

Greater Cambridgeshire Shared Planning

Update to Net Zero Policy Cost Analysis Report

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Currie & Brown

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1. Introduction

This report provides an update to previous cost analysis[1] undertaken for Greater Cambridge Shared Planning to reflect current (Q2 2025) cost data and updated energy modelling scenarios for achieving compliance with the proposed net zero policies for new residential and non-residential developments.

Net zero policy standards tested in this cost analysis are:

- Space heat demand[2] – 15-20 kWh per m^2
- Energy use intensity[3] – 35 kWh per m^2 for housing and 65 kWh per m^2 for schools
- No fossil fuel (eg natural gas) connection or use for space heating and hot water supply
- Renewable energy generation – targeting onsite generation at least equivalent to onsite energy use

The analysis considers the same house types that were previously evaluated in 2021, namely:

- Semi-detached house (Gross Internal Area 103m^2)
- Terraced house (Gross Internal Area 84.2m^2)
- Low rise block of 40 apartments (Gross Internal Area 3,889m^2)
- Secondary School (Gross Internal Area 3,287m^2)

In this update, costs are shown in comparison to the notional specification for current building regulations (Part L 2021)[4] rather than previous regulations (Part L 2013).

Details of each reference building including specifications for current regulations and to achieve the net zero policy are included in Appendix A.

[1] Greater Cambridgeshire Shared Planning, 2021. Greater Cambridge Local Plan: Cost Report. July 2021.
[2] Energy (heat input) required to maintain a comfortable internal environment.
[3] Total energy required including all energy uses (heating, hot water, ventilation, lighting, cooking, small power, etc).
[4] Following the gas boiler and photovoltaics compliance route.

2. Basis for cost analysis

Elemental cost data

The uplift costs associated with each specification were estimated based on Currie & Brown's cost datasets for energy efficient and low carbon technologies. These incorporate information from market prices, specific market testing and first principles cost planning by specialist quantity surveyors.

The costs are based on Q2 2025 prices and reflect an East of England cost base.

Costs were developed for each building element linked to energy efficiency or carbon emissions, principally external envelope and building services. Those elements that are not materially affected by the energy efficiency / low carbon technology options. E.g., substructure, roof coverings, kitchen and bathrooms, etc, were not costed in detail. Instead, these costs were incorporated within a 'balance of construction' cost estimated using a typical baseline whole building construction cost per m² for the building type in question.

Elemental cost rates used in the study are included in Appendix B.

Calculation of the baseline build costs

The baseline build cost for this study was taken as being for a building constructed to meet minimum regulations only.

The benchmark £/m² cost was estimated for each building type based on Currie & Brown's experience of helping deliver developments across the UK with costs adjusted to reflect an East of England location.

Benchmark costs used in the study are:

- Semi-detached houses - £2,075 per m^2
- Terraced houses - £1,906 per m^2
- Low rise apartment block - £2,358 per m^2
- School - £3,527 per m^2

These benchmark figures are deemed more representative of current development costs for Greater Cambridgeshire and reflect a medium specification. It should be noted, however, that total build costs can vary significantly dependent on design and specification choices to reflect target market requirements.

3. Updated results

The Table 3.1 and Figure 3.1 show the results of modelling for the uplift cost associated with the proposed net zero policy in comparison to meeting Part L 2021 standards.

Table 3.1 Additional costs associated with delivery of net zero policy requirements in comparison to the Part L 2021 notional specification

