

Summary of Results

The building heat loss and energy usage calculations have been undertaken based on the worst-case scenario. e.g. the coldest outside temperature and the whole building heated to its highest design temperature(s).

External Temperature	-3.40 °C
Internal Temperature	18.00 °C - 22.00 °C
Total Building Heat Loss	15082.09 W
Heat Pump Model	

Worst Performing Room (based on area)

Heat Loss Per Area: $\geq 75 \text{ W/m}^2$ $< 75 \text{ W/m}^2$ $< 35 \text{ W/m}^2$

Room Name	Study
Total Room Heat Loss	1306.51 W
Room Area	13.23 m ²
Heat Loss Per Area	98.74 W/m ²

Room Material

Walls

Room Name	External Wall	Internal Wall
Lounge	External Wall (0.61 W)	Building Regs 2022 Limit (0.26 W)
Study	External Wall (0.61 W)	Building Regs 2022 Limit (0.26 W)
Utility	External Wall (0.61 W)	Building Regs 2022 Limit (0.26 W)
W/C	External Wall (0.61 W)	Building Regs 2022 Limit (0.26 W)
Kitchen/Dining	External Wall (0.61 W)	Building Regs 2022 Limit (0.26 W)
Hall	External Wall (0.61 W)	Building Regs 2022 Limit (0.26 W)
Bedroom 2	External Wall (0.61 W)	Building Regs 2022 Limit (0.26 W)
Bedroom 3	External Wall (0.61 W)	Building Regs 2022 Limit (0.26 W)
Bedroom 4	External Wall (0.61 W)	Building Regs 2022 Limit (0.26 W)
Bed 4 Ensuite	External Wall (0.61 W)	Building Regs 2022 Limit (0.26 W)
Bathroom	External Wall (0.61 W)	Building Regs 2022 Limit (0.26 W)
Bedroom 1	External Wall (0.61 W)	Building Regs 2022 Limit (0.26 W)
Bed 1 Ensuite	External Wall (0.61 W)	Building Regs 2022 Limit (0.26 W)
Landing	External Wall (0.61 W)	Building Regs 2022 Limit (0.26 W)

Windows & Doors

Room Name	Window	External Door	Internal Door
Lounge	Window (1.40 W)		
Study	Window (1.40 W)		

Utility			
W/C	Window (1.40 W)		
Kitchen/Dining	Window (1.40 W)		
Hall		Door (3.00 W)	
Bedroom 2	Window (1.40 W)		
Bedroom 3	Window (1.40 W)		
Bedroom 4	Window (1.40 W)		
Bed 4 Ensuite			
Bathroom	Window (1.40 W)		
Bedroom 1	Window (1.40 W)		
Bed 1 Ensuite	Window (1.40 W)		
Landing	Window (1.40 W)		

Floor & Ceiling/Roof

Room Name	Floor	Ceiling/Roof
Lounge	Floor (1.20 W)	Roof (0.13 W)
Study	Floor (1.20 W)	Roof (0.13 W)
Utility	Floor (1.20 W)	Roof (0.13 W)
W/C	Floor (1.20 W)	Roof (0.13 W)
Kitchen/Dining	Floor (1.20 W)	Roof (0.13 W)
Hall	Floor (1.20 W)	Roof (0.13 W)
Bedroom 2	Building Regs 2022 Limit (0.18 W)	Roof (0.13 W)
Bedroom 3	Building Regs 2022 Limit (0.18 W)	Roof (0.13 W)

Bedroom 4	Building Regs 2022 Limit (0.18 W)	Roof (0.13 W)
Bed 4 Ensuite	Building Regs 2022 Limit (0.18 W)	Roof (0.13 W)
Bathroom	Building Regs 2022 Limit (0.18 W)	Roof (0.13 W)
Bedroom 1	Building Regs 2022 Limit (0.18 W)	Roof (0.13 W)
Bed 1 Ensuite	Building Regs 2022 Limit (0.18 W)	Roof (0.13 W)
Landing	Building Regs 2022 Limit (0.18 W)	Roof (0.13 W)

