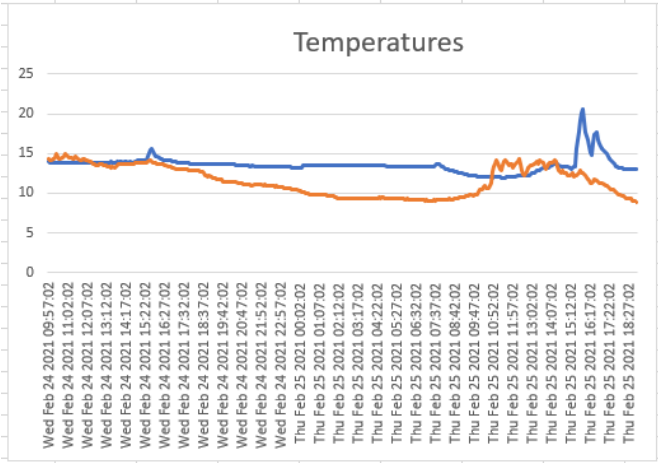
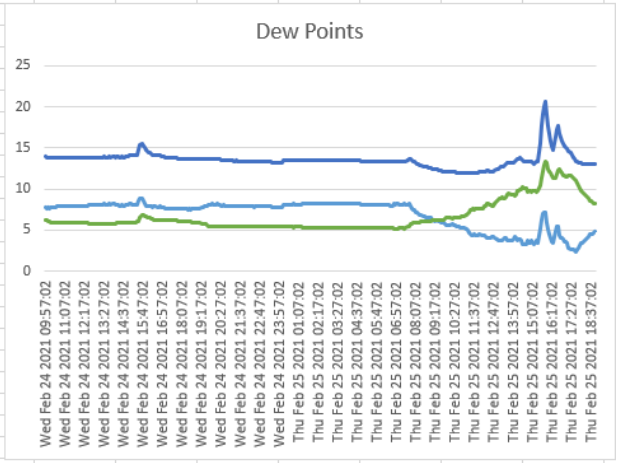
Bedroom 1 (1990 building regulations):

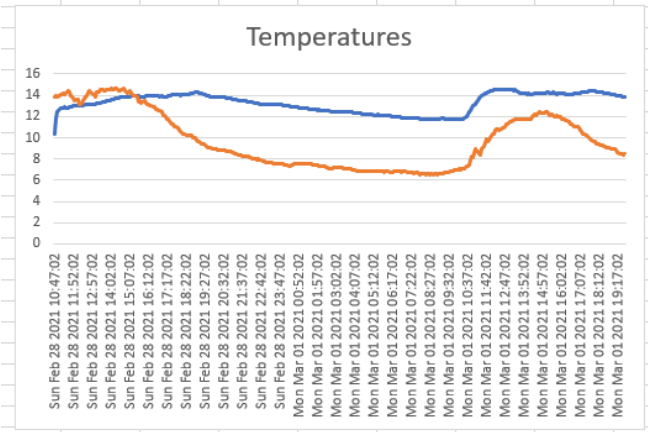


blue= internal temp
orange= external temp

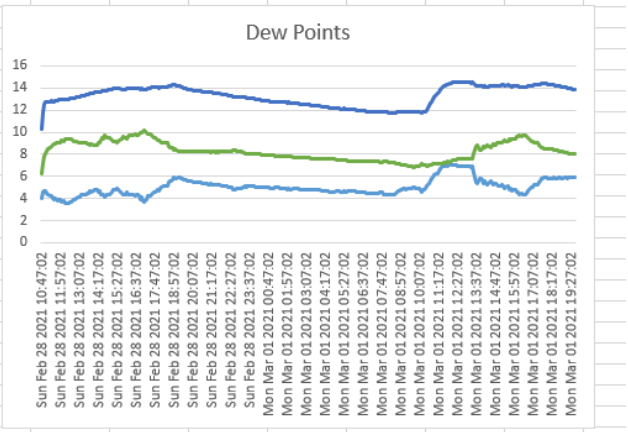


dark blue= internal temp
light blue= safe dew point
green= diff between temp & safe dew point

Kitchen:



blue= internal temp
orange= external temp



dark blue= internal temp
light blue= safe dew point
green= diff between temp & safe dew point

