# Appendix: Summary of cited necessity, feasibility and cost evidence by policy component

**Table 1: Summary of necessity, feasibility and cost evidence with links to evidence sources.**

| | Policy component | Necessity (alignment with climate mitigation duty, and other local or national policy) | Feasibility rationale or sources | Cost evidence sources for viability test (for methodology, see Appendix 2 ) |
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| SCC 1.1 | ≥63% TER improvement on Part L 2021, or equivalent, from energy efficiency* measures<br><br>(*includes heat pumps as well as fabric improvements and other energy efficiency improvements)<br><br>% improvement on Part L 2021 TFEE, by home type:<br>• End terrace: ≥12%<br>• Mid terrace: ≥16%<br>• Semi detached with room in roof: ≥15%<br>• Detached: ≥17%<br>• Bungalow: ≥9%<br>• Flats / apartments: ≥24% (weighted average, whole block).<br><br>This is to be calculated using the current version of SAP (SAP10.2) or later updated Part L calculation. | • These requirements are expressed as % reductions on the Part L TER, using a specified version of SAP, and cost uplifts are provided here to assess the impact on viability and housing delivery. As such, they accord with the Written Ministerial Statement of 13th December 2023. The TFEE targets are subordinate to the TER target and these TFEE targets are selected to be aligned with the TER target.<br>• Aligns with the %TER reduction that the national Future Homes Standard will achieve, based on Government statements that the FHS will achieve ~75% reduction on Part L 2013 and that Part L 2021 achieves a 31% reduction on Part L 2013.<br>• Ensures that new homes will use low carbon heat (not gas), as the Committee on Climate Change (2020) has shown will be necessary in new homes from no later than 2025 in order to hit the UK's carbon budgets (and in fact this was already thought necessary in 2019 Committee analysis for the UK's older, laxer carbon budgets)<br>• Energy efficiency improvement is vital in order to reduce energy demand to the point where it can eventually be matched with solar panels on a home's own roof thus becoming zero carbon – which all homes should achieve from 2025 if the UK's legislated carbon budgets are to be met according to the Committee on Climate Change (2020) which sets and tracks those carbon budgets<br>• Protects against the risk of the FHS being withdrawn (like the Code for Sustainable Homes was in 2015), watered down, or delayed beyond its purported 2025 introduction date (which would put UK carbon budgets at risk, as per the above cited Committee on Climate Change analysis).<br>• Ensures the carbon target of the Future Homes Standard is delivered via energy efficiency (as originally proposed by Government in its consultation response 2021, whose indicative FHS specification had improved fabric and a heat pump but no PV), so that poor efficiency cannot be masked by solar PV.<br>  ○ This energy efficiency reduces the strain on the electrical grid and the amount of renewable energy that will need to be added (onsite or in the wider grid) to make the home zero carbon (thus also reducing the cost of new renewable energy installation and of upgrading grid capacity to distribute that energy).<br>  ○ This also helps protect occupants from fuel poverty risks that have risen during the ongoing energy cost crisis, especially in light of the latest FHS consultation 2023-24 which indicates that heat bills could double compared to today's new builds if carbon savings are delivered only by switching to electric heating without improved fabric (and without any PV). This is the reason why the FEE target is necessary. Meeting the FHS via energy efficiency means occupants will see bill savings even if they are not at home | The TER and TFEE targets can both be achieved using moderate fabric improvements and switching from gas boiler to a heat pump, without solar panels, as per the indicative FHS notional building specification released in Government's Response to the FHS Consultation (2021). All of the elements in that specification are available within the construction sector today.<br><br>The TFEE target feasibility is evidenced through the SAP10.2 modelling conducted by the Future Homes Hub (2023); see columns "Ref2025" which represents the indicative FHS specification released by Government in 2021 as cited above.<br><br>A similar or better standard of TER reduction has been recently achieved via similar elements in practice in the Midlands, e.g. Gallows Hill aka Europa Way, Warwick.<br><br>The TER reduction may also be achieved with even less improvement than described above, as Cornwall local plan evidence base shows that a 76% TER improvement on Part L 2013 can be achieved just by using a heat pump, without any improvement to fabric or PV (calculated in SAP10 which is not the latest but quite recent). This is similar to or even slightly greater than Policy SCC1.1's requirement for a 63% reduction on Part L 2021. However, we would not encourage this heat-system-only route to compliance, due to the impact on heating bills when using electric heating without any improvement to fabric. This is the reason for the (secondary) TFEE target. | Fabric: 1.4% uplift on Sandwell viability assessment baseline sample period. Weighted average of estimated uplifts between building regs compliance and FHS fabric-only spec, as stated for mutually comparable building types in the following evidence sources (plus inflation where data was from earlier than 2023):<br>  ○ Government FHS Impact Assessment 2019, 'Future Homes Fabric-Only' (as cost uplift from Part L 2013)<br>  ○ Government FHS Final Stage Impact Assessment 2021 (combined with data from the 2019 FHSIA as above, to estimate the fabric uplift from Part L 2013 to 2021, to derive the FHS fabric uplift from Part L 2021)<br>  ○ Cornwall Climate DPD Evidence Base (Energy review & modelling, Feb 2021) (as cost uplift from Part L 2013)<br>  ○ Cornwall Climate DPD Evidence Base (technical appendix, 2021) (as cost uplifts from Part L 2013 and Part L 2021)<br>  ○ South Oxfordshire & Vale of White Horse 2023 (uplift on Part L 2021)<br><br>Heat pump & associated system components, replacing gas: 1.6% on Sandwell viability assessment baseline sample period. Weighted average of cited figures from national government and several other local plan recent evidence bases by reputable buildings engineers and costs experts:<br>  ○ Government's Future Homes Impact Assessment 2021 (deduct cost of gas boiler and gas connection; but add cost of heat pump, hot water cylinder and enhanced electrical supply; also add cost of larger radiators to the part of the Sandwell baseline where Part L 2013 was the standard).<br>  ○ Cornwall Climate DPD Evidence Base (technical appendix and Energy review & modelling, both 2021); used to derive uplifts on both Part L 2013 and 2021 |

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| | | to use energy at the time-when their PV is producing, for example key workers who often work away from home during the day.<br>• An identical requirement for TER % reduction was recently found sound in Warwick Net Zero Carbon DPD as of April 2024. The sound Warwick DPD also requires a % TFEE improvement, albeit a smaller improvement due to a scarcity of evidence about what was feasible at the time when Warwick's DPD was drafted. It is reasonable for Sandwell's TFEE improvement targets to be larger thanks to newer evidence (see 'feasibility' column). | | ◦ South Oxfordshire & Vale of White Horse 2023 (this informed the uplift only on the part of the Sandwell baseline for which Part L 2021 was the standard).<br>The majority of the above sources, and others in Essex and London, also state a base build cost (before any local policy improvement). Taking an average of these base build costs, we converted the average *fabric uplift* and average *heat system* cost uplifts into these cited average % cost uplift that is reasonable to apply to the Sandwell policy.<br>Where any of these uplift or baseline figures were from more than a year ago, an inflationary uplift (see Appendix 2 for costs methodology). |
| SCC 1.2 | Positive weight will be given where proposals achieve:<br>• Total Energy Use 35 kWh/m²/year (EUI)<br>• Space heating demand 15kWh/m²/year | • These targets match the level of energy performance that is needed in new homes in order to deliver the UK's legislated carbon budgets, as per analysis by leading building experts coalition LETI and professional body RIBA, as well as evidenced in analysis by the Committee on Climate Change which is the entity which devises those budgets before they are passed in to law by parliament.<br>◦ A space heat demand limit of ≤15-20kWh/m²/year was shown necessary by that Committee on Climate Change analysis.<br>◦ A home targeting ≤35kWh/m²/year EUI target would need to have a heat system at least as efficient as a heat pump (thus following the Committee's aforementioned finding that new homes need to have low carbon heat from 2025 onwards). LETI also explains that this 35kWh target reflects new homes' fair share of the limited amount of energy available within the UK in the 'balanced pathway to net zero', in which the UK will need to end unabated fossil fuel generation by 2035 and upscale renewable energy to represent 60% of the UK's generation mix by 2030 (and 80% by 2050) as per Committee on Climate Change (2020) analysis.<br>◦ We consider the UK's carbon budgets to be the only logical benchmark to interpret fulfilment of the NPPF's instruction to achieve "radical reductions in greenhouse gas … [via] a proactive approach … in line with the objectives and provisions of the Climate Change Act" (NPPF December 2023, paragraph 157-158 and footnote 53).<br>• A home designed to meet these limits is (except possibly in higher-rise flats) so efficient that it can later much more easily and cheaply become truly net zero carbon via the addition of solar PV that fit on its own roof area (as per evidence from Good Homes Alliance (2020) and from evidence bases of local plans of Cornwall, Central Lincolnshire, Essex, South Oxfordshire & Vale of White Horse and Greater Cambridge). Solar PV is relatively easy to retrofit, while fabric and heating systems are far harder and more expensive to retrofit (three to five times the cost of meeting the same standards in new build). Therefore a home | This particular policy is not a minimum required standard but rather a mechanism to reward exemplary performance, therefore does not need to demonstrate majority-case feasibility.<br>Still, the feasibility of these targets (using existing technologies and techniques) has been demonstrated in recent evidence bases of several other local plans both adopted (Central Lincolnshire, Cornwall, Bath & North East Somerset) and emerging (South Oxfordshire & Vale of White Horse, 18 London Boroughs, Greater Cambridge, and Essex].<br>The above evidence sources show that a full range of home types with reasonable form factor (shape and size) can achieve these targets using a combination of the following improvements over current Building Regulations standards:<br>• Modest improvements to thermal envelope (insulation value of walls, floors, doors, windows etc)<br>• Reasonable improvement to airtightness<br>• Switch to heat pump (instead of the current gas boiler standard). | This particular policy is not a minimum required standard but rather a mechanism to reward exemplary performance, therefore does not need to demonstrate cost uplift.<br>Still, the estimated cost of reaching these standards (using existing technologies and techniques) has been demonstrated in recent evidence bases of several other local plans both adopted (Central Lincolnshire, Cornwall, Bath & North East Somerset) and emerging (South Oxfordshire & Vale of White Horse, 18 London Boroughs, Greater Cambridge, and Essex].<br>In some of these cases, the cost of reaching these exemplary targets was found to be not much greater than the cost of meeting the fabric and heat system elements of the previous indicative Future Homes Standard outlined by Government in 2021. This is because the improved fabric thermal efficiency (low space heat demand) can be met with a smaller, cheaper heat pump than would have been needed for a building that just has the Government's indicative FHS fabric as cited above. |