Room-by-Room Heat Loss Calculations

Worcester Bosch

Cotswold Way, Warndon, Worcester, WR4 9SW

01905751464

imira.mutkova@uk.bosch.com

Date of Calculation: 31 Mar 2026

Site Address:

7543.1.2 - Plot 47 (Rev 1)

Caerleon Rd, Newport, UK

Heat Loss Per Area: ≥ 75 W/m² < 75 W/m² < 35 W/m²

Name	Design Temp	Air Changes / Hour	Thermal Bridging	Area	Volume	Fabric Heat Loss	Ventilation Heat Loss	Spare Capacity Heat Loss	Total Heat Loss	W/m ²	Annual Energy
Lounge	21.0 °C	1.00	0.05	20.79 m ²	62.36 m ³	1015.22 W	510.22 W	157.62 W	1733.82 W	83.41 W/m ² 	3789.40 kWh
Study	21.0 °C	1.50	0.05	13.23 m ²	39.69 m ³	667.20 W	487.17 W	118.77 W	1306.51 W	98.74 W/m ² 	2855.47 kWh
Utility	18.0 °C	2.00	0.05	5.76 m ²	17.29 m ³	172.76 W	248.10 W	42.95 W	472.45 W	81.99 W/m ² 	1032.57 kWh
W/C	18.0 °C	1.50	0.05	4.53 m ²	13.60 m ³	169.33 W	146.40 W	32.42 W	356.62 W	78.66 W/m ² 	779.41 kWh
Kitchen/ Dining	21.0 °C	1.50	0.05	47.69 m ²	143.07 m ³	2202.34 W	1755.95 W	406.84 W	4475.24 W	93.84 W/m ² 	9780.98 kWh
Hall	18.0 °C	1.00	0.05	20.24 m ²	60.71 m ³	563.36 W	435.64 W	102.72 W	1129.88 W	55.84 W/m ² 	2469.44 kWh
Bedroom 2	18.0 °C	1.00	0.05	20.80 m ²	49.93 m ³	489.73 W	358.28 W	87.25 W	959.75 W	46.14 W/m ² 	2097.59 kWh
Bedroom 3	18.0 °C	1.00	0.05	20.97 m ²	50.33 m ³	457.10 W	361.15 W	84.11 W	925.22 W	44.12 W/m ² 	2022.14 kWh

Bedroom 4	21.0 °C	1.50	0.05	17.20 m ²	41.28 m ³	391.10 W	506.61 W	91.73 W	1008.99 W	58.67 W/m ² 	2205.22 kWh
Bed 4 Ensuite	22.0 °C	1.50	0.05	3.62 m ²	8.70 m ³	78.77 W	111.15 W	19.38 W	213.23 W	58.83 W/m ² 	466.04 kWh
Bathroom	22.0 °C	1.50	0.05	4.52 m ²	10.85 m ³	129.34 W	138.58 W	27.44 W	301.82 W	66.78 W/m ² 	659.66 kWh
Bedroom 1	21.0 °C	1.50	0.05	21.36 m ²	51.27 m ³	512.91 W	629.28 W	116.78 W	1284.62 W	60.13 W/m ² 	2807.64 kWh
Bed 1 Ensuite	22.0 °C	1.50	0.05	4.53 m ²	10.87 m ³	124.40 W	138.83 W	26.94 W	296.39 W	65.46 W/m ² 	647.78 kWh
Landing	18.0 °C	1.00	0.05	18.57 m ²	44.57 m ³	230.06 W	319.84 W	56.14 W	617.54 W	33.25 W/m ² 	1349.68 kWh
Total/Avg.	NA	NA	NA	223.82 m²	604.50 m³	7203.60 W	6147.21 W	1371.10 W	15082.09 W	67.39 W/m²	32963.02 kWh

