South Warwickshire Net zero carbon local plan policy support

Evidence base:
Carbon budget assessment

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Version 1

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Bioregional

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Executive Summary

Bioregional is supporting Warwick District Council and Stratford-on-Avon District Council in preparing a robust evidence base for net zero carbon policy in their combined emerging South Warwickshire Local Plan. This carbon budget assessment tests whether a 'True net zero' operational energy performance standard for *new-build housing* can be demonstrated as necessary for South Warwickshire to remain aligned with the UK's legislated carbon budgets and the national (and local) net zero target of 2050.

Purpose of the report

The assessment assesses the operational energy performance of typical new homes against a a **local carbon budget** (for the operational emissions of new-build housing) that is logically derived from national carbon budgets. For the share of the new housing growth trajectory that this new local plan policy would affect, two policy approaches are compared:

- a TER / Building Regulations-aligned approach, represented here using Future Homes Standard (FHS) as the "no policy" scenario; and
- a "True Net Zero EUI" approach. This approach uses absolute energy metrics (Energy Use Intensity and Space Heat Demand) and requires on-site renewable generation to match annual energy use, thus achieving net zero operational emissions from year 1.

The modelling also accounts for new homes that would already have planning permission before the new local plan is adopted and therefore would not be affected by any new policy. These homes follow Building Regulations (Part L 2021 or FHS) in both policy options.

The goal is to explore whether each of these possible policy approaches would be effective in ensuring the new housing growth stays within its reasonable share of national legislated carbon budgets, thus 'mitigating climate change … in line with the objectives and provisions of the Climate Change Act' as the local plan is instructed to do by the NPPF.

Key modelling assumptions

- Energy performance is drawn from PHPP-based modelling for six archetypes: mid-rise block of flats, low-rise block of flats, terrace houses, bungalow houses, semi-detached houses, detached houses, weighted using an assumed 87% houses / 13% flats split.
- To maintain consistency and comparability across scenarios, PHPP outputs are used to represent energy performance of new homes in both scenarios, recognising that SAP is a compliance tool and may not reflect real-world energy use accurately.
- The housing trajectory consists of 54,925 new dwellings in the 2025-2050 plan period. This is the sum of Stratford-on-Avon's target of 27,800 and Warwick's target of 27,125.
- Homes completed in years up to and including 2027 are assumed to follow Part L 2021 (with gas heating). Thereafter, homes completed from 2028 assumed to be all-electric under FHS / policy scenarios, given the FHS transition period which ends in March 2028.
- If a 'net zero' policy is included in the new plan, decisions would be in line with this from 2028 for simplicity, as the latest plan timetable[i] indicates adoption in early 2028.
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Results

The report derives a local carbon budget for South Warwickshire area from national carbon budgets to 2050, then apportions a share of this to the housing sector, and then a share of that to the new homes that would be built during the carbon budget period.

Some of the homes that would be built in the carbon budget period are homes that already have permission before the new local plan comes into force. As the new plan policy cannot affect these homes that would already have permission, they should not be part of the carbon budget against which the policy options should be compared. Therefore, from the carbon budget allocated for new homes built in the carbon budget period, this report finally allocates a share specifically to the homes that the new plan policy *can* influence (i.e. the ones that would be granted permission *after* the local plan comes into force).

In this approach, the available carbon budget for operational emissions (2025–2050) of housing built during the carbon budget period, of which the new policy can affect, is -0.8 $ktCO_2e$, implying that these homes would need to offset emissions from homes built in previous years. Correspondingly, the available carbon budget for new-build homes that the policy *cannot* affect is 220.34kt. The resulting total new-build budget is 219.55kt.

At a per-home level (weighted average), there is a large change between the approaches:

		Weighted average per new-build home in South Warwickshire reflecting local split of 13% apartments vs 87% houses		
Metric	Unit	Part L 2021 (today)	FHS ('no policy' scenario)	True net zero EUI (SWLP proposal)
Net annual carbon per home in 2025	kg CO_2e/yr	1,368	-25	-516

When scaled across cumulative delivery, reflecting the anticipated housing delivery trajectory in South Warwickshire and assessed against the carbon budget, the results show:

- "No policy" (Part L 2021 until 2027, FHS from 2028): Emissions of the policy-affectable homes would be -1.03kt (and emissions from new homes unaffected by the policy due to prior permission would be 286.01kt)
- True Net Zero EUI: Delivers a significant net negative contribution from the policy-affectable homes, totalling -21.15 $ktCO_2e$. The emissions from new homes unaffected by the policy would remain 286.01$ktCO_2e$. Thus the policy-affected homes would offset 7.4% of the emissions of the unavoidable homes. The net emissions from all new homes built in this period would therefore be 264.86$ktCO_2e$.

The core conclusion is that a Building Regulations / FHS-led "no policy" pathway would have negligible offsetting effect on South Warwickshire's carbon budget for new-build housing operational emissions, indicating clear local circumstances for adopting a more effective approach to increase the likelihood of staying within the available carbon budget. The True Net Zero EUI approach is shown to be the most robust and "proactive" policy option, because it is the most effective scenario in counterbalancing unavoidable near-term emissions associated with the pre-policy period.

Introduction & overview

Bioregional is commissioned by Warwick District Council and Stratford-on-Avon District Council to produce an evidence base on net zero carbon policymaking, to underpin the emerging South Warwickshire Local Plan (SWLP). This report is part of that evidence base. This report's purpose is to explore, through reasoned analysis, what local standards for new buildings' energy performance can be demonstrated necessary in order for South Warwickshire area to remain in line with the national carbon budgets and net zero target date of 2050. This is part of the policy justification as per the NPPF tests of soundness.

This is relevant to the fulfilment of the following expectations laid on the local plan:

- The legal duty to mitigate climate change (Planning & Compulsory Purchase Act 2004)
- The NPPF requirement that this mitigation should entail "radical reductions in [carbon] emissions … in line with the objectives and provisions of the Climate Change Act 2008"
- The expectation that during the pursuit of sustainable development in plan-making, local circumstances should be taken into account (NPPF 2024, paragraph 9).

The Climate Change Act includes the net zero goal and the legislated carbon budgets for the UK (limits on the permissible amount of emissions in each 5 years; see Figure 1).

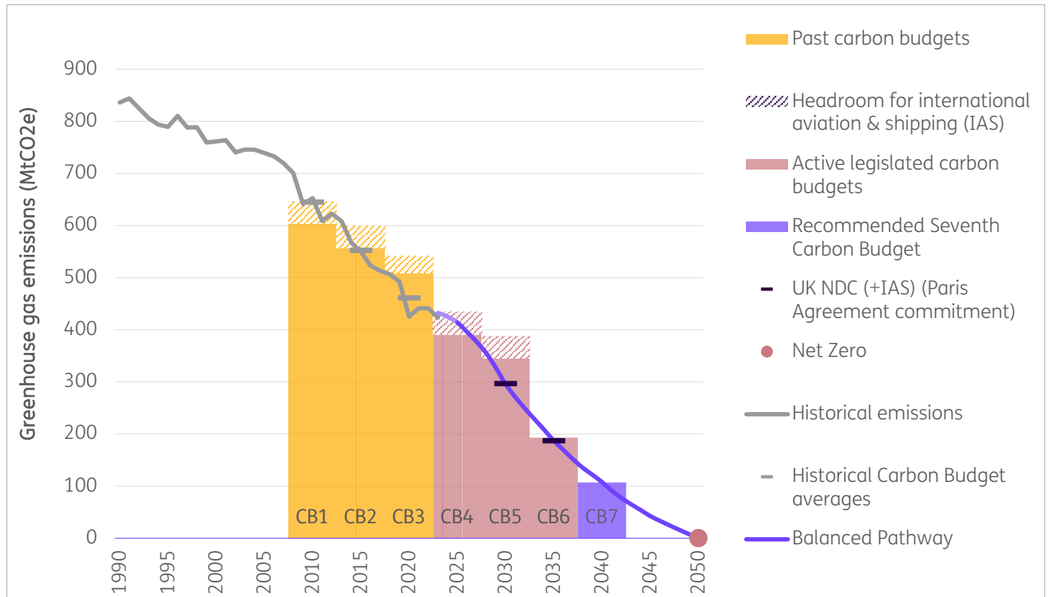


Figure 1: The UK's legislated carbon budgets (past, present and future) within the Climate Change Act. Adapted from: Climate Change Committee, 7th Carbon Budget report, 2025.

This report assesses the carbon impact of two broad types of policy approach:

1. An approach that reflects the incoming Future Homes Standard, utilising the Building Regulations Target Emission Rate (TER) metric, expressed as a % reduction against the TER baseline of today's Building Regulations Part L 2021, according to the approved national calculation methodology (currently Part L SAP10.2 methodology).This would be close to the residential standard in SWLP's 2025 consultation draft policy 22.
2. An approach that is based on the energy efficiency metrics of total Energy Use Intensity (EUI) and space heat demand (SHD) calculated using a more accurate energy modelling methodology, plus renewable energy provision on site sufficient to at least match total energy use thus reaching 'true net zero' in operation. .

The impetus for this analysis is that the Written Ministerial Statement of 13th December 2023 (WMS2023) purports to stipulate that any local plan energy efficiency standard should be expressed as a % TER reduction via a specific version of SAP. However, industry best practice[1] is to use metrics other than TER; specifically EUI and SHD, using a more accurate methodology than SAP. It is legally established[ii] that local plans can diverge from national policy if there are local or exceptional circumstances to justify this. This report explores whether such circumstances are extant in light of the effectiveness of TER-based vs EUI-based standards in keeping South Warwickshire within its proportionate share of national carbon budgets, thus meeting the mandate to 'mitigate climate change in line with the Climate Change Act'[2].

To determine whether local circumstances are demonstrated, this study sets a local carbon budget for the specific scope of operational carbon of new build housing in South Warwickshire (derived from the national legislated carbon budgets). This study then models new homes' operational emissions in 2025-2050 in two policy scenarios:

- Future Homes Standard (FHS), which is a WMS2023-compliant standard anticipated to become the new Building Regulations Part L in March 2027 and thus represents the 'no policy' situation;
- "True Net Zero EUI" policy scenario (which represents an approach that diverges from the WMS2023 by using more effective metrics for energy efficiency).

The carbon emissions of these two scenarios draw on prior energy modelling of the performance that would be achieved by typical South Warwickshire new homes in those policy scenarios. The number of homes modelled reflects the South Warwickshire plan period housing growth target (to 2050), plus an estimate of the number of homes that would be delivered after the end of the plan period but before the 2050 end date of the UK's national carbon budgets. The energy performance figures in each scenario are translated into carbon emissions through to the UK's legislated net zero goal date of 2050, reflecting national

[1] As endorsed by all major standard-setting professional bodies in the UK construction sector, by their co-creation of the UK Net Zero Carbon Buildings Standard which uses the metrics of EUI, SHD and renewable energy provision

[2] This local plan is expected to be examined to the NPPF 2024. However, this reference to the Climate Change Act is also present within the emerging new NPPF (2025/26 consultation). Thus this analysis would also support divergence from the less supportive parts of that emerging new NPPF if that becomes relevant.

datasets for conversion of gas and electricity to emissions including future electrical grid decarbonisation.

Where the carbon budget for new build housing's operational emissions is exceeded by a policy scenario, this demonstrates that the policy scenario is not aligned with the Climate Change Act goals (and therefore the climate mitigation mandate in law and policy as above). While the Climate Change Act does not legislate emissions limits on individual sectors, the legislated national carbon budgets rely on steep falls in all sectors' emissions[iii] (see Figure 2), to a level that will be challenging for each sector to achieve even without trying to balance any underperformance by other sectors. It is thus most effective to pursue indicative sectoral carbon budgets to keep the national legislated mitigation target feasible. Therefore, logically, all sectors in South Warwickshire will need to stay within their reasonable share of the overall area-wide carbon budget, in order to meet that climate mitigation mandate while avoiding a situation in which certain sectors must overcompensate for sectors that produce excessive emissions. This is therefore an appropriate and logical test to apply when determining what policies are appropriate for the local plan's climate mitigation mandate.

The "True Net Zero EUI" policy scenario requires net zero operational emissions for new buildings, using absolute energy metrics, which diverge from the stipulations of the WMS2023 as previously outlined above. This study concludes that there are demonstrated local circumstances to justify divergence from the WMS2023, as the approach set out in "True Net Zero EUI" policy scenario is necessary for South Warwickshire to align as closely as possible to local and national net zero target dates, including the national carbon budgets legislated via the Climate Change Act (thus part of the "objectives and provisions" that the NPPF instructs the local plan to pursue).