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| | | built to these standards is not only climate-aligned but truly 'net zero ready' within the power of its owner to implement the next steps to reach net zero, rather than having to rely on grid decarbonisation and/or expensive, disruptive and potentially risky fabric retrofit.<br>• The policy is designed to provide a mechanism to recognise and reward truly exemplary performance, because the Future Homes Standard in its previous or current draft forms will fail to meet these targets, as evidenced in:<br>○ SAP10.2 modelling by the Future Homes Hub shows that, for the 'contender specifications' (CS2/2a) whose fabric closely resembles that of the Government's current FHS options, space heat demand in most homes will be far higher. Only flats were found to achieve ≤20kWh, while all houses fail this limit (mid terrace 21-22kWh; end terrace 28kWh, semi-detached 30kWh; detached 46-52kWh; bungalow 46-47kWh). By contrast, in 'CS3' whose fabric is similar to Government's previously proposed FHS fabric, the flats, terraces and semi are below 15kWh, while detached and bungalows still had much improved rates (29kWh and 33kWh respectively). This is before adjusting for SAP's underestimation of space heat demand by 210-560%, as demonstrated in Cornwall local plan evidence.<br>○ South Oxfordshire & Vale of White Horse local plan evidence base (2023) realistic energy predictive modelling shows that the FHS (even with the better fabric previously indicated in Government's 2021 consultation response) would have a space heat demand of 48-70kWh/m²/year depending on type of home. | If airtightness is improved further, there may be no need to improve the insulation values. Also, homes with more efficient form (shape and size) – such as flats – may be able to hit the targets with direct electric heating instead of a heat pump. | |
| SCC 1.3 | No fossil fuels: The use of fossil fuels and connection to the gas grid will not be considered acceptable.<br>Major developments must explore opportunities for decentralised energy. | • Further ensures that no new homes are connected to the gas grid from 2025, which was shown to be a necessary step to meet the UK's carbon budgets within aforementioned 2020 'balanced pathway' analysis from the Committee on Climate Change.<br>• This is a backstop against the risk of any applicant claims that the 63% minimum onsite TER reduction could be unfeasible or unviable for their individual development. It clarifies the expectation that even if the Council chooses at any point to waive the 63% reduction for unforeseen circumstances in future, the presumption should still not be to revert to gas heating, because the aforementioned analysis indicates that new-build residential gas heating is incompatible with the UK's carbon budgets from 2025.<br>• This is a policy on carbon emissions, not energy efficiency, therefore is not subject to the Written Ministerial Statement of 13th December 2023, whose constraints relate expressly to "local energy efficiency standards". | As for heat pumps, above. Many other commonly used technologies can provide the functions that grid gas has previously fulfilled – such as:<br>• Heating and hot water: Heat pumps (air-, ground- or water-source); direct electric heating; heat recovery ventilation; heat-recovery from wastewater (which is part of the current Part L 2021 notional building); district heating.<br>• Cooking: Direct electric hobs; electric induction hobs; electric ovens; microwaves. | As above – see costs sources for heat pumps. |
| SCC 1.4 | On-site renewable electricity generation capacity to at least equal to 39% of the predicted annual | • Ideally, for full climate mitigation, an even greater amount of PV (to match 100% of total energy use) would be provided. That would make the home operational net zero carbon, which is thought to be a necessary step in order to achieve the UK's carbon budgets, according to the Committee on Climate Change (2020) 6th carbon budget analysis, taking the most 'balanced pathway' to net zero in 2050. However, the target of matching 50% of regulated energy use is instead selected due to viability pressures in Sandwell. | Part L SAP provides estimated regulated energy use, albeit an underestimation (see 2021 evidence of Cornwall local plan). This underestimation may be solved in HEM, the incoming replacement for SAP. Meanwhile, other more accurate energy modelling | The targeted amount of PV panel provision specified in Policy SCC1.4 is a direct derivative of the available budget remaining for PV (within the £6,500 energy policy cost allowance set within the Sandwell 2023 Viability Assessment, minus the cost of firstly achieving the energy efficiency requirements of Policy SCC1.1). |

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| | regulated energy use.<br><br>If the above is demonstrated unfeasible, then backstop target for renewable electricity generation is 35kWh/m² projected building footprint/year. | • The draft policy target of 39% PV provision reflects the amount of PV that can be provided, within a given available total energy policy cost uplift allowance specified in Sandwell's 2023 viability assessment, after deducting the cost of meeting SCC1.1 as described above. See Appendix 2.<br>• Even if ignoring the 'buildings' sector role in the UK's pathway to net zero, this policy requirement also supports another part of the Committee on Climate Change (2020) analysis of the necessary steps in the electricity sector towards the national carbon budgets in the 'balanced pathway', which include:<br>  ○ Doubling of electricity demand by 2050 (due to the necessary "switch towards electrification in transport, heating, and manufacturing and construction" as well as new growth)<br>  ○ Increasing renewables to reach 60% of the electricity generation mix by 2030, and 80% by 2050<br>    ▪ Within this, solar generation increases from 10 TWh in 2019 to 60 TWh in 2035 and 85 TWh in 2050. This means adding 3GW of solar per year across the country. If this is not done, more wind energy will need to be installed instead (which is still under an effective moratorium in onshore locations under the current planning system).<br>• This proposed policy also aligns with relevant national policies expressed within the NPPF:<br>  ○ Expectation that the local plan should increase the supply of renewable energy:<br>    ▪ "The planning system should support the transition to a low carbon future … It should … support renewable and low carbon energy and associated infrastructure" (Paragraph 157)<br>    ▪ "To help increase the use and supply of renewable and low carbon energy and heat, plans should … provide a positive strategy [these] sources, that maximises the potential for suitable development … [and] identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems" (Paragraph 160)<br>    ▪ "Local planning authorities should … not require applicants to demonstrate the overall need for renewable or low carbon energy, and recognise that even small-scale projects provide a valuable contribution to significant cutting greenhouse gas emissions" (Paragraph 163a)<br>  ○ "Planning policies and decisions should support development that makes efficient use of land" (Paragraph 128). It is clearly most land-efficient to put this necessary PV on the roofs of the new homes, because otherwise greenfield or other open land will need to be used to accommodate this required growth in renewable energy (as part of the fulfilment of the UK's carbon budgets as cited above).<br>• The policy acknowledges and provides for the event that the primary target (50% of regulated energy use matched with onsite renewable electricity) is | tools are available including PHPP and CIBSE TM54.<br><br>The target is eminently achievable in that, based on a range of industry estimations about the regulated energy demand of a home that meets SCC1.1, the 39% target could be met just 7.35m² of PV (equating to only approximately 14% of the estimated roof space of the average Sandwell new build home. This is in fact significantly less than the amount of PV that is already in the Part L 2021 baseline. See Appendix 2 for calculations.<br><br>Energy modelling in other local plan evidence bases show that it is technically feasible to go far further, i.e. if a home firstly meets best practice energy efficiency targets, then a much more stringent target of net zero total operational carbon using PV on its own roof space:<br>• Can be achieved up to 3- 4 storeys, or 6 storeys if roof is optimised for PV (Central Lincolnshire)<br>• Can be achieved with a similar amount or even less PV than is already in today's Building Regulations baseline. (Essex)<br><br>Energy modelling evidence for 18 London Boroughs (2023) demonstrated the following % TER reductions (on Part L 2021, modelled in SAP10.2) with efficient fabric and heat pump and an amount PV varying by home type:<br>• Terraced house: PV on 36% of roof. 99% TER reduction if fabric is 'good practice'; rising to 104% reduction if fabric is 'ultra low energy'.<br>• Low-rise flats: PV on 40% of roof. 89% TER reduction if fabric is 'good practice'; rising to 96% reduction if fabric is 'ultra low energy'.<br>• Mid-rise flats: PV on 33% of roof. 75% TER reduction if fabric is 'good practice'; rising to 81% reduction if fabric is 'ultra low energy'. | The cost uplift of meeting SCC1.1, from a baseline of Part L 2013 or 2021, took into account that the SCC1.1-compliant home does not include PV, therefore deductions were made to reflect the cost of Part L 2021 PV for the share of the Sandwell viability assessment baseline that occurred while Part L 2021 was in place (see Appendix 2 for more detail).<br>• The remaining budget for PV, after the cost of meeting SCC1.1 including inflation, was £2,126.<br>• £2,126 would buy 1.62kWp of solar panels, according to DESNZ PV costs per kWp (median, including inflation, average of all installation sizes, average of the 5 year sample period matching Sandwell viability assessment baseline build cost sample)<br>• Estimated PV output, with Sandwell's annual sunlight, is 972.7kWh/kWp. Result: Annual output of 1,573.2kWh from the 1.62kWp array.<br>• 1573.2kWh PV output works out to 39% of the estimated regulated energy use of a building that meets SCC1.1 (estimation described below).<br><br>The regulated energy demand (in a home that already meets the FHS through other means, as per Sandwell draft policy SCC1.1), has been estimated by averaging data from reputable sources:<br>  ○ Good Homes Alliance Building Standards Comparison (2020) (SAP10.1 with ASHP)<br>  ○ Future Homes Hub (2023) 'Ready for Zero' and appendix ( "Ref2025', 'room-in-roof')<br>  ○ South Oxfordshire & Vale of White Horse energy modelling (FHS, semi-detached).<br>  ○ Resulting average estimated regulated energy use: 44.5kWh/m² floorspace.<br><br>• Multiply by average floor space in Sandwell new builds: HM Government 'Table NB7' on new build EPCs by local authority area ('houses', total floor area divided by number of houses; weighted average of 5 years concurrent with the Sandwell viability assessment's baseline sample period = 90.06m² floorspace per home) |