Material Heat Loss

Room Name	External Wall	Internal Wall	Party Wall	Window	External Door	Internal Door	Floor	Ceiling/ Roof
Lounge	346.68 W	12.03 W	0.00 W	245.95 W	0.00 W	0.00 W	399.09 W	11.47 W
Study	267.51 W	8.98 W	0.00 W	136.64 W	0.00 W	0.00 W	254.04 W	0.03 W
Utility	80.97 W	0.00 W	0.00 W	0.00 W	0.00 W	0.00 W	89.89 W	1.90 W
W/C	37.80 W	0.00 W	0.00 W	59.92 W	0.00 W	0.00 W	70.72 W	0.88 W
Kitchen/Dining	757.94 W	21.66 W	0.00 W	491.90 W	0.00 W	0.00 W	915.66 W	15.18 W
Hall	118.54 W	0.00 W	0.00 W	0.00 W	128.40 W	0.00 W	315.67 W	0.75 W
Bedroom 2	242.09 W	0.00 W	0.00 W	189.56 W	0.00 W	0.00 W	0.20 W	57.87 W
Bedroom 3	257.77 W	0.00 W	0.00 W	140.32 W	0.00 W	0.00 W	0.68 W	58.34 W
Bedroom 4	240.06 W	12.49 W	0.00 W	78.58 W	0.00 W	0.00 W	5.41 W	54.56 W
Bed 4 Ensuite	61.10 W	2.34 W	0.00 W	0.00 W	0.00 W	0.00 W	3.36 W	11.97 W
Bathroom	41.96 W	4.68 W	0.00 W	64.01 W	0.00 W	0.00 W	3.77 W	14.92 W
Bedroom 1	270.81 W	13.84 W	0.00 W	159.87 W	0.00 W	0.00 W	0.63 W	67.77 W
Bed 1 Ensuite	41.73 W	2.63 W	0.00 W	64.01 W	0.00 W	0.00 W	1.08 W	14.95 W
Landing	69.17 W	0.00 W	0.00 W	107.86 W	0.00 W	0.00 W	1.37 W	51.66 W
Total	2834.12 W	78.64 W	0.00 W	1738.62 W	128.40 W	0.00 W	2061.58 W	362.25 W

Heat Emitter Summary

Worcester Bosch

Cotswold Way, Warndon, Worcester, WR4 9SW

01905751464

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Site Address:

7543.1.2 - Plot 47 (Rev 1)

Caerleon Rd, Newport, UK

Date of Calculation: 31 Mar 2026

Demand Met: < 50% < 100% ≥ 100%

Room Summary:

Room Name	Design Temperature	Heat Loss	Heat Supplied
Lounge	21.0 °C	1734 W	1923 W (110.91%) 
Study	21.0 °C	1307 W	1348 W (103.15%) 
Utility	18.0 °C	472 W	546 W (115.60%) 
W/C	18.0 °C	357 W	382 W (107.17%) 
Kitchen/Dining	21.0 °C	4475 W	4600 W (102.80%) 
Hall	18.0 °C	1130 W	1310 W (115.96%) 
Bedroom 2	18.0 °C	960 W	1092 W (113.76%) 
Bedroom 3	18.0 °C	925 W	1092 W (118.00%) 
Bedroom 4	21.0 °C	1009 W	1152 W (114.15%) 
Bed 4 Ensuite	22.0 °C	213 W	221 W (103.77%) 
Bathroom	22.0 °C	302 W	323 W (106.91%) 
Bedroom 1	21.0 °C	1285 W	1344 W (104.60%) 
Bed 1 Ensuite	22.0 °C	296 W	323 W (108.87%) 
Landing	18.0 °C	618 W	655 W (106.04%) 

Room Summary by Emitter Type:

Room Name	Emitter Type	Design Temperature	Heat Loss	Heat Supplied
Lounge	RAD	21.0 °C	1923 W	1923 W (110.91%) 
Study	RAD	21.0 °C	1348 W	1348 W (103.15%) 
Utility	RAD	18.0 °C	546 W	546 W (115.60%) 
W/C	RAD	18.0 °C	382 W	382 W (107.17%) 
Kitchen/Dining	RAD	21.0 °C	4600 W	4600 W (102.80%) 
Hall	RAD	18.0 °C	1310 W	1310 W (115.96%) 
Bedroom 2	RAD	18.0 °C	1092 W	1092 W (113.76%) 
Bedroom 3	RAD	18.0 °C	1092 W	1092 W (118.00%) 
Bedroom 4	RAD	21.0 °C	1152 W	1152 W (114.15%) 
Bed 4 Ensuite	RAD	22.0 °C	221 W	221 W (103.77%) 
Bathroom	RAD	22.0 °C	323 W	323 W (106.91%) 
Bedroom 1	RAD	21.0 °C	1344 W	1344 W (104.60%) 
Bed 1 Ensuite	RAD	22.0 °C	323 W	323 W (108.87%) 
Landing	RAD	18.0 °C	655 W	655 W (106.04%) 