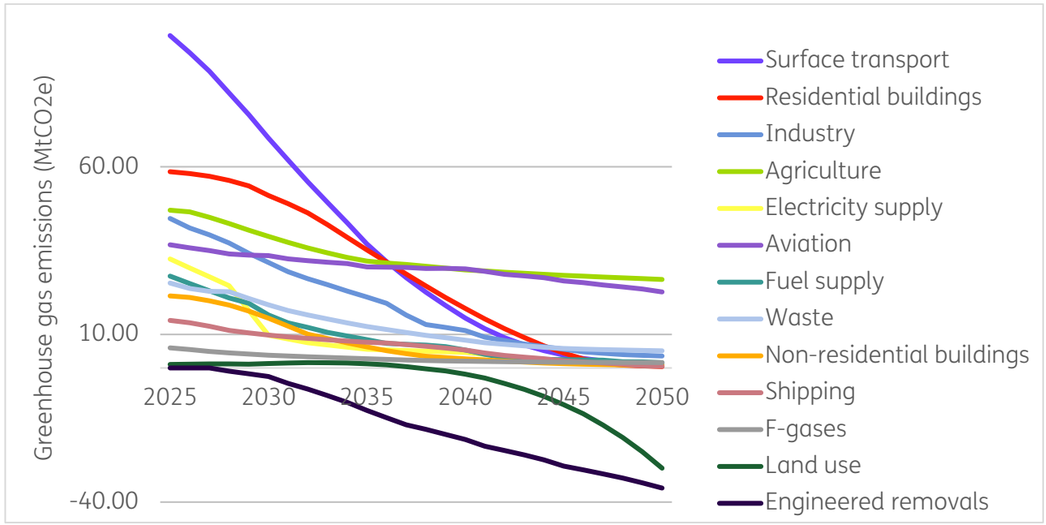


Figure 2: Chart showing how each sector's emissions must fall in the 'balanced' pathway to net zero in 2050. Adapted from: Climate Change Committee, 7th Carbon Budget report, 2025.

1. Comparison of policy scenarios

Scenarios tested

The first step of this study was to identify energy use data to reflect a "True Net Zero EUI" policy scenario, versus no policy scenario. This energy use would then be converted to carbon emissions, to determine which policy scenario is best aligned to UK's legally binding net zero target and South Warwickshire's local net zero target of 2050.

To represent the emissions of a "no policy" scenario, Building Regulations Part L 2021 is assumed to apply until 2028, after which the Future Homes Standard is assumed to take effect. The Future Homes Standard is the new Building Regulations Part L, which was due to have been introduced in 2025 but was only recently published on 24 March 2026. The published document indicated the FHS standard to go into effect on 24th March 2027, with the transition period lasting until 24th March 2028. This Future Homes Standard includes a heat pump, and some on-site solar PV in most cases, but barely any fabric improvement compared to today's building regulations (Part L 2021).

Secondly, the "True Net Zero EUI" policy scenario was tested. This "True Net Zero EUI" policy scenario is aligned with industry best practice absolute energy metrics and represents a 'true net zero operational carbon' policy by requiring that on-site renewable energy generation is equal to total energy consumption and that all of the above are calculated using accurate energy use modelling methods. This policy scenario does not wholly align with the requirements of the 2023 WMS because it does not use the Target Emissions Rate metric, but would more effectively optimise energy performance and thus assist fulfilling South Warwickshire's contribution to the UK's legislated carbon budgets and national net zero target of 2050. For the purpose of this study, it is assumed that policy scenarios are delivered entirely on-site and there is no use of offsetting to compensate for a lack of on-site mitigation measures.

FHS and/or TER-based policy option	True Net Zero EUI
• Target Emissions Rate metric based on % improvement, not absolute values, which makes comparison difficult due to different baselines used • Only considers regulated energy uses (heating, cooling and lighting), not unregulated ones (plug-in appliances) • SAP is a compliance tool and does not accurately model energy use • Cannot be verified during operation to understand potential performance gap between designed and as-built building • Not fit for development of true net zero buildings, due to modelling inaccuracy • May not ensure all buildings are net-zero-carbon until the energy grid is fully decarbonised (via future development of extensive standalone renewables).	• Uses absolute energy-based targets that directly limit energy consumption, which are verifiable in-use by the occupier at the meter • EUI accounts for regulated and unregulated energy use • Uses a predictive energy modelling tool (e.g. Passivhaus Planning Package) that is proven to accurately predict energy use, thus reflects real-life performance • Industry-evidenced best-practice to deliver true net zero buildings • Easier to predict impact of design and construction on resident's energy bills • Prioritises renewable energy on-site, rather than assuming that standalone renewable energy schemes will decarbonise the grid.

	FHS (no policy)	True Net Zero EUI
Metrics used	Target Emissions Rate (approximately 63% reduction on today's Part L 2021 TER) Calculate TER and TFEE with SAP or HEM[3]	Energy Use Intensity (EUI) and space heating demand, via an accurate method
Renewable energy on site (solar PV)	PV area = ~40% of ground floor[4]	Match total energy consumption on an annual basis
Net zero building?	Not until grid is fully zero carbon	Yes, from year 1
Aligned to WMS2023?	Yes	No

[3] SAP will be nationally replaced by the Home Energy Model (HEM) approximately 15 months after the Future Homes Standard is in force: Government statements in March 2026 indicate that HEM will "become an approved calculation methodology no earlier than 3 months after this consultation response is published" (thus, late June 2026 or later) and that it will remain acceptable to use either SAP 10.3 or HEM for at least 24 months after that (therefore at least until late June 2028, which is 15 months after the FHS first enters force). It is also confirmed that HEM will continue to use the TER and TFEE metrics, and previous consultations have indicated that it may also offer other metric outputs.

[4] Please note that the amount of PV in the FHS notional building is in fact not a fixed amount but instead will reflect the amount of PV that the actual proposed building has, up to this figure of 40% of floor area. However, the published FHS also contains a new 'functional requirement' for a 'reasonable output' of renewable energy to be produced on the building or within its curtilage. While the FHS allows variance in what is a 'reasonable amount' between different buildings and their situations, it is stated that this benchmark figure of 40% of floor area would be deemed to fulfil the 'reasonable' amount.

Establishing the energy use in each of the two policy scenarios

To reflect the energy use in each of the two respective policy scenarios, this analysis uses energy specifications used to conduct energy modelling and cost analysis, which forms an earlier part of this evidence base.

For each archetype, these inputs of building elements for each policy scenario (see Appendix 1 'envelope performance' and 'building services' tables) for highly accurate energy prediction modelling method (Passive House Planning Package; PHPP[5]) to identify the total energy use of South Warwickshire's typical new-build homes in "True Net Zero EUI" policy scenario, and in the 'no policy' scenario (Part L 2021 for homes built up to end of 2027, and Future Homes Standard for homes built thereafter).

With the predicted energy use established in each policy scenario, this energy use was then combined with projected grid decarbonisation factors during 2025-2050 (this period reflects the local plan period and also the remaining years in the Climate Change Act national legally binding carbon budgeting period through to the national legislated 'net zero' target date). The emissions for each policy scenario can then be compared against the available local carbon budget for new build housing, as a share of the national carbon budget (explained later).

The following section focuses on the carbon budget modelling process. For all policy scenarios, the cited energy use data came from energy modelling using PHPP, despite that the FHS (which is a TER-based scenario) uses SAP or HEM in implementation rather than PHPP. This is because if the "True Net Zero EUI" scenario were tested using PHPP, whilst FHS were tested using SAP or HEM, inconsistency between the modelling tools would result in incomparable figures. Also, HEM is not yet available and SAP is inaccurate at predicting actual energy use[iv,v,vi], whereas PHPP has a track record of accuracy[6]. Therefore, the use of PHPP calculations for energy use in all policy scenarios ensures consistent and accurate predictions of energy use (and thus of carbon).

The cited PHPP modelling data includes both regulated and unregulated energy use of each of the home types, giving a detailed picture of home energy use[7] from which operational carbon emissions are derived. Our analysis uses the modelled energy use of six archetypes: mid-rise block of flats, low-rise block of flats, terrace homes, bungalows, semi-detached homes, detached homes. The same archetypes were used for both policy scenarios (see Appendix 1), to ensure comparability between the two scenarios.

[5] PHPP is a modelling tool used to accurately calculate a building's energy use. This is a tool used in the design of Passivhaus buildings, but can also be used as a generic modelling tool in buildings that are not pursuing Passivhaus certification. The tool provides wide functionality through a range of input variables to predict heat loss, energy and broader comfort metrics.

[6] As acknowledged by the industry (e.g. RICS) and also by national government via its 2023 HEM consultation, in which PHPP has been one of the validation tools during the development of that new national model HEM, thanks to PHPP being "regarded as demonstrably accurate for modelling of high-performance homes".

[7] In practice, a strictly WMS2023-compliant policy may not assess unregulated energy as the metric stipulated by the WMS2023 – Target Emissions Rate – only considers regulated energy. Yet, homes built under a WMS-compliant policy would still *have* unregulated energy use and associated carbon emissions until the grid is zero carbon. A WMS2023-compliant policy might address the unregulated energy by requiring it to be met by onsite renewable energy, rather than an energy efficiency requirement (as the WMS2023 only addresses energy efficiency policies, not renewable energy policies). But when the unregulated energy use is not minimised at source (which the TER metric cannot do) then it may not be feasible in all cases to fully match that with onsite renewable energy capacity.

Energy modelling results per home if built in 2025

Table 1: Emissions per home in carbon budget period 2025 to 2050, if built in 2025, in different energy performance scenarios

		Apartment (one apartment as share of total 40-apartment 5-storey building)			**Apartment (one apartment as share of total 2-apartment 2-storey building)**			**Semi-detached (one house)**			**Terrace (one house)**			**Bungalow (one house)**			**Detached (one house)**		
Metric	Unit	Part L 2021 (today)	Future Homes Standard (FHS)	True net zero EUI-based policy	Part L 2021 (today)	Future Homes Standard (FHS)	True net zero EUI-based policy	Part L 2021 (today)	Future Homes Standard (FHS)	True net zero EUI-based policy	Part L 2021 (today)	Future Homes Standard (FHS)	True net zero EUI-based policy	Part L 2021 (today)	Future Homes Standard (FHS)	True net zero EUI-based policy	Part L 2021 (today)	Future Homes Standard (FHS)	True net zero EUI-based policy
Net total energy use per home, after deducting solar PV generation (same in each year)	*kWh/yr*	*4,885 gas* *442 electricity*	*0 gas* *2,389 electricity*	*0 gas* *1,262 electricity*	*4,675 gas* *-999 electricity*	*0 gas* *156 electricity*	*0 gas* *-1,577 electricity*	*7,302 gas* *-675 electricity*	*0 gas* *61 electricity*	*0 gas* *-2902 electricity*	*6,260 gas* *-701 electricity*	*0 gas* *-467 electricity*	*0 gas* *-2,960 electricity*	*10,067 gas* *-3763 electricity*	*0 gas* *-4612 electricity*	*0 gas* *-10,642 electricity*	*11,627 gas* *-2410 electricity*	*0 gas* *-925 electricity*	*0 gas* *-6,076 electricity*
Net annual carbon per home in 2025	kg CO_2e/yr	952 kg	313 kg	165 kg	725 kg	20 kg	-207 kg	1,248 kg	8 kg	-380kg	1,054 kg	-61 kg	-388 kg	1,349 kg	-604 kg	-1,394 kg	1,812 kg	-121 kg	-796 kg
Total operational carbon emissions per home, in the carbon budget period (2025-2050) if this home is built in Year 1 (2025), with electricity grid decarbonisation	kg CO_2e/yr	**23,582 kg**	**1,858 kg**	**982 kg**	**21,462 kg**	**121 kg**	**-1,227 kg**	**34,209 kg**	**48kg**	**-2,257 kg**	**29,234 kg**	**-364 kg**	**-2,303 kg**	**44,959 kg**	**-3,588 kg**	**-8,279 kg**	**53,432 kg**	**-720 kg**	**-4,727 kg**

Table 2: Energy use and emissions per average home built to each building standard, taking into account the anticipated mix of housing types in SWLP.

		Weighted average per new-build home in South Warwickshire, reflecting local split of 13% apartments/87% houses		
Metric	Unit	Part L 2021 (today)	FHS 1 ('no policy' scenario)	True net zero EUI-based policy
Net total energy use per home, after deducting solar PV generation (same in each year)	kWh/yr	8,338 kWh/year gas -1,204 kWh/year electricity	0 gas -192 kWh/year electricity	0 gas -3,938 kWh /year electricity
Net annual carbon per home in 2025	kg CO_2e/yr	1,368 kg	-25 kg	-516 kg
Total operational carbon emissions per home, in the carbon budget period (2025-2050) if this home is built in Year 1 (2025), with electricity grid decarbonisation	**kg CO_2e/yr**	**38,728 kg**	**-150 kg**	**-3,064 kg**

The above 'total operational carbon emissions' rows take into account the anticipated decarbonisation of the electricity grid in the stated period, based on national projections of future grid decarbonisation[vii]. Please note that while that row is given as an illustration of what a home's total emissions to 2050 would be if the home were built in 2025, the analysis in the next steps of this work do take into account the fact that delivery of new homes will occur gradually across each year of the carbon budget period rather than all occurring in 2025. Additionally, as noted in the introduction, this analysis eventually focuses specifically on the homes that would gain permission after the local plan comes into force, which would therefore start to be delivered from 2028.