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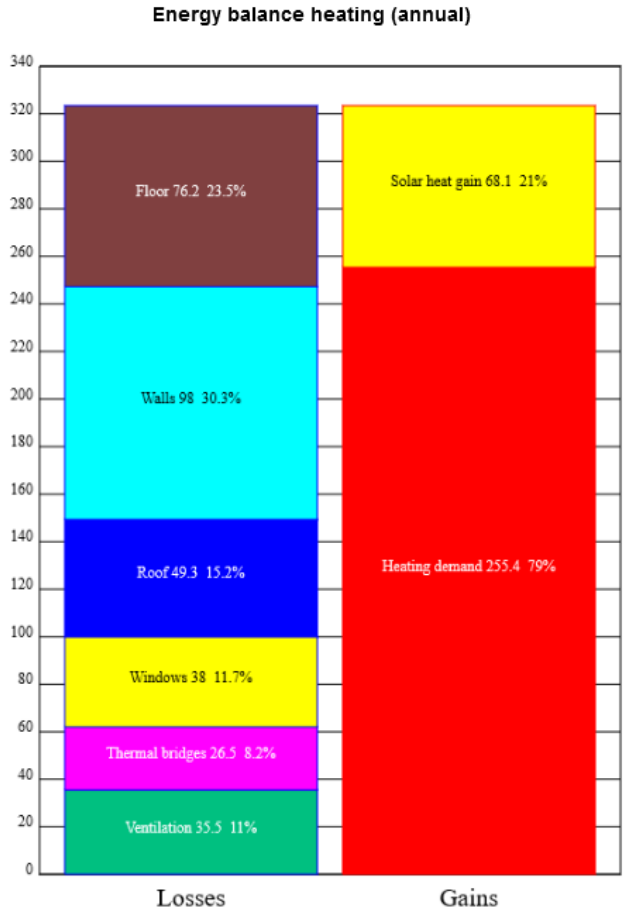
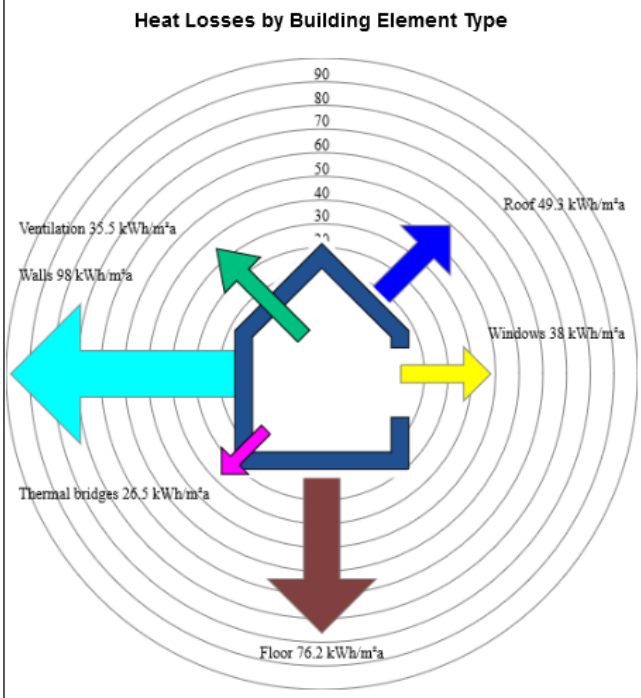
The following modelling results are based on your entries using the E-Pack app while maintaining a continuous 20^{O}C throughout your home. We have verified these and confirm they represent a reasonable assessment. A more accurate assessment can be obtained by following the E-Pack assessment process during the 'steady state' conditions specified and using the measuring tools provided.





The following are monthly calculations:

Month	Degree days	Ground Temperature	Fabric kWh	Wind speed m/s	Air changes per hour	Ventilation Loss coefficient W/K	Heat transfer coefficient W/K	Ventilation loss kWh	Heat loss rate kWh	Solar radiation W/m	Solar gain kWh	Heating requirement kWh	Cooling requirement kWh
jan	403	7.19	2990.93	6	0.58	39.13	348.36	378.43	3369.36	11.5	188.69	3180.67	
feb	381	6.92	2827.66	5.6	0.57	38.43	347.67	351.42	3179.081	16.2	263.53	2915.55	
mar	377	7.19	2797.97	5.6	0.57	38.43	347.67	347.73	3145.705	27.54	442.26	2703.44	
apr	303	7.92	2248.77	5	0.56	37.48	346.72	272.56	2521.331	37.51	593.9	1927.43	
may	223	8.92	1655.03	5	0.56	37.48	346.72	200.6	1855.633	44.21	693.05	1162.59	
jun	138	9.92	1024.19	4.4	0.54	36.64	345.87	121.35	1145.536	46.55	726.77	418.76	
jul	86	10.65	638.26	4.4	0.54	36.64	345.87	75.62	713.885	42.45	664.02	49.86	
aug	110	10.92	816.38	4.3	0.54	36.51	345.74	96.38	912.765	39.45	621.85	290.92	
sep	150	10.65	1113.25	4.7	0.55	37.05	346.28	133.37	1246.618	31.11	496.67	749.95	
oct	244	9.92	1810.89	5.4	0.56	38.1	347.34	223.13	2034.021	21.02	340.36	1693.66	
nov	320	8.92	2374.94	5.5	0.57	38.27	347.5	293.88	2668.82	13.14	215.06	2453.76	
dec	343	7.92	2545.63	5.9	0.58	38.95	348.18	320.62	2866.253	9.27	152.4	2713.86	
Total	3078		**22843.91**					**2815.1**			**5398.56**		**0**
Metered heat												**1868.6**	
Per m^2			288					35.49			68.06		0
Months when heating exceeds cooling													
Total			**22843.91**					**2815.1**			**5398.56**	**20260.45**	
Per m^2			**288**					**35.49**			**68.06**	**255.43**	
% of losses			112.75					13.89			-26.65	100	

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