Radiators:

Room Name	Design Temp	Heat Loss	Mean Water Temp	Delta T	Emitter Name	Emitter Height	Emitter Width	Emitter Type	Output @ 50°C Delta T	Output @ System Delta T	Flow Rate	Demand Met
Lounge	21.0 °C	1734 W	50.0 °C	10.0 °C	Towelrad Compact Compact T33 Triple	600 mm	1600 mm	RAD	3904.0 W	1923 W	0.05 L/s	110.91% 
Study	21.0 °C	1307 W	50.0 °C	10.0 °C	Towelrad Compact Compact T22 Double	600 mm	1600 mm	RAD	2736.0 W	1348 W	0.04 L/s	103.15% 
Utility	18.0 °C	472 W	50.0 °C	10.0 °C	Towelrad Compact Compact T22 Double	700 mm	500 mm	RAD	980.0 W	546 W	0.01 L/s	115.60% 
W/C	18.0 °C	357 W	50.0 °C	10.0 °C	Towelrad Pisa Pisa Chrome Straight	1800 mm	600 mm	RAD	673.0 W	382 W	0.01 L/s	107.17% 
Kitchen/Dining	21.0 °C	4475 W	50.0 °C	10.0 °C	Towelrad Compact Compact T33 Triple	700 mm	1400 mm	RAD	3867.0 W	1894 W	0.05 L/s	42.33% 
Kitchen/Dining	21.0 °C	4475 W	50.0 °C	10.0 °C	Towelrad Compact Compact T33 Triple	700 mm	2000 mm	RAD	5524.0 W	2706 W	0.07 L/s	60.47% 
Hall	18.0 °C	1130 W	50.0 °C	10.0 °C	Towelrad Compact Compact T22	700 mm	1200 mm	RAD	2351.0 W	1310 W	0.03 L/s	115.96% 

					Double							
Bedroom 2	18.0 °C	960 W	50.0 °C	10.0 °C	Towelrad Compact Compact T22 Double	700 mm	1000 mm	RAD	1959.0 W	1092 W	0.03 L/s	113.76% 
Bedroom 3	18.0 °C	925 W	50.0 °C	10.0 °C	Towelrad Compact Compact T22 Double	700 mm	1000 mm	RAD	1959.0 W	1092 W	0.03 L/s	118.00% 
Bedroom 4	21.0 °C	1009 W	50.0 °C	10.0 °C	Towelrad Compact Compact T22 Double	700 mm	1200 mm	RAD	2351.0 W	1152 W	0.03 L/s	114.15% 
Bed 4 Ensuite	22.0 °C	213 W	50.0 °C	10.0 °C	Towelrad Pisa Pisa Chrome Straight	1600 mm	450 mm	RAD	460.0 W	221 W	0.01 L/s	103.77% 
Bathroom	22.0 °C	302 W	50.0 °C	10.0 °C	Towelrad Pisa Pisa Chrome Straight	1800 mm	600 mm	RAD	673.0 W	323 W	0.01 L/s	106.91% 
Bedroom 1	21.0 °C	1285 W	50.0 °C	10.0 °C	Towelrad Compact Compact T22 Double	700 mm	1400 mm	RAD	2743.0 W	1344 W	0.03 L/s	104.60% 
Bed 1 Ensuite	22.0 °C	296 W	50.0 °C	10.0 °C	Towelrad Pisa Pisa Chrome Straight	1800 mm	600 mm	RAD	673.0 W	323 W	0.01 L/s	108.87% 
Landing	18.0 °C	618 W	50.0 °C	10.0 °C	Towelrad Compact Compact T22 Double	700 mm	600 mm	RAD	1175.0 W	655 W	0.02 L/s	106.04% 