While this study is undertaken in early 2026, 2025 is the first relevant year for carbon budget analysis purposes because the latest national emissions figures available today are for calendar year 2024, which are deducted from the available national carbon budget before assigning the local carbon budget (see later section on establishing the national carbon budget). See Table 2 below.

Table 3: Relevant timelines within this assessment

Year	2008-2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Legislated carbon budget period	Carbon budgets 1, 2 & 3	Carbon budget 4						Carbon budget 5					Carbon budget 6					Carbon budget 7					Carbon budget 8					Carbon budget 9		
(of which emissions already known)																													
Local plan date of adoption[8] to end of period				*[in 'plan period' but before plan adoption]*																									
Building Regulations Part L 2021																													
Building Regulations FHS[9]																													

The 'total operational carbon emissions' in Table 1 take into account the national projection of future decarbonisation of the electricity grid[viii] in the carbon budget timescale of 2025-2050.

The energy modelling found that in both types of apartment and the semi-detached house, the FHS did not include enough rooftop solar PV to annually match the building's total electricity use. However, in the other house archetypes (terraced, bungalow and detached), the assumed amount of PV in the FHS could annually generate an amount of electricity that *exceeds* those houses' annual electricity use. Taking into account the anticipated mix of home types, the average new-build FHS home may have a small amount of negative energy use and thus small negative emissions (-25kg in 2025, as per Table 2). However, this modelling was produced before the final FHS was published. The modelling assumed the FHS amount of PV was "kwp = (ground floor area * 0.4)/6.5" as indicated in the FHS consultation. The published FHS now in fact confirms that while this amount would fulfil the FHS' requirement for a "reasonable" amount of PV generation, the required "reasonable" amount will vary between buildings. Therefore in some cases the FHS will allow less PV, or even none if any storey is over 18 metres height or if other constraints prevent the achievement of a 'reasonable' amount of solar PV output. The published FHS establishes that the 'notional' building will not have a fixed amount of PV but instead will have the same amount of PV as the actual proposed building, *up to* the amount described in the equation above. Therefore, the 'negative' emissions shown in the FHS scenario in the current report might not actually be achieved if there are many new builds in SWLP area whose developers convince Building Control that it is not feasible to accommodate as much PV as assumed here.

The modelling shows that in the "True Net Zero EUI" policy scenario, a significant amount of negative emissions are produced from all new home archetypes except the mid-rise apartment block. This is because the policy would very effectively minimise energy demand and require renewable electricity to at least equal annual energy demand and in some cases exceed this, where feasible. The energy modelling looked at a reasonable maximum amount of PV that could be fitted on the roofs of each typical home type, which is included in the 'true net zero EUI-based policy' scenario. The excess solar PV becomes 'negative' consumption as it is exported to the grid. Most archetypes were able to include enough PV on site to match their energy use in this scenario, but in the event that they could not (e.g. due to site-specific constraints such as overshadowing), this policy would require that exact amount of shortfall to be offset via a contribution to offsite PV.

[8] The official plan period is 2025-2050, However, at the time of writing, the latest available Local Development Scheme for South Warwickshire gives March 2028 as the anticipated adoption date. For the sake of simplicity in the calculation, 2028 is here assumed as the first date on which new grants of permission would be compliant with the new local plan policies.
[9] The FHS will first enter force for applications submitted to building control from 24th March 2027. However, the FHS allows that new buildings whose full plans are submitted by 23rd March 2027 escape the FHS, so long as construction commences by 23rd March 2028. Given the delay between submission of plans through to construction and completion, this means that most homes actually completed across 2027 will be built to Part L 2021 standard. For the sake of simplicity, these calculations therefore assume that the FHS becomes the default standard for new homes completed from 2028, except for homes that the SWLP trajectory figures show are expected to hold prior full permission.

Scaling up the per-home results to reflect South Warwickshire's total new housing delivery trajectory

To determine the relative contribution from houses and apartment archetypes to the overall new-build housing carbon emissions in South Warwickshire, the new-build housing in the plan period is assumed to follow the same split of houses versus apartments that has taken place in recent years in South Warwickshire as follows. According to the latest EPC data for new dwellings by housing type, the latest 5 years[10] of data show that 87% of new domestic buildings in South Warwickshire were houses, whilst the remaining 13% were flats. This % split is assumed to remain constant for the delivery of new homes from now on.

A housing growth trajectory for homes with planning permission was provided by South Warwickshire in April 2026, showing the estimated amount of housing to be delivered in the plan period. According to those housing projection figures, 54,925 homes should be delivered throughout the period of 2025-2050, with the plan expected to come into force in 2028 (it should be noted that 2025 had already elapsed at the time the analysis was undertaken. The approach taken to address this is set out below). The figures also showed the amount of new homes that have already attained planning permission[11]. However, these trajectory figures had to be adjusted in several small ways to align with the carbon budget periods that are set nationally, as follows:

- South Warwickshire housing trajectory for homes with planning permission was presented in financial years (e.g. 2027/28) which end in March of the latter year, whereas the national carbon budget figures are based on calendar years (as are the national emissions figures, grid carbon factors, and local-level energy use data). To ensure consistency between these datasets, the housing delivery figures were converted from financial years to calendar years. For example, the housing figure for 2027 is calculated as 3/12 of the '2026/27' delivery (representing January–March 2027) plus 9/12 of the '2027/28' delivery (representing April–December 2027). This approach is applied consistently across this carbon budget analysis to align housing delivery data with the calendar-year basis of the national carbon budget.
- The housing target was equally distributed across the plan period as the exact growth trajectory was not available at the time of the analysis. This resulted in an annual delivery target of 2,113 homes. For every year, the number of dwellings with planning permission was subtracted from the total delivery target to give the number of dwellings that would be subject to the new local plan from its adoption in early 2028.
- Since 2025 and 2026 Q1 have already elapsed, actual housing delivery figures were used where available. However, at the time of analysis, the most recent dataset on *existing* housing stock was only available up to 2024. These existing housing stock figures represent a snapshot of 31st March in the given year. As a result, dwellings completed in Q2-Q4 2024, all of 2025 and the first quarter of 2026 were estimated using live data tables on new-build EPCs. While the plan period is 2025-2050, it is assumed that the March 2024 'existing housing' snapshot is the baseline for the SWLP housing trajectory, thus new homes built in Q2-Q4 2024 are assumed count towards SWLP housing targets.
    - For 2025, it was estimated that 3,439 new dwellings had been delivered since the 'existing' housing number from March 2024. This figure includes both the 1,605 homes completed in 2025 itself, and also the 1,834 homes completed in Q1–Q4 2024. Emissions from dwellings built during 2024 would already have been captured within national 2024 emissions, but only for the part of the year in which those homes existed. National 2024 emissions thus do not reflect a full year of operational energy use from these dwellings. Because the 2024 new-build homes are treated within the '2025 new builds', the 390 homes built in Q1 2024 were also deducted from the 2024 'existing housing' number at March 2024. This enabled the analysis to account for those homes' full annual emissions from 2025 onwards at Part L 2021 standard.
        - For 2026, Q1 delivery was assumed to be wrapped into the annual delivery target of 2,113 homes.
        - According to live data tables on new-build EPCs, 1,605 new dwellings were built during 2025. However, as the annual housing target is 2,113, the remaining 508 unbuilt targeted dwellings were assumed to be delivered in 2026.
- The resulting estimated total is 55,315 dwellings delivered across 2025–2050, of which:
    - 6,728, before the plan is adopted (2028), all subject to Part L 2021
    - 981 in 2028–2030 that have full planning permission and thus subject to Part L 2021
    - 5,191 with outline prior permission thus are not affected by new policy (thus all FHS)
    - 42,415 that the plan policy can affect.

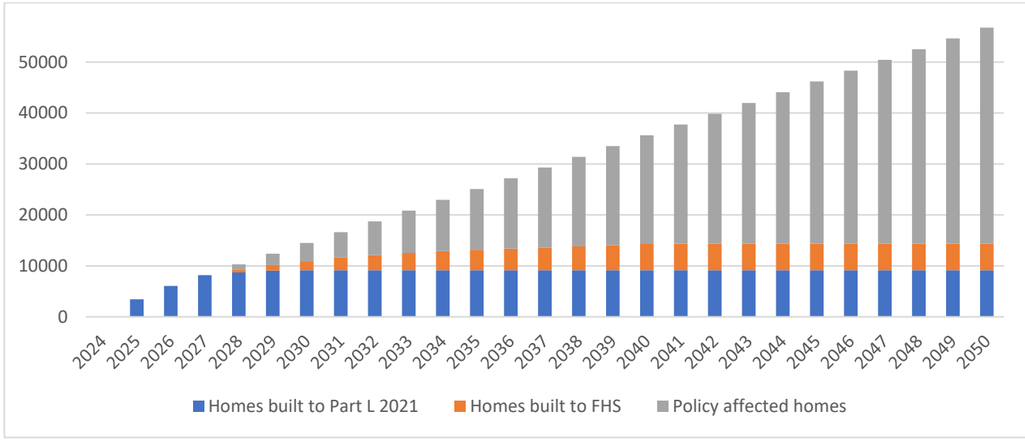


Figure 3: Illustration of South Warwickshire housing trajectory, adapted to calendar years and extended to end of carbon budget period

[10] At the time of conducting this analysis. This national dataset is released quarterly.
[11] This information is necessary because the new local plan policy cannot be retrospectively applied to planning decisions that were already made.

We assume that as each home is delivered, it is occupied and begins consuming energy in that year[12]. Multiplying the cumulative number of new builds in each year with the energy use per home, we find the assumed total new build stock's energy use in each year of the carbon budget period (2025–2050 as previously noted).

Up to the end of 2027, new homes are assumed to be built to Part L 2021 standards[13] and therefore have gas boilers, resulting in associated operational emissions from gas throughout future years from those homes, as well as their electricity-related emissions. Homes from 2028 onwards are assumed to be all-electric (using electric heating not gas – as this is the specification for the FHS and all policy scenarios). Therefore:

- The total electricity use in each year (by the cumulative number of new homes completed up to that year) is multiplied by the electrical grid carbon factor for that year[14].
- The annual gas use in each year (from the cumulative number of new homes completed up to that year) is multiplied by today's latest available national carbon factor for natural gas use today[ix]. There is no national projection dataset for future gas grid decarbonisation, therefore the same gas carbon factor is used for every year. As previously noted, the only new-build homes that have gas use are those built to Part L 2021 standard (here assumed to apply to all that are built from 2025-2027).
- The annual electricity-related emissions and the annual gas-related emissions of all 'new build' homes are summed together to get the operational carbon emissions of the cumulative number of new homes in each year of the carbon budget period. The emissions in each year can then be summed to give the total operational carbon emissions from new builds completed within the carbon budget period.