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| | | unfeasible – for example in tall buildings where there is not enough roof space to provide PV to supply all floor areas – by setting the fallback target of 35kWh/m2/year, which scales up with building footprint (effectively, roof space) rather than by floor area or energy use.<br>• This is a policy on renewable energy, not energy efficiency, therefore is not subject to the Written Ministerial Statement of 13th December 2023, whose constraints relate expressly to "local energy efficiency standards". | • High-rise flats: PV on 21% of roof. 77% reduction if fabric is 'good practice'; rising to 81% reduction if fabric is 'ultra low energy'.<br>• As the PV area is not maximised in the above scenarios, there is clearly scope for further TER reduction by using more of the roof for PV.<br>In practice, a recent scheme in the Midlands (Europa Way, Warwick) has achieved regulated net zero (≥100% TER reduction) using PV after improving energy efficiency via a heat pump and airtightness. It appears there would have been scope even for more PV, as the engineer's case study states they were able to reduce the PV provision thanks to the energy efficiency.<br>120kWh/m$^2$ building footprint/year has been proven feasible using PV in the evidence bases of South Oxfordshire & Vale of White Horse, Central Lincolnshire, and Essex:<br>• In Oxfordshire this used 70% of a building's roof space, or in Essex only 60%. This % will fall as PV technology improves.<br>• Taking into account Sandwell's slightly lower annual sunlight, the equivalent feasible target in Sandwell would be 113.4kWh/m$^2$/year. However, that has not been pursued as it would exceed the cost cap described in Appendix 2, beyond which there would be anticipated to be significant viability challenges.<br>The Sandwell target of 35kWh/m$^2$ building footprint represents the exact equivalent of the amount of PV needed for the 39% target, divided by the estimated footprint of the average Sandwell new house. | ○ Result: Regulated energy use of 4,004.6kWh / Sandwell new build house / year.<br>Resulting cost for solar panel provision to match 39% of energy use in the typical Sandwell new build home: 0.9% uplift on our weighted average cost baseline (four years of Part L 2013 and 1 year of Part L 2021, to match the Sandwell 2023 viability assessment baseline costs sample period).<br>Please note that the amount of budget available for PV after meeting SCC1.1 may have been underestimated, as the inflationary uplift applied to the fabric and heat pump costs source data was a generic England-wide figure which is higher than the difference in element prices seen between the FHS Impact Assessments 2019 to 2023. See Appendix 2 for explanation. However, this figure is adopted here as a cautious assumption in order to not overestimate the available budget within the £6,500 cost uplift allowed for in the Sandwell 2023 viability assessment. |
| SCC 1.5 | Offset at £1.37/kWh for any residual annual energy demand not met by on-site annual | • The necessity for having an offsetting policy is as a fallback to the renewable energy policy, recognising that the following scenarios where there could theoretically be legitimate claims of non-feasibility to provide enough PV to get to net zero on site at developments that are otherwise desirable: | There are emerging initiatives and tools that will help the Council develop a pipeline of suitable projects: | • The cost per kWh figure reflects the estimated cost of the shortfall in on-site PV to be instead delivered off-site. This cost is directly derived from the same costs and |

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| | renewable energy generation (where net zero on site is demonstrably unfeasible) | ○ The taller a building is, the more energy-using floorspace it has, but without a corresponding increase to roof space to accommodate on-site solar PV panels. This can mean that a building above a certain height can struggle to accommodate enough PV to match its own energy use (albeit this should be extremely rare when the target is only 39% of regulated energy use; in evidence from other local plan areas it has been proven feasible to meet total energy use – equivalent to approximately four or five times the Sandwell target – in buildings up to 4 storeys, assuming they meet best practice energy efficiency targets; see evidence cited from Cornwall, Essex, Oxfordshire, Central Lincolnshire and Greater Cambridge cited in Appendix 2). Sandwell, as a predominantly urban or suburban area, is more likely than rural areas to see mid-to-high-rise proposals. Still, Sandwell's new homes in the last 5 years (2019-2023) were majority low-rise (houses 59%; bungalows 1.8%), while there were 39% flats and 0.6% maisonettes (some of which may also be low-rise). Therefore this offsetting option is not expected to be necessary in the overwhelming majority of cases, but provides flexibility for high-rise developments which are otherwise desirable in that they enable efficient use of land and denser development (putting homes closer to jobs and services, reducing the need to drive).<br>○ If the site is very heavily overshadowed by existing non-removable trees or taller buildings, the output of PV may be lower than optimal if the proposed building cannot be laid out to avoid that shading.<br>○ If a large proportion of roof must unavoidably be used for other purposes, such as green roof to meet the national mandatory minimum Biodiversity Net Gain, or for other building servicing equipment that cannot be put on walls, in basements or at ground floor in the building curtilage. This scenario is only likely in tight urban settings with very little outdoor curtilage. In the low-rise home for which costs and feasibility were explored (see Appendix 2), the 39% target can be met using only ~14% of roof space, therefore the competing uses would need to take up more than 86% of a low-rise home's roof before this would be a legitimate reason to not achieve the PV target on site and therefore resort to offsetting. In higher rise buildings (which increase floor space but without a corresponding increase to roof space), the PV roof coverage percentage would need to increase from 14% (thus reducing the proportion of roof space that competing roof uses could take up before inhibiting the PV target).<br>○ In tight urban plots there may be an unavoidable need for a large proportion of green roof to meet the national mandatory Biodiversity Net Gain, (if vertical greenery is unfeasible), leaving insufficient room for the required amount of PV. Green roof provision does not necessarily rule out solar panel provision; 'biosolar' roof options should be explored first (solar panels mounted above planting or between rows of planting, spaced sufficiently to allow enough sunlight for the plants and/or the plants chosen to thrive in full or partial shade).<br>○ At some sites, visible PV may be considered to have an unacceptable impact on the setting of nearby heritage assets. However, this should be explored | • West Midlands Combined Authority Geospatial Local Area Energy Plan, supported by National Grid and Advanced Infrastructure. Its online digital mapping tool data will identify existing rooftops suitable for PV, grid capacity by small areas, existing energy demand by area (enabling choices to co-locate generation with demand to minimise grid impact). The tool can also model possible PV projects, including grid impact, cost and carbon saving, and can even be used to notify the grid network operator. This would be highly useful to identify not only potential sites to use the offset fund within Sandwell itself, but also sites outside Sandwell but in the same region in the event that there is a lack of opportunity to spend the fund in Sandwell itself within the time limit on Section 106 payment usage.<br>• To maximise smooth and effective implementation of projects using the offset funds, Sandwell Council may be able to draw on insights from its 'net zero in Sandwell' grants that it has delivered to SMEs via its 'Sandwell Business Growth' arm. | kWh generation described for on-site provision, as stated in the previous row.<br>• There is therefore no additional cost to developers if they have to go via the offsetting route, rather than the onsite PV provision route, to meet the required provision of 39% of regulated energy use.<br>• In practice, the Council would incur administrative costs in running and utilising these funds to deliver projects to generate the equivalent amount of renewable energy in the local area.<br>• However, it is assumed that the Council's delivered projects will use funds pooled from multiple contributions, allowing economies of scale to be achieved. The cost of £1.35 used in the calculation represents the DESNZ estimation of the average cost of all sizes of installation, but the DESNZ figures also show that PV installations of over 10kWp can be achieved at £0.98/kWh.<br>• The difference between £0.98 and £1.37 (stated in the policy) provides room for the Council's administrative costs to run the fund, and/or a minority proportion of smaller-scale PV installations to be included within the Council's overall offsetting project portfolio. Please refer to the offsetting report for further clarification of offsetting costs.<br>• It is unnecessary to separately viability-test the offsetting cost because, as previously cited, it should be feasible to meet the renewable energy requirement on-site in the overwhelming majority of cases, in which case there is no need to offset. In the event that offsetting is needed, the cost is designed to be identical to that of delivering the PV on-site. |

