

RIDGE

VIADUX PHASE 2
EUI PREDICTION
ARTAL & SALBOY
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EUI PREDICTION VIADUX

To support the Environmental Impact Assessment for the sustainability planning deliverables, an energy usage intensity figure is required to support the SAP primary energy figures which accounts for predicted heating, hot water, systems, and lighting figures but exclude small power. This document will look at existing sources to provide a reasonable assumption of a suitable small power figure based on RIBA challenge 2030 residential target energy proportions and Government data from 2019 on existing residential buildings.

RIBA Challenge 2030 Small power estimates

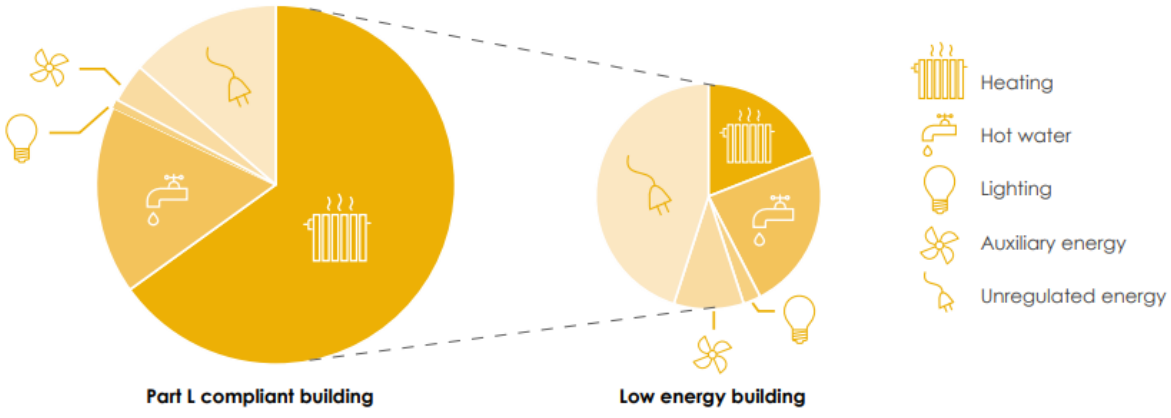


Figure 1.7 - Residential energy breakdown

Small power circa 45% of overall energy usage in low-energy building. This would be a pessimistic % breakdown if assuming SAP Primary energy figure makes up 55% of the overall building energy.

Government data: Small power EUIs for existing residential buildings

EPC RATING	FIRST YEAR OF CONSUMPTION	AVG. ENERGY CONSUMPTION PER M² (KWH/M²)	AVG. ELECTRICITY CONSUMPTION PER M² (KWH/M²)	AVG. GAS CONSUMPTION PER M² (KWH/M²)	NUMBER OF PROPERTIES
A	2015	117	34	83	1,225
A	2016	113	32	81	1,710
A	2017	113	29	84	1,453
B	2015	127	35	92	69,066
B	2016	124	33	91	89,915
B	2017	122	31	90	98,584
C	2015	132	46	85	17,747
C	2016	124	49	75	14,430
C	2017	121	53	68	11,589
D	2015	117	88	29	1,067
D	2016	117	104	13	1,019
D	2017	114	102	12	1,155

If we look at the electricity consumption of EPC ratings A & B buildings the figure comes out at 32.75 kwh/m2/yr. This would outline a worst-case scenario however it would include lighting EUIs in that figure.
Source: Energy consumption in new domestic buildings 2015 – 2017 (England and Wales) ***December 2019***
Energy consumption in new domestic buildings 2015 – 2017 (England and Wales) (publishing.service.gov.uk)

Benchmark data against Sample SAP data

	EPC A & B BUILDINGS	EPC A BUILDINGS
Mean kwh/m^2/yr =	32.75	31.56

Sample Dwelling 1:
Primary energy comes out at 39.2 kwh/m2/yr, if 32.75 kwh/m2 is assumed for small power that would equate to a small power usage ratio of 45.5% of the dwelling energy.

Sample Dwelling 2:
Primary energy comes out at 29.79 kwh/m2/yr, if 32.75 kwh/m2 is assumed for small power that would equate to a small power usage ratio of 52.4% of the dwelling energy.

Sample Dwelling 2:
Primary energy comes out at 29.18 kWh/m2/yr, if 32.75 kWh/m2 is assumed for small power that would equate to a small power usage ratio of 52.9% of the dwelling energy.

Should only EPC A buildings be considered the figure comes out at 31.56 kWh/m2/yr, the adjusted % scale for the three sample dwellings comes to:

Sample Dwelling 1: 44.6%
Sample Dwelling 2: 51.4%
Sample Dwelling 3: 52.0%

Residential EUI Concluding statement

Table 11 shows the electricity consumption of EPC ratings A & B based on Government data, with an average figure coming out at 32.75kwh/m2/yr. As this figure does include lighting as well as unregulated energy, this would outline a worst-case scenario. 32.75kwh/m2/yr was considered against the SAP calculations as the initial small power figure however this illustrated a small power ratio between 45.5-52.9%. This small power figure prorated to 45% for each SAP sample provides an average small power estimate of 29.46kWh/m2/yr. With consideration that the proposed development is currently under design five years on from the gathered government data, this should provide a robust estimate. The mean primary energy consumption across the three sample dwellings is 32.73kWh/m2/yr, using 29.46kWh/m2/yr as small power, **this predicts an EUI for the building at 62.19kWh/m2/yr.**

Retail EUI Statement

For the Retail units located on block 2C, the BRUKL can be used for an indicative EUI figure based on Part L methodology.

The resultant summary table from the BRUKL certificate illustrates the predicted energy use for regulated (Heating, Cooling, Auxiliary, Lighting & Hot Water) and unregulated (equipment) energy.

Energy Consumption by End Use [kWh/m^2]		
	Actual	**Notional**
Heating	11.88	13.84
Cooling	1.78	0.71
Auxiliary	3.64	7.85
Lighting	7.58	9.41
Hot water	0.73	0.66
Equipment*	9.28	9.28
TOTAL**	**25.61**	**32.47**

Regulated total energy: 25.61 kWh/m^2/yr
Unregulated Energy: 9.28 kWh/m^2/yr

Total predicted EUI for the 2C retail unit: 34.89 kWh/m^2/yr