	Unit	'No policy' scenario (FHS)	True Net Zero EUI-based policy
Total operational carbon emissions to end of 2050, from new housing that the local plan can affect ($ktCO_2e$)	**$ktCO_2e$**	**-1.03 kt**	**-21.15 kt**

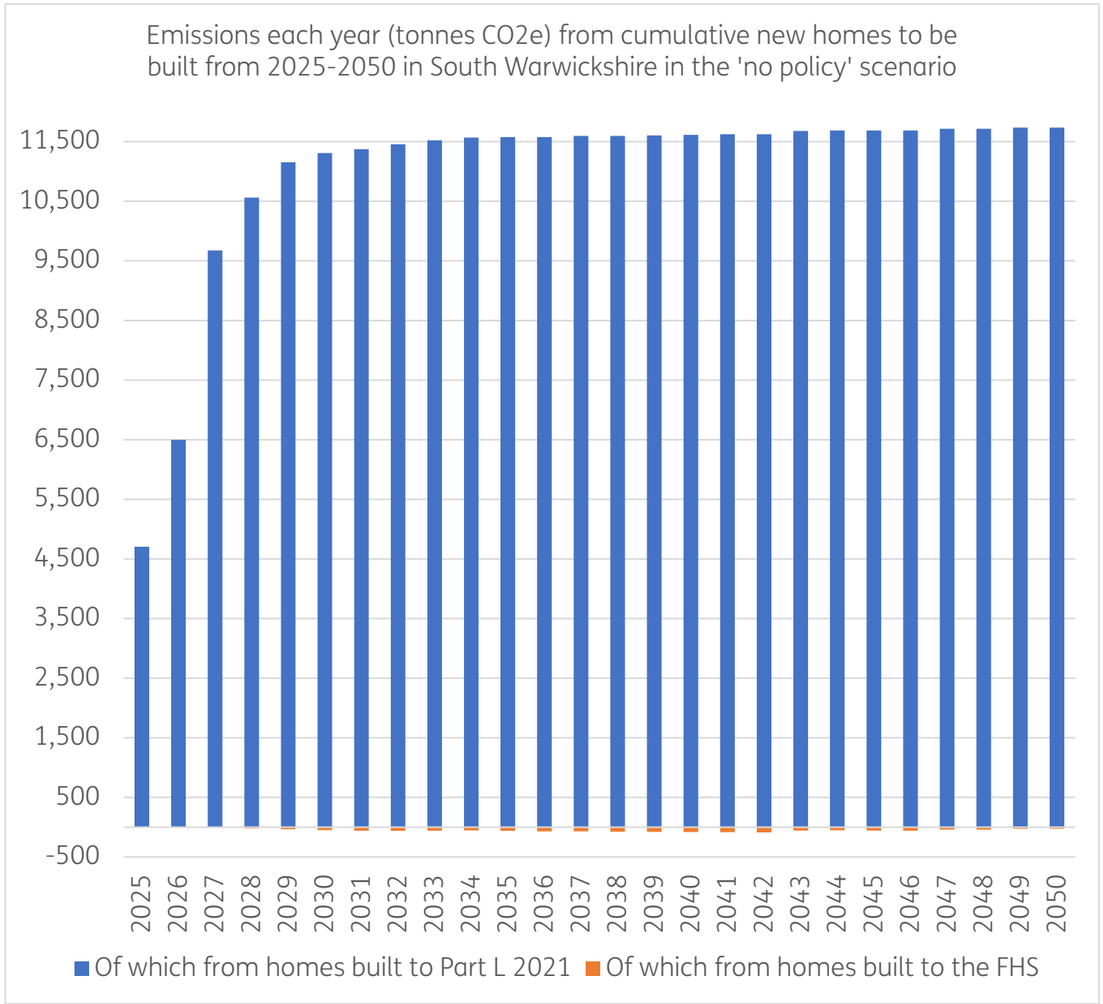


Figure 4: Emissions each year (tonnes CO_2e) from cumulative homes that would be completed from 2025 onward (cumulative homes; annual emissions) with the assumed "no policy" scenario (Part L 2021 for homes built up to end of 2026; FHS for homes built 2028 onwards).

This first graph (Figure 4) shows what the annual emissions would be of all homes built in South Warwickshire from 2025 onwards, if the new local plan did *not* include any policy requiring any improvement on Building Regulations standards for energy performance. Blue sections represent homes built to Part L 2021 standard (assumed here for all homes built up to end of 2027), while light orange bars represent homes built from 2028 onwards to the FHS.

[12] This avoids the potential error of assuming all homes are using energy from the first year of the plan period. We recognise there may also be some cases where newly completed homes may have a period of non-occupation for marketing; yet such incidences should be rare and short if the housing demand is as urgent as stated by industry and government, especially given that significant proportions of new builds are sold before completion.

[13] This is because the Future Homes Standard was published on 24 March 2026 and confirms that it will first enter force on 24th March 2027. Yet as previously noted, it allows buildings to avoid meeting the new standard so long as their full plans are submitted before 24th March 2027 and construction begins no more than a year later.

[14] See Appendix 2.

As Part L 2021 has gas heating, this means that the overall emissions are dominated by those Part L 2021 homes despite them only representing 13.94% of the total new-built homes represented here. This is because the Part L 2021 homes' net energy use is dominated by gas usage. There is no future projection for gas grid decarbonisation, whereas there is for the electricity grid. Part L 2021 homes also generate renewable electricity from their rooftop PV, and the energy modelling figures indicated that the amount of electricity use was less than the amount of PV electricity generation, but this was nowhere near enough to offset the emissions of these homes' gas usage. By contrast, the FHS is all-electric (gas-free). This graph therefore also reveals how grid decarbonisation changes the emissions of the FHS homes that would have been built up to each year (see the gradual change in the size of the orange bars). Because in the energy modelling the FHS was found to have slightly net negative energy use in the average SWLP home, this translates to net negative emissions (as each kWh of PV energy sent to the grid is assumed to reduce the need to generate that grid electricity elsewhere through the standard grid generation mix). Because the grid electricity is decarbonising in each year, this means that the amount of carbon 'saved' per unit of PV energy sent to the grid is reducing annually.

The second graph (Figure 5) shows that due to dwellings with existing planning permissions being built after the start of the local plan period, the new builds' emissions in each year adds up to a significant cumulative amount of emissions in the total national carbon budget period (up to 2050). As previously noted, this total amount of emissions from new build homes in the absence of any local policy would reach 285 kilotonnes of emissions over the period of 2025-2050. The Government has described the FHS as "net zero carbon ready" because it is all-electric and will therefore gradually decarbonise along with the grid. Yet the Government's own electricity grid decarbonisation projections used to perform our analysis (see Appendix 2) do not show the grid getting all the way to zero carbon in this period, although it is projected to get very low in the mid-2030s.

In this modelled scenario for SWLP, all of the emissions in this period come from the unavoidable Part L 2021 homes, and none from FHS homes. This is because, as previously noted, the energy modelling on which this analysis draws found that three of the six typical home archetypes would generate slightly more PV energy than their annual energy consumption, and these net-negative energy using archetypes make up a greater share of anticipated home types in SWLP area. However, as also previously noted, the energy modelling was produced on the assumption that the FHS notional building standard would include a universal amount of PV representing approximately 40% of floor area (or kWp = (floor area * 0.4) divided by 6.5. By contrast, the actual published FHS now indicates that the notional standard will not always include this amount of PV, and may be as little as none in some cases, including where the building has a storey of 18 metres in height. If the reality in SWLP turns out to include a significant share of buildings that avoid having to provide this amount of PV in the FHS, then the figures shown Figure 5 would be higher, and the 'FHS' (orange) sections in previous Figure 4 might become positive rather than negative emissions.

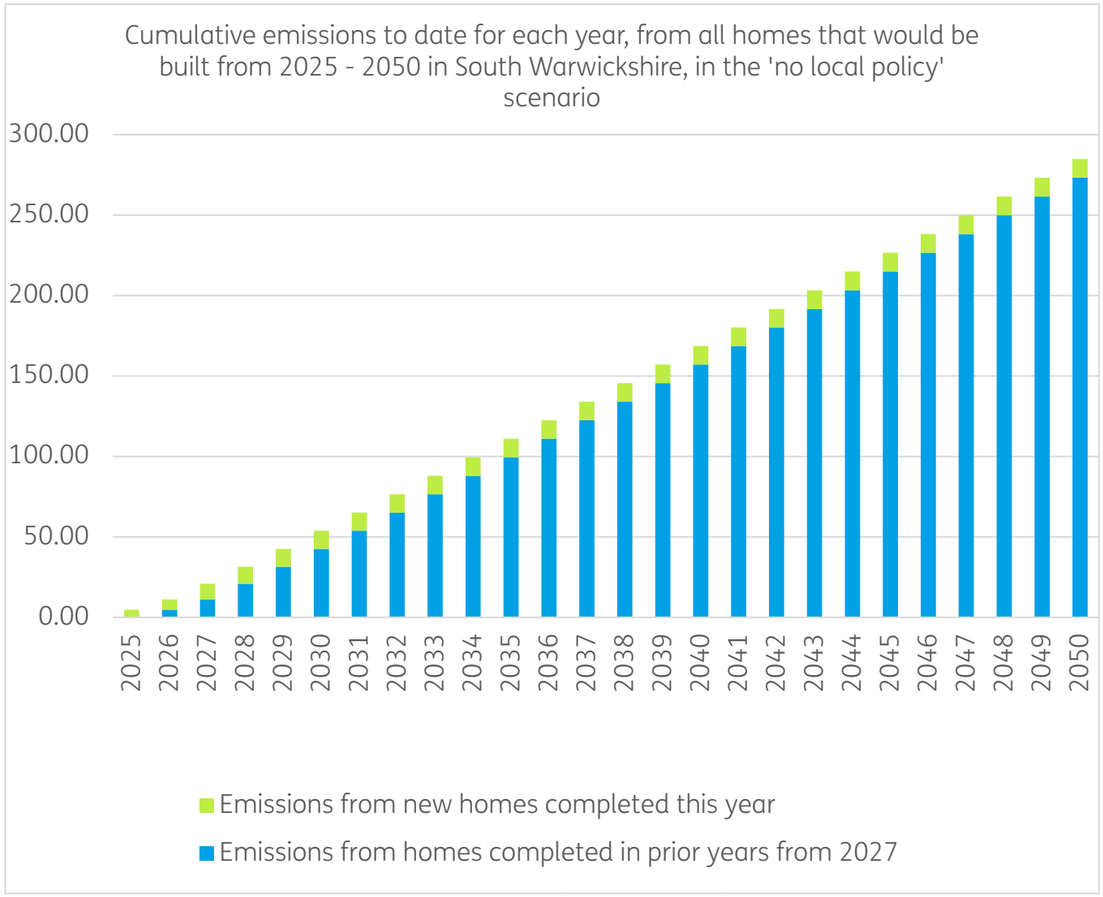


Figure 5: Cumulative emissions (ktCO2e) to date for each year, from all homes that would be built from 2025 onward (cumulative homes; annual emissions) with the assumed "no policy" scenario (that is, meeting Part L 2021 for builds completed up to 2028; and meeting FHS for builds completed thereafter).

In the following section, these cumulative emissions from new housing are compared against the available carbon budget that can reasonably be assigned for new housing in South Warwickshire, as a share of national carbon budgets (and eventual net zero 2050 goal) set within the Climate Change Act 2008.

2. Setting a carbon budget for South Warwickshire

Importance of setting a carbon budget

The exercises in this section are crucial to determine whether the "True Net Zero EUI" policy scenario is necessary for South Warwickshire to sufficiently contribute to the legislated national carbon budgets through to the local and national net zero target date of 2050, by staying within its share of those legislated national carbon budgets. These are considered the only rational tests for whether the plan will sufficiently fulfil its legal duty to mitigate climate change (set by the Planning & Compulsory Purchase Act 2004) to the extent required by the NPPF 2024 (i.e. proactively and in line with the Climate Change Act), as the Climate Change Act includes the national carbon budgets.

To fulfil the WMS2023's expectation to demonstrate local circumstances to justify the policy, the estimated emissions with and without the policy (identified in Section 1) can be compared against the carbon budget that is available for the operational emissions of new build homes in South Warwickshire, as set by the carbon budget identified in this section.

By testing these policy scenarios against the available carbon budget, it can be determined whether the "True Net Zero EUI" policy is justified and required for the new housing sector to sufficiently contribute to climate change mitigation. If it is found that the "True Net Zero EUI" policy scenario stays within the carbon budget, while the "no policy" (FHS) scenario fails to do so, this would demonstrate clear local circumstances to justify divergence from the WMS in pursuing the "True Net Zero EUI" policy scenario.

Net zero context for South Warwickshire

Both Warwick District Council[xxi] and Stratford-on-Avon District Council[xii] declared a climate emergency in 2019. While both commit to work towards net zero in 2030, the national net zero target is 2050. For the specific scope of this study, net zero operational carbon in new build housing[15], it is therefore, both locally and nationally important to consider what policy requirements are aligned achieving net zero by 2050. The Balanced Pathway to Net Zero (set out in the 6th Carbon Budget, which is one of the series of legally binding national carbon budgets passed into law under the aegis of the Climate Change Act 2008 that also sets the UK's 2050 net zero goal), states that new build homes should be net zero from no later than 2025[xiii]. Prior analysis[xiv] had shown that this will need to include that new homes achieve a space heating demand of 15-20 kWh/m^2/yr. The "True Net Zero EUI" policy scenario requires that all new housing achieves exactly these two points, and is thus aligned with national legislated carbon goals and the local net zero 2050 aspiration.