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| | | with a heritage officer or other relevant authority, not be simply assumed wherever there is a conservation area or a nearby listed building.<br>• The necessity for this off-site renewable energy to be delivered (in terms of the necessity for climate mitigation) is identical to that stated for the on-site renewable energy policy as noted above.<br>• This policy is a backstop to the *renewable energy* policy, not the energy efficiency policy, therefore it is not subject to the Written Ministerial Statement of 13th December 2023, whose constraints relate expressly to “local energy efficiency standards”. | | |
| SCC 1.6 | Implement an assured performance method throughout construction [to reduce or eliminate the energy performance gap] | • The ‘energy performance gap’ (between design-stage predictions and actual performance) is well-documented. This arises due to a wide range of weaknesses in the design and construction process, ranging from inaccurate energy prediction methods through to construction-related errors (such as punctures in airtightness membrane), and to some extent user error relating to lack of familiarity with any innovative heating or ventilation systems in the building.<br>• Part L SAP energy calculation methodology is particularly inaccurate at predicting actual energy use, especially its underestimation of space heat demand (likely to be 210-560% higher in reality than in SAP predictions, as demonstrated in evidence from other local plans including Cornwall). This is a problem believed to affect all parts of the construction industry but can be avoided through application of certifications or assured performance processes developed by the industry. These include a range of steps to address all the reasons by which the energy performance gap would otherwise arise, from energy modelling to construction to handover.<br>• Without a method to reduce the performance gap, new homes will not perform to the standards specified in the previous policies which were carefully selected to align with the UK’s carbon budgets (and protect occupants from the recent excessive rise in energy costs). Therefore the Committee on Climate Change (2020) analysis of necessary steps towards the UK’s legislated carbon budgets includes at least a one-third reduction in the performance gap in existing buildings through retrofit, and does not allow for a performance gap at all in new-build homes. | Several energy performance assurance processes suitable for residential buildings are offered across the industry including BSRIA Soft Landings, NEF/GHA Assured Performance Process, and Passivhaus certification. Other processes may be available or become available during the course of the plan.<br>There are some additional tools which are not in themselves an assured performance process but can assist in improving the energy performance of a building in-use, such as BS40101. | Not expected to create a significant additional amount of cost. |
| SCC 1.7 | Demonstrate consideration of potential for energy storage and/or smart energy distribution to bridge the time and locational difference in energy generation | • Although the upscaling of renewable energy generation is vital within the achievement of the UK’s carbon budgets (as per Committee on Climate Change analysis previously cited), these renewable installations are variable in when they generate energy and their peak generation does not always coincide with the peaks in energy demand (such as during the day and during peak sunlight hours).<br>• This policy encourages the developer to seek ways to overcome any potential constraints in the ‘availability of appropriate local energy infrastructure’ which the Written Ministerial Statement of 13th December 2023 notes may otherwise be foreseen to pose feasibility challenges to compliance with other policies. | Energy storage technologies in the form of batteries are already available.<br>Demand-side response technologies are emerging, as are more innovative energy storage technologies such as for heat storage.<br>The policy only requires exploration or consideration of such technologies. | Not expected to create additional costs, as the policy requirement is only to demonstrate *consideration* for these technologies, not a requirement to implement any particular technology or standard. This consideration should be part of the normal process of considering and selecting energy-related elements of any development. |

| | Policy component | Necessity (alignment with climate mitigation duty, and other local or national policy) | Feasibility rationale or sources | Cost evidence sources for viability test (for methodology, see Appendix 2 ) |
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| | and energy consumption | | Exploration of opportunities is not subject to feasibility challenges. | |
| SCC 1.8 | Monitoring and reporting of energy use and renewable energy generation for first 5 years of occupation (required only in schemes of 50 or more homes) | • Developers' and planning officers' action is vital in reducing the energy performance gap (aforementioned, see policy SCC1.6 above) in order to ensure homes perform as needed within the UK's carbon budgets. However, these essential decisionmakers are often unaware of the energy performance gap or at least its scale and prevalence. Many developers and prospective occupants do not realise that the SAP-predicted energy use figures quoted in an EPC seriously underestimate the building's actual energy use, and consequently their energy bills.<br>• More data is needed, both in the planning sector and in the development/construction industry, to more widely and robustly evidence the scale of the performance gap in order to develop industry-wide responses to this and to inform potential future iterations of building regulations.<br>• Policy SCC1.8's required energy monitoring exercise will therefore fulfil two functions: Firstly as a learning exercise for developers and planning officers, and secondly to gather evidence on the scale of the performance gap which can inform future local plan policy and be fed into relevant evidence-gathering exercises at national level. | Feasibility is demonstrated through several years of the same requirement across Greater London (as part of London Plan policy SI2 and accompanying paragraph 9.2.10, with accompanying guidance on how to fulfil this requirement). The London guidance shows how this can be done without causing breaches of data privacy, by aggregating data up to 'reportable units' of 5 homes or more. | Not expected to create a significant additional amount of cost. We note that the adopted London Plan viability assessment (and accompanying technical report and addendum) similarly did not express a need to apply any specific cost uplift relating to London's energy monitoring requirement, yet this plan was still considered sound and has been implementing its energy monitoring policy for several years now with no signs of impact on housing delivery.<br>Should costs be incurred, these should benefit from economies of scale in that the policy only applies to developments well in excess of the 'major' threshold. |
| SCC 2.1 | Minimum improvement on Part L TER via on-site measures, by typology:<br>• Offices: ≥25%<br>• Schools: ≥35%<br>• Industrial buildings: ≥45%<br>• Hotels: ≥10%<br>• Other non-residential buildings: ≥35% | • The Committee on Climate Change (2020) analysis of necessary steps in the non-residential buildings sector to meet the UK's legislated carbon budgets include (but are not limited to):<br>  ○ Businesses and industry to improve energy efficiency by ≥20% by 2030 (from 2017 level)<br>  ○ Natural gas to be fully phased out by 2050 in existing building stock replaced by a mix of electricity and hydrogen (noting that hydrogen has only a small role, expected to meet only 5% of non-residential heat demand even by 2050)<br>  ○ No oil- or coal-boilers in public buildings from 2025 or in commercial buildings from 2026<br>  ○ No gas boilers from 2030 onwards in public buildings or 2033 in commercial buildings<br>  ○ Scale-up the market for heat pumps<br>  ○ Roll-out low-carbon heat networks in dense urban areas especially hospitals and schools, and switch existing heat gas-fired heat networks to low-carbon and waste heat from 2025 to complete this switch by 2040<br>• Non-residential buildings vary much more than residential buildings do, in terms of their energy use profile and appropriate technologies for the characteristics of the building use. Therefore it is appropriate to vary the targets according to what is feasible good practice for different broad categories of non-residential use, based on application of the most appropriate technologies to bring forward the | Energy modelling for 18 London Boroughs (2023) evidenced that the following % TER reductions (on Part L 2021, using SAP10.2) can be achieved:<br>• Office (7-storey) with 50% of roof covered in PV: 25% TER reduction with 'good practice' fabric and basic heat pump, or 32% with 'ultra-low energy' fabric and an improved heat pump. These TER reductions become 49% and 57% respectively if PV is increased to 70% of roof area<br>• School (3-storey) with 25% of roof covered in PV: 40% TER reduction with 'good practice' fabric and basic heat pump, or 83% with 'ultra-low energy' fabric and an improved heat pump<br>• Industrial building (3-storey) with 20% of roof covered in PV: 40% TER reduction with 'good practice' fabric and four-pipe chiller, or 61% with 'ultra-low energy' fabric and an improved heat pump<br>• Hotel (9-storey) with 50% of roof covered in PV: 10% TER reduction with | Energy modelling for 18 London Boroughs (2023) evidenced that the specified minimum % TER reductions could be achieved with a combination of technologies that would result in the following cost uplifts:<br>• Office: 0.4% cost uplift<br>• School: Could be cost-neutral or even cost-negative while achieving even higher TER % reductions,<br>  ○ But could alternatively have cost uplift of 1.1%-2.9% if a less cost-effective combination of technologies is chosen. This variation is because of how Part L SAP10.2 baseline is configured in non-residential buildings, resulting in a failure to recognise the benefits of certain technologies as a % TER improvement.<br>• Industrial: 5.5% cost uplift, although could be up to 6.2% if a different combination of technologies is used. Again, % TER improvement is not directly correlated with % cost uplift.<br>• Hotel: 0.5% cost uplift. |

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| | | necessary changes in the sector for the energy efficiency and clean heat transition needed for the UK's carbon budgets as summarised above<br>• The targets selected reflect those shown to be feasible based on very recent energy modelling and cost analysis across 18 London boroughs, which like Sandwell is a built-up urban setting (albeit less so than London). This results in targets that may in fact be less ambitious than what non-residential buildings could technically achieve, because Sandwell's growth is likely to be lower-rise than London's and therefore the specified amount of PV would meet a greater proportion of the building's energy use and therefore achieve a greater TER % reduction.<br>• These requirements (to which it is hoped energy efficiency improvement will make the main contribution) are expressed as % reductions on the Part L TER, and cost uplifts are provided here to assess the impact on viability. As such, they accord with the Written Ministerial Statement of 13th December 2023. (The Ministerial Statement's encouragement to use a 'specified version of SAP' is not relevant to policy on non-residential buildings, given that SAP is only applicable to residential buildings). | 'good practice' fabric and basic heat pump, or 16% with 'ultra-low energy' fabric and an improved heat pump.<br>The same London report concludes with recommended % TER reduction targets by typology. Sandwell draft Policy 2.1 reflects those stated targets, except that the London report did not differentiate 'hotels' from 'other non-residential', whereas the Sandwell policy sets a looser target for hotels in light of the fact that the London modelling had indicated that the feasible TER improvement in hotels was 10-16% (unless increasing the amount of PV). | ○ But: a slightly different combination of technologies achieving only a slightly better TER improvement (11% instead of the policy target 10%) could have a cost uplift of 1.6%. Again, this illustrates how an increase in cost is not directly proportionately linked to an improvement in TER. |
| SCC 2.2 | Positive weight will be given where proposals achieve:<br>• Total Energy Use (EUI): 65 kWh/m²/year<br>• Space heating demand (SHD): 15 kWh/m²/year. | • These targets would drive performance towards the changes that were previously described above as necessary steps towards the UK's carbon budgets, including:<br>○ The 20% improvement in energy efficiency (this will be supported by both the EUI target and the space heat demand target)<br>○ The phase-out of gas, coal and oil and the roll-out of heat pumps, given that the specified EUI target will be much easier to hit when a building benefits from the energy efficiency of a heat pump (250-500% efficient) in comparison with that of gas boilers (~89% efficient).<br>• These targets are in line with those set by LETI derived from analysis of the UK's finite energy budget within the context of the energy system changes that need to happen to meet the UK's carbon budgets and the performance that is feasible in buildings today using today's available best practice techniques and technologies. LETI differs in that LETI's EUI targets vary between offices (55kWh) and schools (65kWh). The draft Sandwell policy refers to a single EUI figure for simplicity (the middle ground of the LETI targets), which is reasonable given that this policy creates an *optional* benchmark for desirable exemplary practice, not an absolute requirement.<br>• These are not set as absolute requirements mainly because there is such great variety in unregulated energy use profiles between individual buildings even within the same use class – for example a warehouse or industrial building may have extremely low unregulated energy use if it is mainly a storage or logistics building, but may have extremely high unregulated energy use if it is a data centre. Similarly a retail building's unregulated energy use can be dramatically different depending on whether it has refrigerated sections. Hotels in particular are thought to find it difficult to meet these targets (see 'feasibility' column) due | This particular policy is not a minimum required standard but rather a mechanism to reward exemplary performance, therefore does not need to demonstrate majority-case feasibility.<br>Still, the feasibility of similar targets, via available construction methods, has been demonstrated in energy modelling in several other recent local plan evidence bases including:<br>• South Oxfordshire & Vale of the White Horse (emerging; 2023) (the warehouse, retail, school, and office could reach an EUI of 31-46kWh/m²/year with reasonable improvements, or 42-57kWh even just via the indicative Future Buildings Standard)<br>• Essex energy modelling (2023):<br>○ Space heat demand kWh/m²/year: school ~12; office ~10.25; industrial ~10.<br>○ EUI kWh/m²/year: School ~62; office ~66; industrial ~28.<br>• 18 London Boroughs (2023):<br>○ Space heat demand kWh/m²/year: Office 4-12; school 4-12; industrial 10-12; hotel 15-24. | This particular policy is not a minimum required standard but rather a mechanism to reward exemplary performance, therefore does not need to demonstrate cost uplift.<br>Still, the estimated cost of reaching these standards (using existing technologies and techniques) has been demonstrated in energy modelling within several other recent local planning evidence bases including those cited to in the 'feasibility' column. We do not cite those costs here as we do not wish to indicate a need to viability-test costs of non-mandatory policies. |