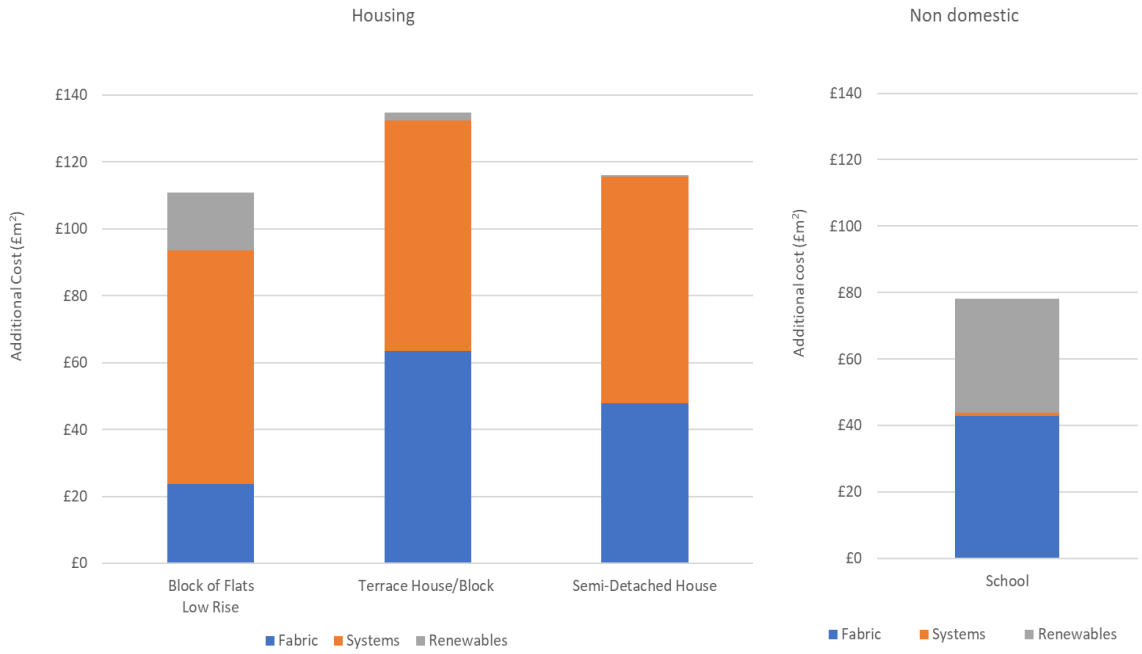
	Domestic			Non-domestic
	Low Rise Flats	Terrace House	Semi-Detached House	School
Gross Internal Area (m^2)	3,889	84	103	3,287
Base build costs (Part L2021)	£2,358	£1,906	£2,075	£3,527
Cost uplift for net zero (£m^2)				
Fabric	£24	£64	£48	£43
Systems	£70	£69	£68	£1
Renewables	£17	£2	£1	£34
Total uplift (£m^2)	**£111**	**£135**	**£116**	**£78**
Total uplift (£ per building)	**£430,716**	**£11,356**	**£11,964**	**£257,175**
% increase	**5%**	**7%**	**6%**	**2%**

For houses, additional costs are relatively equally split between investment in improved fabric and building services (ventilation and heat pump systems) with relatively little additional expenditure required on renewable energy. This is because the Part L2021 notional specification already requires a relatively high level of renewable energy generation and so the additional requirement for the net zero policy is small.

For the low-rise apartment, the uplift to fabric costs is smaller than for houses reflecting the reduced external envelope of these homes compared to houses. The cost uplift for renewable energy generation is higher for apartments than houses. This is because the calculation of renewable energy requirements in the Part L 2021 notional specification is based on building footprint and there is a proportionately smaller photovoltaic array for higher rise buildings in comparison to houses (eg 4 storeys rather than 2-2.5 storeys).

For the school building uplift costs for building services are small with total uplift costs split relatively evenly between fabric enhancements and renewable energy generation. Uplift costs for the low carbon building services are small for schools because the more efficient building fabric means that the total size of the heating system can be reduced so although the cost per kW of heat output is higher this is largely offset by the reduced demand.

Figure 3.1 Additional costs associated with delivery of net zero policy requirements in comparison to the Part L 2021 notional specification



Comparison to previous results

Uplift costs reported in 2021 were in comparison to a different regulatory baseline and on cost analysis from 2020. Previous cost uplift and difference to the 2025 results are shown in Table 3.2.