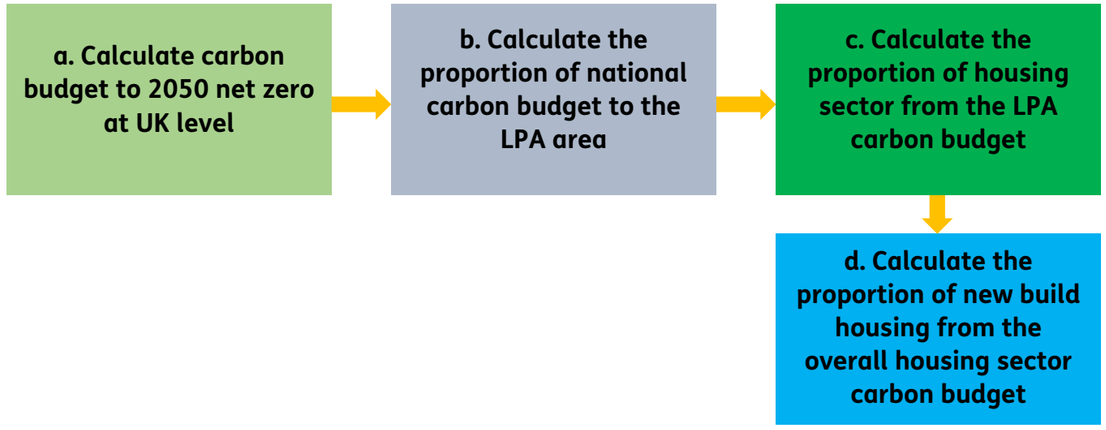
It is crucial that local plans fulfil their mandate to contribute to the national legislated Climate Change Act target of 2050 (and legislated carbon budgets). As per the NPPF (cited above), it is the responsibility of local authorities to ensure their plan *proactively* plays its fair role in this. In local areas that have the physical ability and the viability margin to carry the cost uplift of higher build standards, this would logically mean maximising policy ambitions to balance out for less progressive policies in other areas of the UK that may be less able to meet optimal standards due to local constraints on viability, supply chain or type of development that can be physically accommodated. Testing policies against the national legislated carbon budgets and net zero goal will determine whether the policy is sufficient to proactively mitigate climate change in line with those carbon budgets set via the Climate Change Act.

Carbon budget methodology

The first step in determining whether any of the policy scenarios ("True Net Zero EUI" policy scenario or an "FHS/no policy" scenario) would ensure new build housing is compatible with local or national carbon goals is to rationally establish a specific carbon budget for new build *housing* in the carbon budget period through to 2050.

The established carbon budget will reflect the local and national net zero 2050 goal. The policy scenarios will be compared against this budget. This local carbon budget does not assume any level of plan policy ambition. Rather, it represents the maximum allowable emissions to align South Warwickshire's anticipated housing growth with the Climate Change Act.

As the WMS2023's specific scope is not relevant to embodied carbon, existing buildings nor non-residential buildings, we here derive local carbon budgets that represent only the maximum allowable emissions for energy use of new build *housing* in South Warwickshire.



[15] The 2023 WMS only applies to energy efficiency standards in new build housing (asking that this be expressed in terms of TER, which is operational carbon from regulated energy only) and does not apply to policies on embodied carbon, on-site renewable energy, existing buildings or non-residential buildings. Operational carbon is any carbon emitted during the occupancy of a building. Energy efficiency is using less energy to achieve the desired result (in this case, the desired result is homes that function well for their occupants including remaining a comfortable temperature year-round).

a. Calculating remaining carbon budget to 2050 net zero at UK level

Our first step is to identify the remaining carbon budget at a national level through to the net zero date of 2050.

We here reflect the actual legislated carbon budget figures where those are available (all years up to 2037), and the soon-to-be-legislated carbon budget figure for 2038-42 which has been devised by the Committee on Climate Change and is now with parliament waiting to be legislated[xv].

The actual budget for the 2043-2050 period has not been defined by the CCC and won't be until the 8th and 9th Carbon Budget reports in a few years. For the purposes of this local carbon budget exercise, these figures for 2043-2050 have been indicatively derived from the Balanced Pathway trajectory. In short, this reflects Climate Change Committee reports on the Balanced Pathway to Net Zero in 2043-2050, adjusted by the % by which the legislated carbon budgets have historically differed very slightly from the 'Balanced Pathway' figures. See Appendix 3 for more detail on this.

Our resulting overall carbon budget value for the entire UK, on its path from 2025 to net zero by 2050, is therefore 4,588.1 MtCO2e.

Period	Budget source	Carbon budget ($MtCO_2e$)	Average/yr ($MtCO_2e$/yr)
2025–2027	Remainder of 4th Carbon Budget (2023 to 2027 total = 1,950$MtCO_2e$; actual emissions in 2023+2024 totalled 837. 1950 - 837 = **1,113**)	1,113	390/yr across whole CB; 371/yr in 2025-2027
2028–2032	5th Carbon Budget (legally binding)	1,725	345
2033–2037	6th Carbon Budget (legally binding)	965	193
2038–2042	CCC's 7th Budget recommendation (2025)	535	107
2043–2050	Not officially budgeted, but assume the following based on CCC "Balanced Pathway" annual emissions figures in each year (summing to 250.1 $MtCO_2e$):		
	2050: (65.29 x 103.1%)	67.3	
	2044: (54.07 x 103.1%)	55.7	
	2045: (42.47 x 103.1%)	43.8	
	2046: (33.33 x 103.1%)	34.4	
	2047: (24.58 x 103.1%)	25.3	
	2048: (16.09 x 103.1%)	16.6	
	2049: (7.99 x 103.1%)	8.1	
	2050*: (-1.11 x 103.1%)	-1.14	
Total		**4,588.1**	n/a

b. Deriving South Warwickshire's share of the total national carbon budget

This next step identifies what share of national carbon budget value can reasonably be assumed to be available for this local area.

A reasonable principle is to assume that each local area's respective share of current national emissions will continue into the future[16]. Therefore it is necessary to identify what % this local area's current emissions contribute to current national emissions, using the DESNZ UK Local Authority GHG Emissions dataset (2025 is the latest release; 2023 latest emissions values).

For South Warwickshire, this calculation is 1,822ktCO_2e (South Warwickshire annual emissions total) divided by 356,094 ktCO_2e (UK annual emissions total) = **0.51%.**

0.51% is therefore applied to the national carbon budget value (from the previous stage of this report), to represent the specific carbon budget for South Warwickshire. Hence, South Warwickshire's carbon budget in 2025-2050 is **23.47 MtCO_2e** (0.51% of 4588.1 MtCO_2e).

c. Deriving the housing sector's share of the total local carbon budgets

This step apportions a share of the aforementioned total South Warwickshire carbon budget to the housing sector in South Warwickshire. As per the previous stage, here the housing sector is apportioned a share that reflects the housing sector's existing share of existing total South Warwickshire emissions, based on DESNZ UK Local Authority GHG Emissions dataset as previously cited.

The share of emissions made up by each local sector can vary year-by-year due to shocks such as the COVID lockdowns (which strongly reduced transport emissions for one year). To avoid such distortions, instead of using the single latest year's data to base the local sectoral breakdown, an average of emissions from the housing (domestic) sector over the last 10 years is taken, which is representative of the housing sector's contribution to South Warwickshire's typical total emissions.

In South Warwickshire, 2014-2023 average annual housing emissions were 440.6 ktCO_2e, whilst South Warwickshire's average annual total emissions were 2,109.8 ktCO_2e. Thus the housing sector contributes 20.9% to South Warwickshire's total emissions.

- This 20.9% value is therefore applied to the local carbon budget value from the previous step.
- 23.47 MtCO_2e (total local share of national carbon budget value 2025 to 2050) x 20.9% = **4,901.83 ktCO_2e** is the local carbon budget for housing in 2025 to 2050.

d. Deriving new builds' share of the overall housing sector carbon budget

The previous step separated the housing sector from the overall local carbon budget value. The final steps are to separate the housing sector carbon budget between existing housing and new-builds, and then to further separate out the *avoidable* new build housing emissions. This last step is to focus in on only what this new local plan's new-build housing policy can affect.

Firstly, the expected emissions from existing homes and new build homes throughout the carbon budget period (2025-2050) are calculated. The new homes are then separated into 'avoidable emissions' (those that this policy can affect) and 'unavoidable' (those that this policy cannot affect). Note that the 'unavoidable' category includes any homes that would be built during the plan period that will not be affected by the policy (due to holding existing permission). "New housing avoidable emissions" therefore will only consist of homes that can be influenced by the policy.

Hence, the % split between the expected emissions from existing homes (all unavoidable), new build homes with unavoidable emissions, and policy-affectable new build homes from 2025 to the net zero target date in the "no policy' scenario, are identified. This will be the % split that will be applied to the previous stage's housing sector total carbon budget value. By applying this % split, the value apportioned to "policy-affectable new build homes" forms the final carbon budget value to assess policy scenarios within.

Unavoidable emissions - Existing housing built before the carbon budget period

To calculate the expected emissions from actual existing homes within the carbon budget periods, we first needed to determine the figure for the existing housing stock.

The latest MHCLG live housing stock figure for 2024 (136,499 dwellings) is a March 2024 snapshot and therefore excludes homes completed from 1 April to December 2024. These April-December dwellings are thus not included in the official 'existing housing stock' baseline.

However, emissions arising in 2024, including those from homes completed during that year, are already captured within the 2024 national emissions (which were deducted from the national 2023-2027 carbon budget as described in previous step 2.a.) and local energy use data (that were used to derive the local share of the carbon budget). Yet, as the homes built in 2024 were built gradually throughout the year and therefore were not all in use for the full year, the 2024 national emissions did not fully capture what the energy use of those homes would be in all future years. For this reason, we need to separate those 2024 homes from the 2024 'existing housing' baseline so that their full annual energy use can be separately accounted for as Part L 2021 'new homes' for all subsequent years of the plan period. Hence, homes built in 2024 are subsequently included in 2025 'new homes'. The 2024 'existing housing' baseline, as above, is a snapshot of March that year, therefore would have only

[16] This is a principle used by other local carbon budget expert analysis such as that of the Tyndall Centre, termed 'grandfathering'. It more fairly apportions emissions than alternative ways such as by population or financial indicators, because grandfathering automatically takes account of the sectors that make up the economy of each local area. For example, a location with a heavy dependence on employment in manufacturing would struggle to transition to low-carbon as rapidly as a service-based economy, while maintaining employment. Grandfathering automatically factors-in the current economic base of each area by reflecting the existing emissions profile of the area (e.g. in Rugby's case, heavy industrial emissions, most likely from a cement plant).

captured the homes that were built in the first quarter of the year. Utilising the proxy of new-build home EPCs issued in Q1 2024, that number of new-builds was 390. Therefore:

- 136,499 (existing housing stock March 2024) - 390 (2024 Q1 new homes built, which are instead treated in the 'new homes' figure) = 136,109.

We use actual local domestic energy consumption data as the basis for the prediction of emissions of the existing housing stock throughout the carbon budget period. The latest available figures on local energy consumption reflect 2024. As noted above, the new homes built in 2024 itself would have been built to current building regulations (Part L 2021) therefore would have a different energy use profile than the rest of the local existing housing stock, most of which is much older and thus less efficient especially in terms of heating use. Moreover, as those new-build homes would have been delivered gradually throughout the year and not occupied from 1st Jan 2024, the 2024 energy consumption figures would not reflect the amount of energy use that these homes will have when occupied for a full year. Therefore, for year 2025 onwards, when calculating the energy use of South Warwickshire's existing housing we utilise the *per-home* consumption figures from year 2023 so as to exclude the impact of energy use of the homes that were built in 2024. This 2023 energy use data is the final year that represents the energy performance of the housing sector before those 2024 new-build homes existed. It is as follows:

- In South Warwickshire the average 2023 electricity consumption (per existing home, annual) was 3,681 kWh and gas consumption 8,783 kWh (per existing home, annual, domestic standard meters)[17].
- Multiplied by local existing housing stock of 136,109 homes[18] built before 2024, this makes 1,195,432,811 kWh of electricity use and 500,990,862 kWh of gas use per year across pre-existing housing in South Warwickshire from 2025 onwards. In this first instance, these figures are assumed to continue throughout the carbon budget period.

To calculate the greenhouse gas emissions of this energy use by existing homes in each year, these consumption values are multiplied by the relevant carbon factors, using UK Government datasets for electricity (Table 1; Grid average, consumption, domestic) and gas (Fuels tab; natural gas; gross CV) for years 2025-2050.

- The electricity factor includes future grid decarbonisation, whereas no such decarbonisation projections exist for the gas grid[19].
- The gas-related emissions and electricity-related emissions are then summed to identify the total emissions of the existing housing (built before 2024) in each year of the carbon budget study period.
    - As a result, the emissions of these existing homes built before the carbon budget period is predicted at 284,394 tonnes in 2025, falling to 220,267 tonnes in 2050 because of the future electricity grid decarbonisation.

Summing each of the years in the carbon budget period (2025 to 2050) gives a cumulative total of **6,077,640** tonnes (6,077.64 kt) of emissions from the housing stock of 136,109 homes.