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| | | to high hot water use. Therefore the policy is designed to reward exemplary practice but does not go so far as to *require* performance to these standards.<br>• Hitting these targets would mean that a building has a much greater chance of being able to match its own annual energy use using solar panels that its own roof can accommodate, thus becoming truly net zero carbon in operation.<br>• Efficiency of this degree protects the organisations and businesses that will occupy these buildings, helping to protect Sandwell's economy from the recent extreme hikes in energy prices. | ⊖ EUI kWh/m²/year: School 57; office 66; industrial 27. The hotel however was at 142, failing the EUI target. | |
| SCC 2.3 | Fossil fuels and connection to the gas grid will not be considered acceptable.<br>Major non-residential developments should assess opportunities to connect to decentralised energy networks. | • See Policy 2.1 'necessity' column commentary on phase-out of goal, oil and gas heating in non-residential buildings as a necessary action towards the UK's carbon budgets. | See rationale for equivalent residential policy (SCC1.3). In some non-residential cooking/catering scenarios, biofuels may be a further option. | None required beyond that already covered in Policy SCC2.1 (TER reduction achieved by fabric and fossil-free heating). |
| SCC 2.4 | On-site renewable energy generation capacity to at least equal to the 39% OF predicted annual *regulated* energy use.<br><br>OR if this is unfeasible then provide renewable energy generation equal to 35kWh/ m² projected building footprint/year. | • The policy allows for a fallback target aligned to the footprint rather than the energy usage, again in recognition of the fact that taller buildings or non-residential buildings with unavoidably high energy use (e.g. hotels; see SC2.1 feasibility above) can still be brought to provide a reasonable but ambitious amount of renewable energy within their own roof space.<br>• This is a policy on renewable energy, not energy efficiency, therefore is not subject to the Written Ministerial Statement of 13th December 2023, whose constraints relate expressly to "local energy efficiency standards". | Regarding the per- m² footprint target of 35kWh/year: See equivalent rationale for policy SCC1.4.<br>See feasibility rationale for Policy SCC2.1 regarding %TER reductions on site in London modelling evidence: These were achieved with PV equivalent to only 20-50% of the building's footprint. Ergo, significantly larger reductions could be achieved with larger (yet reasonable) amounts of PV.<br>Evidence from South Oxfordshire & Vale of White Horse (2023) shows that their basic archetypes (retail, school, office, warehouse), if built to an optimal level of energy efficiency, could all take enough PV on their roofs to match *total* energy use (well in excess of the PV needed to match only 39% of *regulated-only* energy as sought by the draft Sandwell policy). The exceptions to the Oxfordshire net zero | Costs evidence that can be used for various building types to meet this standard can be cited from:<br>• South Oxfordshire & Vale of White Horse (2023) (note: the PV costs shown in this report are sufficient to match *total* energy use, not just *39% of regulated-only energy*, so would need to be scaled down to reflect each building type's respective ratio of regulated-only energy, in order to reflect the Sandwell draft policy)<br>• 18 London Boroughs 'Delivering Net Zero' 2023 (note: PV costs are not shown separately to fabric + heat system costs in this report). |

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| | | | (total energy use) achievement were datacentres and some refrigerated retail.<br><br>By contrast, the basic retail and basic warehouse, built to Future Building Standard energy efficiency levels, could meet their own needs using less than the 120kWh/m²footprint generation target, which represented approximately 70% coverage of roofs (for which the equivalent with Sandwell's annual sunlight would be 113.4kWh as cited elsewhere in these appendices). In the offices and school with 'Future Buildings Standard' efficiency, the 120kWh/m²footprint generation was not enough to match *total* energy demand but likely sufficient to match *regulated-only* energy demand (assuming that regulated energy is 30-60% of total), which in turn is a larger figure than the Sandwell target of 39% of regulated-only energy. | |
| SCC 2.5 | Energy offsetting: Where demonstrably unfeasible to meet policy 2.4 on site, offset residual regulated energy demand at £1.37/kWh | As per equivalent draft policy in residential (Policy SCC1.5). | As per equivalent draft policy in residential (Policy SCC1.5). | As per equivalent draft policy in residential (Policy SCC1.5). |
| SCC 2.6 | Implement an assured [energy] performance method throughout construction | As per equivalent draft policy in residential (Policy SCC1.6). | As per equivalent draft policy (SCC1.6) in residential, but for non-residential there is also one additional method: NABERS UK (administered by CIBSE). NABERS is currently only available for offices but intended to extend to other building types in future. | As per equivalent draft policy in residential (Policy SCC1.6). |
| SCC 2.7 | Demonstrate consideration of potential for energy storage and/or smart energy distribution | As per equivalent draft policy in residential (SCC1.7) | As per equivalent draft policy in residential (SCC1.7). | As per equivalent draft policy in residential (SCC1.7). |
| SCC 2.8 | Monitor and report energy use and renewable energy | As per equivalent draft policy in residential (SCC1.8) | As per equivalent draft policy in residential (SCC1.8). | As per equivalent draft policy in residential (SCC1.8). |

| | Policy component | Necessity (alignment with climate mitigation duty, and other local or national policy) | Feasibility rationale or sources | Cost evidence sources for viability test (for methodology, see Appendix 2 ) |
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| | generation for first 5 years of occupation [only schemes of ≥5,000m² floor space]. | | | |
| SCC 3.1 | BREEAM standards in non-residential:<br>• 1,000-5,000m2: Very Good until 2029; Excellent from 2029-39<br>>5,000m2: Excellent. | BREEAM is a holistic sustainability standard that covers a wide range of topics including management, innovation, energy, water, waste, materials, ecology, health, and transport. BREEAM certifications at different levels incorporate certain minimum good practice criteria on certain topics as well as awarding an overall score based on a % of available credits earned.<br>Many of the BREEAM criteria (and associated credits that can be earned) relate to essential climate-related needs mentioned elsewhere in this report including improved energy performance, water efficiency and overheating. Most of these credits are not mandatory for any given rating, therefore it is necessary to have separate policies on these; however, a BREEAM rating offers confidence that a decent level of overarching sustainability is being targeted by a development. | BREEAM is a commonly used and commonly sought-after certification in the non-residential building sector. It is a common requirement in many other local plans; the industry is familiar with delivering it and there is a significant supply of professionals in the industry able to implement this certification. | The last published indication of the cost uplift of BREEAM that we have identified is from 2016, since when the BREEAM standards have undergone further iterations, and a further iteration has been released in beta form already in 2024. There are therefore no reliable sources of the costs that will be involved in achieving the standard by the time the Sandwell policy is in place. However, we note that the costs cited for the energy and carbon policies (SCC2.1 – 2.8) would already make up some of the cost of achieving BREEAM standards, as those policies fulfil some of the mandatory and optional criteria for energy-related BREEAM credits. |
| SCC 3.2 | [not separately considered here; cross-refers to separate policy SC4] | Not separately considered here as this policy simply cross-refers to another. | Not separately considered here as this policy simply cross-refers to another. | Not separately considered here as this policy simply cross-refers to another. |
| SCC 3.3 | Demonstrate that overheating risk is mitigated by following the cooling hierarchy (including by optimising solar heat gains to balance the need to minimise space heat demand with the need to maintain comfortable temperatures during increasingly hot summers) | • Overheating in new buildings is an increasing concern as buildings become more insulated and more airtight, and as the UK's summers are becoming increasingly hotter and drier with climate change.<br>• Extremely hot spells of increasing duration are becoming more common and are projected to occur more frequently in coming years (well within the lifetime of today's new buildings). Recent UK Climate Projections from the Met Office (2022) show that 2018 had the UK's hottest summer yet (equal with 2006, 2003 and 1976). Those projections also show that summers like 2018 have already become more frequent, now likely to happen every 4-8 years (12-25% chance) and by 2050 this will reach more than than every 2 years (50-60% chance).<br>Following the cooling hierarchy prioritises passive (non energy using) design features to mitigate overheating risk, before resorting to energy-using cooling features. This helps to avoid the risk of unacceptably high energy use (and accompanying carbon emissions) in the pursuit of creating climate-proof, future-proof buildings. | Self-explanatory; simply requires evidence of having followed a logical design process. | Not expected to create additional costs, as the policy requirement is only to demonstrate *consideration* within the design process, not a requirement to implement any particular technology or standard. |
| SCC 3.4 | In homes, use the CIBSE TM59 method as the route to Part O compliance. | This climate change related risk described above has recently (2021) become recognised in Building Regulations through a new 'Part O'. Part O of Building Regulations requires overheating assessments to be undertaken in residential development, with CIBSE TM59 (overheating risk mitigation assessment) provided as one route to compliance for residential buildings. Therefore, draft policy C2 is aligned with national policy in that it requires the use of a method endorsed in | Uses commonly practiced and most highly regarded effective mitigation methodologies, following established standards that are already in use within the industry (and already in mandatory regulation for homes). | Not expected to create additional costs. The policy requirement for residential is part of what may be implemented to meet basic Building Regulations (therefore should already be part of the cost baseline for residential). |

| | Policy component | Necessity (alignment with climate mitigation duty, and other local or national policy) | Feasibility rationale or sources | Cost evidence sources for viability test (for methodology, see Appendix 2 ) |
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| | In non-residential, complete CIBSE TM52 assessment. | national regulation. The draft Sandwell policy simply specifies the more effective of the methods permitted in national regulation.<br><br>CIBSE TM52 is the non-residential equivalent of CIBSE TM59. There is currently no Part O requirement for non-residential, so the policy is designed to ensure an equivalent careful approach to ensuring that these new buildings properly protect Sandwell's workers, pupils, students, visitors and medical patients from the changing climate. Overheating could otherwise have unacceptable impacts on productivity, learning, and health. | | The policy requirement for non-residential is a process-based approach and does not imply the use of any specific technologies. Professional fees may be incurred to undertake the assessment, but no robust source of data is available on the cost of this (one source quotes £250-£1000 for an assessment depending on the project, but no year or region is stated in the source). |
| SCC 3.5 | Incorporate measures to increase resilience to extreme weather and changing climate, including by reducing flood risk, use of sustainable drainage, and blue/green infrastructure to reduce the heat island effect | Regarding the heat island effect, see above commentary on overheating (as per commentary on policies SCC3.3 and SCC3.4.<br><br>Regarding the need to mitigate flood risk, see any relevant flood risk assessments conducted for the Sandwell Local Plan. | Not part of this appointment.<br>No specific standards are required whose feasibility could be assessed. | Not part of this appointment.<br>No specific standards are required whose costs could be assessed. |
| SCC 4.1 | **Complete a RICS Whole Life Carbon Assessment (if proposal is ≥50 dwellings, or ≥5,000m² non-residential floorspace)** | • Committee on Climate Change analysis shows that at present:<br>○ Manufacturing and construction represent ~12% of the UK's total emissions<br>○ Of this, manufacturing represents 90% (within which 96% was fuel combustion and 14% was process emissions such as the chemical reaction in cement kilns)<br>○ Off-road machinery emits the remaining 10%, of which 77% in construction.<br>○ There are gaps in national policy to support more resource efficient products and construction; policies must be developed to improve resource efficiency, energy efficiency and material substitution.<br><br>• The Committee on Climate Change analysis (as above) shows that the following changes are necessary for the 'balanced pathway' to the UK's carbon budgets:<br>○ Reducing the amount of clinker used in cement<br>○ Energy efficiency improvement in the manufacturing and construction sectors<br>○ Fuel-switching (from gas/coal/oil to electricity, hydrogen, and to a lesser extent biofuel) in the manufacturing sector<br>○ Improving resource-efficiency, including via Government policy to optimise construction designs to reduce material inputs, increase reuse and recycling of construction materials, and material substitution. Resource efficiency has a particularly key role relevant to building, including in cement, lime, iron and steel.<br>○ Material substitution towards lower-embodied carbon materials – specifically, increasing the use of wood in construction (substituting for steel/concrete) | RICS Whole Life Carbon Assessment is widely offered by professional building services consultancies of the same type that would typically be appointed to develop energy strategies or structural assessments by developers of major proposals. | Professional fees will be incurred for this assessment. Although there is no robust source of publicly available data on the cost of these assessments, anecdotal experience in recent years suggests this could be around £10,000-15,000 depending on the size and complexity of the project. If this figure is used in viability testing, it should only be applied where the policy applies (i.e. super-major development).<br><br>Similar policies in other adopted or emerging local plans often are applied from a 'major' threshold. However, in light of the Sandwell viability constraints, the threshold for this policy in Sandwell has been quintupled to allow for greater economies of scale in the cost of assessment. |

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| | | ○ Development of carbon capture technology and use of this at manufacturing facilities with high carbon emissions at source<br>○ Steel and cement production must reach near-zero emissions by 2035 and 2040<br>○ Government should develop carbon intensity measurement standards for industrial products and processes, then mandate disclosure by the mid-2020s.<br>○ Crucially, a policy recommendation is made to “introduce mandatory disclosure of whole-life carbon in buildings and infrastructure to facilitate benchmarking as soon as possible” in order to then “introduce a mandatory minimum whole-life carbon standard for both buildings and infrastructure which strengthens over time, with differentiated targets by function and usage … [to] be included within the Future Homes Standard.”<br>• While (albeit insufficient) national regulation is in place to address operational carbon (Part L of Building Regulations), by contrast embodied carbon is completely neglected by national regulation. Yet it is being increasingly revealed as a major (or sometimes even majority) contributor to new buildings’ total carbon footprint, so cannot be neglected if the UK is to hit its carbon budgets (as outlined above). Therefore in the absence of national policy, it must be addressed by local policy in order to meet the local plan’s duty to mitigate climate change (Planning & Compulsory Purchase Act) in line with the Climate Change Act (as per the expectation laid out in the NPPF).<br>• In the absence of any regulation nor any mention of embodied carbon in the NPPF or relevant written ministerial statements, there is no ‘relevant national policy’ with which this local policy needs to align, other than the necessary interventions for the Climate Change Act carbon budgets as outlined above. | | |
| SCC 4.2 | Positive weight will be granted where it is shown that a development meets an embodied carbon limit of 600kg/m$^2$ gross internal area in RICS modules A1-A5 | • Please note this is a NON-MANDATORY target, forming a benchmark by which good practice can be recognised<br>• Modules A1-A5 are the ‘up-front’ embodied carbon: that which is emitted up to the completion of the building<br>• This limit therefore does not require any assumptions to be made about what will happen to the building during operation or at its end of life, but does incentivise choices of materials that are low embodied carbon, material-efficient designs, and resource-efficient practices on the construction site<br>• There has been industry benchmarking led by LETI in collaboration with RIBA, CIBSE and others, defining a range of performance ‘bands’ from G (worst) to A++ (best). The Sandwell policy guideline figure falls into ‘band C’ for offices or ‘band D’ for all other building types, representing reasonably good practice using today’s feasible techniques and commonly available materials but without causing the need for radical reworking of existing designs and supply chains to the extent that would come with major cost uplifts (see cost column). | This target has been shown to be achievable in six building archetypes (houses, low-rise flats, retail, school, office, warehouse), as cited in South Oxfordshire & Vale of White Horse evidence base modelling of energy and embodied carbon (2023). All of these building types already performed below 600kg/m$^2$ using standard practice construction techniques (built to Part L 2021).<br><br>In practice, a recent development in the Midlands (Europa Way) ‘reduced’ embodied carbon by switching from brick & block to a timber frame. However, the exact figure does not appear to have been publicly disclosed. | South Oxfordshire & Vale of White Horse emerging local plan evidence base (2023) shows that this target can be hit with no additional costs, given that it is within the range of standard practice using today’s existing standards.<br><br>However, this is a non-mandatory policy in Sandwell, therefore there is no need to cost it in any case. |

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| SCC 4.3 | Design new buildings to enable easy disassembly for material reuse at end of life | • Enables and boosts likelihood of material reuse, supporting the resource efficiency improvements in the construction sector necessary for the UK's carbon budgets as outlined above (see rationale for D1).<br>• By contrast, an enormous amount of value is lost in today's 'business as usual' demolition of conventionally constructed buildings | This is within the industry's current capability in that it is part of the most common environmental certification used across the industry (BREEAM; see criteria for optional credit 'Wst 06'). | No robust and replicable source of costs evidence could be identified at the time of writing. |
| SCC 4.4 | Pre-redevelopment or pre-demolition audit where the proposed site contains existing buildings or structures | • Enables and boosts likelihood of material reuse, supporting the resource efficiency improvements in the construction sector necessary for the UK's carbon budgets as outlined above (see rationale for D1). | This is within the industry's current capability in that it is part of the most common environmental certification system used across the industry (BREEAM; see criteria for credit 'Wst 01', which is mandatory for an 'Outstanding' rating but optional for all lower BREEAM ratings). | No robust and replicable source of costs evidence could be identified at the time of writing. If an appropriate source is found, this should only be applied to the proportion of development that is expected involve existing buildings. |
| SCC 4.5 | Minor schemes: Embodied carbon choices narrative | • As per narrative above on SCC4.1 and SCC4.2. Developers are generally unaware of the embodied carbon impact of their buildings given that there is no regulatory requirement to consider this. | This policy will encourage minor developers to explore and consider this topic via self-education, without imposing any daunting or expensive targets or standards to be achieved. | No significant costs anticipated, as the policy only requires narrative and not the any specific standard or feature. |

# Appendix 2: Summary of cost sources, amounts and % uplift on Part L 2021 base build

## Introductory notes

### Policy designed towards a capped costs limit

Bioregional and Edgars were advised that a cost uplift allowance for an energy/carbon policy had already been set within the most recent iteration of Sandwell's viability study (November 2023). That allowance was £6,500 and it was acknowledged that this may already impact viability.

Bioregional and Edgars were therefore tasked to devise a policy option that would go as far as possible in reducing carbon emissions, while being reasonably expected not to exceed that £6,500.

However, our sources of data on cost *uplifts* (to meet various different energy and carbon standards) are varied. Some of those sources are from regions where affluence, cost of living, and therefore build costs, are higher than in Sandwell. Such regional differences in *baseline* build costs are thought to be echoed by regional differences in build cost *uplifts* to reach improved energy/carbon performance.

Therefore it is considered better to translate the build cost uplift source data into a % uplift on the baseline cost from the same data source, and apply that % uplift in Sandwell's next viability exercise, rather than applying an absolute £ uplift straight from the source data, because the absolute figure would most likely overstate the uplift due to the source data being partly from higher-cost regions.

Still, to take a cautious approach, the £6500 allowance formed the absolute limit to which we calibrated the draft policy, even within the source data. This ruled out more stringent policies (e.g. a requirement for PV provision to match 100% of energy use). The draft policy is thus set to require the amount of PV that can be provided within that £6,500 limit after the costs uplift of fabric and heat system necessary to meet the 63% carbon reduction from energy efficiency.

### Calibrating the data to the relevant period

Sandwell's 2023 viability study baseline costs reflect a BCIS 5-year sample period to August 2023. BCIS provides that data with all the older years' costs normalised to 2023 prices (i.e. reflecting inflation).

That sample period therefore straddles a step-up in the building regulations Part L standards on energy/carbon, bringing significant additional costs by adding solar PV, larger radiators, wastewater heat recovery, and minor fabric improvements. This change in baselines has a major impact on the cost "uplift" to reach any given improved standard of energy/carbon performance: The uplift will be *smaller* from the new Part L 2021 baseline, because Part L 2021 already includes several of the features that would be needed to meet the improved energy standard for the draft Sandwell policy.

Therefore, to find the cost uplift of the policy, we need a weighted average figure reflecting the relative influence that Part L 2013 and Part L 2021 each had on the baseline cost in the 2023 viability study.

- Part L 2013 was in place for nearly a decade, then Part L 2021 came into force in mid-2022.
- Therefore the Sandwell viability baseline costs sample represents four years of Part L 2013 (lower cost) and one year of Part L 2021.
- In acknowledgement of this, we likewise sampled costs (both baseline and uplifts) from published sources that examined Part L 2013 and Part L 2021 (and the respective different cost uplifts to meet the draft Sandwell policy).
- We then combined these in the same proportions as the Sandwell viability study's sample, to form a blended average (made up of four-fifths Part L 2013 and one-fifth Part L 2021).

As the Sandwell 2023 viability study's BCIS 5-year sample was normalised to 2023 prices, we also apply an inflationary uplift to any of our data sources that had a cost year of 2022 or earlier.

- That inflationary uplift we applied to most of our source data (baseline and uplifts) is based on the Bank of England inflation calculator increase from the respective cost year to 2023.
- However, for the cost uplift data sourced from the national FHS Impact Assessment (FHSIA), the inflationary uplift was calibrated to reflect the difference in element costs from the FHSIAs of 2019 and 2021 (both in 2019 prices) and the FHSIA2023. This enabled a differentiated inflation rate for different parts of the building that would change from the baseline to the draft policy.
  - This was done by identifying which identical elements were costed in the FHSIA2019-2021 AND FHSIA2023, categorising those elements into fabric / gas systems / electric systems / PV, and finding the average increase in each of those four categories.
  - Interestingly, the uplift between FHSIA2019 prices and FHSIA2023 prices was far less than the same period's nation-wide inflation shown by the Bank of England calculator. The FHSIA increases from 2019 prices to 2023 prices were 14.3% for fabric, 14% for gas heat systems, 6.7% for electrical heat systems (including enhanced grid connection), or 10.8% for PV. Meanwhile the Bank of England calculator shows 23%.
    - This indicates that build costs – at least those of energy and carbon improvements – have not inflated as fast as the national general inflation.
    - Therefore, the Bank of England inflationary uplifts that we applied to all our other source data may be an overestimation, thus the Sandwell draft policies may not in fact cost quite as much as indicated by our 'post-inflation' figures (which incorporate the FHSIA data among seven other data sources). Nevertheless, we use that potentially over-inflated figure so as to build-in headroom and avoid an over-optimistic conclusion on what can be viably achieved. We consider this to be a cautious and robust approach.
  - The FHSIA inflation figure did not affect our baseline, as the FHSIA did not provide a baseline cost for either Part L 2013 or 2021.

Where we cite national (DESNZ) data on PV costs, this is also an average of a matching 5-year sample. DESNZ provides median average costs with and without inflation, so no manual adjustment is needed.

We are informed that the viability report is not expected re-baseline its costs for the next iteration of Sandwell's viability assessment, so the uplift costs we present here should remain valid.

### Other notes on approach

As most of the cost uplift data that we rely on reflects a semi-detached house, we also reflected this in our baseline data. This is also seen as a reasonable middle-ground between detached/bungalows, terraces and flats. As that source data house size varied, we normalised this to a per-$m^2$ figure and then multiply up to the Sandwell average new build house size in the same five-year period as the viability assessment's baseline sample described above. Average new build home size data is taken from national live quarterly tables on new build EPCs by local authority area (Government 'Table NB7').

**The tables following in this appendix provide the estimated cost uplifts for each part of the draft policy for residential dwelling, with explanation of how these were reached from the source data**.

| Table 2: Summary of cost baseline, uplift amounts, and % uplift on base build – RESIDENTIAL, HOUSES | | | | |
|---|---|---|---|---|
| Baseline build cost against which to calculate % uplifts of each element | | Weighted average of baseline build costs for Part L 2013 and Part L 2021, weighted to reflect the period that was sampled in the Sandwell 2023 viability exercise (as described in the introduction). Our samples came from the following sources.<br>Average of £/$m^2$ baseline figures for most relevant/comparable home type with Part L 2013 regulations, found in:<br>• Cornwall DPD (adopted 2023), Evidence base: Energy Review & Modelling Report (2021), semi detached home<br>• Central Lincolnshire Local Plan (adopted 2023) Climate Change Evidence Base Task H – Cost Implications (2021), semi-detached<br>• Greater Cambridge Emerging Local Plan Cost Report 2021, semi-detached.<br>Average of £/$m^2$ baseline figures for most relevant/comparable home type with current building regulations (Part L 2021) found in:<br>• Cornwall DPD (adopted 2023), Evidence base: Energy Review & Modelling Report (2021), semi detached<br>• 'Delivering Net Zero' (evidence base commissioned by 18 London boroughs to support all of their respective local plan policy development), terraced (as this study did not include a semi-detached archetype)<br>• Essex energy modelling (2023) (evidence commissioned by county to support several constituent local planning authorities), semi-detached<br>• South Oxfordshire & Vale of White Horse 2023, semi-detached.<br>Inflationary uplift applied to all of the above to bring them up to 2023 prices (for comparability against the Sandwell Viability Assessment baseline sample). The inflationary uplift reflected the % inflation from the respective source report's 'cost data year' up to 2023, reflecting Bank of England inflation calculator.<br>Scaled to Sandwell average new build house size derived from Government 'Table NB7' (type 'houses', 5-year period to match the Sandwell viability study baseline of Q32018-Q22023, floor area divided by homes = 90.06$m^2$ per home). Please note this scaling to Sandwell new house size was also done for all uplifts.<br>Our resulting baseline reflects a weighted average of the two different Part L periods (as described in introductory notes), including inflationary uplift.<br>For comparison, the aforementioned Sandwell 2023 viability assessment baseline build cost for a "general" semi-detached home in Sandwell ranged from £908/$m^2$ to £3,229/$m^2$ (mean average £1,497; median average £1,427). Therefore our baseline from the cost uplift data sources is within the range found in the Sandwell viability study's sample, but is higher than the averages within that Sandwell sample.<br>• The difference is likely to be because our costs sources cited above related mostly to regions with higher affluence and living costs, thus higher build costs.<br>• Such regional differences in baseline build cost are likely to also be mirrored in the cost uplifts.<br>• It is therefore recommended that Sandwell's next viability test expresses the draft policy cost as a % uplift on the baseline from our data sources, as the policy cost uplifts are heavily informed by those same sources. | | **£1,840/$m^2$**<br>**£165,694 /home (sized to average Sandwell new build house)** |
| **Policy element** | | **Source** | **Cost uplift** | **% cost uplift** |
| SCC1.1 (63% TER reduction via energy efficiency) | Future Homes Fabric (insulation + glazing; no change to airtightness) | Average of per-$m^2$ figures (weighted av. of uplift from Part L 2013 and Part L 2021 to match baseline), as found in:<br>• Government FHS Impact Assessment 2019, 'Future Homes Fabric-Only' (semi detached, page 7), minus wastewater heat recovery (page 30) as this was not part of the subsequent indicative FHS specification on which the Sandwell policy is based. These are cost uplifts on Part L 2013; for the uplift on Part L 2021, a deduction was made to reflect difference between Part L 2013 to Part L 2021, using element costs from FHSIA 2021.<br>• Cornwall Climate DPD Evidence Base technical appendix, July 2021 and Energy Review & Modelling Report February 2021; (semi-detached). This suite includes data that can be combined to derive uplifts over both Part L 2013 and Part L 2021 baselines.<br>• South Oxfordshire & Vale of White Horse 2023 (semi detached; cost uplift over Part L 2021 baseline). | £26.21 / $m^2$ floorspace<br>£2,360.35/ Sandwell house<br>(both incl. inflation) | 1.4% |
| | Heat pump system (instead of gas system) | Average of £/$m^2$ figures (home types as above; weighted as above) for heat pump system uplift compared to gas boiler system, found in:<br>• Cornwall Climate DPD Evidence Base technical appendix, 2021 and Energy Review & Modelling Report February 2021; (combined figure for all parts of heat system); this document suite includes data that can be combined to derive uplifts over both Part L 2013 and Part L 2021 baselines. | £30.08/$m^2$ floorspace | 1.6% |