Table 3. 2 Comparison with previously reported costs in 2021

Building type	Costs reported in 2021 (2020 prices)	Costs reported in 2025 (2025 prices)	Difference
Block of low-rise flats	£302,735	£430,716	£127,981
Terraced house	£13,985	£11,356	-£2,629
Semi-detached house	£12,880	£11,964	-£916
School	£208,865	£257,175	£48,310

For the flat and school buildings costs have increased between 2020 and 2025, this reflects overall increase in costs of construction over this period of high inflation. Increased costs are not materially offset by the change in building regulations (Part L) in 2022, this is because the scale of changes for flats and non-domestic buildings were proportionately much smaller than for houses.

For the two assessed houses the additional costs have reduced between 2020 and 2025. This reflects two factors the impact of changes in building regulations in 2022 (Part L 2021) these changes increased construction costs for the baseline specification considerably (in the order of £5,000 per home). Therefore, although total construction costs are higher than in the previous study, the uplift in cost is smaller because the comparison is against a more expensive baseline.

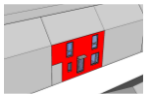
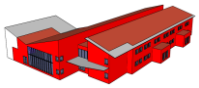
4. Conclusion

This report provides updated benchmark costs for meeting Greater Cambridgeshire's net zero policy. In the period between the previous cost study and this report there has been substantial cost inflation for a wide range of factors including the Covid-19 pandemic and the war in Ukraine. In addition, building regulations changed in June 2022, as a result the regulatory minimum against which the policy is compared changed. This regulatory change is particularly significant for houses.

For low rise flats and school buildings the uplift costs of the net zero policy in 2025 are higher in absolute terms, but relatively similar in terms of percentage increase on construction costs (5 and 3% respectively in 2025 in comparison to 5 and 2% previously).

For terraced and semi-detached houses, the additional costs are lower in absolute terms and substantially lower as a percentage of construction cost (7 and 6% respectively in 2025 in comparison to 13 and 10% previously).

Appendix A - Specifications

Geometry									
		Part L 2021 Baseline	**Net Zero Carbon**	**Part L 2021 Baseline**	**Net Zero Carbon**	**Part L 2021 Baseline**	**Net Zero Carbon**	**Part L 2021 Baseline**	**Net Zero Carbon**
Modelling information	Space Heating Demand target (kWh/m2GIA/year)	unknown	21	unknown	21	unknown	15	unknown	15
	Energy Use Intensity target (kWh/m2GIA/year)	unknown	28	unknown	32	unknown	26	unknown	38
	TFA (m2)	91	91	76	76	2833	2833	2630	2630
	GIA (m2)	103	103	84.2	84.2	3889	3889	3287	3287
	Form factor	3.05	3.05	3.75	3.75	1.76	1.76	2.32	2.32
Fabric	Floors u-value (W/m^2K)	0.13	0.12	0.13	0.12	0.13	0.16	0.12 (0.15)	0.15
	External wall u-value (W/m^2K)	0.18	0.10	0.18	0.10	0.18	0.16	0.15 (0.18)	0.13
	Roof U-value (W/m^2K)	0.11	0.10	0.11	0.10	0.11	0.15	0.12 (0.15)	0.12
	Windows u-value (W/m^2K)	1.20	0.90	1.20	0.90	1.20	0.90	1.1 (1.4)	0.95
	Windows g-value	0.62	0.50	0.62	0.50	0.62	0.50		
	Thermal bridge allowance (kWh/m2/yr)	5	2	5	2	5	4	Defaults	3
	Airtightness (m3/m2h)	5	0.55	5	0.55	5	0.65	3	0.65
Systems	Ventilation	Natural ventilation with intermittent extract fans	88% MVHR <2m external duct 25mm insulation	Natural ventilation with intermittent extract fans	88% MVHR <2m external duct 25mm insulation	Natural ventilation with intermittent extract fans	88% MVHR <2m external duct 25mm insulation	70% MVHR <2m external duct 25mm insulation	80% MVHR <2m external duct 25mm insulation
	MVHR specific fan power	0.24 W/m3/h	0.45 W/m3/h	0.15 W/m3/h	0.45 W/m3/h	0.15 W/m3/h	0.45 W/m3/h	1.6 W/l/s	0.45 W/m3/h
	Space Heating	Gas combi boiler	ASHP	Gas combi boiler	ASHP	Gas combi boiler	Individual Nilan type exhaust air heat pump	Communal ASHP	Communal ASHP
	DHW Insulation		120mm jacket insulation		120mm jacket insulation				120mm jacket insulation
	DHW tank size		150L		150L				
	WWHR efficiency	36%	0%	36%	60%	36%	50%	0%	50%
PVs	Peak power	2.8kW	2.9kW	3.1kW	3.4kW	15.0kW	112kW	-	128kW

Appendix B - Cost data

Element	Type	Aspect	Value	Unit	Q2 2025	Cost Unit
Ground Floor	Ground Floor	u-Value	0.15	W/m².K	£178	m2 element
		u-Value	0.13	W/m².K	£183	
Roof	Roof - Insulation at Joists	u-Value	0.1	W/m².K	£227	
		u-Value	0.11	W/m².K	£224	
	Roof - Flat	u-Value	0.11	W/m².K	£343	
		u-Value	0.13	W/m².K	£336	
		u-Value	0.15	W/m².K	£333	
External Wall	Ex Wall – Light metal frame and mineral wool	u-Value	0.13	W/m².K	£574	
		u-Value	0.15	W/m².K	£561	
		u-Value	0.18	W/m².K	£550	
	Ex Wall – Traditional + Mineral wool	u-Value	0.1	W/m².K	£284	
		u-Value	0.18	W/m².K	£265	
External Windows	Windows	u-Value	0.8	W/m².K	£502	
		u-Value	1.2	W/m².K	£418	
Space Heating Heat Source	Condensing gas boiler - system	kW output	18.00	kW	£1,608	Nr
	Condensing gas boiler - combi	kW output	24.00	kW	£1,608	
	Air Source Heat Pump - higher eff (incl cylinder)	kW output	5.00	kW	£6,818	
	Exhaust Air Heat Pump - with heat recovery, ducting, hot water store and 8*panel heaters	kW output		kW	£11,832	
Heat distribution and emitters	Distribution / sundries for wet systems	Per	1.00	m2 GIFA	£30	m2 GIFA

Element	Type	Aspect	Value	Unit	Q2 2025	Cost Unit
	Low temperature radiators	Per	1	m2 GIFA	£32	
Electricity uplift	Enhanced electrical supply - ASHP	kVa uplift		kVa	£102	Nr
Waste Water Heat Recovery	WWHR - pipe system	Showersave	QB1-21C		£480	
Airtightness	Airtightness level 1	Air permeability rate	5	$m^3/h \cdot m^2$ at 50 Pa	£0	m2 GIFA
	Airtightness level 2	Air permeability rate	3	$m^3/h \cdot m^2$ at 50 Pa	£6	
	Airtightness level 3	Air permeability rate	1	$m^3/h \cdot m^2$ at 50 Pa	£10	
Ventilation	Intermittent extract fans with trickle vents	Semi / terrace	4	Fans per home	£1,286	Per home
		Small Flat	2	Fans per home	£643	
	Good Qual MVHR	Unit	1	Per home	£1,321	
Ventilation distribution	MVHR rigid ductwork	Semi-detached and mid terrace			£20	m2 GIFA
		Flat			£24	
Photovoltaics	Roof mounted PV - fixed	Installations	1	Number under 4kWp	£1,291	Nr
	Roof mounted PV - variable <4kWp	Output	1	kWp (under 4kWp)	£686	kWp