Crucially, this reveals that the predicted emissions from existing housing built prior to the carbon budget period already exceed the available South Warwickshire housing sector carbon budget previously identified, by 24%:

Figure 6: Comparison between predicted emissions of existing homes and total housing sector carbon budget in South Warwickshire from 2025 to 2050 (in kt)

Taken at face value, this would imply that there is no room in the carbon budget for any new homes. However, other than grid decarbonisation, these figures do not assume any future changes to existing homes, e.g. energy efficiency retrofit or switching from gas to electric heating. Realistically it is likely this will occur to some extent. Therefore, the next step divides the total available local housing carbon budget between policy-affected and non-affected homes (of which the latter includes these existing homes), in proportion to what their predicted emissions would be in the absence of policy. This has the effect of assuming that both the pre-2025 and post-2025 homes will undergo some degree of future improvement versus their current energy use profile, especially in pre-2025 existing housing (well beyond the electricity grid decarbonisation that has already been factored into the predicted emissions), to make room in the budget for the emissions of new homes.

[17] Per-home figures derived by dividing the South Warwickshire 2023 total domestic gas and total domestic electricity use by the number of homes in South Warwickshire in 2023 from MHCLG live tables on housing stock.
[18] As previously described
[19] This means that while the emissions from electricity fall steadily in each year even if electricity use remains static, the emissions from gas are equal in each year of the carbon budget period.

'Avoidable' and 'unavoidable' emissions from housing built during the carbon budget period

To recap: 'Avoidable' and 'unavoidable' here refer to whether the new local plan policy for new housing has the opportunity to prevent the emissions of these homes or not.

Of the homes built during the carbon budget period, we assume that those built up to end of 2027 would meet Part L 2021 standard, and those built from 2028 onward would meet the FHS (as per the previous section) in the 'business as usual'/'no policy' scenario (i.e. in the absence of any local plan policy[20] on energy / carbon performance). As previously noted, the new local plan is expected take effect for planning decisions only from 2028 onwards, therefore any homes built before then *and* any homes that have full planning permission already would follow the 'business as usual' path. It is also worth noting that even after 2028, homes that already have with full planning permission would still follow Part L 2021 standard (as it is expected that construction would start before the FHS transition period ends in March 2028, and a typical 12-month construction period would mean these would start to be delivered in 2029). In the housing trajectory figures received from SWLP team, only a very small number of proposed new homes already hold *full* permission *and* are stated to be delivered in 2029-2030[21]. Those that currently only hold *outline* permission are assumed follow the FHS from 2028 along with all other new builds.

The weighted average energy use figure from the six archetypes (noted previously), is reflective of an average new-build home in South Warwickshire, based on what is known about the typical split of housing types in South Warwickshire. As previously described, based on housing growth values from 2025 onwards, the following cumulative emissions for homes built in South Warwickshire from 2025 are calculated as follows in the 'no policy' scenario:

- Unavoidable emissions for new homes built in 2025 until end of 2027 and those that have 'full plans' permission already (therefore meeting Part L 2021): 286.28 $ktCO_2e$
- Unavoidable emissions for new homes built from 2028 onwards (built to Future Homes Standard; these are policy-unaffected homes due to prior permission): -0.28 $ktCO_2e$
- Avoidable emissions for homes built from 2028 (policy affectable-homes, but built to the FHS in this 'no policy' scenario): -1.03 $ktCO_2e$.

Adding together the aforementioned *existing homes cumulative emissions* over the respective carbon budget period to that of homes built during the carbon budget period, this gives a total housing sector emissions figure of:

- 6,077.64 $ktCO_2e$ (existing homes) + 286.28 $ktCO_2e$ -0.28 $ktCO_2e$ -1.03 $ktCO_2e$ = 6,362.61 $ktCO_2e$

Based on the cumulative emission calculations for the carbon budget period, the respective % contributions from each housing segment to overall expected housing sector emissions in the 2025-2050 carbon budget period are:

- From existing housing built before 2025: 6,077.64 / 6,362.61 = 95.52%
- From new-build homes built to Part L 2021 (those built in 2024 to end of 2027 and homes built in 2028-2030 with prior full permission): 286.28 / 6,362.61 = 4.50%
- From policy-unaffected homes built from 2028 (unavoidable FHS): -0.28 / 6,362.61 = -0.004%
- From policy-affectable homes built from 2028 onwards (avoidable FHS, 'no-policy' scenario: -1.03 / 6,362.61 = -0.02%.

As previously mentioned, the assumption is made that room must be made in the carbon budget to allow for the new housing growth (i.e. that existing housing in South Warwickshire will not be allowed to exceed the available local housing sector carbon budget and therefore will undergo some sort of carbon performance improvement in future years). We allocate that room for new housing based on policy-affectable new homes' % of actual predicted emissions, as above.

Applying this % contribution to the previously identified 2025-2050 South Warwickshire housing sector carbon budget value of 4901.83 $ktCO_2e$ therefore results in final carbon budgets for each housing segment as follows:

- **Existing housing:** 4901.83 $ktCO_2e$ x 95.52% = 4,682.29 $ktCO_2e$.
- **Homes built until end of 2027 (Part L 2021 homes, unavoidable):** 4901.83 $ktCO_2e$ x 4.50% = 220.56 $ktCO_2e$.
- **Policy-unaffected (unavoidable FHS) homes built from April 2027 onwards:** 4901.83 $ktCO_2e$ x (-0.004)% = -0.21 $ktCO_2e$.
- **Policy-affectable homes built from April 2027 onwards:** 4901.83 $ktCO_2e$ x (-0.02) % = -0.80 $ktCO_2e$.

[20] We also note that the most recent consultation version of SWLP, the Preferred Options consultation 2025, included 'Draft Policy Direction 22' whose standard for new build dwellings would be similar to the FHS. Therefore that draft policy direction is not presumed to make a significant difference compared to the 'no policy' scenario.

[21] This number is only 352 in 2029 and 74 in 2030. This is only 6% of the unavoidable Part L 2021 homes in the plan period, 3% of the total new build homes that the policy cannot affect, or 0.8% of all new-build homes in the plan period.

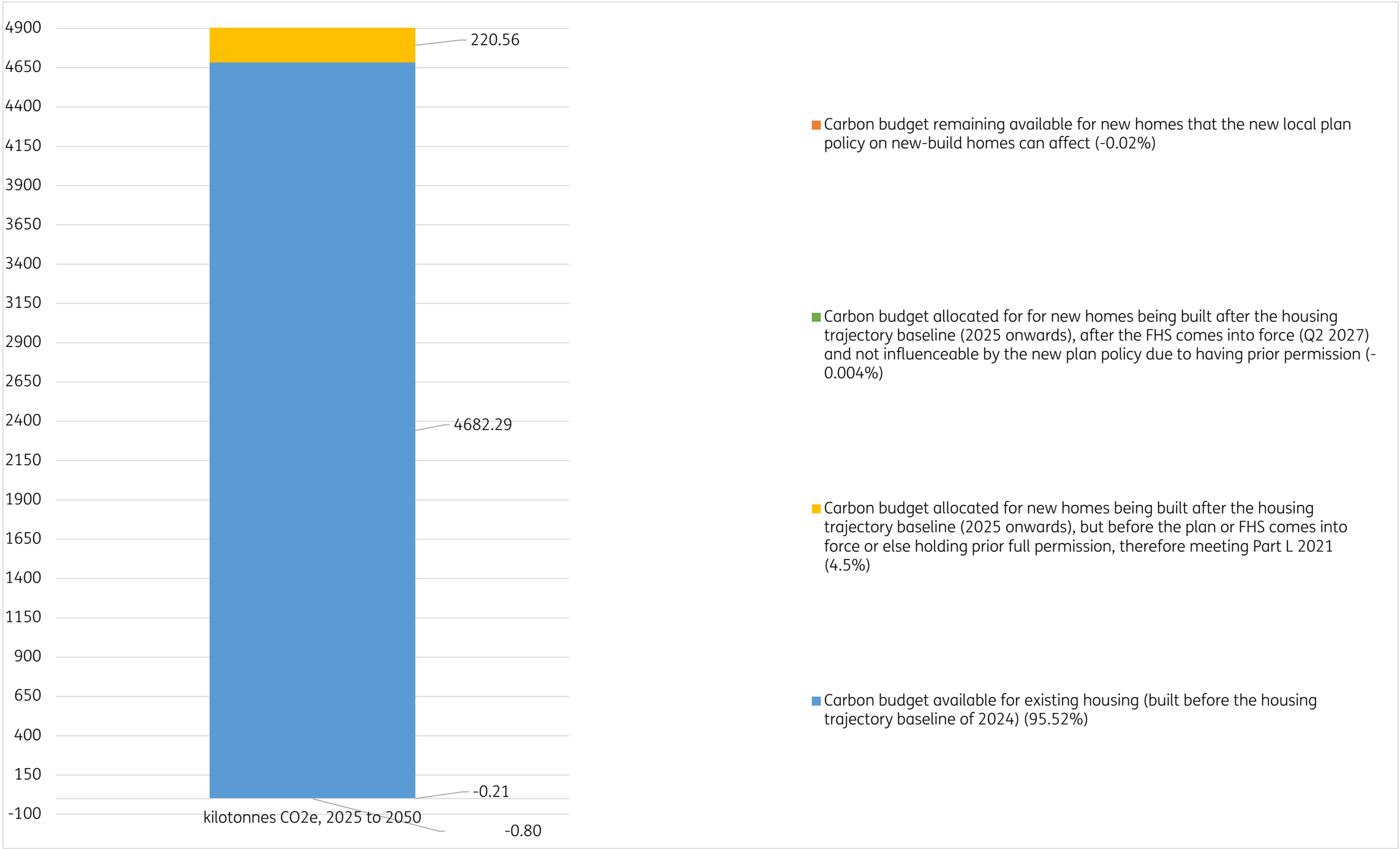


Figure 7: Available carbon budget in 2025-2050 for operational emissions of different parts of the housing sector in South Warwickshire, derived from national carbon budgets as previously described.

3. Conclusion to determine alignment with net zero targets

Headline conclusions

The aim of this report has been to determine whether either of the two policy approaches ("no policy" scenario, or a "True Net Zero EUI" policy scenario), would keep new homes within the remaining carbon budget available for new build housing in South Warwickshire in 2025-2050:

- This is crucial to the question of whether each policy scenario will ensure that housing development in South Warwickshire would "contribute to the mitigation of climate change" as per the local plan's legal duty, to the extent of being consistent with the national policy instruction to do so "proactively … in line with the Climate Change Act" and "support the transition to net zero by 2050" (NPPF 2024).
- These figures provide an illustration of local circumstances that further justify policy going beyond Building Regulations.

	Unit	Available carbon budget	No policy (therefore FHS)	True Net Zero EUI-based policy
Total operational carbon emissions (2025-2050) from new housing *that the new local plan can affect* (kt CO_2e) (Estimated 42,415 homes delivered in this period)	**ktCO_2e**	**-0.80 kt**	**-1.03 kt**	**-21.15kt**

The "True Net Zero EUI" policy scenario results in the greatest decrease in total operational carbon emissions from new housing within the carbon budget period, staying well below the available carbon budget. The policy achieves this by ensuring that every home is extremely energy efficient to the point that its annual on-site renewable electricity generation meets or exceeds the *total* annual energy use. Key elements of this policy are energy efficiency metrics that cover the home's *total* energy use (not just the regulated energy use[22]) and that are demonstrated using accurate energy use prediction methods (PHPP, CIBSE TM54 or similar[23]). These key elements for success are precisely what diverges from the WMS2023.

The 'no policy' scenario was also estimated to result in slightly negative emissions, due to the assumption made in the energy modelling that there would be a generous amount of PV in the FHS notional home. However, as previously explained, the actual published FHS reveals that the amount of PV will not be this generous in all cases and would be zero in some cases. Therefore, the small negative emissions from FHS homes shown here is now very uncertain. The 'true net zero' policy provides far more certain, effective climate mitigation, with far more headroom to avoid the risk of breaching the budget in the event of slight underperformance.