| | | | | |
|---|---|---|---|---|
| | | • Government Future Homes Standard Final Stage Impact Assessments 2021 & 2023. Can be used to derive cost uplifts from both the 2013 and 2021 baselines. (cost of 5kW air source heat pump with cylinder + enhanced electrical grid power supply, minus cost of gas boiler + gas grid connection. Part L 2013 uplift also included a cost for larger radiators, but Part L 2021 baseline already includes those).<br>• South Oxfordshire & Vale of White Horse 2023 (combined figure for all parts of heat system). Included only in the 'Part L 2021' uplift. | £2,709.19 / Sandwell house<br>(both incl. inflation) | |
| SCC1.4 | Allowable solutions to match 39% of regulated energy use with renewable energy.<br>(Estimated to require approx. 7.35m2 of PV panels in semi-detached average home built to energy efficiency standard of policy SCC1.1; equating to approx. 4-5 panels or 14% of estimated total roof space).<br>Where technically unfeasible, fallback target of PV to meet 33.5kWh/$m^2$ building footprint.<br><br>*(Or:* Offset residual regulated energy use to a maximum of 39% of regulated energy use, £1.37/kWh) | Establish budget remaining within the £6500 allowance (as described in appendix introductory notes) after the cost of meeting draft Policy SCC1.1.<br>• Policy SCC1.1 is meant to be achieved entirely through energy efficiency improvements, i.e. *without any contribution from renewable energy*.<br>• By contrast, the baseline is comprises 5 years, of which 1 year when Part L 2021 in force; and Part L 2021 already includes a significant amount of PV provision,<br>• Therefore, an overall cost uplift from the baseline purely to meet Policy SCC1 *without renewable energy* was estimated from the range of available costs data sources: (fabric uplift costs + heating system costs) minus (amount of PV that is in the Part L 2021 specification*, *for the share of the Sandwell baseline period that occurred when Part L 2021 was in force*).<br>  o That cost to meet policy SCC1.1, as an uplift on our baseline, with inflation, was £4,374.<br>• £6500 – £4374 = £2126 available budget for PV per home in Sandwell (£23.61/$m^2$ with average Sandwell house size).<br>• The resulting available budget for PV per home in Sandwell, over our weighted average baseline, was £2,126.<br>With the budget for PV established as above, the policy target for PV provision as a % of regulated energy use was derived as follows:<br>• Calculate how much PV can be provided with that £2,126, using DESNZ solar installation costs per kWp (median including inflation, average of all sizes of PV installation; £1315/kWp). £2,126 / £1,315 = 1.62kWp of PV.<br>• Estimate how much energy this size of PV installation would generate over the course of a year, taking into account the local solar irradiance. Resulting local specific PV output: 972.7kWh/kWp/year. 1.62 kWp x 972.7kWh = 1573.2kWh output per year.<br>• Estimate **regulated** energy use in a home that meets policy SCC1.1; average of the following data sources:<br>  o GHA (2020), SAP10.1 semi detached with heat pump, 'delivered energy'): 50.4kWh/$m^2$/year<br>  o Future Homes Hub energy modelling (2023), SAP10.2 'room-in-roof semi detached', with specification 'Ref2025': 30kWh/$m^2$/year.<br>  o South Oxfordshire & Vale of White Horse 2023, FHS home, semi detached: 53kWh/$m^2$/year.<br>  o Multiply to an average Sandwell new build house size (90.06m2 floorspace, as previously noted). Result: 4004.6kWh/house/year regulated energy use.<br>• 1573.2kWh Sandwell budgeted PV output divided by 4004.6kWh regulated energy use = 39% of regulated energy use would be met by PV.<br><br>With the average Sandwell new house size (90.06$m^2$ as previously noted), the output equates to 35kWh/$m^2$ building footprint/year. This is adopted as a fallback target where an otherwise desirable development might struggle to achieve the 39% target due to a home's different characteristics to that modelled here (for example having many more storeys or heavy overshadowing) without incurring an excessive cost uplift in relation to floor space. However, the 39% target can be met the modelled low-rise home using only approximately 14% of the available roof area, therefore it should be a very rare occurrence that the fallback target needs to be used.<br>*To estimate the amount of PV that would already be in the Part L 2021 baseline, we took an average of figures found in the following:<br>• South Oxfordshire & Vale of White Horse 2023<br>• Cornwall Climate DPD Evidence Base (technical appendix, 2021)<br>• Cornwall Climate DPD Evidence Base (modelling report, February 2021)<br>• FHS Impact Assessment 2023 element cost (Q3 2023 prices) for PV of £665/kWp+£1,219 fixed cost for system sizes under 4kWp. Estimated system size at 2.58kWp for a Part L 2021 semi-detached home (84$m^2$GIA as specified in FHS2021 impact assessment for consistency with fabric costs previously cited; assumed 2 storeys = approx. 42$m^2$ footprint), based on Part L 2021 notional building PV provision of [building footprint*40%] /6.5 = kWp provision). Resulting PV cost £2,938 (£35/$m^2$).<br>• Average of estimates from all of the above after adding inflation to each of the above according to their respective cost years (as described in the introductory notes), this gave an average of £49.51/$m^2$ in today's prices. Scaled to the Sandwell new house size, this is £4,449.<br>• This PV cost of Part L 2021 as described above informed our overall cost uplift to go from Part L 2021 to a Policy SCC1.1-compliant building (which would have better fabric and a heat pump, but no PV, therefore the deducted Part L 2021 PV cost partially offsets the cost uplifts for | £23.61/$m^2$ floorspace<br>£2,126 / Sandwell house<br>(both incl. inflation) | 0.9% |

| | | | | |
|---|---|---|---|---|
| | | fabric and heat pump). That uplift on Part L 2021 in turn formed the minority share of the weighted average cost uplift on the Sandwell baseline sample period (which included four years of Part L 2013 + 1 year of Part L 2021).<br><br>The cost of offsetting would not be AS WELL AS the solar PV costs described above, but would fully or partially REPLACE the solar PV costs described above. The policy's offsetting price reflects the same amount that would be spent if the PV were delivered on-site (£2,126 PV budget divided by 1572.2kWh annual output = £1.35/kWh) and adjusted to £1.37 for the reasons laid out in the offsetting report. This ensures that the offsetting figure would not be any more costly than the on-site PV cost figure, thus not exceeding the overall policy cost allowance of £6,500 as described in the introductory notes to this appendix.<br><br>In practice, whilst an appropriate cost has been calculated for offsetting, the cost of delivery of a scheme would vary and be subject to administration costs. Therefore, it has been assumed that the Council would pool these offset funds to deliver larger PV installations which can achieved economies of scale. Based on the DESNZ data on median PV costs (3-year median from 2021/22 to 2023/24), with the local solar irradiance of 972.7kWh/kWp, larger installations of 10-50kWp in size would work out at a cost of only £1.24/kWh. A 10% administration cost is added to cover costs associated with Council management and operation of the offset fund, taking the offset price to £1.37/kWh. | | |
| **TOTAL COST OF MEETING 'NET ZERO OPERATIONAL CARBON' REQUIREMENTS IN AVERAGE NEW BUILD HOUSES:** | | | | **3.9%** |
| **Please note: an associated value uplift (sale value) of the completed home can also be assumed.**<br>• That value uplift is based on the policy-compliant homes achieving an EPC 'A' as opposed to the typical recent Sandwell new build EPC rating of 'B' (these figures also show that of new build Sandwell homes in our sample period, only 1% achieved an A-rating; 78% achieved a B-rating; 12% achieved a C-rating, 8% D, and 1% E).<br>• This was evidenced in a 2021 study by Lloyds/Halifax, which looked at actual home sale value across all regions of England and Wales, not just surveys of willingness to pay. It expressed the sale value uplift in terms of the % difference between EPC bands. The increase is greater between EPC bands at the lower end (for example a 3.8% value increase from EPC G to EPC F) but there is still an uplift between higher bands (an uplift of 2% from EPC C to EPC B, and an uplift of 1.8% from EPC B to EPC A). All of these values are the average across England and Wales; however, the study confirms that **the uplift effect was evident in all regions**.<br>• The Lloyds/Halifax data does not make it clear whether the study controlled for 'new builds' versus 'existing buildings'. Therefore the viability assessor may choose to make a value judgement about adjusting the stated 1.8% uplift to a more pessimistic figure (for example, 1%) as the draft Sandwell SCC1-suite of policies only apply to new builds. | | | | **Sale value uplift:**<br>**+1.8%** |

| **Table 3: Summary of cost uplifts – SUPER-MAJOR NEW DEVELOPMENT, ALL USES** | | | | |
|---|---|---|---|---|
| SCC 4 | Embodied carbon reporting (super-development, i.e. over 50 homes or 5,000m² floor space) | No available robust source of publicly available costs on RICS Whole-Life Carbon assessment, but estimated to be in the region of £10,000-15,000 per scheme based on professional experience / anecdote. | **£10,000-£15,000 per scheme** | Not convertible to a universal % uplift as this cost is not in directly proportion to scheme size. |

## Other policy elements not cited in tables above

No cost uplift is stated for other policy elements, either because there is no robust replicable publicly available source of cost data for them, or because the policy element is not thought to be associated with any significant additional cost. See rationale in 'costs' column in **Table 1**, Appendix 1.