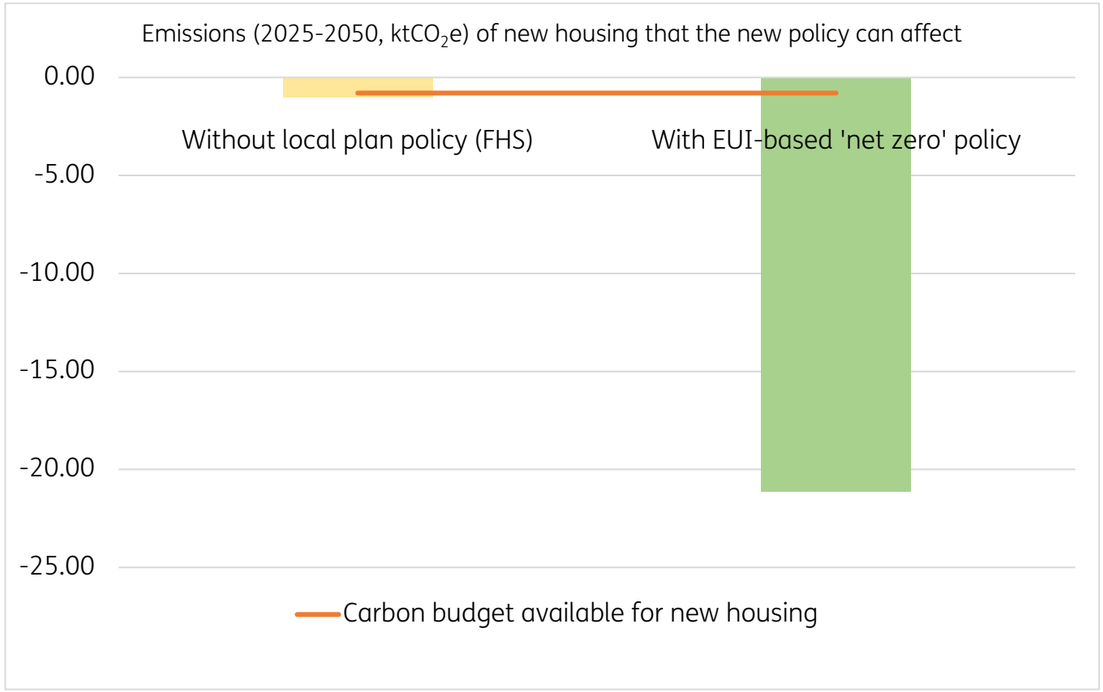


Figure 8: Chart showing the emissions of new homes built from 2025 to 2050 with and without the policy.

Figure 8 (above) shows another view of the available carbon budget, allocating a share of the budget only for all new housing that would be built from the date when the new plan adoption would take effect to the end of the carbon budget period (end of 2050), including both the 'avoidable' and 'unavoidable' new homes as previously explained. Following the same previously described approach to dividing up the available carbon budget in accordance with these homes' share of total emissions in a 'no policy' scenario, their share is -0.02% and the carbon budget for this housing is -0.80ktCO_2e. In the 'no policy' scenario, these homes are built to the FHS.

In the scenario *with* the policy, there will still be 286 kt emissions from homes that are *built* as part of this local plan's housing trajectory but escape the policy due to permission granted before the policy was in place. These 'unavoidable' homes are made up of 7,709 homes that would be built to Part L 2021 (286.28kt emissions) and 5,191 homes built to the FHS (-0.28kt emissions).

[22] This is in contrast to the TER metric stipulated by the Written Ministerial Statement 2023 as previously noted. The TER metric by definition can only account for regulated energy uses, which make up only circa 25-75% of a building's total energy use, depending on building type.

[23] Again, this is in contrast to the WMS' preferred metric of TER calculated using Building Regulations SAP methodology, which is highly inaccurate in predicting actual energy performance (see separate full evidence report for the extent of SAP's inaccuracy).

Discussion

In summary: While both the 'no policy' and 'true net zero' scenarios were found to have some degree of negative emissions, the negative emissions identified in the 'no policy' scenario are due to assumptions about generous amounts of PV in the Future Homes Standard which are now thought to be less likely in light of the publication of the full FHS since the energy modelling was conducted. As previously described, the actual published FHS notes that although this amount of PV *may* come forward in some new homes, other new homes will be permitted to not have any PV at all in the FHS, due to building height or other constraints. Even if such a generous amount of PV were delivered through the FHS, the 'no policy/FHS' scenario emissions were only just within the available carbon budget. This leaves little to no margin for the inevitable errors that will occur in construction, resulting in the widely-documented 'energy performance gap' that is seen across the UK construction industry[24].

The True Net Zero EUI policy is the only policy that has a sufficiently negative emissions effect in the carbon budget period to be certain of staying within the available carbon budget after accounting for margins of error, therefore is the only one that contributes to counteract the locked-in excess emissions (286.28kt) that will occur from the Part L 2021 homes built in the period before the local plan policy could take effect as described above. The True Net Zero EUI policy is therefore demonstrated to be the only policy option that 'proactively' mitigates climate change and helps deliver the objectives of the Climate Change Act as instructed by the NPPF, and helps fulfil the local plan's legal duty to mitigate climate change.

Determining if policy-affected new housing would remain within the remaining carbon budget for new homes

Unavoidable emissions

For policy evaluation, it was important to reflect what the policy could influence. This is because, as noted previously, the adoption of the South Warwickshire Local Plan is anticipated to be 2028. As a result, from the existing housing baseline of March 2024, there will be 12,900 new homes built in South Warwickshire that will either hold existing permission or be subject to an existing application prior to policy adoption, thus escaping the policy. This is made up of 7,709 homes built to Part L 2021 (between April 2024 and 2030) and 5,191 homes built to the FHS after plan adoption based on prior permission. Consequently, when dividing the carbon budget between what the new plan policy can or cannot influence, the category of 'unavoidable/policy unaffectable' includes these 12,900 homes as well as existing homes.

As a result, the cumulative unavoidable emissions for South Warwickshire sums the cumulative emissions of the existing housing stock with the cumulative unavoidable emissions of new homes built against Part L 2021 and new homes built to FHS (2028 onwards, except for 981 homes that already hold full permission before the FHS comes into force and are assumed to commence on site before the end of the FHS transition cutoff of March 2028).

- **6,077.64 $ktCO_2e$** (Predicted emissions from existing housing built before March 2024) + **286.28 $ktCO_2e$** (predicted emissions from unavoidable Part L 2021 new homes) + **(-0.28 $ktCO_2e$)** (predicted emissions from unavoidable FHS new homes) = 6,363.65 $ktCO_2e$ (Predicted total unavoidable housing emissions, not affectable by new local plan policy)
- This means that the unavoidable emissions already exceed the total South Warwickshire Carbon Budget of 4,901.83 $ktCO_2e$ by 1,461.82 $ktCO_2e$.

Therefore, it is important that the new build home emissions that can be avoided must be actively mitigated via the policy – which would only be reliably achieved via the 'true net zero EUI-based' policy standard.

The True Net Zero EUI-based policy achieves significant negative emissions, to a scale which would offset 7% of the emissions of the Part L 2021 homes. By contrast, the equivalent FHS homes (-1.03kt) would at best offset only 0.4% of the Part L 2021 homes' emissions, leaving no room for error or underperformance (and even this figure is in doubt in light of the actual published FHS, as previously explained). The 'True net zero EUI-based' policy thus is the only scenario that reliably, proactively mitigates climate change.

The 'no policy' scenario (FHS or an equivalent TER-based policy aligned to the FHS) is therefore not an appropriate policy approach to fulfil the local plan's mandate to proactively mitigate climate change in line with the Climate Change Act.

Could a TER-based policy be formulated that does better than the 'no policy' scenario yet doesn't go as far as the 'true net zero EUI' policy, and would this be good enough?

Clearly, this study has not attempted to test every possible formulation of a WMS2023-compliant policy scenario. It may be possible to design a WMS2023-compliant policy that makes some extent more carbon savings than shown here in the 'FHS/no policy' scenario. However, the WMS stipulates the use of a metric (TER, calculated by SAP methodology) that by definition does not cover the total energy use of a home and does not accurately reflect homes' actual energy performance because of the shortcomings of SAP as previously noted (in this report and in the previous Literature Review report for South Warwickshire).

Therefore any WMS-compliant policy cannot ensure that homes' energy use is kept low enough that it can be met with on-site renewable energy in actual operation and therefore achieve the actual net zero carbon homes that are necessary for the achievement of national carbon budgets - at least without needing to specify excessive amounts of onsite solar PV provision to counteract SAP's dramatic underestimation of energy use, which could make housing delivery unviable and might not be compatible with electricity grid constraints in some areas. By contrast, the "True Net Zero EUI" policy scenario keeps energy use so low that only small amounts of solar panels on site are needed to match (and even slightly exceed) the home's annual energy use, therefore not bringing excessive construction cost uplifts and minimising the burden that these new homes will place on the electrical grid.

[24] See previous 'Literature Review' report for references regarding evidence of the widespread energy performance gap (the gap between new buildings' predicted energy performance and their actual performance).

Additionally, we reiterate that the carbon budget assumed 'available' to policy-affectable new homes in this study depends on significant reductions in the emissions of existing homes and unavoidable Part L 2021 homes, beyond what will occur via the predicted electricity grid decarbonisation. It is important to focus on the fact that the predicted emissions from existing buildings alone significantly exceed the overall housing (existing and new build) carbon budget values in South Warwickshire.

- Those reductions will need to be delivered by significant rollout of energy efficiency improvements and electric heating (ideally heat pumps) to replace existing gas boilers in the existing housing stock (pre-2024) and in recent homes built to Part L 2021.
- These changes in existing housing is fact a very uncertain prospect, with the latest national progress report showing that the rollout of insulation and clean heating to existing buildings is far behind where it needs to be for the achievement of nationally legislated carbon targets under the Climate Change Act.
- If that rollout of improvements to existing housing in South Warwickshire does not occur, there will be no space for new homes available in the housing sector carbon budget, and in fact that housing sector carbon budget will be exceeded even just by the emissions of existing homes in the carbon budget period as follows:
    - Overall South Warwickshire housing carbon budget of 4901.83 $ktCO_2e$ will be exceeded by 1175.8 $ktCO_2e$ (24%) just by the emissions of the existing housing stock without retrofit.

We reiterate also that these housing sector carbon budgets are derived directly from the legislated national carbon budgets via a logical series of steps previously described in sections 2.a – 2.d, this is untenable in light of the local plan's mandate to mitigate climate change in line with the objectives of the Climate Change Act. While these changes to existing buildings cannot be ensured by the local plan (which only exerts power where permission is needed, and cannot force change to happen in existing buildings), it is the responsibility of the local plan to proactively take the mitigation actions that are within its power to reduce the likelihood of these carbon budgets being breached as shown here.

Given that South Warwickshire's existing housing emissions are unlikely to remain within the available carbon budget for the entire housing sector in South Warwickshire, it is essential that new build housing adds minimal burden to remaining within the budget. It is arguably sensical that a carbon budget of zero should be apportioned to new build housing since the existing housing subsector is already expected to use up all the whole housing sector carbon budget for both local and national periods.

Local plan policy must therefore require robust targets and metrics that truly result in nearly zero carbon development, as the "True Net Zero EUI" policy scenario would achieve. This is currently not achievable under a WMS2023-compliant policy, such as one relying on the FHS, as the Target Emissions Rate in the Standard Assessment Procedure (sought by the WMS) ignores unregulated energy which can account for approximately 25-75% of operational carbon emissions in new buildings. The modelling found that Future Homes Standard resulted in residual emissions from new build housing which resulted in a negligible reduction effect "True Net Zero EUI" policy scenario contributed less than zero emissions in the buildings that would be affected by the policy, which – even after the unavoidable emissions of homes that would be built to Building Regulations standards due to holding permissions/making applications before the policy is in place – results in overall much lower emissions from new build housing compared to any of the other policy scenarios.

It is therefore explicitly apparent that new build housing must be subject to stringent policy that genuinely achieves zero carbon development in the buildings that it can influence, in order to meet the local plan's climate mitigation mandate to the extent required by the NPPF. Expressing a policy in the way that the WMS2023 stipulates – i.e. as a percentage reduction on the TER metric calculated using SAP – would make the policy subject to the inadequacies and inaccuracies of Building Regulations metrics and SAP tool (see separate literature review report). This clearly cannot be risked in light of the carbon budget analysis presented here, if the local plan is to meet its climate change mitigation mandate set by law and policy as previously described in this report and the separate literature review. This study has clearly shown that the modelled WMS-compliant policy ("no policy" scenario) is not appropriate to be aligned with South Warwickshire's local net zero target nor with the UK's legally binding targets. It is only the "True Net Zero EUI" policy scenario that can be considered appropriate as a proactive mitigation step in line with the net zero targets.

Thus, this study has clearly shown that local circumstances exist to justify a departure from national policy, i.e. the 2023 WMS, as South Warwickshire would exceed its remaining carbon budget for new build housing by a significant amount if a policy aligned to the 2023 WMS was implemented, whilst "True Net Zero EUI" policy scenario would contribute towards the mitigation needed in the housing sector.

Appendix 1
Building specifications assumed in each of the three policy scenarios

These building specifications are taken from the primary energy modelling exercise for South Warwickshire, which identified what specifications would be needed in typical new-build home types South Warwickshire to achieve the selected energy performance targets in the policy for homes. These inputs represent different specifications set for different policy scenarios, which are the key factors that influence space heating demand, energy consumption, energy generation and resulting carbon emissions of buildings.

We here provide an extract of apartments and semi-detached houses to illustrate the range of difference between the specifications.

Envelope performance

	Part L 2021					**FHS**					**“True net zero” EUI-based policy (ultra-low energy)**					
Building element	Bungalow & Terrace	Detached	Semi-detached	Low-rise flats	Mid-rise flats	Bungalow & Terrace	Detached	Semi-detached	Low-rise flats	Mid-rise flats	Bungalow	Detached	Semi-detached	Terrace	Low-rise flats	Mid-rise flats
Roof U-value (W/(m^2.K))	0.10				0.11	0.10				0.11	0.09	0.09	0.10	0.11	0.09	0.11
External wall U-value (W/(m^2.K))	0.18	0.16		0.17	0.13	0.18	0.16	0.15	0.17	0.18	0.10	0.10	0.10	0.15	0.10	0.17
Floor U-value (W/(m^2.K))	0.12				0.13	0.12				0.13	0.10			0.13	0.10	0.10
Door U-value (W/(m^2.K))	1.00					1.00					1.00					
Glazing U-value (W/(m^2.K))	1.20 (Double Glazing)					1.2 (Double-glazing)					0.80 (Triple Glazing)					
Air permeability	5 m^3/(m^{2}h)					5 m^3/(m^{2}h)					0.6 ACH or 0.45 m^3/(m^{2}h)	0.6 ACH or 0.60 m^3/(m^{2}h)	0.6 ACH or 0.70 m^3/(m^{2}h)	2 m^3/(m^{2}h)	0.6 ACH or 0.85 m^3/(m^{2}h)	0.6 ACH or 1.25 m^3/(m^{2}h)

Building services

	Part L 2021 (today's standard)						FHS						"True net zero" EUI-based policy					
Building element	Bungalow	Detached	Semi-Detached	Terrace	Low-rise flats	Mid-rise flats	Bungalow	Detached	Semi-Detached	Terrace	Low-rise flats	Mid-rise flats	Bungalow	Detached	Semi-Detached	Terrace	Low-rise flats	Mid-rise flats
Heat source	Gas combi boiler					Communal gas boiler	5kW Air Source Heat Pump Radiators					Communal Air source heat pump with HIUs	5kW Air Source Heat Pump Radiators			Communal Air Source Heat Pump with HIUs		
Ventilation	0% heat recovery with intermittent extract						0% heat recovery with intermittent extract						88% HR. 2m duct 25mm insulation					
Renewable energy	5.85 kWp	4.95 kWp	2.70 kWp	2.70 kWp	4.50 kWp	58.95 kWp	40% GFA / 4.5 kW 9.9kWp	40% GFA / 4.5 kW 6.75 kWp	40% GFA / 4.5 kW 4.50 kWp	40% GFA / 4.5 kW 4.50 kWp	40% GFA / 4.5 kW 4.95 kWp	40% GFA / 4.5 / no. of storeys kW 45.50 kWp	60% GFA / 4.5 kW 14.52 kWp	60% GFA / 4.5 kW 9.68 kWp	60% GFA / 4.5 kW 6.05 kWp	60% GFA / 4.5 kW 6.05 kWp	60% GFA / 4.5 kW 7.26 kWp	72.6 kWp

Appendix 2
Electricity carbon factor change over time

Electricity carbon factors were taken from national projections that are released within the UK Government DESNZ dataset "Green Book Valuation of Energy Use and Greenhouse Gas Emissions for Appraisal"[xvi], data tables 1-19. The relevant table is "Table 1: Electricity emissions factors to 2100, $kgCO_2e/kWh$".

This is the national estimate of the amount of greenhouse gas emissions that will occur due to each kilowatt-hour of grid electricity use. It reduces over time because national government assumes that more and more renewable energy generation will be connected to the grid to replace fossil fuels, and some extent of hydrogen use and/or carbon capture being deployed at any remaining power stations that run on fossil gas or other combustible fuels.

The Green Book dataset is updated periodically. This analysis was conducted in January 2026, at which time the most recent version was released in November 2023.

The Green Book provides the Table 1 data in 2 forms:

- "Long run marginal" and
- "Grid average".

These two forms are further differentiated into:

- generation-based factors
- consumption-based factors, which are further differentiated by:
    - residential,
    - industrial,
    - commercial/public sector.

The guidance within that Green Book data table download confirms that "Analysts should use consumption-based emissions factors for measuring GHG emissions per unit of final energy demand. These emissions factors include transmission and distribution losses, including significant losses due to power station inefficiency. Long-run marginal emissions factors should be used for measuring small changes in consumption or generation [whereas by contrast,] Grid average emissions factors are used for footprinting."

Therefore, as we are looking to find the carbon footprint of new housing in South Warwickshire, for our exercise the appropriate category is 'grid average, consumption-based, domestic'.

We therefore here reproduce the relevant part of Green Book Table 1 that we used.

Year	$kgCO_2e$ per kWh Electricity use (Grid average, consumption-based, domestic)
2025	0.131
2026	0.098
2027	0.073
2028	0.063
2029	0.054
2030	0.049
2031	0.042
2032	0.033
2033	0.026
2034	0.021
2035	0.020
2036	0.020
2037	0.018
2038	0.018
2039	0.017
2040	0.016
2041	0.015
2042	0.015
2050	0.009
2044	0.008
2045	0.008
2046	0.008
2047	0.005
2048	0.005
2049	0.003
2050	0.003

Table 4: Relevant grid electricity carbon factors extracted from national Green Book dataset.

Appendix 3
Forecasting an estimated carbon budget amount for years beyond the legislated and CCC-recommended budgets to date

The ultimate carbon budget for South Warwickshire needed to be derived from national carbon budgets. National carbon budgets are devised by the Climate Change Committee CCC) before being passed into law by parliament under the aegis of the Climate Change Act.

So far national carbon budgets have only been legislated up to year 2037 (the Sixth Carbon Budget), and the next carbon budget (period 2038-2042) has been devised by the CCC and is now waiting to be passed into law (it is here assumed that this will form the next legislated budget, as prior carbon budgets have followed the CCC's recommendation).

Because the NPPF 2024 instructs local plans to support the *transition to net zero* for which the date is 2050, the carbon budget in this exercise needs to cover the full period to 2050. Therefore for years from 2050 to 2050, it is necessary to make a reasonable assumption about what the carbon budget is likely to be in that period.

The last few CCC recommended budgets (which became law) closely follow what the CCC terms the "Balanced Pathway to Net Zero", which represents the most reasonable balance between ambition and feasibility.

The CCC *does* provide projections of this Balanced Pathway all the way through to the legislated net zero target date of 2050, including beyond the period for which national carbon budgets have been devised so far. The latest available version of this, from the CCC's 7th Carbon Budget Report, is as follows:

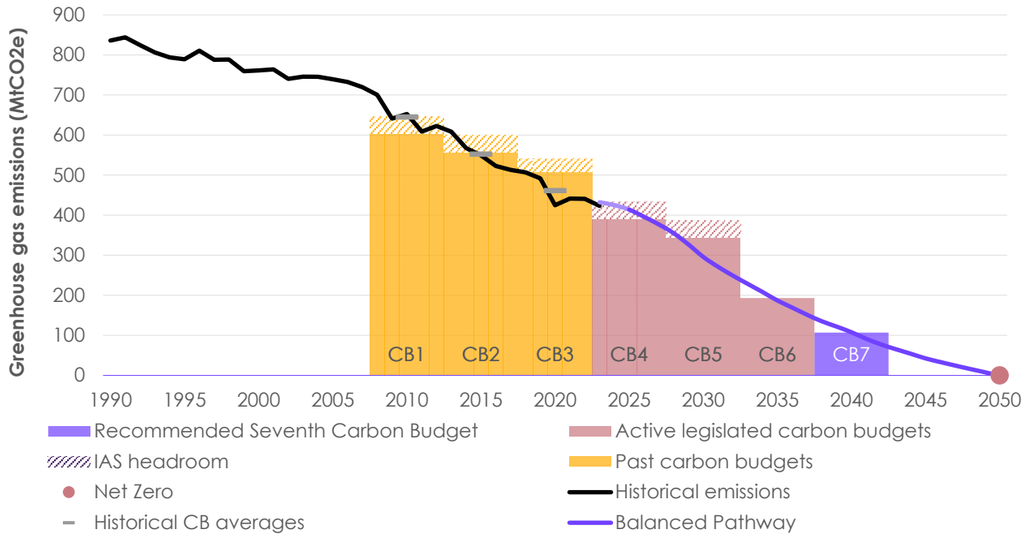


Figure 9: Legislated carbon budgets, soon-to-be-legislated 7th carbon budget, and 'balanced pathway to net zero'. "CB" = Carbon Budget. IAS = International aviation & shipping. Climate Change Committee 7th Carbon Budget, 2025

The CCC's carbon budget reports also come with downloadable spreadsheets of the data that generates these charts. From that download, we can see that the exact emissions in the Balanced Pathway in the years beyond the 7th carbon budget are, in megatonnes CO_2e:

2050	2044	2045	2046	2047	2048	2049	2050
65.29	54.07	42.47	33.33	24.58	16.09	7.90	-1.11

The sum of these is 242.61 $MtCO_2e$.

We could make an assumption that this will be the legislated carbon budget in those years.

However, the CCC's data also show the balanced pathway for years up to 2043, and the actual set carbon budgets (including those that have already been legislated and the soon-to-be-legislated 7th carbon budget). In fact, these actual carbon budgets are not precisely equal to the sum of the 'balanced pathway' annual emissions for the respective years in the period. The current 'live' carbon budget is for 2023-27. As a whole, the sum of all actual carbon budgets from today's onwards is 3.1% higher than the sum of all 'balanced pathway' annual emissions figures in the same period:

-	**Total $MtCO_2e$, 2023 to 2042**
Sum of all "Balanced Pathway" annual emissions:	5019.3
Sum of all actual national carbon budgets: *(including the 7th carbon budget)*	5175.0
Actual national carbon budgets total as a % of 'Balanced Pathway' total	103.1%

Therefore, a more accurate prediction of actual carbon budgets from 2043-2050 can be made by applying this difference to the Balanced Pathway figure for that period as noted above:

- 242.61 $MtCO_2e$ x 103.1% = 250.1 $MtCO_2e$.

This figure of 250.1 $MtCO_2e$ is therefore the figure we use in our assumptions of the total national carbon budget through to the final net zero legislated date of 2050:

- 4338 (budget 2025 to 2042) + 250.1 (budget 2043 to 2050) = **4588.1 $MtCO_2e$**.

All of our local and sectoral carbon budgets are subsequently derive from this national figure.

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[ii] Keep Bourne End Green v Buckinghamshire CC & SSHCLG [2020] EWHC 1984 (Admin) paragraph 105, cited in Estelle Dehon KC to Essex County Council and Essex Climate Action Commission (2025), *FURTHER UPDATED OPEN ADVICE. IN THE MATTER OF THE BUILDING REGULATIONS, PART L 2021 AND THE PLANNING AND ENERGY ACT 2008 Re: Ability of local planning authorities to set local plan policies that require development to achieve energy efficiency standards above Building Regulations.* https://www.essexdesignguide.co.uk/media/3129/essex-open-legal-advice-a-updated-may-2025-energy-policy-in-plans-and-building-regulations.pdf

[iii] https://www.theccc.org.uk/wp-content/uploads/2025/02/The-Seventh-Carbon-Budget.pdf. For a view of the past, current legislated and soon-to-be-legislated carbon budgets, see figure 3.2 on page 64. For a view of the steep reductions pathway in each sector, see figure 3.6 on page 72.

[iv] CIBSE (no date), *Carbon Bites: The Performance Gap*. https://www.cibse.org/media/a1skdgsi/cb11.pdf

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[vi] RICS (2024), *Whole life carbon assessment for the built environment*. For direction on what energy modelling methods are acceptably accurate, in particular that Part L 2021 calculations (i.e. SAP and SBEM) are not, see section '5.3.1 Energy modelling for buildings', page 103. https://www.rics.org/content/dam/ricsglobal/documents/standards/Whole_life_carbon_assessment_PS_Sept23.pdf#page=103#page=103

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[xiii] Climate Change Committee (2020), *The Sixth Carbon Budget: The UK's path to Net Zero.* See table 3.2.c https://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf

[xiv] Climate Change Committee (2019) UK Housing: Fit for the future?. *https://www.theccc.org.uk/publication/uk-housing-fit-for-the-future/*

[xv] UK Parliament (2026), House of Commons Committee Report, Eighth Report of Session 2024–26: "*The Seventh Carbon Budget*". This report was published on 4th March 2026 and includes recommendations that the approval of this should involve at least a half-day debate in Parliament. The report states that "The Government has two months to respond" to the recommendations in this report. https://publications.parliament.uk/pa/cm5901/cmselect/cmenvaud/1327/report.html

[xvi] HM Government Department for Energy Security and Net Zero, *Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal*. https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal