

Table of Contents

.....	1
Executive Summary.....	7
1. Allowable Solutions / Carbon Offsetting.....	12
1.1 Introduction and Purpose of Report.....	12
1.2 Principle of Allowable Solutions / Carbon Offsetting	12
1.3 Research Methodology	13
2. Benefits and risks of Carbon offsetting.....	15
2.1 Benefits	15
2.2 Risks	16
2.3 Key Conclusions from section 2 – balance between risks and benefits of carbon offset regime 19	
3. Proposed Carbon offset charge for the West of England	20
3.1 A nationally recognised price, derived from a recognised carbon pricing mechanism	20
3.2 A price sufficient to encourage on-site measures; i.e. a price equal to or greater than onsite measures.....	22
3.2.1 Implications of grid decarbonisation and changing emissions factors for the carbon price	24
3.3 A price sufficient to abate an equal amount of carbon offsite, based on the actual costs of particular measures	26
3.4 Conclusions on recommended carbon price	30
4. Recommendations for ratcheting the carbon price.....	32
4.1 Key conclusions in respect of Ratchetting the carbon price.....	33
5. Potential size of fund and CO ₂ emissions savings	35
5.1 Assumptions.....	36
6. Relationship of carbon offset payments with CIL and S106	40
6.1 Planning obligations.....	40
6.2 Community Infrastructure Levy	42
6.3 Implications for Carbon Offset administration	43
6.4 The future for Planning Obligations and the Community Infrastructure Levy	48
6.5 Conclusions from section 6, Relationship of carbon offset payments with CIL and S106....	49
7. Suitable projects for carbon offsetting	50
7.1 Eligible carbon offset projects in other Local Planning Authorities.....	50
7.2 Commentary on potentially eligible carbon offset projects in the West of England	50
7.2.1 Domestic Energy Efficiency Retrofit: including Loft insulation / Cavity wall insulation / External wall insulation / Boilers and heating controls	50

7.2.2	Energy advice service	54
7.2.3	Non-domestic retrofitting - Energy Efficiency Improvements to Community Buildings 55	
7.2.4	Non-domestic retrofitting - Energy Efficiency Improvements to non-domestic Buildings 57	
7.2.5	Embodied Energy improvements.....	58
7.2.6	Renewable energy Projects.....	58
7.2.7	Community Energy Projects.....	59
7.2.8	Domestic renewable energy projects	61
7.2.8	Commercial renewable energy projects	62
7.2.9	Electrical Energy Storage.....	62
7.2.10	Unlocking barriers to renewable energy projects - Targeted distribution grid reinforcement	63
7.2.11	Unlocking barriers to renewable energy projects – enabling onshore wind through the planning process	64
7.2.12	Unlocking barriers to renewable energy projects - Radar mitigation to permit wind turbines within Bristol Airport’s airspace	65
7.2.13	District Heating	65
7.2.14	Tree Planting	65
7.2.15	Sustainable Transport initiatives, including walking and cycling infrastructure and public transport infrastructure	67
7.3	Suggestions for eligible carbon offset projects.....	67
8.	Mechanisms for administering the carbon offset regime (including two case study examples) .	69
8.1	Feedback from the authorities we surveyed	69
8.2	Case studies of approaches to carbon offsetting	72
8.2.1	London Borough of Merton	72
8.2.2	London Borough of Camden	74
8.3	One Carbon Offset fund covering all four authorities, or four individual Carbon Offset funds?	75
8.4	Mechanisms for administering the carbon offset regime in the West of England authorities ..	76
8.5	Eligibility and marking criteria for applications to the carbon offset fund	78
8.5.1	Criteria for assessing applications.....	78
8.5.2	Additionality	79
8.5.3	Low Carbon Transition	80
8.5.4	Innovative and Strategic Importance.....	80
8.5.5	Community / Social Benefits	80
8.5.6	Value for Money / Carbon Ratio	80

8.5.7	Delivery timescales	81
8.5.8	Project Lifespans	82
8.6	Recommendations in respect of assessment criteria	82
8.7	Application forms for the fund	82
8.8	Monitoring of carbon offset projects.....	83
8.8	Summary of recommendations from Section 8. Mechanisms for administering the carbon offset regime.....	85
9.	Draft wording for S106, payment timescales and supporting documentation	86
9.1	Draft wording for Section 106 agreements / Unilateral undertaking.....	86
9.2	Payment timescales	86
9.3	Draft conditions	88
9.4	Summary of recommendations from Section 9.....	92
10.	Supporting text for carbon offset, for insertion within Local Plan documents	93
10.1	Potential content of Supplementary Planning Guidance or informal guidance note	94

Appendices

Appendix A - Appendix A - Carbon offset fund, disaggregated by local planning authority and policy Scenario 2018 - 2036

Appendix B - The Environment Centre (2016) Carbon Offset Fund Proposal for Southampton Council

Appendix C - Draft application for carbon offset funding– London Borough of Merton

Appendix D - Section 106 agreement used in Merton Borough Council

Appendix E - Section 106 agreement and unilateral undertakings used in Islington Council

Appendix F – Formula based section 106 Planning Obligation wording - London Legacy Development Corporation

Appendix G - examples of conditions used and CSE appraisal

Appendix H – Example of CO2 emissions savings calculator & worksheet

Figure 1 -Total WoE Fund size (£) assuming the use of gas central heating (carbon price of £95 per tonne)	9
Figure 2 - Carbon Offsetting within the context of the Zero Carbon Homes regime – Zero Carbon Hub	13
Figure 3 Carbon prices suggested for testing - AECOM (June 2017) London Carbon Offset Price - Greater London Authority.....	21
Figure 4 Variance in carbon offset price by LPA (£ per tonne CO2 X 30 years), and satisfaction with this price, as expressed by individual council officers.	22
Figure 5 -Cost of carbon saving for selected carbon saving measures (£/t) - Source: AECOM (2017) London Carbon Offset Price, table 1.....	26
Figure 6 - Offset ratio for selected carbon saving measures – carbon price of 95 £/t.....	28
Figure 7 - Offset ratio for selected carbon saving measures @ 120 £/t.....	28
Figure 8 - Offset ratio for selected carbon saving measures @ 140 £/t.....	29
Figure 9 - Offset ratio @ £95 £/t (50% copayment)	30
Figure 10 - Total WoE Fund size (£) assuming the use of Air Source Heat Pumps (carbon price of £95 per tonne)	35
Figure 11 -Total WoE Fund size (£) assuming the use of gas central heating (carbon price of £95 per tonne)	36
Figure 12 - WoE total figures for carbon emissions and associated income per year as a result of each policy scenario and for both technology options (@£95 per tonne)	39
Figure 13 - Energy efficiency measures funded 2018 - Thrive Community Energy Fund	56
Figure 14 - Western Power Distribution network capacity	63
Figure 15 - Assessment criteria used by authorities in allocating carbon offset funding – Number of authorities using each criterion	78

Executive Summary

The West of England (WoE) Joint Spatial Plan covering the administrative areas of Bath and North East Somerset, Bristol, South Gloucestershire and North Somerset councils includes an aspiration for new development to be built to a zero carbon standard. The four WoE authorities commissioned a report entitled “Cost of Carbon Reductions in New Buildings¹” from consultants Currie & Brown considering different options for achieving this. This report is summarised in the “Non-technical Introduction”². A key conclusion of this was that zero carbon development cannot be achieved on-site through fabric and the incorporation of renewable energy, and that in all of the policy scenarios off-site carbon abatement was required through a carbon offset scheme.

This report provides recommendations that complement and build on the sister report “Cost of Carbon Reduction in New Buildings”, and it should be read alongside the sister report. This report sets out how a carbon offset regime could operate: the risks and benefits of using carbon offsetting, the price that developers should be charged per tonne of carbon to achieve carbon abatement offsite, the type of measures that might be eligible and how a carbon offset fund might be managed.

Carbon offsets operate as part of planning policies that require a reduction in carbon emissions beyond that required by Building Regulations. The offset payments pay for carbon saving projects to go ahead elsewhere, to make up for the carbon savings not achieved within developments. Carbon offsets are collected through “Section 106” legal agreements attached to planning consents, and off-site carbon abatement is assumed to take place over a 30 year period.

We undertook a through literature review and interviews of 6 authorities operating a carbon offset regime. The majority of local authorities responding to our survey reported little resistance to their policies and their carbon offset regime. The survey responses illustrated the potential for the fund to deliver social and environmental benefits and support the local economy, as well as deliver carbon reductions, and the potential of the fund to help deliver existing wider corporate priorities.

We found that carbon offsetting is possible within current planning legislation and guidance, has been used successfully elsewhere, can enable innovation and appears feasible given the institutional capacities of the WoE authorities. The primary risks are of setting the carbon price too low or high, with perverse outcomes of downgrading the carbon savings achieved on site through building design, dampening delivery or increasing housing costs, and these risks should be considered carefully in scheme design. Overall however, we consider that the advantages of having a carbon offset policy to achieve off-site carbon abatement substantially outweigh the

¹ Currie & Brown (2018) “Cost of Carbon Reduction in New Building”

http://www.bathnes.gov.uk/sites/default/files/sitedocuments/Planning-and-Building-Control/Planning-Policy/LP20162036/cost_of_carbon_reduction_in_new_buildings_report_publication_version.pdf

² West of England Authorities (2018) “Cost of Carbon Reduction in New Buildings- Non-Technical Introduction”
http://www.bathnes.gov.uk/sites/default/files/sitedocuments/Planning-and-Building-Control/Planning-Policy/LP20162036/delivering_low_carbon_buildings_woe_non_technical_intro_v3.pdf

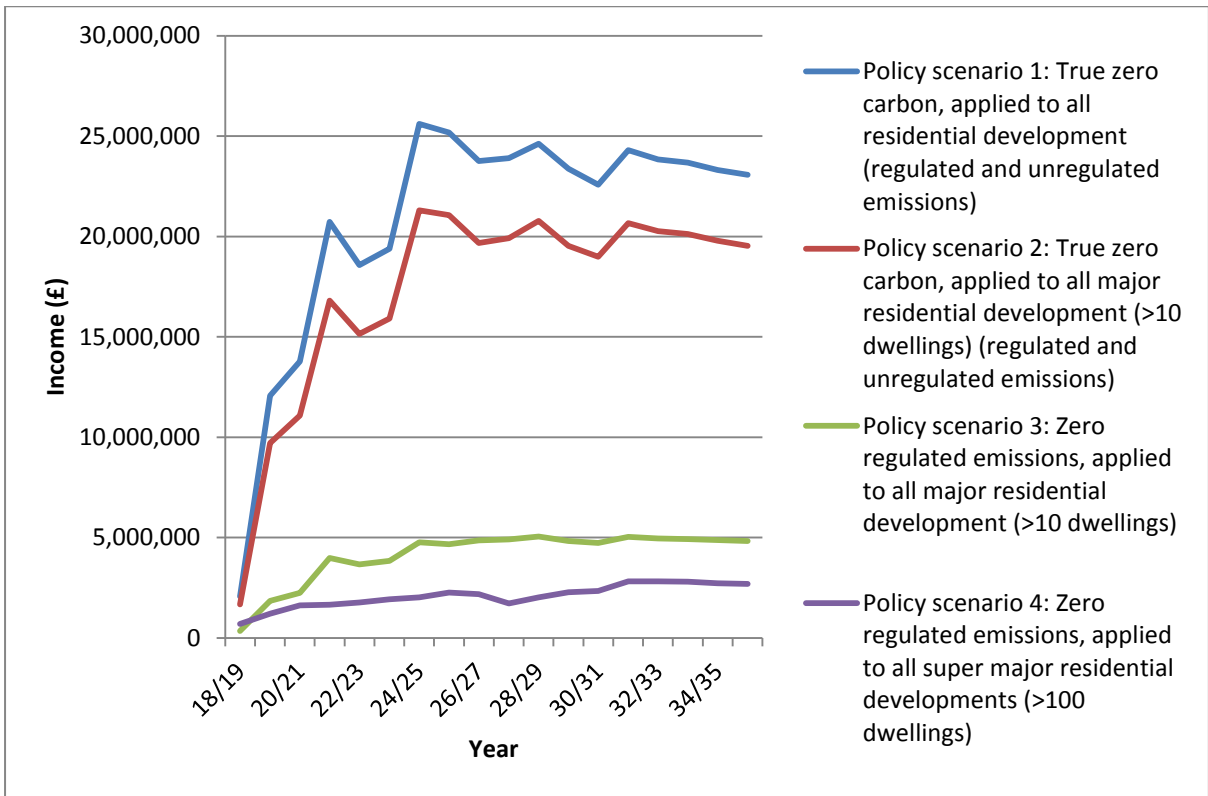
disadvantages; it has the potential to increase overall carbon savings beyond what would be achieved without it.

Many of the authorities surveyed found the current carbon price of £60/ tonne in the existing London Plan too low to encourage onsite measures. The £95 carbon price proposed in the draft London Plan appears to be high enough at the current time to encourage developers to install onsite solar PV where possible instead of paying into the fund.

It is recommended that the carbon price should be set at £95/ tonne CO₂, either within the Local Plan policy itself (subject to review every 5 years), or adopting the approach of the London Plan, within Supplementary Planning Documentation. To reduce the complexity of policy wording, and reduce the scope for challenge at Local Plan examination, we recommend not including arrangements for ratchetting the carbon offset price, however it should be index linked to account for inflation.

Contributions should be directed into a ring-fenced carbon offset fund to provide maximum flexibility and minimise administrative costs.

We have estimated the potential carbon offset fund (and CO₂ savings) in each of the authority areas, in each of the policy scenarios indicated. As can be seen in the graphs below the policy scenario adopted has a significant influence on the fund size available. Policy scenario 4, which most resembles the majority of local authority carbon offsetting schemes rolled out to date, results in the smallest fund sizes across all four areas. Under the gas boiler scenario, option 4 could result in a total funding pot size for the whole of the West of England area that is in the region of £63.8 million by 2036. Under the air source heat pump technology scenario e.g. resulting from a heat hierarchy policy that requires use of renewable heat (as set out in the sister report), the fund would be smaller than this, at around £37.5 million in total. In contrast, policy option 1 results in the largest fund sizes of £422.2 and £373.8 million for the gas and air source heat pump scenarios respectively, but would be likely be the most difficult policy option to implement in terms of the scale of activity needed.



Total WoE Fund size (£) assuming the use of Air Source Heat Pumps (carbon price of £95 per tonne)

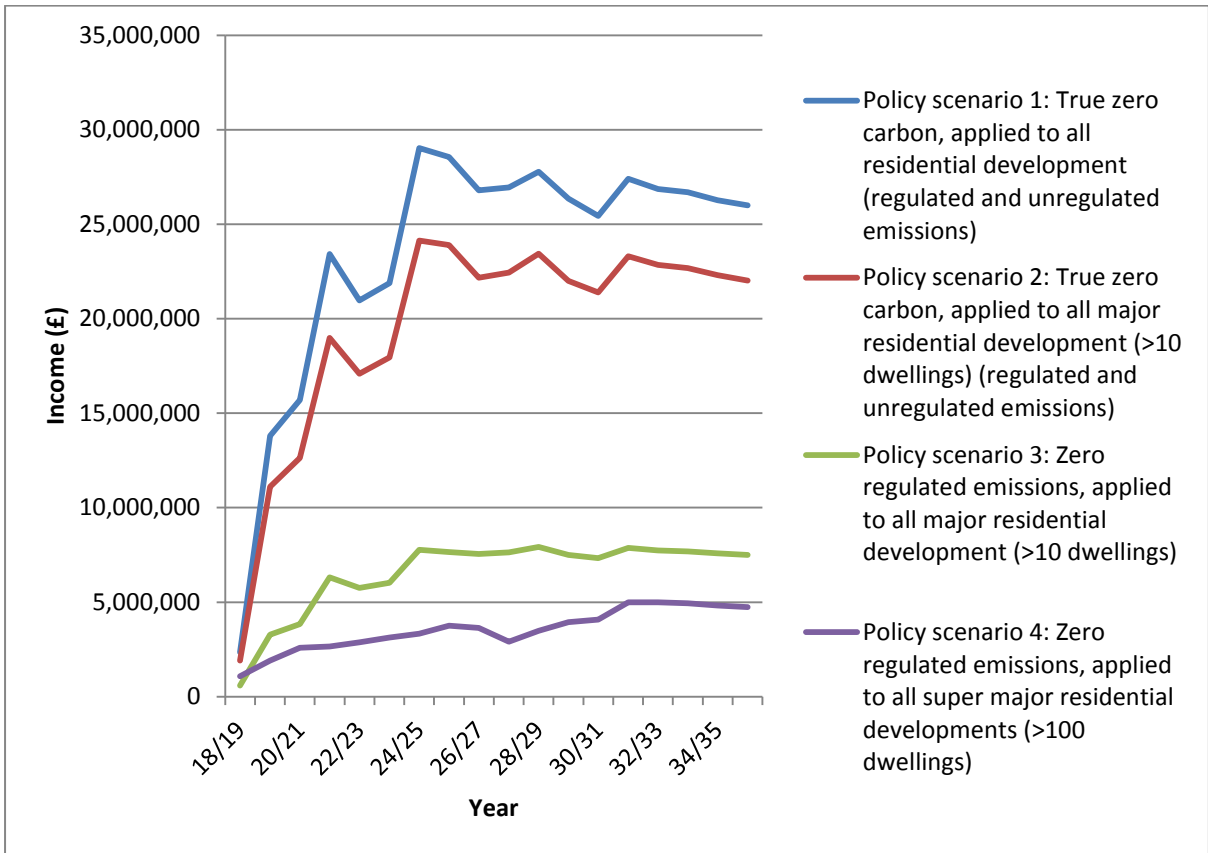


Figure 1 -Total WoE Fund size (£) assuming the use of gas central heating (carbon price of £95 per tonne)

A December 2018 technical consultation proposes to entirely remove the current restrictions on pooling S. 106 contributions from more than 5 developments to infrastructure projects. Provided this is confirmed, carbon offset payments can be pooled within a single ring-fenced pot and directed to the full range of eligible projects, whether defined as infrastructure or not, and it will not be necessary to limit the number of schemes contributing to individual carbon saving projects.

The Community Infrastructure Levy is not an appropriate mechanism for collecting carbon offset payments, in that CIL is a fixed charge per m² and does not account for the varying performance of developments in terms of carbon emissions. Thus Carbon offset funding must be secured through Section 106 legal agreements on planning consents, and every planning obligation must pass three legal tests, that it is *necessary to make the development acceptable in planning terms; directly related to the development; and fairly and reasonably related in scale and kind to the development.*

Administration processes; how decisions are taken to distribute funding and how projects are then subsequently monitored for the resultant carbon savings, should be specifically designed to ensure that the S. 106 tests can be met in every legal agreement entered into and every project funded. For this reason, every project or programme of projects funded (including Council projects) should go through an application process and be assessed against published criteria derived from the legal tests.

The most appropriate administration mechanism will depend on the range and type of projects that are deemed to be eligible for funding and on the scale of the fund. If a large number of applications are expected from the community for relatively small projects, for instance for energy retrofitting or community energy projects, there may be benefits to outsourcing the day to day administration of the fund, with the provider reporting to a panel of representatives from the four authorities. Given the high level of community activity related to energy in the region which should be harnessed and encouraged through the carbon offset fund, this suggests out-sourcing day-to-day administration, though many projects and programmes would themselves be run by council departments.

Given the joint approach adopted so far by the WoE authorities in developing their low carbon planning policies, we recommend that consideration is given to operating a shared WoE carbon offset regime, which would allow administrative savings and enable the authorities to benefit from one another's strengths. Operating a single shared fund would however raise governance and fairness issues which would need careful resolution; it is assumed that offset funds should be spent within the authority which secured them.

Recently published guidance from the GLA supports local authorities in allocating up to 10% of the fund to pay staff to develop and manage identified offsetting projects, in particular in the earlier stages of establishing funds and supporting arrangements.

Our recommendation is primarily to expand and modify existing Council projects which deliver measurable carbon savings, and to allow applications from the community for defined project types. Given the existing range of projects that are already being run, we would suggest that the carbon offset regime is piloted, and that during this pilot period, the following measures are defined as eligible:

- Energy efficiency retrofitting of housing and community buildings, including council run projects and funding applications from the community.
- Community energy projects (e.g. expanding on the Bristol Community Energy Fund).

New initiatives could be developed to support domestic and commercial renewable energy projects (to support the emergence of new business models given the removal of the feed-in-tariff in April 2019) and fund the retrofitting of commercial buildings. Other projects would require further investigation to determine whether they could offer workable carbon offset projects.

As in-depth monitoring of carbon savings from projects could easily take up a large proportion of the funding available, a proportionate approach should be adopted according to the scale of funding and scale of the project, with large projects reporting actual carbon savings and standard assumptions being applied to small projects.

In relation to planning applications:

- Carbon offset payments should be worked out at planning application stage
- With the exception of small sites where cash-flows are often more problematic, and very large sites where it is reasonable to phase contributions in parallel with the build programme, payment should be made prior to the commencement of development
- Include within planning conditions a requirement for as-built SAP measurements to be submitted, to ensure predicted performance standards are achieved. SAP (Standard Assessment Procedure) is the government's recommended method system for measuring the energy rating of residential dwellings
- Linked to this, include within the S. 106 agreement the ability to claw back additional carbon offset contributions where the predicted energy performance standards are not achieved.
- For smaller scale, simpler applications where only a cash payment needs to be made, maximise the use of unilateral undertakings³, and publish template agreements and calculators for use.

³ A unilateral undertaking is a kind of planning obligation made under Section 106 of the Town and Country Planning Act 1990, where only the applicant (developer) need be bound by the obligation and the Council is not a party to the agreement. They are only suitable where a simple financial contribution is required to make the application acceptable and are often quicker to turn around than full S. 106 legal agreements.

1. Allowable Solutions / Carbon Offsetting

1.1 Introduction and Purpose of Report

The submitted West of England (WoE) Joint Spatial Plan (JSP) covering the administrative areas of Bath and North East Somerset, Bristol, South Gloucestershire and North Somerset proposes that the Local Plans within the WoE region explore *“the potential for development to be built to a zero carbon standard, that is net zero emissions from regulated and unregulated heat and power, will be investigated using a consistent methodology... Where viable, policies requiring zero carbon development or development that produces more renewable energy than it uses through opportunities including heat networks and other measures to support the delivery of environmentally sustainable development will be considered for inclusion in Local Plans”* (Paragraph 51, Joint Spatial Plan).

The four authorities commissioned a report from Currie & Brown titled “Cost of Carbon Reductions in New Buildings⁴” looking at the capital and running cost implications of a range of potential energy policy options to meet this objective, for potential inclusion within future planning policy by the four planning authorities within the WoE area. The Currie & Brown report found that it would be possible to achieve significant carbon savings through maximising energy efficiency and through the incorporation of on-site renewable energy, but that to achieve full carbon neutrality, all of the policy approaches modelled required carbon savings to be achieved offsite, funded through a carbon offset regime, similar to that operated by the London Boroughs through the policies set out in the London Plan and some non-London authorities.

This report provides recommendations for how a carbon offset could operate within the WoE authorities: the advantages and disadvantages of using carbon offsetting, the price that developers should be charged per tonne of carbon to achieve carbon abatement offsite, the type of measures that could be defined as eligible and how the carbon offset fund could be managed within the WoE area.

1.2 Principle of Allowable Solutions / Carbon Offsetting

As detailed in this report, Allowable Solutions / Carbon Offsetting is used elsewhere in the country as an integral component of their carbon reduction planning policies. It allows carbon emission reductions that cannot be achieved cost-effectively on-site to be tackled through offsite measures.

The majority of recent literature refers to “carbon offsetting” rather than “allowable solutions”, though the two terms are interchangeable. For clarity we will use the term “carbon offsetting” and shall refer to the “carbon offset” fund throughout this document.

⁴ Currie & Brown (2018) “Cost of Carbon Reduction in New Building”
http://www.bathnes.gov.uk/sites/default/files/sitedocuments/Planning-and-Building-Control/Planning-Policy/LP20162036/cost_of_carbon_reduction_in_new_buildings_report_publication_version.pdf

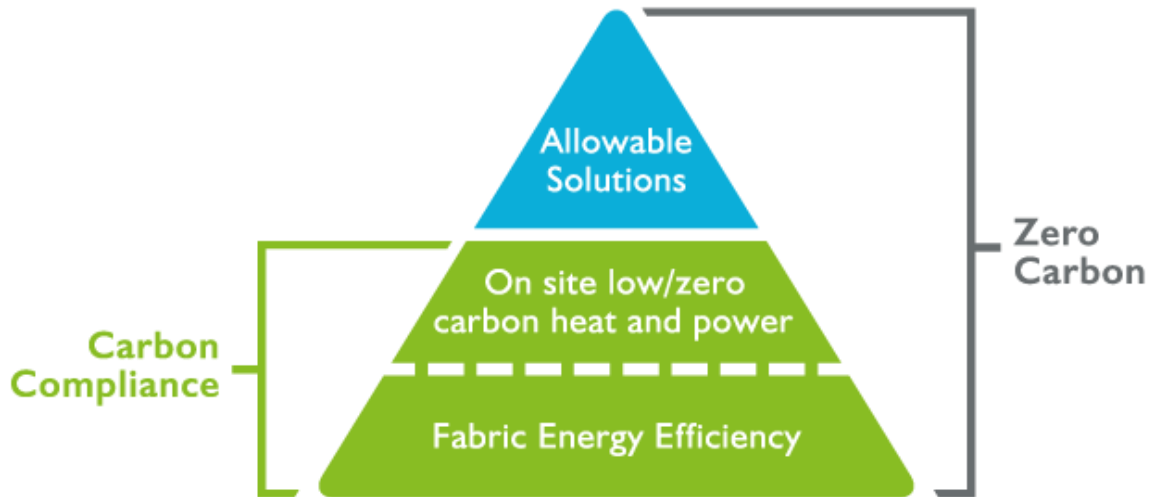


Figure 2 - Carbon Offsetting within the context of the Zero Carbon Homes regime – Zero Carbon Hub⁵

1.3 Research Methodology

We undertook a review of local planning authorities (LPAs) collecting payments to a carbon offset fund. This began with a literature review of the following studies by previous authorities and of LPA’s planning documentation including adopted policies and supplementary planning documents (SPDs):

- Review of Carbon Offsetting Approaches in London (2016) NEF - commissioned by the Greater London Authority (GLA)
- London Carbon Offset Price study (June 2017) AECOM - GLA
- London Borough of Tower Hamlets Carbon Offset Fund Report (2015) Etude – London Borough of Tower Hamlets
- The implementation of London’s Zero Carbon Target and carbon pricing policies (hereafter the Bartlett study). University College London - Bartlett School Of Planning

We also undertook a telephone survey with the Greater London Authority and with the following local planning authorities, seeking their feedback on how their carbon offset regime is set up and is managed, the carbon price they use to calculate contributions to their fund, and how successful their scheme has been to date.

- Southampton
- London Legacy Development Corporation

⁵ www.zerocarbonhub.org/zero-carbon-policy/zero-carbon-policy

- Islington
- Merton
- Camden
- Waltham Forest

The majority of local authorities we found operating carbon offset schemes were located in London. Two councils, Southampton and Milton Keynes outside London also charged carbon offset payments. We note that Bristol and South Gloucestershire councils have delivered Carbon Offsetting projects related to individual projects in the past.

What are a carbon offsets/ Allowable Solutions?

Carbon offsets operate as part of local policies that require a reduction in carbon emissions beyond the level required by Building Regulations. The offset payments aim to ensure that emissions that cannot be abated by on-site measures, for example thicker insulation or solar panels on the roof will be abated elsewhere, by paying for carbon saving measures off-site, for example projects to retrofit existing buildings to improve their energy efficiency and thereby reduce carbon emissions.

Off-site carbon abatement is assumed to take place over a 30 year period, as this is the assumed lifetime of many carbon abatement technologies. Additionally, it is assumed that, by the end of the 30 year period, the electricity grid itself will be de-carbonised, and thus Carbon Offsetting schemes will no longer be required.

Carbon offsets are collected through “Section 106” agreements. These are legal agreements made between developers and councils before planning permission is granted for a development requiring developers to undertake actions or make payments to fund infrastructure or mitigation in order to make an otherwise unacceptable development acceptable in planning terms. Section 6 considers the relationship of carbon offset payments with section 106 agreements and also with the Community Infrastructure Levy.

2. Benefits and risks of Carbon offsetting

2.1 Benefits

If carefully designed, carbon offset payments can mitigate emissions from new development that would not be able to be mitigated on site. Carbon Offsetting:

- a. **Is possible within current planning legislation and guidance.** The consultation response⁶ that accompanied the revised National Planning Policy Framework (NPPF) published in July 2018 confirmed that whilst the government “intends to consult on further improving (national) energy requirements for new homes” ... “the Framework does not prevent local authorities from using their existing powers under the Planning and Energy Act 2008 or other legislation where applicable to set higher ambition. **In particular, local authorities are not restricted in their ability to require energy efficiency standards above Building Regulations.**”

With this clarification, the general direction of policy regarding energy performance standards is significantly clearer, and whilst it is possible that the national regulatory structures around energy performance standards may overtake local policy, there is the potential for local policy development and experimentation to inform national policy rather than simply be superseded by it.

- b. **Has been used successfully elsewhere.** The majority of respondents (4 out of the 6 authorities) interviewed reported that their carbon offset regime had been very successful, and that there had been little resistance and / or no objections to their policy. The West of England authorities can draw upon extensive experience elsewhere when designing the scheme.
- c. **Is needed to enable zero carbon standards to be achieved cost effectively.** Currie & Brown investigated a wide range of policy options in order to achieve the delivery of net zero carbon emissions. In all the options considered, carbon offsetting was needed to enable zero carbon standards to be achieved cost effectively. Currie & Brown’s analysis suggests that it is possible to achieve net zero regulated carbon emissions from a combination of energy efficiency on site carbon reductions and allowable solutions for an additional capital cost of between 5-7% for homes and non-domestic buildings. Achieving net zero regulated and unregulated emission is likely to result in a cost impact of 7-11% for homes.

⁶ Government response to the draft revised National Planning Policy Framework consultation - A summary of consultation responses and the Government’s view on the way forward (2018) MHCLG
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/728498/180724_NPPF_Gov_response.pdf

d. Enables greater carbon reduction overall, by funding offsite measures when meeting the policy requirement is not technically possible to achieve on site.

Currie & Brown showed that for most building types, achieving zero emissions was not possible on-site without significant design implications. However all emissions from new buildings make it harder to meet national and local carbon reduction targets, hence the aim for new buildings not to add to the carbon burden (e.g. to be zero carbon). If this cannot be achieved on site, offsets fund carbon reduction measures elsewhere to mitigate the impact of new buildings. Carbon offset contributions should not be used by developers as a way of buying their way out of complying with adopted policy.

e. Can deliver socio-economic benefits. Our review of carbon offsetting schemes in other authorities suggests that carbon offsetting can also deliver other benefits. There is scope to shape how the carbon offsetting fund is used in order to deliver lasting socio-economic benefits to local communities and to reflect corporate priorities in addition to delivering carbon savings. For example, carbon offset funding can fund retrofitting programmes in hard-to-treat existing buildings or those occupied by the fuel poor (reinforcing existing council programmes), can fund energy efficiency improvements in community buildings, and enable community energy projects to go ahead.

f. Can enable innovation. Critically the fund has potential to enable innovative carbon savings projects to go ahead which would not achieve market funding and to help stimulate the local low carbon economy and initiatives by local communities. Obtaining finance has long been a barrier to small-scale low carbon projects. For instance with the closure of the feed-in tariff in April 2019 which has been central to the business model of renewable energy projects, carbon offset funding could be used to provide low interest loans and development finance for commercial renewable energy projects and enable new business models to be tested.

g. Appears feasible given the institutional capacities of the four authorities within the West of England area. Our interviews with authorities currently operating carbon offsetting regimes indicated the importance of having council staff with the right skills and capacity to get their carbon offset regime up and running, in particular sustainability teams. Between them, the four authorities have the right skills and expertise and already have programmes and projects promoting renewable energy installations, and energy efficiency improvements in buildings; the main likely forms of carbon offset project likely.

2.2 Risks

a. If the carbon price is too high, the further costs passed on to developers will limit development, or be passed on to homeowners in increased house prices. An equal risk is that if set too high the carbon offset acts as a brake on development or increases house prices. As with much of the country, the WoE authorities are in the midst of a housing crisis, with an undersupply of homes, declining affordability levels for households on average incomes and declining levels of home ownership. One of the Government's primary objectives is for the planning system to significantly increase house supply to address these problems. Consequently local planning authorities are required to forecast

and meet the housing needs of their communities (on a five year rolling basis) and are tested on the actual delivery of housing against their intended housing trajectory.

In response, none of the authorities we surveyed reported either significant resistance to the carbon offset charges from developers, or that the regime dampened growth. Since the majority of authorities surveyed are in London, with higher land values than in the WoE it could be argued that there is the risk that development in the WoE might be less able to support additional costs.

In terms of the impact on build rates, in July 2018 the government changed the approach of the planning system to development viability⁷. Local authorities are now required to assess the impact of all development plan policies on viability in plan making, prior to the adoption of their local plan. Thereafter, where up-to-date policies have set out the contributions expected from development, planning applications that comply with them should be assumed to be viable. It is the responsibility of developers to take into account any costs including their own profit requirements and ensure that proposals for development are policy compliant. The price paid for land is not a relevant justification for failing to accord with relevant policies in the plan.

The intention of this change is that with the main development costs (for example affordable housing, Community Infrastructure Levy payments to fund infrastructure and carbon offset payments) being known ahead of time, these costs will be reflected in the residual value (after these and other development costs) offered to landowners.

This changed approach has two consequences for carbon offsetting, firstly that the impact of carbon offset payments and all other policy requirements on development viability will be tested in all of the WoE areas; and secondly that with the new approach the additional costs should primarily reduce the price offered to landowners for land rather than being passed on through house price increases.

This may help to ensure that carbon offset charges do not significantly affect either housing delivery or house prices.

b. If the carbon price is too low, carbon offsets will be used in place of on-site measures.

One of the greatest risk of levying carbon offset payments is of setting the charge too low, thereby incentivising developers to use offsets instead of delivering high energy performance levels on-site. *The Implementation of London's Zero Carbon Target and carbon pricing mechanisms* (hereafter the Bartlett study⁸) suggests that in some cases this may have been the situation in parts of London as explored in Section 3 of this report.

⁷ Planning Practice Guidance – Viability – updated 24 July 2018 - <https://www.gov.uk/guidance/viability>

⁸ University College London - Bartlett School Of Planning - The implementation of London's Zero Carbon Target and carbon pricing policies

Here it is worth reinforcing that although levying a carbon offset charge has great potential for positive investment in carbon savings, it will always be a second best to achieving the maximum carbon savings possible on-site through building design and specification and the integration of renewable energy. The ultimate objective is for new buildings to be zero carbon or carbon 'negative' in performance. Buildings which don't achieve policy compliance will either contribute to climate change for the whole of their lifetime or will require costly retrofit. Carbon offset payments by contrast are usually calculated on the basis of abating carbon emissions for only 30 years whereas the building lifetime should be significantly longer than that.

In terms of whole society costs, it is far more cost-effective to "build right the first time". This will require a shift in construction methodologies and supply chains which can be incentivised if the offset price is high enough to discourage the routine use of offsets. Consideration should be given to designing policy to ensure that carbon emission reductions achieved through contributions into the offset fund are only used as a last resort, once the full range of on-site measures are applied.

- c. **The programmes and interventions funded by carbon offsetting fail to deliver measurable carbon emission reductions.** There is a danger of the carbon offsetting regime not being effective and therefore coming into disrepute. If the programme isn't able to demonstrate that offset payments will deliver carbon savings, requests for contributions will be challenged.

This risk should be mitigated through a transparent approach to assessing carbon offset projects, all of which (including council projects) should go through an open application process against defined criteria (explored in section 7 of this report) including their ability to deliver additional carbon savings.

The projects which make up the programme should then be subject to proportionate monitoring (proportionate with the size of the scheme) to record the carbon savings delivered (explored in section 8 of this report).

2.3 Key Conclusions from section 2 – balance between risks and benefits of carbon offset regime

The WoE Joint Spatial Plan (Policy 5) seeks to “minimise energy demand from new development and maximise the use of renewable energy, where viable meeting all demands for heat and power without increasing carbon emissions” and states that “new Local Plans will explore the potential for development to be built to a zero carbon standard, that is net zero emissions from regulated and unregulated heat and power”. Currie & Brown have explored the technical feasibility of five scenarios to achieve this.

A key conclusion of their research is that zero carbon development cannot be achieved on-site through fabric and the incorporation of renewable energy, and that in all cases off-site carbon abatement is required through a carbon offset scheme.

Overall, we consider that the advantages of having a carbon offset policy to achieve off-site carbon abatement substantially outweigh the disadvantages and has the potential to increase overall carbon savings beyond what would be achieved without it. The majority of local authorities responding to our survey reported little resistance to their policies and their carbon offset regime. It is also clear that carbon offset funds can deliver significant benefits: social, economic and environmental, alongside the carbon savings delivered.

3. Proposed Carbon offset charge for the West of England

Carbon offset prices could be set based on the following principles. Ideally all three would be met:

1. Derived from a nationally recognised carbon pricing mechanism;
2. A price sufficient to encourage on-site measures; i.e. a price equal to or greater than onsite measures;
3. A price sufficient to abate an equal amount of carbon offsite, based on actual costs of particular measures (e.g. retrofitting domestic properties or installing solar PV).

Any offset price needs to be balanced with the requirement for the overall cost of the policy to be shown to be viable and for carbon offset payments to be proportionate to the development. This requirement links back to the 3 tests that any planning obligation must pass, discussed in section 6. To be justifiable, the authorities must be able to demonstrate that the contribution is reasonably related to the scale of the development and necessary. Thus, the carbon offset payment must reasonably relate to the cost of abating the excess carbon emitted by the development.

We undertook a thorough desk review of the 19 local planning authorities we are aware of that operate a carbon offset regime, 16 of which are in London and 3 of which are outside of London. We also carried out telephone interviews with 7 local planning authorities in London and the Greater London Authority (GLA).

3.1 A nationally recognised price, derived from a recognised carbon pricing mechanism

The GLA price proposed in the draft London Plan is selected from a set of prices in a nationally recognised carbon pricing mechanism (the Treasury Green Book) to reflect the cost of offsetting projects.

To set the context, since 2016 the London Plan included policy which requires new major residential developments to be zero carbon. The current iteration of the plan requires all new homes to be zero carbon and new non-domestic buildings should be zero carbon by 2019. The policy sets a hierarchy to minimising carbon dioxide emissions in accordance with the following energy hierarchy: 1 Be lean: use less energy; 2 Be clean: supply energy efficiently; and, 3 Be green: use renewable energy. The remaining regulated carbon dioxide emissions, to 100 per cent, are to be off-set through a cash in lieu contribution to the relevant borough to be ring fenced to secure delivery of carbon dioxide savings elsewhere.

The GLA Supplementary Planning Document *Sustainable Design and Construction (2014)* encourages Boroughs to set a price for carbon dioxide based on a nationally recognised carbon dioxide pricing mechanism; or the actual cost of off-setting carbon dioxide emissions, and sets a baseline price of £60 per tonne.

In 2017 a draft new London Plan was published by the Mayor for consultation, and the GLA commissioned an AECOM study of the carbon price at the same time, *London Carbon Offset Price*⁹.

The AECOM study took the view that “given the wide variability in the costs and carbon savings for potential carbon offsetting projects, it would be difficult to calculate robust costs per tonne of carbon for selected types of offsetting projects. Consequently it would be difficult to analytically derive a robust carbon price based on the cost of offsetting projects.”

Therefore the approach recommended in the AECOM study is to “base carbon prices on a nationally recognised carbon pricing mechanism rather than on the cost of carbon savings derived from potential offsetting projects”. AECOM sourced carbon prices for further testing from the projection of non-traded carbon prices published in “Valuation of Energy Use and Greenhouse Gas Emissions – Supplementary guidance to the HM Treasury Green Book on Appraisal and Evaluation in Central Government.”

Recognising that the viability of development varies by area, the AECOM study identified a set of carbon prices consisting of a low, a central, and a high price. Two options for carbon price sets were identified to allow for testing of a price range centred on the existing carbon price recommended by the GLA (£60 /tCO₂ – ‘Option 1 in table below, page 10 of the study) and a higher price range that would inherently enable a wider range of measures, including notable project types recognised to have significant undelivered technical potential in the stock and that could deliver ‘deep’ carbon savings in homes (Option 2 in the table below) as follows:

Option	Low	Central	High	Comments
Option1	32	64	95	Treasury Green Book non-traded carbon prices for 2017; same source as 'Zero Carbon Hub price' of £60 /tCO ₂ cited as an example in the Sustainable Design and Construction SPG to the London Plan and widely adopted across London
Option 2	64	127	191	High price set based on indicative cost of external solid wall insulation and whole house refurbishment (with low cost cavity wall insulation); low price set to central non-traded carbon price; results in wide price range

These carbon price options are subject to viability testing, and subsequent consideration by GLA before a decision is taken on recommending any carbon offset prices for London.

Figure 3 Carbon prices suggested for testing - AECOM (June 2017) London Carbon Offset Price - Greater London Authority

Subsequent viability testing for the latest iteration of the London Plan tested a price of £95 per tonne and the 2017 draft London Plan¹⁰ states that this can be used by boroughs to collect offset payments.

⁹ Aecom (June 2017) London Carbon Offset Price Greater London Authority - www.london.gov.uk/sites/default/files/london_carbon_offset_price_-_aecom_.pdf

¹⁰ The draft new London Plan was published by the Mayor for consultation in December 2017 and the Examination in Public commenced on 15th January 2019.

Policy Consideration:

A carbon price of £95 per tonne would reflect the most up to date carbon price, based on a nationally recognised pricing mechanisms.

3.2 A price sufficient to encourage on-site measures; i.e. a price equal to or greater than onsite measures

From our desk study of council documentation, our phone surveys, and the earlier studies by AECOM and Etude, we have produced a graph illustrating the range of carbon charges currently in use. The graph also shows those authorities which reported in our interview whether or not they were happy with their adopted carbon price.

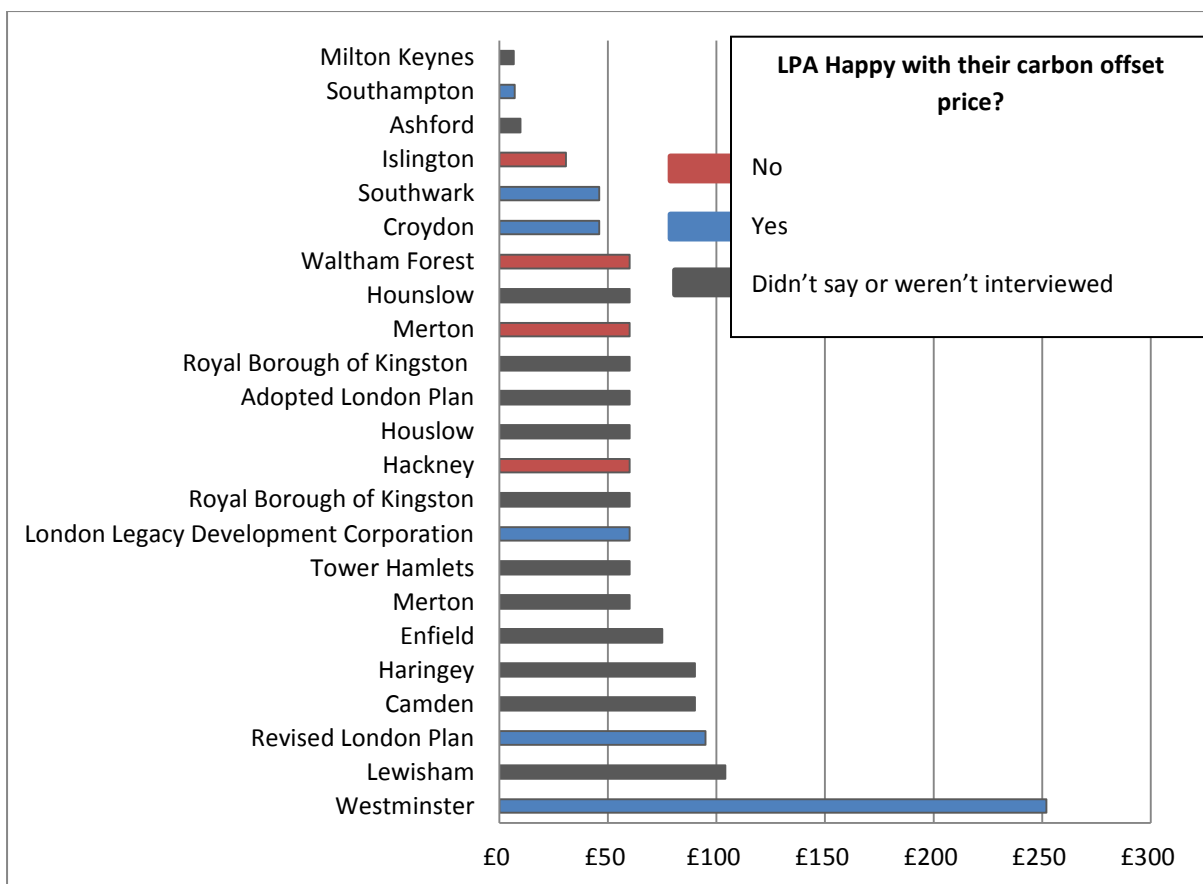


Figure 4 Variance in carbon offset price by LPA (£ per tonne CO2 X 30 years), and satisfaction with this price, as expressed by individual council officers.

Of the authorities we looked at, the majority (9) adopted the price recommended by the GLA, and 4 based their carbon price on their own studies of the local costs of carbon offsetting. One authority

tested the viability of different carbon offset prices and one authority (Ashford) based their price on the shadow price of carbon¹¹.

We also analysed *The Implementation of London's Zero Carbon Target and carbon pricing mechanisms*¹², (a dissertation by Jon Buick of the London Borough of Merton), which contains the following useful commentary on carbon prices, based on interviews with 8 London Boroughs with our emphasis in bold (data protection restrictions mean that the authorities were anonymised):

“The view amongst boroughs interviewed is that the £60 tCO2 price is neither an accurate reflection of the cost of onsite mitigation nor the cost of offsetting. Carbon pricing is intended to provide a price signal that penalises developers financially for failing to employ ‘best practice’ approaches to building fabric or optimising renewable energy options. However, there was concern that the opportunity to offset could be acting as a kind of perverse incentive, distracting attention away from mitigation or even financially rewarding developers for failing to tackle emissions effectively onsite, even in boroughs with higher adopted costs. The best evidence to support the assertion that the GLA’s carbon price is not sufficient to encourage savings beyond the 35% target was supplied by Borough-B’s review of solar PV deployment on ZCT-compliant planning applications, wherein developers chose to offset over optimising renewable energy installation. There is further empirical evidence to indicate the £60tCO2 figure is significantly lower than the cost of offsetting emissions within London.

Even Borough-Q had concerns over their ability to achieve a 1:1 ratio for offsetting with a price that is around 70% more than the GLA’s. The briefly adopted cost of £252tCO2 appears to be the only price that could guarantee carbon equivalence when invested, with other boroughs indicating the cost is around the £120tCO2 mark (Borough-B, Borough-M).”

Below in section 7 is a further exploration of measures that could be funded at different offset prices, which assesses both £95 and £120t CO2.

Jon Buick from Merton commented further:

“Most boroughs will be like us: we know that £60 per tonne is not enough, but no-one wants to take the risk of breaking from the pack. The few that have, have not necessarily

¹¹ The shadow price of carbon (SPC) is used in policy and investment appraisals across UK government and is based on estimates of the social cost of carbon (SCC). The SCC measures the full global cost today of an incremental unit of carbon emitted now, summing the full global cost of the damage over its lifetime in the atmosphere. The SPC is based on the SCC for a given stabilisation goal, but can be adjusted to reflect: estimates of the Marginal Abatement Cost required to take the world onto the stabilisation goal; and other factors that may affect UK willingness to pay for carbon reductions, such as political desire to show leadership. Whereas the SCC is determined purely by our understanding of the damage caused and the way we value it, the SPC can adjust to reflect the policy and technological environment. This makes the SPC a more versatile concept in making sure that policy decisions across a range of government programmes are compatible with the Government’s climate change goals and commitments. The Social Cost Of Carbon And The Shadow Price Of Carbon: What They Are, And How To Use Them In Economic Appraisal In The UK –Defra (December 2007) - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/243825/background.pdf

¹² University College London - Bartlett School Of Planning - The implementation of London’s Zero Carbon Target and carbon pricing policies

had the easiest time of it. A carbon price of £95 per tonne is more achievable. £95 per tonne means there are solar PV projects which would be giving you roughly £90 per tonne. In London they've been paying approx. £900 – 1000 per kw peak of PV, whereas outside the capital you can get it for £600 per kw peak... at £95 per tonne it's cheaper to max out the roof with PV than pay the offset payment. We may have reached that inflection point.” Merton – (currently charging 60 £/t)

Currie & Brown’s analysis is that at present a carbon price of £95 per tonne would be broadly equivalent to the marginal cost of carbon saved by PV using 2012 emission factors. Therefore this price, or a price above this would incentivise the maximum installation of PV before moving to pay the carbon offset fee.

Policy considerations:

- 1. The current price of £60/ tonne in the existing London Plan has been found to be too low to encourage onsite measures.**
- 2. The £95 carbon price proposed in the London Plan appears to be high enough at the current time, and against current emission factors to encourage developers to install onsite PV where possible instead of offsetting.**

3.2.1 Implications of grid decarbonisation and changing emissions factors for the carbon price

Currie & Brown’s analysis reveals that the relationship between the carbon offset price and the costs of carbon abatement through measures that replace save electricity (for example using solar panels) is highly sensitive to the “emissions factor”; the carbon intensity of the national grid.

Emissions factors (the amount of CO₂ produced by a unit of electricity) are falling as more renewable electricity is added to the grid. Part L of the Building Regulations is calculated using the SAP¹³ methodology, which is updated periodically to reflect changing emissions factors. Currently the emissions factors in SAP 2012 are outdated and the government has just published SAP 10 in draft for assessing the energy performance of dwellings, though they will not be used in Part L calculations until the new Part L is introduced. The emission factor set out in SAP 10¹⁴ is approximately half of that set out in SAP 2012. The table also shows forward projections for the emission factor for 2025 and 2030.

Source	Kg CO ₂ e per kWh	% reduction on 2012 SAP
SAP 2012 (current)	0.526	0%

¹³ SAP or Standard Assessment Procedure is the method for assessing the energy and carbon performance of homes to verify compliance with Part L of the Building Regulations.

¹⁴ The Government’s Standard Assessment Procedure for Energy Rating of Dwellings Version 10.0 http://files.bregroup.com/SAP/SAP-10.0_24-07-2018.pdf

Current (real) from BEIS	0.319	40%
SAP 2010 (July 2018 publication – not yet for official use)	0.23	56%
Projection from BEIS in 2025	0.224	58%
Projection from BEIS in 2030	0.129	76%

Table 1 - Changing emission factors (carbon intensity) of national grid electricity

There are several implications of changing emission factors, namely:

- The carbon savings that can be attributed to measures that displace grid electricity, for example on-site renewable energy or LED lighting will therefore decrease as the national grid de-carbonises, as the carbon savings are derived from the fossil fuel sources displaced.
- Therefore the cost of abating carbon emissions through the deployment of renewable energy will become much higher per tonne of carbon offset, as each unit of grid electricity being displaced has lower carbon emissions (*and therefore more renewable energy is needed in order to offset 1 tonne of carbon dioxide.*)

The implications for setting the carbon offset price are as follows:

- The quantity of residual carbon emitted by the properties (i.e. that are subject to carbon offsetting) will reduce over time as the electricity grid de-carbonises. This will especially be the case for renewable electrically heated homes, for example homes heated by electrically powered heat pumps.
- Carbon savings from onsite PV (and from any off-site carbon abatement project where the carbon saved results from increasing electrical energy efficiency or displacing electricity from the national grid) will become more expensive per tonne of carbon saved because the carbon savings per kWh of generated electricity will be lower.

To meet the principle of setting an offset price high enough to encourage onsite measures, the reduced carbon emission factor within SAP 10 could theoretically justify increasing the carbon price from that charged by the London Boroughs so that it keeps pace with the increasing cost of abating a tonne of carbon through solar PV, since PV is the least costly onsite measures and therefore the most likely to be used by developers to reduce emissions. Currie & Brown advise that with the introduction of SAP 10, the carbon offset price would need to be increased to £300 - £400 per tonne in order to make the on-site installation of solar PV cost effective against paying the carbon offset charge. Looked at in isolation, such a price might threaten viability. However Currie & Brown advise that for renewably heated homes, the effect of the increased carbon price could be cancelled out by the reduced residual emissions modelled and that the overall carbon offset payment would remain roughly the same as at present.

Raising the offset price to keep pace with decarbonisation might result in a carbon price that is higher than that required to achieve the equivalent carbon saving offsite, particularly if spent on measures such as insulation in gas heated homes where the cost of abatement does not respond to decarbonisation of electricity. In this case, the offset payment could mitigate more carbon than the new building would produce and may not pass the test for S106 contributions of being related to the impacts of the development.

Policy considerations:

On the basis of the current costs of PV and considered against the carbon intensity of grid electricity described in SAP 2012, a carbon price of £95 per tonne would be appropriate and would provide a price signal to support developers maximising the on-site installation of PV over paying carbon offset charges.

However if the carbon price were linked to the price of offsetting carbon savings through the installation of PV, it would need constant review as the carbon intensity of the grid falls, and would become too high when compared with the costs of saving carbon through other measures, for example off-site energy efficiency programmes.

3.3 A price sufficient to abate an equal amount of carbon offsite, based on the actual costs of particular measures

It is beyond the scope of this study to model the cost of off-site carbon abatement projects in the West of England, however the 2017 AECOM study (London Carbon Offset Price) examined the indicative cost of measures in a London context. They also looked at annual carbon savings, lifetime, and hence lifetime carbon savings, and 'raw' (without co-payments) costs per tonne of carbon for a range of project types as shown in figure 5 below.

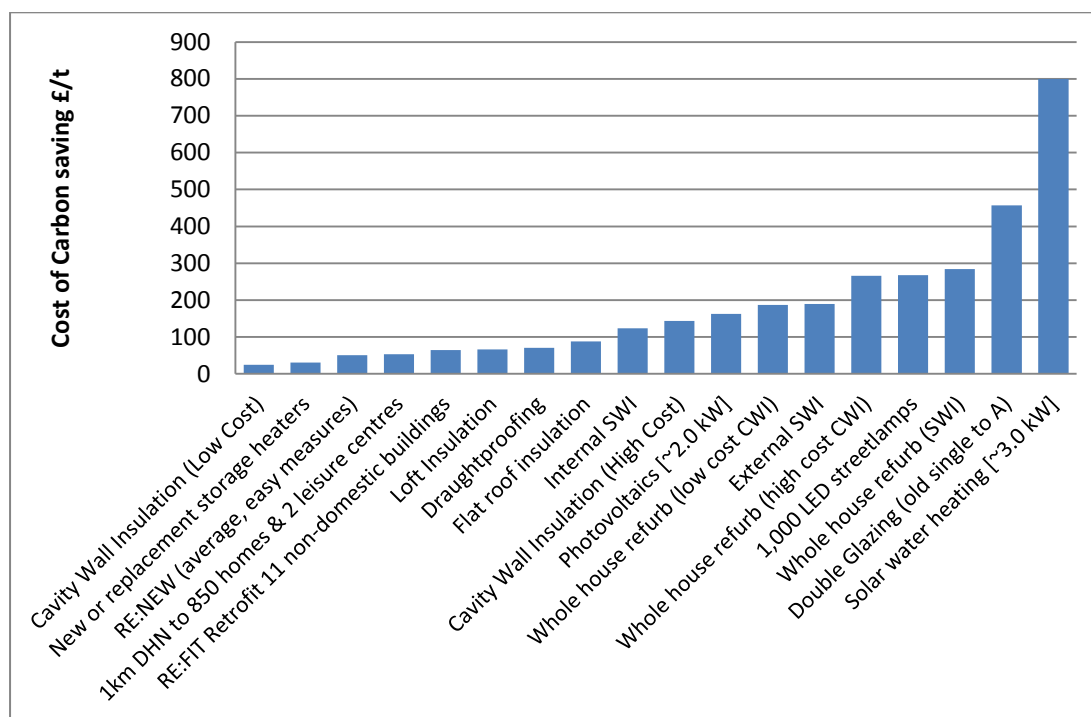


Figure 5 -Cost of carbon saving for selected carbon saving measures (£/t) - Source: AECOM (2017) London Carbon Offset Price, table 1.

Note that the cost given for PV in the 2017 Aecom study (of £163 per tonne carbon over 30 years for a 2.0 Kw array) substantially exceeds the equivalent figures given by Currie & Brown (if £103 per tonne for a 2.0 Kw array) based on reverse auctions set up to supply homes in London. This reflects the rapidity with which the PV market is changing and also the competitiveness achieved through these reverse auctions.

What the results show is the broad variability in the cost of carbon savings of different types of projects. Costs in the West of England may differ from those shown by AECOM's London study, depending on the mix of projects defined as eligible (for instance should larger scale renewable energy projects be proposed than those modelled above), and as a result of the housing stock (reflecting the higher costs of retrofitting historic buildings in B&NES in particular).

Figures 6 – 8 below, again derived from the AECOM study, look at the “affordability” of these measures at carbon prices of £95, £120 and £140 per tonne, expressed in terms of the offset ratio. An offset ratio of 1:1 indicates that the measure could be fully funded at that carbon price. Values of less than 1 indicate offset ratios worse than 1 to 1, i.e. that the cost per tonne of carbon saved through that specific measure is higher than the carbon price being modelled.

Investing in projects with offset ratios less than 1 to 1 means that the carbon savings achieved are less than the residual emissions from the developments from which offset funds were collected, so some excess carbon remains which has not been offset. Conversely, values greater than 1, mean that the cost of that measure is below the carbon price, and therefore carbon savings will exceed residual emissions. The dashed lines illustrate a carbon ratio of 1:1; projects above this line could be fully funded. In all likelihood the overall carbon offset regime within the west of England authorities will fund a mix of different project types, those which overachieve carbon savings (are cheaper than the carbon price charged to developers), and those which under-achieve carbon savings at the carbon price adopted.

Policy consideration

Recent guidance from the GLA advises in respect of the carbon ratio of carbon offset measures:

“A strict 1:1 ratio (i.e. the cost of the offset measure to save one tonne of carbon compared to the offset price per one tonne of carbon) is not required. Such a ratio would only allow the simplest retrofitting measures to be carried out and would leave more complicated, costly measures without access to funding.”

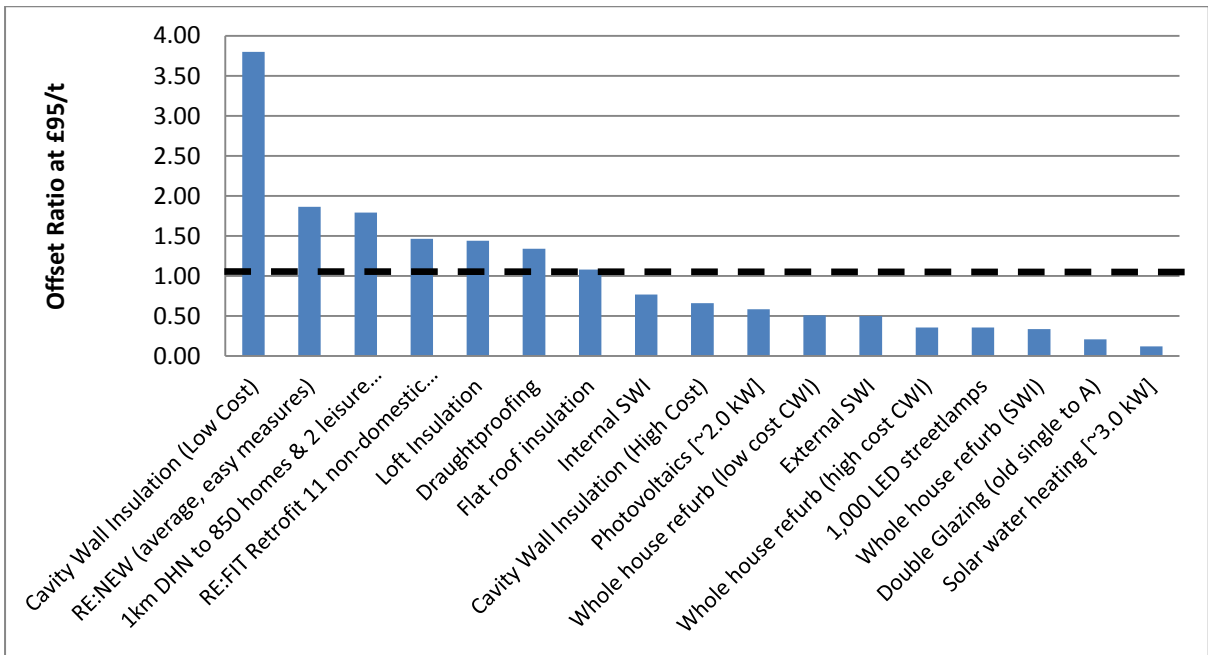


Figure 6 - Offset ratio for selected carbon saving measures – carbon price of 95 £/t

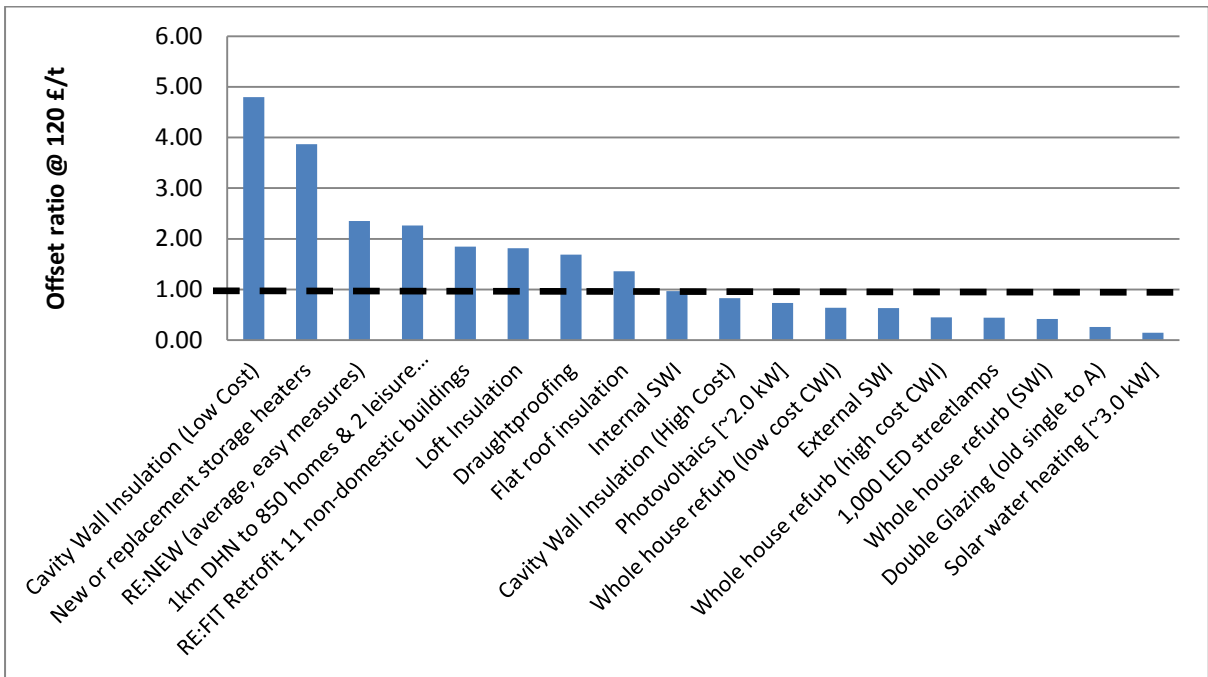


Figure 7 - Offset ratio for selected carbon saving measures @ 120 £/t

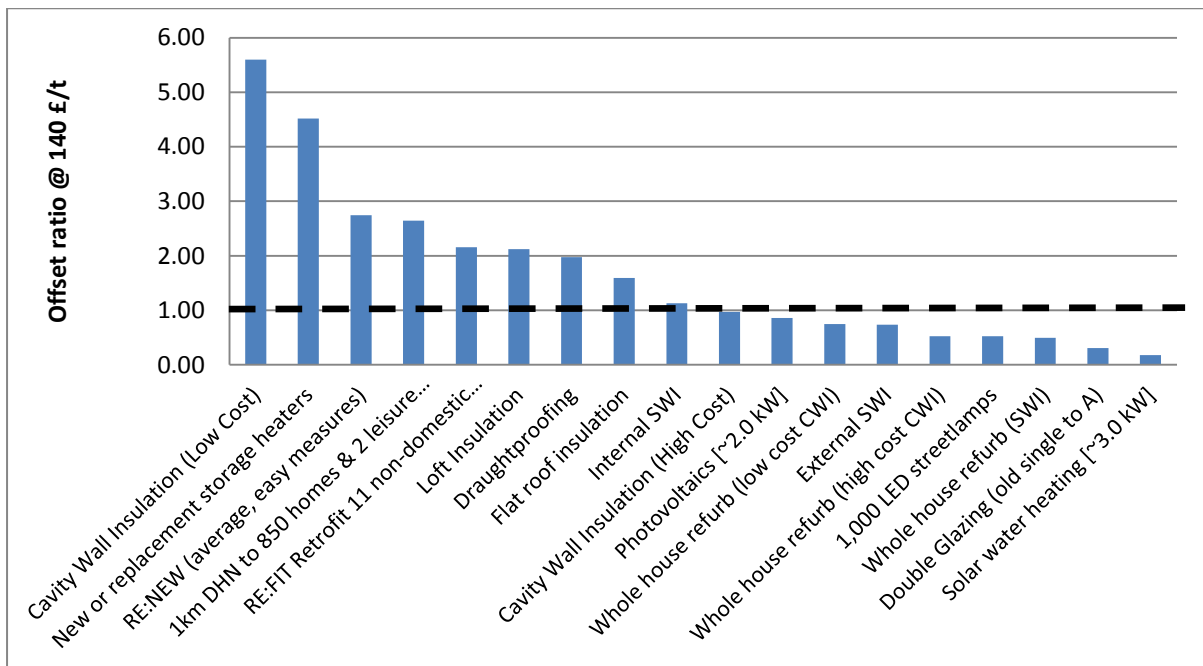


Figure 8 - Offset ratio for selected carbon saving measures @ 140 £/t

Self-evidently the higher the carbon price, the greater the range of measures which can be fully funded by carbon offset contributions, but the impact of these different charging levels is not dramatic. A 120 £/t charge or more would allow internal solid wall insulation to be fully funded, but even a charge of 140 £/t would not allow external solid wall insulation to be fully funded. However it is likely that some measures with a high carbon ratio could subsidise measures with more expensive carbon savings.

To improve the affordability of different measures, the beneficiary of carbon offset funding (for example the building owner in the case of retrofitting projects) may pay part of the implementation costs, or different funding streams could be combined, for example from the Energy Company Obligation. Figure 9 below illustrates the impact of a 50% co-payment on the offset ratio of different measures, assuming a carbon price of 95 £/t.

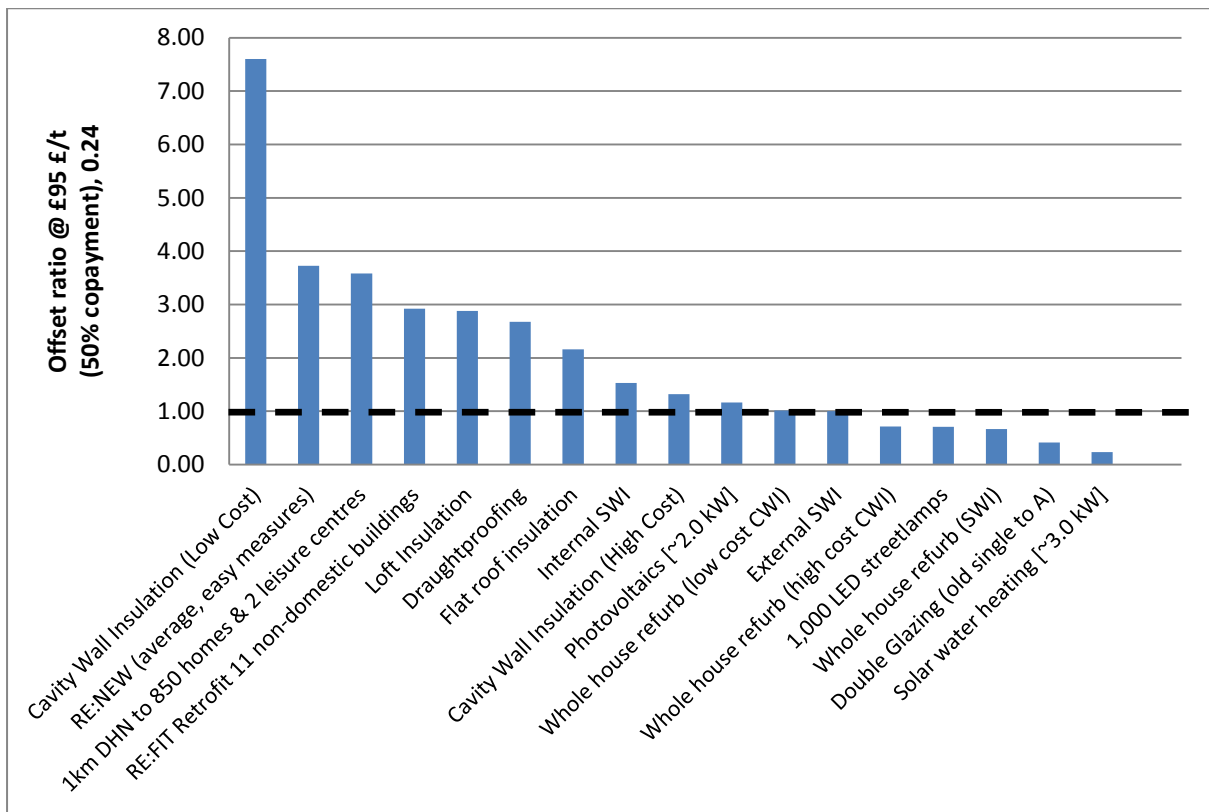


Figure 9 - Offset ratio @ £95 £/t (50% copayment)

3.4 Conclusions on recommended carbon price

There is evidence that a carbon price of 60 £ / t is not enough to fund carbon abatement measures, and evidence from the Bartlett study that at this price there is a perverse incentive for developers to pay the Carbon Offset charge rather than maximise onsite carbon reductions through fabric and renewable energy.

The costs of carbon abatement projects vary considerably by project type, and a carbon price of £95 per tonne would not be enough to fully fund all the carbon offset projects likely to be possible, but it would be possible to cross-subsidise measures to achieve an acceptable carbon ratio overall. Other sources of funding could also be combined, and contributions from fund recipients could be used to increase the scope of the fund and make a greater range of projects affordable.

Following the example of the London Plan, a carbon price of £95 per tonne would also reflect the most up to date carbon price, based on nationally recognised pricing mechanisms.

There is strong evidence to support a carbon price of 95 £ / t. Currie & Brown suggest that at 95 £ / t the carbon price would be broadly equivalent to the current marginal cost of carbon saved by PV at current prices. The officer we interviewed from London Borough of Merton suggested the same, commenting that at this price it is cheaper to maximise on-site renewable energy than pay the offset payment. At the current time, this price would be sufficient to encourage on-site measures, that is the full utilisation of solar PV.

As discussed in section 4, ongoing reductions in the carbon intensity of grid supplied electricity (and the expected introduction of SAP 10) means that in the near future a significantly higher carbon price (of £300 – 400) might be needed in order to maintain the financial incentive to maximise the installation of on-site PV.

Encouraging onsite measures is only one of the principles for setting an offset price however, and the regulations around planning obligations provide no support for setting planning obligations at a level to provide a price signal to motivate desired behaviour. Instead the obligation and contribution must be sufficient to fund appropriate mitigation, necessary to make the development acceptable, that is directly related to the development; and fairly and reasonably related in scale to the development. Taking this into account, the carbon price must primarily be set at a level which allows actual off-site carbon abatement projects to take place in the WoE area, and as discussed in section 7, these are likely to predominantly consist of off-site energy efficiency measures, with some renewable energy projects.

Policy Consideration

Taking into account the likely predominance of carbon savings projects related to heat energy efficiency, and the lack of other evidence to support a higher carbon offset price, we would recommend that for the purposes of the carbon offset regime, the carbon price is set at 95 £ / t CO₂, but that policy wording should allow for regular reviews of this price, particularly at points where the SAP regime (and therefore standard carbon factors) change.

4. Recommendations for ratcheting the carbon price

From our research, we have not found any examples of Local Authorities which include within their policies arrangements to ratchet the price of carbon for the purposes of carbon offset contributions. London Plan policy SI2¹⁵ (Minimising greenhouse gas emissions) which the London carbon offsetting regime hangs upon, does not mention the carbon price specifically. The supporting text to the policy simply states that the price for offsetting carbon is reviewed regularly and that the GLA's suggested carbon offset price would be updated through future guidance.

We have considered the following options for ratcheting the carbon price:

- a. **Pegging the carbon price to the marginal cost for photo-voltaic panels.** This would provide a logical basis for ratcheting the carbon price for the purposes of carbon offsetting as rooftop PV is likely to be one of the most common and cost-effective form of on-site carbon abatement. However, the capital cost (though not installation costs) of PV is predicted to continue falling. If pegged to PV capital cost therefore, over time offset carbon payments would not reflect the cost of other types of carbon abatement.
- b. **Pegging the carbon price to the marginal cost for photo-voltaic panels, while also taking into account the carbon intensity of electricity from the national grid,** which is falling as the contribution of renewable energy to our energy mix rises. This would result in an increase in the carbon price as the carbon intensity of the national grid falls, in that ever larger amounts of renewable energy would need to be installed in order to abate a tonne of carbon dioxide. Whilst this would be reasonable in theory, with the introduction of SAP 10, with substantially lower emission factors, the carbon price would need to be increased to £300 - £400 in order to make the on-site installation of solar PV cost effective. Our research suggests that a carbon offset cost of £300 – £400 would be well above the carbon costs of the overwhelming majority of retrofitting measures. Unless all offset funds were spent on renewable electricity generation (which is unlikely) such a carbon price would be difficult to justify.
- c. **Pegging the WoE carbon price to government carbon values.** The Fifth Carbon Budget¹⁶ sets out the UK Government's carbon values for policy appraisal, which are designed to be aligned with action required under the Climate Change Act and consistent with the costs of limiting warming to 2°C. These carbon values reach £78/tCO₂e in 2030, growing steadily to £220/t in 2050, with low and high values 50% below and above the central level.

¹⁵ Draft New London Plan – Policy S12 – Minimising Greenhouse Gas Emissions - www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/draft-new-london-plan/chapter-9-sustainable-infrastructure/policy-si2-minimising

¹⁶ The Fifth Carbon Budget The next step towards a low-carbon economy November 2015 - <https://www.theccc.org.uk/wp-content/uploads/2015/11/Committee-on-Climate-Change-Fifth-Carbon-Budget-Report.pdf>

Ashford Borough Council followed this approach and set their carbon price at £9.71 based on the Shadow Price of Carbon (SPC) set by DEFRA. Setting and revising carbon prices in line with these carbon values would not support a carbon price high enough to prioritise on-site abatement other than the very simplest measures.

- d. **Not including provisions for ratchetting the carbon price within Local Plan policy and pegging the future Carbon Offset price to the basket of carbon savings measures available within the West of England authorities.** The carbon price could either be set out in the policy itself and reviewed every 5 years through the normal plan review process, or adopting the approach of the London Plan, could be set out in Supplementary Planning Documentation. In this case the supporting text to policy would state that the carbon price will be reviewed periodically, and would outline the principles which will be taken into account in this review and then the carbon price itself, and further detail on how the carbon offset regime will operate, would be set out within a supplementary planning document.

Possible appropriate principles for carbon price review could be:

- Maintaining development viability and build-out rates
- Reflecting the real world costs of carbon abatement as applied in the West of England authorities, as the available range and scale of projects become clear.
- Prioritising on-site carbon savings through building fabric and the incorporation of renewable energy

Our view is that a review period of between 3 and 5 years would be beneficial, in that well within this time, evidence will build up as to the real world costs of carbon abatement within the WoE area based on the basket of measures funded and as to whether the carbon price is set at an appropriate level. It would also be reasonable to review the carbon price taking into account the changes in SAP / Building Regulations, to ensure that if possible the carbon price is set at a level which continues to incentive the incorporation of renewable energy on site. It would make sense where possible to review the recommended offset prices at a time when updated prices can be tested as part of a viability assessment that is required to address other proposed policy changes. If the Carbon Offset price is pegged to non-electrical carbon savings, for example energy efficiency improvements to homes heated with gas, continuing reductions in the carbon intensity of the national grid would significantly reduce the amount of carbon abatement needed over time, thereby reducing the size of the carbon offset pot for investment.

4.1 Key conclusions in respect of Ratchetting the carbon price

There are considerable advantages to not including arrangements for ratchetting the carbon offset price within the policy itself, but committing to review the carbon price periodically through Supplementary Planning Documents or through the Local Plan 5-year review cycle. This would significantly reduce the complexity of policy wording, and reduce the scope for challenge at examination. This would allow data to be collected on the mix of abatement technologies suitable and appropriate within each of the WoE authorities, in recognition of the varying building typologies,

landscapes and planning constraints, and enable the local carbon price (WoE or authority specific) to change as the evidence of the costs of real world cost carbon abatement in the WoE becomes clear.

Policy Consideration

We found no clear basis for the inclusion of provisions to ratchet the carbon price within the policy itself. Rapid changes in the carbon intensity of grid electricity and in Pv prices, and a lack of data as to the mix and actual costs of carbon offsetting projects within the WoE area make it very difficult to provide a fair and accurate prediction of what the carbon price should be in the future.

Instead we recommend that the carbon price either be set out in the policy itself and reviewed every 5 years through the normal plan review process, or adopting the approach of the London Plan, could be set out in Supplementary Planning Documentation. It would be reasonable to index link the carbon price to inflation and it would however be beneficial to set out principles which should influence the level at which the carbon price is set, applying the following priorities:

- **Maintaining development viability and build-out rates**
- **Reflecting the real world costs of carbon abatement as applied in the West of England authorities, as the available range and scale of projects become clear.**
- **Prioritising on-site carbon savings through building fabric and the incorporation of renewable energy**

5. Potential size of fund and CO₂ emissions savings

Working with Currie & Brown’s modelling and the scale of housing delivery indicated in the Joint Spatial Plan and their consideration of the proportion of carbon savings that will reasonably be able to be achieved on site, we have estimated the potential carbon offset fund (and CO₂ savings) in each of the authority areas, in each of the policy scenarios indicated.

The graphs below at figures 9 and 10 show the total carbon offset fund size per year within the West of England area as a whole for the low, medium and high policy scenarios selected, for both technology scenarios included within Currie & Brown’s analysis (i.e. where new development is assumed to be served by either a gas boiler or an air source heat pump). Figure 11 shows these figures in tabulated form.

The equivalent figures disaggregated by local planning authority are tabulated at Appendix A.

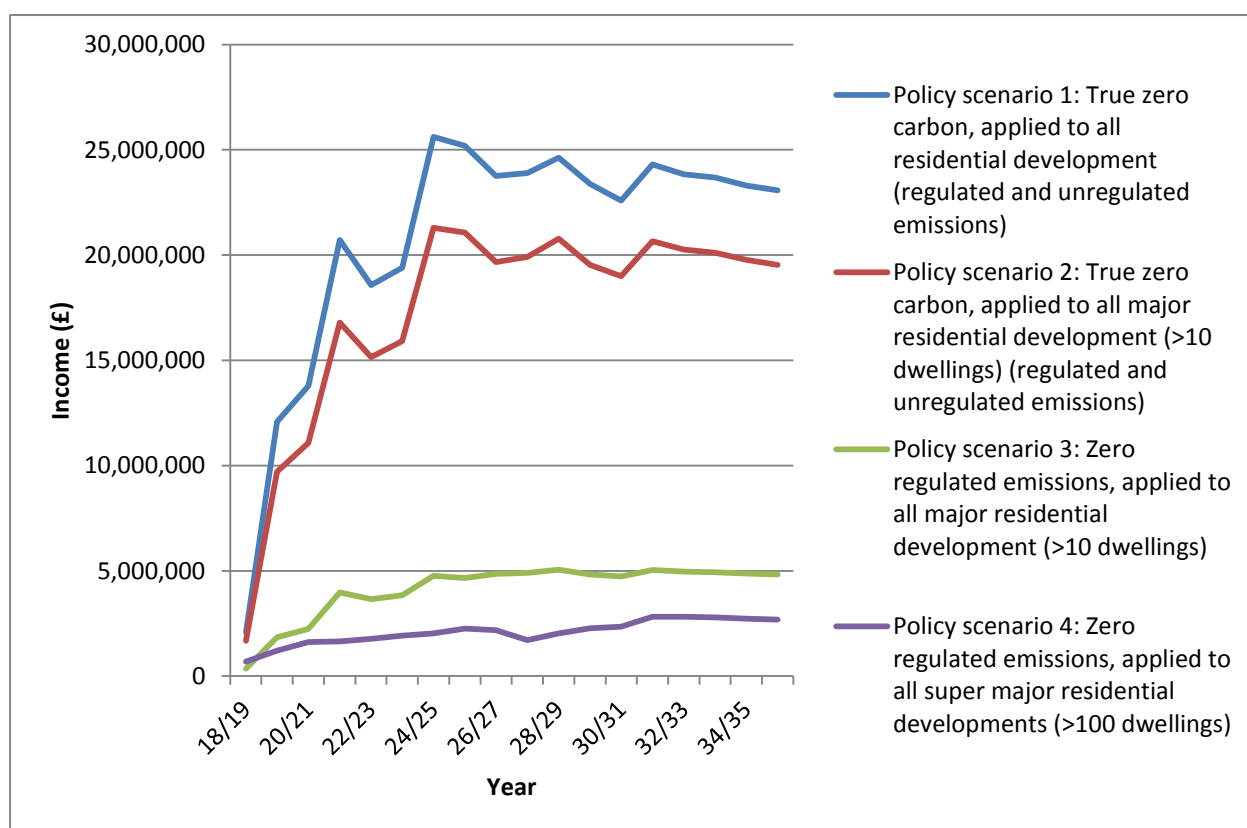


Figure 10 - Total WoE Fund size (£) assuming the use of Air Source Heat Pumps (carbon price of £95 per tonne)

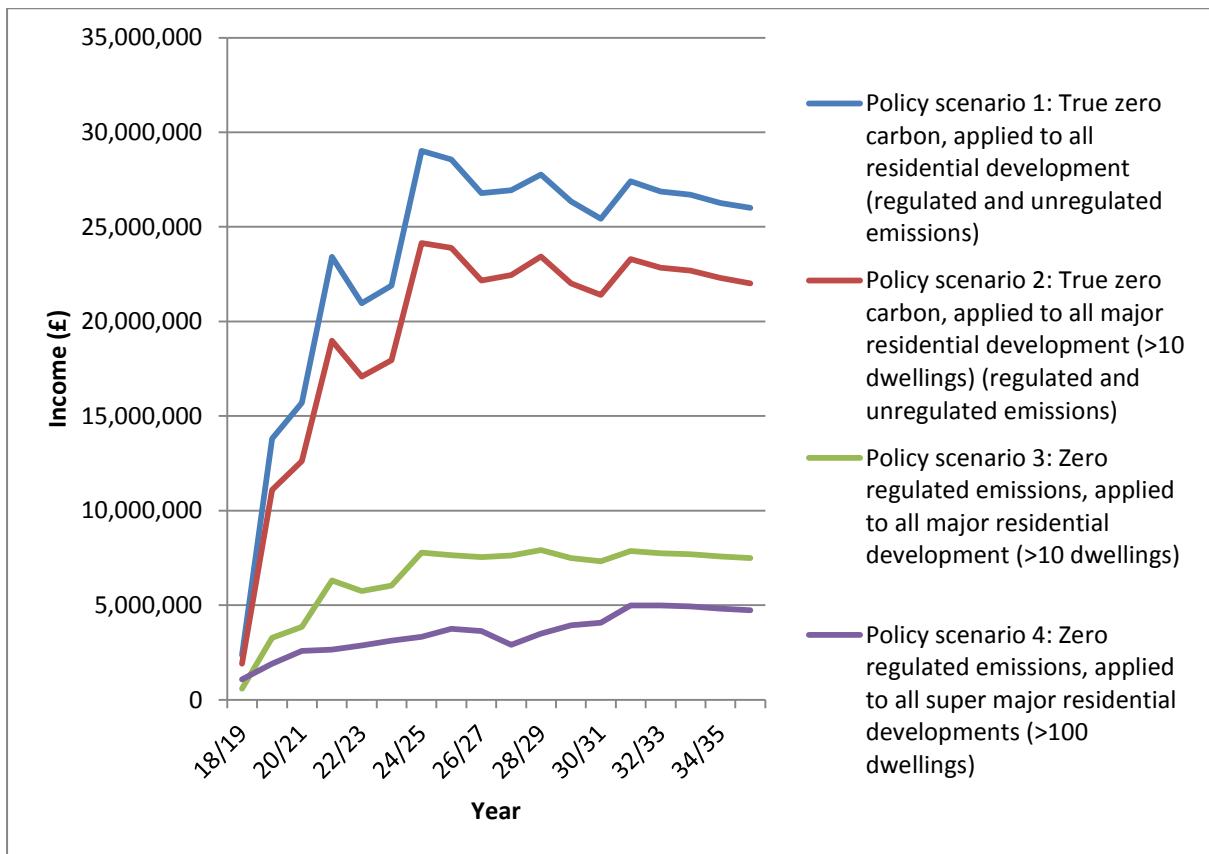


Figure 11 -Total WoE Fund size (£) assuming the use of gas central heating (carbon price of £95 per tonne)

As can be seen the policy scenario adopted has a significant influence on the fund size available. Policy scenario 4, which most resembles the majority of local authority carbon offsetting schemes rolled out to date, results in the smallest fund sizes across all four options. Under the gas boiler scenario, option 4 could result in a total funding pot size for the whole of the West of England area that is in the region of £63.8 million by 2036. Under the air source heat pump technology scenario the fund would be smaller than this, at around £37.5 million in total. In contrast, policy option 1 results in the largest total fund sizes of £422.2 and £373.8 million for the gas and air source heat pump scenarios respectively, but would be likely be the most difficult policy option to implement in terms of the scale of activity needed.

5.1 Assumptions

The modelling is based on a number of assumptions. The number of dwellings to be constructed over time has been set out to reflect the figures included in the SD 14F: West of England Housing Trajectory by Unitary Authority and Component of Supply section of the Joint Spatial Plan. Homes that are classed as either having been completed or having already received planning permission have been removed from the early years of the timeline in line with SD 14G: Topic Paper 5: April 2018 Housing Supply Evidence Paper. To account for the varying emissions that might arise from different housing types, and to align with the modelling carried out by Currie & Brown, these figures were split down into numbers of detached houses, semi-detached houses and flats. This split was informed by feedback from the local authorities (for example information regarding the split between types under existing or historic planning commitments) and from dwelling categorisation within the JSP trajectory document (e.g. those classed as ‘urban living’ were assumed to be flats in

cases where no more detailed information was available). Where homes with planning permission have been removed from the SD 14F timeline, this proportional split has been maintained”

In order to apply the four policy scenarios, it was also necessary to consider the size of developments in terms of the number of dwellings that are likely to come forward as part of small (10+ dwellings), major (10 to 100 dwellings) or super major development (100+ dwellings). Again, the number of dwellings assumed to be in each of these categories was primarily based on information provided by the local authorities, including data relating to existing planning applications and development plans. Again, assumptions were made where no more detailed information was available, for example all dwellings classified as ‘small windfalls’ in the JSP were assumed to be part of developments of under 10 dwellings, and all those being built as part of a Strategic Development Location (500+ dwellings) were assumed to be part of a super-major development.

All four policy scenarios have been modelled based on a £95 per tonne cost of carbon and assuming that 10% of carbon reductions are the result of energy efficiency measures, that 35% of reductions will be made onsite, and that the developments will aim to achieve a ‘zero carbon’ standard overall (whether this definition includes just regulated or regulated plus unregulated emissions varies between policy scenarios). These figures are based on estimates of carbon abatement requirements by dwelling type and technology that have been provided by Currie & Brown. For reference, the modelling is further broken down by local authority in the spreadsheet accompanying this report.

	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34	34/35	35/36	Total
Policy scenario 1: True zero carbon, applied to all residential development (regulated and unregulated emissions)																			
CO ₂ emissions (tonnes) - gas																			
Gas fund size (£)	432,012	478,592	451,316	336,395	313,543	311,732	305,487	300,590	281,988	283,615	292,363	277,348	267,756	288,510	282,779	280,976	276,452	273,737	5,735,193
CO ₂ emissions (tonnes) - ASHP																			
ASHP fund size (£)	380,745	421,957	397,546	296,620	276,598	275,140	269,542	265,071	250,154	251,578	259,214	246,095	237,721	255,837	250,834	249,249	245,299	242,929	5,072,130
	36,170,788	40,085,907	37,766,880	28,178,898	26,276,828	26,138,301	25,606,486	25,181,790	23,764,676	23,899,863	24,625,346	23,379,033	22,583,503	24,304,553	23,829,236	23,678,653	23,303,403	23,078,253	£481,852,397
Policy scenario 2: True zero carbon, applied to all major residential development (>10 dwellings) (regulated and unregulated emissions)																			
CO ₂ emissions (tonnes) - gas																			
Gas fund size (£)	361,333	401,263	376,712	281,059	261,531	260,572	256,145	252,297	233,159	236,085	246,562	231,455	225,039	246,806	241,992	240,236	236,194	233,238	4,821,682
CO ₂ emissions (tonnes) - ASHP																			
ASHP fund size (£)	318,890	354,276	332,270	248,185	231,021	230,279	226,267	222,713	206,951	209,507	218,654	205,456	199,854	218,855	214,653	213,111	209,582	207,001	4,267,524
	30,294,542	33,656,180	31,565,649	23,577,537	21,946,962	21,876,475	21,495,360	21,157,722	19,660,322	19,903,180	20,772,159	19,518,318	18,986,164	20,791,270	20,392,004	20,245,500	19,910,277	19,665,114	£405,414,733
Policy scenario 3: Zero regulated emissions, applied to all major residential development (>10 dwellings)																			
CO ₂ emissions (tonnes) - gas																			
Gas fund size (£)	116,819	130,268	121,068	91,396	85,349	85,429	83,609	81,773	79,763	80,612	83,626	79,246	77,401	83,653	82,268	81,728	80,566	79,716	1,604,288
CO ₂ emissions (tonnes) - ASHP																			
ASHP fund size (£)	71,916	80,493	74,139	56,551	52,972	53,234	51,901	50,447	51,512	51,983	53,634	51,213	50,201	53,623	52,864	52,546	51,909	51,443	1,012,582
	6,832,058	7,646,848	7,043,158	5,372,305	5,032,328	5,057,254	4,930,611	4,792,498	4,893,649	4,938,375	5,095,266	4,865,197	4,769,118	5,094,144	5,022,058	4,991,915	4,931,392	4,887,128	£96,195,303
Policy scenario 4: Zero regulated emissions, applied to all super major residential developments (>100 dwellings)																			
CO ₂ emissions (tonnes) - gas																			
Gas fund size (£)	11,383	20,163	27,303	27,881	30,194	32,885	35,111	39,450	38,291	30,693	36,765	41,450	42,838	52,493	52,493	52,059	50,758	49,890	672,099
	1,081,380	1,915,497	2,593,797	2,648,713	2,868,463	3,124,088	3,335,547	3,747,713	3,637,630	2,915,797	3,492,713	3,937,763	4,069,630	4,986,797	4,986,797	4,945,588	4,821,963	4,739,547	£63,849,423

CO ₂ emissions (tonnes) - ASHP	7,294	12,686	17,075	17,372	18,619	20,191	21,354	23,793	23,015	18,014	21,342	23,909	24,670	29,669	29,669	29,432	28,718	28,243	395,066
ASHP fund size (£)	6,92,965	1,205,132	1,622,132	1,650,298	1,768,798	1,918,148	2,028,632	2,260,298	2,186,465	1,711,332	2,027,498	2,271,398	2,343,665	2,818,582	2,818,582	2,795,998	2,728,248	2,683,082	£37,531,253

Figure 12 - WoE total figures for carbon emissions and associated income per year as a result of each policy scenario and for both technology options (@£95 per tonne)

6. Relationship of carbon offset payments with CIL and S106

6.1 Planning obligations

Planning obligations (also known as Section 106 agreements) are legal agreements made between local authorities and developers and can be attached to a planning permission to make an otherwise unacceptable development acceptable in planning terms. The agreement binds the land, rather than the person or organisation that develops the land, and obligations pass on to future owners.

The Community Infrastructure Levy Regulations 2010 passed into law¹⁷ three tests that a proposed planning obligation must pass in order to be a legitimate justification for granting planning permission; that the obligation is:

- (a) necessary to make the development acceptable in planning terms;*
- (b) directly related to the development; and*
- (c) fairly and reasonably related in scale and kind to the development.*

Requests for planning obligations are regularly challenged by reference to these tests, and in an appeal scenario a planning inspector would habitually assess a proposed planning obligation against the tests, whether or not it was challenged by the developer.

The implications of these tests are that administration process around carbon offset contributions should be able to show:

- A proportionate audit trail showing that the contributions will actually deliver carbon emission reductions within a reasonable timescale of the development being occupied.
- Additionality - that the carbon savings delivered by the payment are clearly additional to what would have happened anyway
- That the contributions demanded aren't double charging, for example requiring contributions to sustainable transport infrastructure on the basis of reducing carbon emissions, whilst also funding public transport infrastructure through the Community Infrastructure Levy or through the section 106 agreement.
- An evidence base to demonstrate that the contribution sought to deliver off-site carbon abatement is reasonable in scale and commensurate with the emissions to be offset

Policy Consideration: Where can Carbon Offset funds be spent?

Criteria (b) of the CIL tests, that a planning obligation should be directly related to the development is generally interpreted as requiring contributions to be spent within the locality of the development, to resolve problems directly caused by the development which make it

¹⁷ Paragraph 12, The Community Infrastructure Levy Regulations:
www.legislation.gov.uk/ukdsi/2010/9780111492390/regulation/122

unacceptable in planning terms. For example, it would be difficult to require that a project provide contributions to upgrade a vehicle junction miles away from the development site.

The situation regarding the requirement for carbon offsetting contributions is however highly unusually in a planning context, in that the problem the contribution is seeking to resolve (the contribution of the development to climate change through its carbon emissions) is actually global, not local in nature, though some impacts are local.

There is no direct relationship between where the location where emissions are generated and the location where adverse weather and other climate impacts are experienced. The contribution could theoretically be spent anywhere and still be directly related to the development, in that climate change is proved to be caused by the generation of greenhouse gases such as carbon dioxide, and the scale of the contribution is directly proportionate to the excess emissions produced by the development which need to be offset.

It is however reasonable to impose a limitation that carbon offset projects should happen within the local or regional authority area where the development takes place, in order to localise the side benefits of these projects going ahead and in order to simplify the practicalities of managing projects and ensuring that they go ahead.

Paragraph 123 of the 2010 CIL regulations introduced further limitations, prohibiting the pooling of S. 106 contributions for infrastructure from five or more sources which is still in force. The full text is as follows:

Paragraph 123¹⁸

(3) A planning obligation (“obligation A”) may not constitute a reason for granting planning permission to the extent that—

- a) obligation A provides for the funding or provision of an infrastructure project or type of infrastructure; and*
- b) five or more separate planning obligations that—*
 - i. relate to planning permissions granted for development within the area of the charging authority; and*
 - ii. which provide for the funding or provision of that project, or type of infrastructure,*

have been entered into before the date that obligation A was entered into.

Policy Consideration: Removal of Pooling restriction on S. 106 obligations

In their March 2018 consultation: “Supporting housing delivery through developer contributions”¹⁹ the government proposed to remove the restriction on pooling contributions from S. 106

¹⁸ The Community Infrastructure Levy Regulations: www.legislation.gov.uk/ukdsi/2010/9780111492390/regulation/122

¹⁹ Supporting housing delivery through developer contributions - Reforming developer contributions to affordable housing and infrastructure - Ministry of Housing, Communities and Local Government – March 2018

agreements (see further detail in the section below entitled, ‘The future for Planning Obligations and the Community Infrastructure Levy’).

The technical consultation entitled “Reforming developer contributions - Technical consultation on draft regulations”, published December 2018²⁰, confirms the government’s intention to delete paragraph 123 and remove the restriction on pooling in its entirety, allowing “all local planning authorities to seek section 106 planning obligations to fund infrastructure to help support, and bring forward new housing regardless of how many planning obligations have already contributed towards an item of infrastructure.”

Assuming the consultation proposals are carried through (the consultation closes 31st January), carbon offset funds can be pooled within a single ring-fenced pot and directed to the full range of eligible projects, whether defined as infrastructure or not. Prior to this consultation, we suggested setting up processes to enable contributions into and out of the carbon offset fund to be tracked to allow the number of schemes contributing to offsetting projects to be tracked and recorded. It seems likely that this additional layer of administration will not be required.

6.2 Community Infrastructure Levy

The Community Infrastructure Levy (CIL), introduced by the Planning Act 2008 is a tool to help councils deliver infrastructure in tandem with new development. It works differently to Section 106 payments, and effectively operates as a development tax based on a fee per m² of development. Where a local planning authority has chosen to set a charge in its area, the authority publishes a list of infrastructure projects or types of infrastructure that it intends will be funded by CIL payments.

The London Mayor Sustainable Design and Construction Supplementary Planning Guidance advises that boroughs should secure off-setting measures through s106 agreements. All the local authorities we encountered through our research who were collecting carbon offset payments were doing so through Section 106 planning agreements.

We agree with the conclusions of the Tower Hamlets study²¹ that CIL is not considered to be an appropriate mechanism for collecting carbon offset payments, in that CIL is a fixed charge per m²

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/691182/Developer_Contributions_Consultation.pdf

²⁰ Reforming Developer contributions - Technical consultation on draft regulations” (December 2018)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/767292/CIL_Amendment_Regulations_Consultation_Paper.pdf

²¹ The London Borough Of Tower Hamlets Carbon Offset Fund Report - www.towerhamlets.gov.uk/Documents/Planning-and-building-control/Strategic-Planning/Local-Plan/Carbon_Offset_Solutions_Study_2015.pdf

and does not account for the varying performance of developments in terms of carbon emissions. It is also not charged on affordable housing or charitable premises or refurbishments, and CIL must be spent on new infrastructure, limiting the range of eligible carbon offsetting projects (for instance retrofitting projects would not be eligible).

6.3 Implications for Carbon Offset administration

The main implication of the CIL regime for the operation of carbon offsetting is that infrastructure funded through CIL cannot also be funded through carbon offset payments. It was therefore necessary to review the CIL Infrastructure List for each authority, the results of which are given in figure 10, below.

The following table lists the entire infrastructure to be funded by CIL payments across the west of England authorities.

Bristol City Council ²²	Bus Rapid Transit (Ashton Vale to Bristol Temple Meads and City Centre)
	South Bristol Link Bus Rapid Transit (North Fringe to Hengrove)
	Infrastructure schemes in the Temple Quarter Enterprise Zone (excluding site specific highway access / public realm works required to directly mitigate the impact of proposed developments)
	Existing Parks and Green Spaces identified in the Parks and Green Spaces Strategy
	School Schemes set out in the Schools Organisation Strategy
	Infrastructure schemes to support the regeneration of Lockleaze (see attached area boundary)
	Infrastructure schemes to support the regeneration of Knowle West (see attached area boundary)
	Strategic Flood Defence measures
South Gloucestershire Council ²³	Metro Bus Project (North Fringe – Hengrove Package) Cribbs Causeway Metro Bus Extension project to Parkway from CPNN, inc subways for pedestrians & cyclists at Gipsy Patch Lane and Hatchet Rd
	Stoke Gifford Transport Link
	Greater Bristol MetroWest Project (inc new stations at Henbury & Filton)
	A4018 & A38 Bus Priority, walking & cycling improvements
	Improvements to Aztec West Rbt, Filton Rbt (A38/A4174), widening of Gipsy Patch Lane to A38 south.
	Traffic Management measures in communities of the North & East Bristol Fringe and North Bristol.
	Strategic Walking & Cycling Networks
	Community / Demand Responsive Transport
	SORT IT and transfer station in the Bristol North Fringe
	Re-modelling of Yate Recycling Depot
	Nursery facilities, and primary and secondary School Places
	Youth Facilities
	Community Meeting Spaces - Onsite facilities or in-kind or financial contribution to serve Cribbs Patchway New Neighbourhood & East of Harry Stoke New Neighbourhood
	Libraries
	Health and social care Facilities

⁴ Bristol City Council - Regulation 123 List - 1 August 2015 www.bristol.gov.uk/documents/20182/239261/Regulation+123+List/34bff8d4-5249-4129-b0f2-d62052a4c875

²³ South Gloucestershire - Regulation 123 list – amended September 2018 <http://www.southglos.gov.uk/documents/Regulation-123-list-September-18.pdf>

	Indoor Leisure Facilities & Centres
	Museum or heritage asset
North Somerset Council ²⁴	<i>Summary of CIL Infrastructure</i>
	Community and leisure: Leisure Centres, gyms and swimming pools, libraries, off-site play areas, playing pitches and skate parks. Community capacity funding, community development and youth services, cultural facilities
	Education: Early years' provision and children's centres, Primary and secondary school provision, special Educational Needs and Disabilities provision.
	Green Infrastructure & Public Realm: Formal parks and public gardens, Community parks, off-site woodlands and woodland areas, off-site conservation sites, public realm improvements, including heritage-related schemes and parking schemes, off-site allotments.
	Flood & drainage: strategic flood and drainage schemes; coastal and seafront defences; moors and lowland flood defence schemes;
	Transport & travel: Improvements to junctions 19, 20 and 21 of the M5 and associated projects, rail improvements, showcase bus routes/Metrobus, improvements to routes to Bristol Airport, Herluin Way/Locking Road Link, strategic Public Rights of Way and cycle, foot and bridleway routes, including the Strawberry Line, Festival Way, coastal routes and Pill to the Mendips route
	Other: strategic broadband schemes, economic development, emergency services provision, health services, and strategic waste management schemes.
Bath and North East Somerset Council ²⁵	Strategic Transport Infrastructure including cycling and walking infrastructure, and public transport (excluding development specific mitigation works on, or directly related to, a development site)
	Green infrastructure to deliver the requirements set out in the Green Infrastructure Strategy, including specific green space requirements identified in the Green Space strategy (excluding on site provisions)
	Early Years provision and School Schemes set out in the Schools Organisation Plan
	Social Infrastructure, including social and community facilities, sports, recreational, play infrastructure and youth provision, and cultural facilities (excluding on site provisions)
	Strategic Energy Infrastructure (excluding on site provisions)

²⁴North Somerset Council Community - CIL Regulation 123 List www.n-somerset.gov.uk/wp-content/uploads/2015/11/Regulation-123-list.pdf

²⁵ Bath and North East Somerset Council - CIL Regulation 123 list www.bathnes.gov.uk/sites/default/files/sitedocuments/Planning-and-Building-Control/Apply-for-Planning-Permission/bnes_reg_123.pdf

	Health and Well-being Infrastructure (excluding on site provisions)
	Strategic Waste Facilities
	Strategic Flood Risk Management Infrastructure (excluding on site provisions)

Table 2 - Infrastructure to be funded by Community Infrastructure Levy, west of England authorities

Given the range of infrastructure to be funded through CIL, there is significant potential for double charging to occur for the following items. It would be safest for these to be excluded from consideration for funding from potential Carbon Offset funds:

- Sustainable Transport infrastructure, including bus services and infrastructure, pedestrian and cycle infrastructure
- Parks and green spaces and tree planting

In deciding on the range of projects which would be eligible for carbon offset funding, it would also be beneficial to provide further clarification as to how CIL funds are spent for the following items, to avoid potential issues of double charging:

	Infrastructure to be funded	Query
Bristol City Council ²⁶	Infrastructure schemes in the Temple Quarter Enterprise Zone (excluding site specific highway access / public realm works required to directly mitigate the impact of proposed developments)	Does this include District Heating?
	Infrastructure schemes to support the regeneration of Lockleaze (see attached area boundary)	Does this include District Heating?
	Infrastructure schemes to support the regeneration of Knowle West (see attached area boundary)	Does this include District Heating?
North Somerset Council ²⁷	Community capacity funding	Does this include spending on fuel poverty projects?
Bath and North East Somerset Council ²⁸	Strategic Energy Infrastructure (excluding on site provisions)	We assume this does include District Heating

⁴ Bristol City Council - Regulation 123 List - 1 August 2015 www.bristol.gov.uk/documents/20182/239261/Regulation+123+List/34bff8d4-5249-4129-b0f2-d62052a4c875

²⁷ North Somerset Council Community - CIL Regulation 123 List www.n-somerset.gov.uk/wp-content/uploads/2015/11/Regulation-123-list.pdf

²⁸ Bath and North East Somerset Council - CIL Regulation 123 list www.bathnes.gov.uk/sites/default/files/sitedocuments/Planning-and-Building-Control/Apply-for-Planning-Permission/bnes_reg_123.pdf

All	Social Infrastructure / community meeting places / social and community facilities	Do CIL funds go towards energy efficiency retrofitting of existing community buildings?
-----	--	---

Table 3 -- queries in respect of CIL lists, west of England authorities

Given the likely future changes to the CIL regime listed in section 6.4, it could be advantageous to revise the regulation 123 lists to provide further precision as to what these funding items comprise, which might potentially allow a more flexible application of offsetting funds.

A further complication is potential double counting between eligible carbon offset projects and initiatives funded by parish councils and neighbourhood forums through their share of CIL contributions. Where a neighbourhood plan is adopted, a qualifying body receives 25% of CIL payments arising from housing developments within their areas, with no limitations on how these funds are to be spent. It is possible that some qualifying bodies spend these receipts on carbon saving initiatives such as energy efficiency improvements to community buildings and fuel poverty projects. However provided that eligibility criteria for funding are set out carefully, it should be possible to demonstrate that the offset payment delivered additional carbon savings over and above that achieved through the discretionary spending of CIL monies by Parish or neighbourhood planning bodies.

6.4 The future for Planning Obligations and the Community Infrastructure Levy

The government commissioned evidence in order to undertake a review of the Community Infrastructure Levy review and its relationship with planning obligations in the delivery of infrastructure. The review concluded in October 2016 and recommended²⁹:

- That the Community Infrastructure Levy be replaced by a hybrid system of a broad and low level Local Infrastructure Tariff (LIT), with Section 106 agreements retained for larger developments.
- That the restrictions on pooling contributions from section 106 agreements should be removed

The March 2018 consultation: *Supporting housing delivery through developer contributions*³⁰ sets out the government's response to the CIL review. The government proposes to:

- Remove the pooling restriction in areas that have adopted CIL, where CIL cannot feasibly be charged or where development is planned on several strategic sites
- Retain the ability to enter into Section 106 agreements
- Retain and amend the Community Infrastructure Levy, including replacing regulation 123 lists with more detailed and transparent Infrastructure Funding Statements, which will set out priorities for how a charging authority proposes to use CIL and, where possible, section 106 contributions for the coming five years.
- Enable Combined Authorities or joint committees with strategic planning powers to set up an additional Mayoral type Strategic Infrastructure Tariff which could operate alongside any localised form of developer contribution e.g. CIL and section 106 and contribute to the funding of strategic, large-scale infrastructure projects that cross administrative boundaries

As discussed above in section 6.1, the 2018 Technical Consultation confirms the government's intention to entirely remove current restrictions on pooling Section 106 contributions towards infrastructure provision.

The likely outcome from the review is that the Section 106 planning agreements will continue to be the route for securing carbon offset payments for off-site carbon mitigation.

²⁹ A new approach to Developer Contributions – a Report by the Cil Review Team – October 2016
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/589637/CIL_REPORT_2016.pdf

³⁰ Supporting housing delivery through developer contributions - Reforming developer contributions to affordable housing and infrastructure - Ministry of Housing, Communities and Local Government – March 2018
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/691182/Developer_Contributions_Consultation.pdf

6.5 Conclusions from section 6, Relationship of carbon offset payments with CIL and S106

The Community Infrastructure Levy is not an appropriate mechanism for collecting carbon offset payments, in that CIL is a fixed charge per m² and does not account for the varying performance of developments in terms of carbon emissions.

Thus Carbon offset funding must be secured through Section 106 legal agreements on planning consents, and every planning obligation must pass three legal tests, that it is *necessary to make the development acceptable in planning terms; directly related to the development; and fairly and reasonably related in scale and kind to the development.*

The implications of these tests are that administration process around carbon offset contributions should be specifically designed to ensure that the S. 106 tests can be met in every legal agreement entered into. The local planning authority should be able to show:

- A proportionate audit trail showing that the contributions will actually deliver carbon emission reductions within a reasonable timescale of the development being occupied.
- **Additionality** - that the carbon savings delivered by the payment are clearly additional to what would have happened anyway
- That the contributions demanded aren't double charging, for example requiring contributions to sustainable transport infrastructure on the basis of reducing carbon emissions, whilst also funding public transport infrastructure through the Community Infrastructure Levy or through the section 106 agreement.
- An evidence base to demonstrate that the contribution sought to deliver off-site carbon abatement is reasonable in scale and commensurate with the emissions to be offset

A technical consultation published in December 2018 again proposes that current restrictions on pooling contributions from more than 5 developments are to be removed in their entirety. Provided this is confirmed, carbon offset payments can be pooled within a single ring-fenced pot and directed to the full range of eligible projects, whether defined as infrastructure or not, and it will not be necessary to limit the number of schemes contributing to individual carbon saving projects. Prior to this consultation, we suggested setting up processes to enable contributions into and out of the carbon offset fund to be tracked to allow the number of schemes contributing to offsetting projects to be tracked and recorded. It seems likely that this additional layer of administration will not be required.

The CIL review proposes changes further changes to how the CIL and S. 106 regimes will operate. The likely outcome from the review is that the Section 106 planning agreements will continue to be the route for securing carbon offset payments for off-site carbon mitigation.

7. Suitable projects for carbon offsetting

7.1 Eligible carbon offset projects in other Local Planning Authorities

The Bartlett study reported the following carbon offsetting projects amongst London Boroughs in 2017:

Project type	Current Project	Future Project
Fuel Poverty	17	8
Housing: Council	14	4
Schools: Maintained	13	4
Corporate / Operational Estate: energy efficiency projects	12	5
Corporate / Operational Estate: Renewable Energy Projects	12	6
Decentralised Energy Projects	9	5
Housing: Associations	7	2
Behaviour Change and Education	5	3
Schools: Academies	4	2
Greening Projects (Trees and Green Spaces)	4	1
Private Sector housing grants	3	1
Other (Specify)	3	2
Business Energy Grants	2	1

Table 4 - Carbon offsetting project types by London Boroughs

As can be seen, the most popular projects were building energy efficiency, retrofitting and fuel poverty projects, followed by renewable energy projects.

7.2 Commentary on potentially eligible carbon offset projects in the West of England

Our commentary on the various options is as follows:

7.2.1 Domestic Energy Efficiency Retrofit: including Loft insulation / Cavity wall insulation / External wall insulation / Boilers and heating controls

Domestic retrofitting projects have good potential as eligible carbon offset projects offering:

- Direct socio-economic benefits to residents through reduced heating costs and reduced ill health / mental health issues associated with fuel poverty
- Significant potential for cost-effective local carbon savings and economies of scale
- Potential to align with, contribute to and expand existing retrofitting and fuel poverty alleviation schemes and be delivered through existing programmes.
- Potential economic benefits for local contractors and SME's

The proposed removal of the current limitation on pooling S. 106 contributions increases the potential for such programmes to deliver at scale, enabling multiple carbon offset contributions to be pooled to fund large scale projects.

As the council's housing departments already carry responsibilities for alleviating fuel poverty and improving the quality of the housing stock, the four authorities are already well set up to deliver grant funding, with the following advice and grant schemes already in place:

- *Bath and North East Somerset* - Energy at Home Scheme, developed in partnership with Curo and Bath and West Community Energy, is designed to provide a local framework for delivery of energy saving advice and installation of measures.
- *Bristol City Council* - Warm Up Bristol is Bristol City Council's initiative to improve the energy efficiency of the private housing stock, and has been active in rolling out subsidised domestic energy efficiency upgrades.
- *South Gloucestershire* - Warm and Well, run in association with Severn Wye has been providing free local home energy advice to Gloucestershire householders since 2001, and has facilitated the installation of over 60,000 energy efficiency measures.
- *North Somerset* – Somerset Warm and Well offered domestic and insulation grants to private householders in Somerset until 2008. This scheme is not running at present.

There is potential to target funding at properties which fail to meet the minimum energy efficiency standards brought in for private rental properties³¹. These regulations introduce a minimum EPC standard of E and mean that buildings cannot be rented out unless they meet this standard, however they rely on Local Government for enforcement and there are exemptions in relation to the cost of the measures needed (under £3,500), and their impact on the market value of the property. In addition, in the context of our carbon reduction targets, an EPC rating of E is still relatively low.

Funding the retrofitting of F and G rated private rented properties would benefit often vulnerable households in private rented housing, target the least energy efficient of our housing stock, and help the four authorities to enforce these regulations by helping landlords to meet them.

We are aware that Bristol City Council is beginning a project with the Centre for Sustainable Energy and the department for Business, Energy and Industrial Strategy to map F and G rated properties in Bristol and develop an enforcement methodology.

A previous study for The Lambeth Carbon Offset Fund³² considered the trade-offs between deep and shallow retrofits and short and long term carbon saving strategies. They found that whilst the

³¹ Energy Efficiency (Private Rented Property) (England and Wales) Regulations 2015 - www.legislation.gov.uk/ukdsi/2015/9780111128350/contents

³² The Lambeth Carbon Offset Fund – Report, Energy And Carbon Databases Gis Tool (2015) www.towerhamlets.gov.uk/Documents/Planning-and-building-control/Strategic-Planning/Local-Plan/Carbon_Offset_Solutions_Study_2015.pdf

capital costs rose rapidly with the % carbon reduction sought and therefore “shallow” retrofits might be considered the “cost effective” approach in the short term, “there is a potential risk for shallow retrofits to result in lower levels of energy efficiency and higher medium term mitigation costs when compared to performance based policies promoting deep retrofits” (Para 5.2.4).

Putting this another way, it would be possible to design a grant scheme to bring a large number of properties up to EPC band F, reflecting the targets in the Fuel Poverty Strategy, and this would deliver widespread socio-economic benefits to residents, plus moderate carbon savings per property in the short-term. However the UK carbon reduction trajectory (an 80% CO₂ cut by 2050 set by the Climate Change Act, likely to be tightened further to carbon neutrality by the Paris Climate Accord) is likely to dictate that these properties would need to be upgraded again to achieve more radical CO₂ reductions within the next 30 years. Actions by the Councils themselves may also increase ambitions for the speed and depth of carbon reductions³³.

Therefore from the perspective of long-term cost effectiveness, it could be justifiable to direct the fund at deeper, more expensive measures, achieving radical CO₂ reductions to a smaller pool of properties, although this would result in greater socio-economic benefits being distributed to a smaller pool of residents.

An alternative would be to design a retrofit scheme so as to deliver widespread shallow energy efficiency improvements in the short-term, whilst not precluding subsequent deep retro-fitting, or making it more expensive.

A further consideration is the imperfect overlap between measures targeting carbon reductions and those targeting fuel poverty reductions. Some fuel poverty measures for people in severe fuel poverty could potentially increase carbon emissions from some homes. Using the national household model, CSE’s research and technical team could carry out an analysis of the mix of measures which across the four authorities could achieve the greatest carbon savings and fuel poverty improvements, although this is out of scope of this current study.

There may also be community energy groups who would be interested in initiating their own fuel poverty initiatives and programmes (for example the Bristol Energy Network), and our view is that such groups should also be able to apply for funding through an open application process.

In calculating the resultant carbon savings, retrofitting and energy efficiency projects would need to consider “comfort taking” by occupiers, so as not to over-state the carbon savings achieved. Put another way, when a home is made more energy efficiency, some residents (particularly those in fuel poverty or underheated homes), may use the increased energy efficiency to heat their home to a higher temperature, rather than using the taking the benefit in lower heating bills (and carbon emissions).

³³ On 13th November 2018, Bristol City Council declared a climate emergency and pledged to make the city of Bristol carbon neutral by 2030, taking into account both production and consumption emissions - www.bristolgreenparty.org.uk/library/FC_motion_13th_Nov_-_Climate_Emergency.pdf

Policy Consideration: directing retrofitting to maximise social benefits (and fuel poverty alleviation or long term carbon reductions)

In planning and delivering retrofitting projects, there are tensions between the objectives to target fuel poverty and maximise social benefits and the objective to achieve long term carbon reductions.

- **The capital costs for retrofitting projects rise rapidly with the % carbon reduction sought. Simple “shallow” retrofitting projects, targeting moderate carbon savings and leaving more complex invasive work for the future, might be considered the most cost effective in the short term, and would assist in spreading the social benefits most widely.**
- **Such “shallow” retrofitting projects may however represent poor value for money in the medium term, given the likely need to upgrade these properties again to achieve more radical carbon reductions in the coming decades.**

Action and Next Steps

In designing and specifying retrofitting schemes funded by the carbon offset fund, careful consideration should be given to the tensions between short and medium term cost effectiveness, and in particular to ensure that any short-term “shallow” retrofitting measures do not preclude subsequent “deep” retrofits or make these more radical measures more expensive to administer. Using the National Household model, an analysis could be carried out of the mix of measures which across the four authorities could achieve the greatest carbon savings and fuel poverty improvements.

7.2.2 Energy advice service

Utilising carbon offset funding to pay for fuel poverty advice services is another option. It would deliver significant social benefits to often highly disadvantaged groups, deliver corporate objectives around fuel poverty and could potentially enable continuity of advice services; however directly attributing carbon savings to advice delivery is challenging. The degree to which savings can be achieved will depend on a combination of the type of household being advised, the type of advice being given and any physical intervention in the property.

Households with higher disposable income typically have higher energy use and associated carbon emissions. If these households are given advice on the optimal use of their heating controls then the potential savings are significantly higher than those for a fuel poor household. Furthermore, if this advice is given in conjunction with an intervention, such as full or smart heating controls, then the savings are likely to be higher and sustained.

The Centre for Sustainable Energy (CSE) runs an energy advice service for a number of local authorities. The majority of CSE's advice work is focussed on vulnerable households who have lower energy use. Our advice work often helps these households to use energy in the most optimal way possible. This may also result in them using *more* energy if that's affordable i.e. they are using energy more wisely and understand that their household budget can accommodate this. To help maximise the benefits of our advice work we now install minor measures as part of our service e.g. LED lightbulbs, draught proofing and secondary glazing. These measures will all deliver quantifiable carbon savings, when compared to the status quo, which could be claimed as part of a scheme supporting carbon offsetting. Although the savings from these minor measures can't be guaranteed in the context of the property, many funders and Government schemes are happy to claim the savings in this way.

There are two options to maximise carbon savings from an energy advice scheme:

1. Savings attributed to single measures – the scheme would support and claim the savings from energy efficiency measures. It would ignore comfort taking and assume the average savings achieved using published figures.
2. Household level savings – the scheme would be designed to maximise carbon savings i.e. advice would be given to higher income households with measures tailored to deliver the highest saving. Ideally the advice and associated measures would be designed to inherently deliver the maximum saving e.g. behavioural advice at the point of heating control installation.

Policy Consideration: Using Carbon Offset funding to pay for an energy advice service

It would be challenging to reliably attribute carbon savings to the delivery of energy advice. Energy advice, focussed on vulnerable households in fuel poverty may result in these households using *more* energy to improve their health and comfort. Therefore we would advise against simply funding existing fuel poverty advice work from the carbon offset fund.

Instead any advice work should be tailored to deliver carbon savings:

- **Installing minor measures alongside our advice to which quantifiable carbon savings can be attributed e.g. LED lightbulbs, draught proofing and secondary glazing.**
- **Targeting higher income households, which are likely to have higher energy demands.**

Further work would be needed to design such a scheme and predict the carbon savings possible.

7.2.3 Non-domestic retrofitting - Energy Efficiency Improvements to Community Buildings

CSE has in recent years administered the [Thrive Renewables Community Benefit Programme](#), offering grants of up to £4,000 for energy efficiency improvements to community buildings such as village or community halls within proximity of Thrive renewable energy sites across the UK. In order to be eligible, applications to these funds needed to be from not-for-profit community or voluntary groups and the community buildings were required to be regularly used by a wide cross-section of the community.

Our experience suggests that this type of project could be highly attractive as an eligible carbon offsetting project, offering:

- Significant benefits to local communities, reducing the running costs of community buildings, improving their usability and allowing savings in running costs to be directed towards community activities. Grant recipients report that renting the space to local clubs and groups becomes easier once the building is warmer, meaning that they can generate more income than before the retrofit, in addition to the savings on bills.
- A high degree of additionality, offering funding for upgrades to community buildings which would be very unlikely to take place otherwise.
- A great deal of flexibility. Such grants can be dispensed and implemented quite quickly, within 3 – 6 months.
- Potentially a relatively large pipeline of projects.
- Improved understanding of sustainable energy use for applicants.

Our experience is that funding is often directed to fairly basic upgrades to buildings in poor condition, and that there could be a high latent demand for such improvements. The chart below shows the spread of measures funded through the Thrive scheme in 2018. Whilst the Thrive scheme funded the installation of replacement gas boilers, and assumed carbon savings for the energy efficiency improvements achieved, in the context of our carbon saving targets, a legitimate argument could be made that the installation of fossil fuel heating technology (however efficient) is

not cost effective in the medium term, or in line with our medium term carbon reduction targets. Funding could therefore be offered to carbon saving efficiency measures and / or low and zero carbon heating technologies.

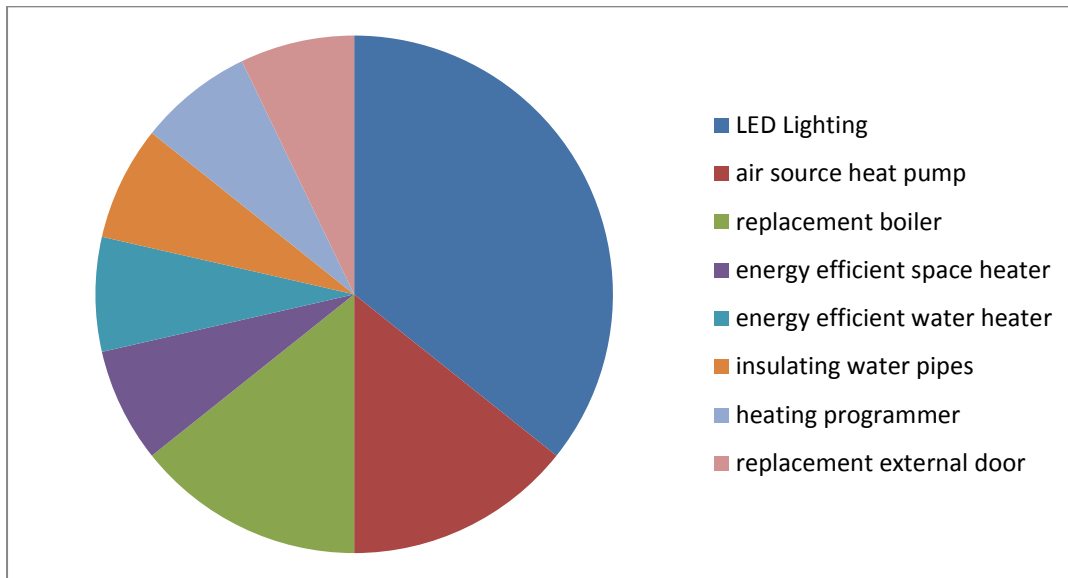


Figure 13 - Energy efficiency measures funded 2018 - Thrive Community Energy Fund

Applications to the Thrive fund were subject to a spending cap of £4,000 for measures that reduced carbon emissions including lighting and heating upgrades, insulation and draft proofing, low energy appliances, double glazing and renewable energy technologies. The spending cap influenced the measures that could be funded, but it was evident from the number of repeat applications that considerably more than £4,000 could be invested in upgrading the energy efficiency of some community buildings.

At present the Thrive fund is administered as follows:

- Thrive replenishes the fund (and pays CSE's administration costs) as their finances allow. Between funding cycles the scheme lies dormant.
- At each replenishment, the fund is promoted through community networks and Twitter and direct approaches to eligible community buildings.
- The fund can be used in conjunction with other funding to pay for improvements but measures must be installed within 6 months.
- Applications are required to be accompanied by an energy survey and 2 quotes for the work and provide photos to demonstrate that the measures funded have been installed.
- Applicants are required to carry out an energy audit, using a template provided by CSE, and provide details of their gas, oil, LPG and electricity consumption, allowing total energy consumption and carbon emissions to be calculated.
- Assumed reductions are applied to the carbon emissions according to the measures installed, for example roof insulation will typically reduce heating energy use by 15%.

The Thrive Community Benefit Programme is deliberately designed so as to be accessible to anyone, and no specialist skills or reports are needed to apply.

In the latest round of funding, CSE allocated a grant pot of £30,600 within a 3 month period, for which our administration costs were £4,400. As the Thrive scheme operates across the UK independently of local authorities and eligible buildings need to be within small postcode areas, getting word to the correct people takes considerable effort, using over 20% of this budget. A scheme promoted within the WoE area by all four authorities and through local networks would by contrast require very little promotion.

Approximately 15% of the administration costs were devoted to assessing applications and making awards. It is likely that if the spending cap of £4,000 per application were to be increased allowing deeper retrofits, these costs would fall as a proportion of the total funds awarded.

We calculate that the 2018 round of funding delivered predicted carbon savings of 22.81 tonnes per year, spread across 9 buildings with the following lifetime costs per tonne CO2 saved, based on the estimated lifetime of the measures given below.

	Lifetime (years)	Average lifetime cost (per tonne CO2 saved)
LED lighting	10	£106
Heating programmer	10	£123
Air source heat pump	20	£95
Combi boiler	15	£134
Replacement door	20	£2,370

Table 5 - Lifetime costs of carbon savings by measure - Thrive Community Energy Fund

The architecture and administration of this fund could easily be adapted for use as a carbon offset project across all four authorities. The application forms, guidance notes and the template energy survey can be viewed on this link: www.cse.org.uk/projects/view/1304.

7.2.4 Non-domestic retrofitting - Energy Efficiency Improvements to non-domestic Buildings

Initiatives to improve the energy efficiency of the four authorities' building stock, including schools, offices and shops, council buildings and social housing have good potential as eligible "carbon offset" projects offering:

- In the case of improvements to Council-owned buildings, straight-forward delivery through the council's own asset / building management teams
- Secondary benefits to residents and tax payers through reductions in corporate spending on fuel, allowing the savings to be re-directed towards service delivery
- Direct benefits to residents of council housing through reduced fuel bills
- Potential economic benefits for local contractors and SMEs
- In the case of privately owned non-domestic buildings, such initiatives could assist in increasing carbon savings possible from privately leased offices and shops, where the owner has little incentive to achieve bill savings or comfort improvements, the benefits of which flow to the leasee.

Given the ease of delivery, the retrofitting of council owned properties would be well suited to be the first projects funded through the carbon offset fund, with funding being opened up to the retrofitting of privately owned buildings in due course.

7.2.5 Embodied Energy improvements

Embodied energy improvements consist of capturing additional carbon savings on-site through upgrading the building specification to use components or materials which require less energy in their manufacturing and construction, for example reinstating aluminium cladding panels with timber³⁴. These carbon savings would therefore be additional to those achieved through specifying high standards of energy efficiency and reducing energy demands for heating. To demonstrate savings from embodied energy, it is necessary to calculate the embodied energy of what is being proposed, and compare this to the standard alternative.

Such an approach offers significant advantages, capturing carbon savings throughout the lifetime of the building (rather than over a 30-year period) and, by incentivising developers to experiment with sustainable materials beyond their usual palette, nudging the construction industry towards low carbon approaches and helping to support this supply chain. The main challenge with such an approach is likely to be ensuring that the carbon savings secured through reducing embodied energy are additional to what would have happened anyway; and there is the potential for developers to 'game' this allowance by initially specifying materials with very high levels of embodied energy with the prior intention of changing them and thereby minimising their carbon offset payments. In terms of the objectives of the policy however, any reductions in carbon offset payments through 'gaming the system' would be likely to be substantially outweighed by the advantages described above.

The example we have seen from the London Legacy Corporation³⁵ allows 3rd party developers to apply to the fund for a grant to upgrade the specifications of their development (securing offsite carbon savings) and thereby reducing the carbon emissions embodied within it. We consider that initially a simpler approach would be to allow developers to upgrade the specifications within their own development and count the carbon savings achieved towards their overall carbon reductions, thereby reducing the amount of carbon they need to offset and the carbon offset payment they need to make.

7.2.6 Renewable energy Projects

Whilst renewable energy projects do not themselves directly reduce carbon emissions, they can be considered as a carbon abatement technology to the extent that they replace or substitute energy

³⁴ Embodied energy is the total amount of energy (and therefore carbon dioxide emissions) embodied in the material or component through its life-cycle, including the extraction and processing of raw materials and the manufacturing process.

³⁵ Carbon Offset - Local Plan Supplementary Planning Document – London Legacy Development Corporation – August 2016 - www.queenelizabetholympicpark.co.uk/-/media/lldc/planning/supplementary-planning-documents/carbon-offset-spd-august-2016.ashx?la=en

generated from fossil fuels. They therefore have the potential to be considered as an eligible Carbon offset project.

In July 2018, the government consulted on the closure of the feed-in tariff (FiT) in March 2019. The FiT was a subsidy paid to owners of small-scale renewable generators per unit of electricity produced, funded through levies on suppliers, which are passed on to consumers. The feed in tariff has been extremely successful in helping renewable energy technologies come to market and the income from FiT has been central to many renewable energy projects coming forward. Whilst installers of renewable energy may benefit from generating free electricity for them to use themselves, or may be able to sell electricity to a specific end user, new projects will no longer receive an income from generating electricity for export to the local distribution network. Therefore whilst the costs of renewable energy continue to fall, in the short to medium term, previous business models will become redundant.

With the closure of the FiT renewable energy developers are exploring alternative income streams. During this transition, directing carbon offset funding to support renewable energy development of all types in the west of England could offer high levels of additionality.

The following comments relate to community owned or led projects, householder renewable energy projects and commercial projects.

7.2.7 Community Energy Projects

Community energy projects offer:

- Benefits to local communities and dividends to members holding equity investments. Community Energy Companies, often incorporated as non-profit community interest companies or Community Benefit Societies, are required by their articles of association to return their profits to the community. Consequently such projects have high potential to deliver socio-economic benefits within their communities (for instance funding fuel poverty projects, other community projects and buildings), grow community capacity and deliver carbon savings.
- High levels of additionality. Community energy projects have struggled to secure conventional financing in the past, in particular during the development phases. As demonstrated by the success of the Urban Community Energy Fund³⁶ (now closed) and Bristol Community Energy Fund³⁷ (limited to 2 or 3 projects at a time) such funds and programmes have the potential to unlock community run projects which would not occur through the open market. The fund would need to take account of State Aid limits, and this may place an upper limit on capital investments.
- Market stimulation, the potential Local supply chain procurement, and upskilling of and increased paid employment within local community energy groups. The community energy sector if nourished has the potential to contribute to the wider low

³⁶ Urban Community Energy Fund - www.cse.org.uk/projects/view/1249

³⁷ Bristol Community Energy Fund - www.bristolcommunityenergy.co.uk/

carbon economy in the WoE region and increase the proportion of energy spending captured in the local and regional economy.

- Alignment with corporate objectives and/or devolution agreements. BANES and Bristol City Council already have corporate objectives with a strong emphasis on supporting the community energy sector.
- Informed community consent and understanding for renewable energy³⁸. Bottom-up community energy projects have huge potential to increase energy literacy amongst the wider community, and to deliver informed consent around renewable energy projects, which can in turn reinforce local authority initiatives and open up the scope of what is possible. By illustration, Ambition Lawrence Weston carried out a consultation in respect of the potential for additional wind turbines within Avonmouth and Lawrence Weston, with 96.2% and 97% of residents surveyed in favour of additional development. Bottom up initiatives from community energy and neighbourhood planning groups may be better placed to harness and deliver support for hosting or developing renewable energy projects. This demonstration of support enabled Bristol City Council to approve a commercial scale wind turbine³⁹ in Avonmouth. Following on from this consultation, Ambition Energy was formed and funded by the Bristol Community Energy Fund (details below) are carrying out development work in respect of a further (community owned) commercial scale turbine.

Due to actions by community organisations, the West of England authorities and third sector organisations, there is an active community energy sector in the wider Bristol area, and a rapidly maturing level of confidence from community energy groups to take on and deliver ambitious and innovative energy projects. The following organisations, initiatives, structures and relationships within the West of England area could be built upon to create a pipeline of community energy projects, funded or subsidised by carbon offset contributions.

- **Bath and North East Somerset** have adopted a Community Energy Strategy⁴⁰ in order to deliver ambitious targets for the installation of 110 MWe installed renewable electricity capacity and 165 MWth installed renewable heat capacity by 2029. This includes a Cooperation Agreement with Bath and West Community Energy (BWCE) and Keynsham Community Energy (KCE), non-profit community energy organisations working in the area. BWCE work across the south-west and have installed a portfolio comprising over 40 MW of renewable energy projects.

³⁹ www.bristolpost.co.uk/news/bristol-news/council-approves-plans-130m-wind-409251

⁴⁰ Bath and North East Somerset Council – Community Energy Strategy
www.bathnes.gov.uk/sites/default/files/sitedocuments/Environment/Sustainability/community_energy_strategy_2015_to_2018.pdf

- **Bristol City Council's** Energy Service manages the Bristol Community Energy Fund. This rotating fund delivers grant and loan funding to community energy projects across the city. The Energy Service also invests directly in renewable energy installations and community energy projects, procures the Council's energy supply and installs energy infrastructure including District Heating. The recently announced "City Leap" project seeks commercial partners and investment in a range of ambitious carbon reduction projects: £300million to develop a large-scale heat network from Avonmouth to Severnside, £300million to improve domestic energy efficiency, renewable energy projects across the city and battery storage projects. Bristol Energy Network is a network of active community energy groups within the wider Bristol area
- **North Somerset** - Low Carbon Gordano is another community energy group active, with a portfolio of community owned solar projects in North Somerset

Possible Action for South Gloucestershire Council

At present the community energy sector in South Gloucestershire seems to be less active than in the three other authorities. There is potential for the carbon offset fund, in conjunction with South Gloucestershire Climate Change Strategy and Climate Change Action Plan to stimulate this sector, for the benefit of local communities and your local economy.

7.2.8 Domestic renewable energy projects

Grants or subsidies for privately owned domestic scale renewable energy projects have reasonable potential to be eligible "carbon offset" projects offering:

- Some additionality. Ownership restrictions means that the benefit from domestic renewable projects would primarily accrue to the "able to pay" market: homeowners and private landlords; however tenants would still benefit from the energy generated through reduced energy bills. The ability to provide a larger subsidy for vulnerable applicants would potentially open up the installation of domestic renewable energy beyond its traditional market.
- Market stimulation. With the closure of the Feed in Tariff in 2019, this funding source could help support SMEs working in the micro-generation sector.
- Scale-ability and ease of delivery. Such a grant scheme would be relatively easy to administer. The micro-generation industry should be well placed to provide quotations and projections of energy savings to support applications from householders.

Camden's Climate Fund offers grants of up to £1,500 to support households and landlords install renewable energy measures to help reduce bills and cut associated carbon emissions. Grants are open to homeowners, private tenants and private landlords. Successful applicants are required to match-fund 50% of the cost up to (and any additional costs over) £3,000, although the online application process also takes into account affordability considerations, such as age, illness and whether applicants receive benefits. Some applicants may therefore receive 100% funding.

Applications are assessed on carbon reduction potential, cost to benefit (i.e. cost of installation in relation to the carbon savings) and feasibility.

Complementing this, Camden have signed up to “solar together⁴¹” a reverse auction for Solar PV providers, whereby suppliers bid to offer the most competitive price for solar PV installations.

7.2.8 Commercial renewable energy projects

Whilst commercial renewable energy projects deliver fewer community benefits than community energy projects, they are highly scalable. Following the closure of the Feed-in Tariff, the development of new business models would be highly beneficial to the local and wider economy and in terms of the take-off of renewable energy without subsidies. Therefore, there are strong arguments behind using carbon offset funding, at least in the short term, to provide low interest loans and development finance for commercial renewable energy projects. To ensure this does not backfire with communities feeling that renewable energy projects are imposed upon them subsidised by development which may in part also feel imposed, commercial developers should be encouraged to offer offering a high level of local community engagement for such projects.

7.2.9 Electrical Energy Storage

One of the most significant barriers to the greater use of renewable energy in our energy system is the problem of intermittency: matching the variable and often unpredictable supply of renewable electricity to our variable demands for electricity. (Contrast the greatly contrasting characteristics of a still cold January morning (high heat and electrical demand; low supply from wind and solar) and a summer afternoon (low heat demand, high supply from solar and potentially wind).

The decarbonisation of our transport system (the rise of electrical vehicles) and energy system (the move from gas to electrified heating) is likely to place further demands on our electricity supply network, which in parts of the south west is already at capacity, and thereby add to these problems.

Electrical energy storage technology, most commonly in the form of batteries, offers the potential to help overcome these problems, storing energy locally for when it is needed, and smoothing out peaks in demand and supply. Energy storage also offers the potential to improve the economic viability of renewable energy projects by increasing the proportion of renewable electricity used locally as opposed to being sold to the distribution grid. For example the resident who fits a solar panel and wall mounted battery, and uses the electricity generated whilst they are at work in the daytime in the evening, reducing the amount they buy from the national grid.

Energy storage thus has the potential to enable greater amounts of renewable energy to connect the distribution grid, thereby enabling carbon savings to be achieved. However, whether an individual energy storage project will result in carbon savings depends to a great extent on where and how it is used (whether in tandem with a renewable electricity plant or in isolation, storing

⁴¹ Solar Together - <https://www.london.gov.uk/what-we-do/environment/energy/solar-together-london>

excess night-time electricity from the distribution grid for daytime use). Additionally the carbon savings achieved will vary from moment to moment as the carbon intensity of grid supplied electricity varies. It would therefore be very difficult to predict attribute carbon savings to electrical storage projects, and further work would be needed to establish whether energy storage proposals could be supported as a workable carbon offset projects.

7.2.10 Unlocking barriers to renewable energy projects - Targeted distribution grid reinforcement

As illustrated below the capacity to connect renewable energy projects to the local electrical distribution grid is highly constrained across all four authorities. This means that even where projects have planning permission, in order to become operational, they frequently need to either fund localised grid reinforcement, join a queue awaiting capacity to become available, or enter into a timed connection agreement which limits the times during which they can sell electricity to the grid. This limits the growth of renewable energy generation in the region and the viability of renewable energy projects.

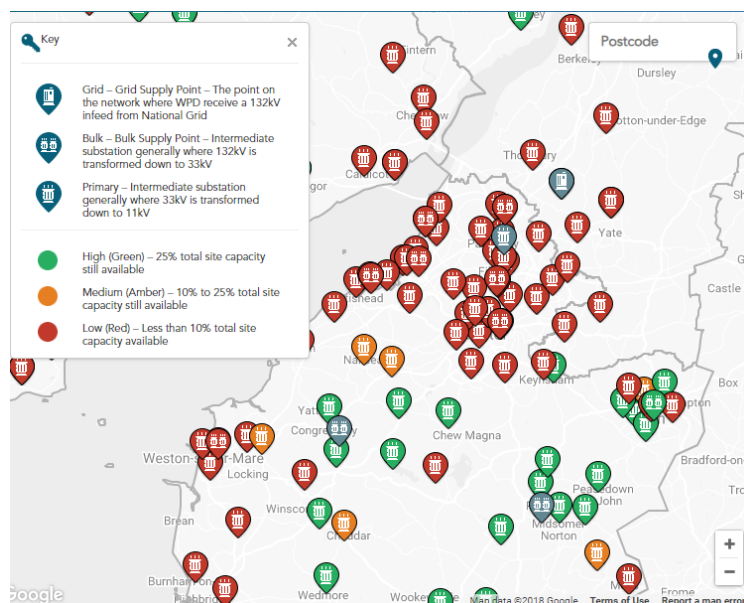


Figure 14 - Western Power Distribution network capacity⁴²

Utilising funds to subsidise or pay for grid reinforcement could be an innovative way of enabling greater renewable energy generation within the region, and could be specifically targeted at community energy projects investing their profits in their communities. This could also potentially enable grid reinforcement work to come forward faster.

Further detailed engagement would need to take place with Western Power Distribution in order to understand the scale of additional renewable energy installations that would be possible, the costs of grid reinforcement, carbon savings delivered and to ensure the funding would deliver additionality over the work that would happen / was planned anyway. Additionally the distribution

⁴² www.westernpower.co.uk/connections/generation/network-capacity-map.aspx

grid itself is technology neutral, distributing electricity both from fossil fuel and renewable energy plants. Therefore some way would be needed to ensure that the grid reinforcements funded were used to specifically enable renewable electricity generators to connect into the grid.

7.2.11 Unlocking barriers to renewable energy projects – enabling onshore wind through the planning process

The greatest barrier to the development of onshore wind within the West of England authorities is the current national planning regime. Since 2015, in order to be permitted, onshore wind projects must be located in areas that have specifically been identified as being suitable for onshore wind in a local or neighbourhood plan⁴³. Nationally only a minority of local planning authorities have done so⁴⁴, and within the area of the four west of England authorities, we are aware of only Bristol having such a policy, and this only relates to the Avonmouth area, though we are aware that North Somerset and Bath and North East Somerset Council are both considering identifying suitable areas in future planning documents. South Gloucestershire

Funding from the carbon offset fund could potentially pay for extra planning expertise and community engagement capacity in order to bring forward this work and allocate sites for wind, either within local plans or neighbourhood plans. CSE's experience is that where communities are given the opportunity to develop an informed consensus over the forms of renewable energy which would be acceptable within their neighbourhoods, mature and extensive discussions can result and ambitious community scale energy plans can be developed.

Delivering funding to bring this work forward could offer:

- Benefits to local communities, provided that a community led approach is taken to identifying suitable areas, and particularly if the potential for community owned wind sites is explored
- Benefits to the local low carbon economy
- In the case of funding neighbourhood plans to carry out this work, clear additionality over existing market processes. Government funding for neighbourhood plan development administered through Locality⁴⁵ (the government's main appointed advisor for neighbourhood planning) does not provide for renewable energy studies.

The greatest difficulty would be to attribute carbon savings to such work, in that this type of policy preparation work would not directly deliver carbon reductions itself and would take time to come to fruition. Additionally, the scale of carbon savings ultimately deliverable would not be clear at the outset, and would depend on developers coming forward with projects. However at the present

⁴³ The wind ministerial Statement is now integrated into the 2018 National Planning Policy Framework, footnote 49 - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740441/National_Planning_Policy_Framework_web_accessible_version.pdf

⁴⁴ Centre for Sustainable Energy (2017) Survey of local authority wind policies www.cse.org.uk/downloads/reports-and-publications/policy/community-energy/planning/survey-of-local-authority-wind-sites.pdf

⁴⁵ <https://neighbourhoodplanning.org/>

time, the preparation of supportive policies for onshore wind is a necessary pre-condition for any schemes coming forward.

7.2.12 Unlocking barriers to renewable energy projects - Radar mitigation to permit wind turbines within Bristol Airport's airspace

Bristol airport is a major block on wind development in the area, constraining wind development on the airport approaches within Bath and North East Somerset and potentially within North Somerset. Without expensive technical mitigation, wind turbines and wind farms in line of sight of the airports radar create false tracks and confusing signals on air traffic control displays, making safe air traffic control more difficult. Individually such technical mitigation is often unaffordable even for commercial scale wind projects, and therefore such projects cannot go ahead. Pooled contributions could remove this blockage, allowing otherwise acceptable projects to go ahead.

Further work would need to be undertaken with Bristol Airport and aviation experts to understand the costs of such mitigation (which can be significant) and the scale of onshore wind development which could potentially be unlocked.

7.2.13 District Heating

District heating infrastructure appears to be funded through CIL payments in Bath and North East Somerset, and within several of the authorities, existing planning policy requires developments to connect into the district heating network where it is available.

With government funding available through the Heat Networks Investment Project, and taking into account the likely scale of the Carbon Offset fund in comparison to the very high capital costs of district heating projects, district heating does not seem like a good candidate for carbon offset funding. In our view, in everyday language, it would be difficult to describe district heating as anything other than a type of energy infrastructure, to which at present, the restriction on pooling Section 106 contributions would apply.

7.2.14 Tree Planting

Tree planting has been suggested as a possible carbon offset measure in only a few of the previous carbon offset schemes. In addition to the ability to sequester carbon dioxide, tree planting has a variety of benefits to a local area, including:

- Localised cooling and reduced Urban Heat island;
- Habitat provision;
- Improved local air quality;
- Townscape improvements;
- Surface water management;

Trees are only effective in sequestering carbon if they are left in place to grow, and therefore to be included as an eligible measure, a mechanism would need to be created to ensure this. The Tower

Hamlets study commented on the possible use of the Woodland Carbon Code⁴⁶ for this purpose. This is a voluntary standard for woodland creation projects in the UK which offers clarity about the carbon savings delivered, plus ongoing verification and certification.

The Tower Hamlets study however considered and discounted tree planting as an eligible option due to its high cost, as follows:

Tree Type	Lifetime (years)	Installation Cost	Cumulative Carbon Sequestration at End of Life per stem (tCO ₂ e/stem)	Cost per tCO ₂ (£/tCO ₂ e)
Lime	195	£2,150	0.28	£7,796
Cherry	28	£2,017	0.20	£10,140
Maritime Pine	95	£463	0.07	£6,680
Oak	195	£559	0.48	£1,157

Table 6 - Total lifetime carbon sequestration costs per tree planted

These costs seem to be based on street tree planting costs for semi-mature trees, plus several years of watering and maintenance, rather than the costs for woodland creation and management, which can be as low as a couple of pounds per tree.

It would be possible to provide a route to secure carbon sequestration through tree planting via an accredited UK offset scheme, such as that run by the Woodland Trust, however it is not clear whether it would be possible to restrict planting through this scheme to within the area of the four West of England authorities, and therefore ensure that local residents could benefit from the wider environmental benefits delivered.

Our view is that there could be a substantial overlap between the requirements to carry out tree planting to achieve carbon sequestration and landscaping required as an integral aspect of new development and that it could be difficult to rebut arguments of double charging. Therefore it would be simpler not to define tree planting as an eligible activity for the purposes of carbon offsetting.

However with further research and engagement with a specialist such as the Woodland Trust, the Tree Council, or Trees for Cities, it may be possible to address these issues. Additionally, these issues might be resolved were tree planting to happen in a way that is clearly independent of and additional to the landscaping associated with a development, for instance in managed blocks and with an agreed management plan. Tree planting could be considered for eligibility by each Council according to their circumstances and views.

⁴⁶ [www.forestry.gov.uk/pdf/WWC_V2.0_08March2018.pdf/\\$FILE/WWC_V2.0_08March2018.pdf](http://www.forestry.gov.uk/pdf/WWC_V2.0_08March2018.pdf/$FILE/WWC_V2.0_08March2018.pdf)

7.2.15 Sustainable Transport initiatives, including walking and cycling infrastructure and public transport infrastructure

To the extent that walking, cycling and public transport infrastructure reduces carbon emissions by getting people out of their cars; it would be possible to treat such infrastructure as a form of carbon offsetting. Such an approach would have benefits, enabling unfunded sustainable transport initiatives to go ahead, including sustainable transport proposals put forward by community groups, and would deliver significant socio-economic benefits, especially to rural communities.

However there are substantial overlaps both with site specific infrastructure normally funded through Section 106 agreements and with strategic infrastructure funded by CIL payments. Unsurprisingly, all four authorities in the West of England include sustainable transport infrastructure within their CIL lists and only Bristol City Council specifies where this infrastructure funding would be directed. Were sustainable transport initiatives to be defined as eligible for carbon offset funding, it would be difficult to rebut arguments of double charging.

Therefore at this time we would not recommend that sustainable transport infrastructure is defined as an eligible carbon offset project within the WoE scheme.

It would however be possible to revise the CIL 123 lists so as to be much more specific about the location and nature of transport infrastructure to be funded, a change that is likely to happen anyway following the Community Infrastructure Levy review. This could then allow carbon offset funds to be used to fund smaller scale sustainable transport schemes, such as local cycle improvements and subsidies to rural bus services.

7.3 Suggestions for eligible carbon offset projects

Given the existing range of projects that are already being run within the four authorities, and the ease with which projects could be initiated or adapted, we would suggest that the carbon offset regime is piloted, and that during this pilot period, the following measures are defined as eligible:

- **Domestic energy efficiency retrofitting, via council fuel poverty alleviation initiatives**
- **Non-domestic retrofitting - energy efficiency improvements to council buildings, managed by the council's facilities management teams**
- **Non-domestic retrofitting - energy efficiency improvements to community building, expanding on CSE's Thrive Community Energy Programme.**
- **Community energy projects, expanding on the Bristol Community Energy Fund**

The following project types could potentially be developed as new initiatives:

- **Domestic renewable energy projects**
- **Commercial renewable energy projects**
- **Non-domestic retrofitting - energy efficiency improvements to commercial building**

The following would require further investigation to determine whether they could offer workable carbon offset projects:

- **Energy advice service**
- **Carbon savings through embodied energy**
- **Radar mitigation to permit wind turbines within Bristol Airport's airspace**
- **Targeted reinforcement of the electrical distribution grid within the region, so that additional renewable energy developments are able to connect to it**
- **Support for allocating wind sites in local and neighbourhood plan documents – a precondition if onshore wind sites are to be developed.**
- **Tree planting**
- **Energy storage**

Given the overlaps with conventional planning requirements and infrastructure funded through the Community Infrastructure Levy, we would suggest that the following are not defined as being eligible for carbon offset funding:

- **District heating**
- **Sustainable transport**

8. Mechanisms for administering the carbon offset regime (including two case study examples)

8.1 Feedback from the authorities we surveyed

We undertook a telephone survey with the Greater London Authority and with the following 6 Local Planning Authorities, seeking their feedback on how their carbon offset regime is set up and is managed, the carbon price they use to calculate contributions to their fund, and how successful their scheme has been to date.

Local Planning Authority	Relevance to study	Administration of fund
Southampton	£210 (one off payment) - equivalent to £7 per tonne over 30 years Non London borough collecting carbon offset payments	Externally by The Environment Centre Carbon Offset Fund Proposal attached at Appendix B
London Legacy Development Corporation⁴⁷	Detailed supplementary planning guidance on Carbon Offsetting	Internally by planning team
Islington	Carbon price - £920 (one off payment) - equivalent to £30.60 per tonne over 30 years Flat fee for minor development : - £1500 per house - £1000 per flat	Internally by planning officer
Merton	Carbon price £60 – Merton have also carried out their own study reviewing similar schemes across London Boroughs	Internally by sustainability team
Camden	Carbon price £60	Internally by planning team
Waltham Forest	Carbon price £60	Internally

Table 7 - Local planning authorities interviewed

⁴⁷ The London Legacy Development was the delivery vehicle for the creation of the Olympic Park for the 2012 London Olympics.

Except in the case of Southampton and Islington, where a one-off payment is made for each tonne of carbon to be abated, the carbon offset is calculated by multiplying the carbon price by 30 to give the overall payment that needs to be made. This is the approach set out by the Greater London Authority (GLA) in their guidance on preparing energy statements⁴⁸.

We asked the authorities we interviewed, overall, how successful has the emissions target and allowable solutions / Carbon Offsetting policy been in your authority?

The majority of respondents (4 out of the 6 authorities) interviewed reported that their carbon offset regime had been very successful, and that there had been little resistance and / or no objections to their policy. The remaining two authorities commented that it was too soon to come to conclusions. Individual comments of particular relevance are as follows:

"As above, projects to date have focused on fuel poverty. However, the end project report for the pilot reported on a wide range of outcomes achieved (e.g. cash savings made by residents, numbers assisted with debt and wider social benefits). Like many other authorities, the council is attempting to move to a more preventative approach across its services. This is to avoid the higher costs of reacting to resident needs after problems have escalated. The Croydon Healthy Homes service is an example of this – in reducing fuel bills and debt, improving health etc. When the Croydon Energy Fund is sufficient to set up a capital retro-fit scheme, we intend to do this via a cooperative local installer network (similar to the Retrofitworks model). This would meet other council objectives to 'buy local' and support the local economy." Croydon Council

"It's important to remember that really you want people to improve energy performance on-site rather than pay into the fund." Waltham Forest

"There were political benefits from having a carbon offset fund, though we have to be careful to not direct spending in a political way. It's early days, so there is no overall assessment, but officers are excited about innovative approaches. Merton Council

The comments illustrate the potential for the fund to deliver social benefits and support the local economy, as well as deliver carbon reductions, and the potential of the fund to help deliver existing wider corporate priorities.

We asked the authorities we interviewed, is there any particular advice that you would offer to the West of England Authorities in setting up their carbon offsetting regime? The answers received were as follows:

"Ensure you build adaptability into your scheme." Islington

"Working with a partner who is already working closely with the council on fuel poverty projects allows funding to be combined to assist vulnerable households who would otherwise not be able to afford to carry out retrofitting measures." Southampton

⁴⁸ Greater London Authority (March 2016) Energy Planning - guidance on preparing energy assessments - www.london.gov.uk/sites/default/files/gla_guidance_on_preparing_energy_assessments_-_march_2016.pdf

"Think about how Bristol / Bath / North Somerset / South Glouc are structured. Do they have capacity? All boroughs with activities, have internal teams: e.g. sustainability officer. Boroughs which have lost this capacity don't undertake work. Could the councils get together and fund an officer between them? Could they train and upskill different planning teams. Once the expertise and skills are lost from the building, introducing Carbon offset won't work. Merton

"I would recommend authorities initially try to estimate what the potential offset revenues might be – along with the phasing of income. The structure set up to deliver projects should then be matched to the scale of the potential fund.

Across London boroughs there has been much debate on whether like-for-like CO2 reductions should be required from offset funded projects. Our view is that at £60/tonne this is very difficult to achieve (certainly in Greater London) and that £60 per tonne is too low. We therefore decided to adopt a more flexible approach which gives us discretion as to what type of projects are funded. As mentioned above, we will establish a more formal programme once sufficient CEF funds are secured. However, we would still not want to adopt strict equivalent CO2 savings targets as we are more likely to have a wider range of evaluation criteria – e.g. fuel poverty, support for Community Energy, renewables, new energy infrastructure etc. – as well as CO2. Our advice would therefore be:-

- Don't invest too much up front in the scheme governance until you have sufficient offset funds to justify this. Try to use any relevant existing boards to manage the initial funds (e.g. wider S106 spending)*
- Follow your own local and political priorities for energy. You don't have to target 'like-for-like' CO2 reductions if you have other priorities.*
- Treat first funded projects as pilots, and ensure you collect good monitoring data and feedback. This will help set future criteria, and provide a growing evidence base for what the future fund could deliver." Croydon*

"Try to make the process as simple as possible if making available to residents/ communities/ businesses. It is worth launching as a pilot to enable you to tweak if required." Camden

"One thing coming out of working group meetings so far is the importance of having a plan for the types of projects that you would like to fund, and mapping out schemes to check for overlap with other funding streams." Waltham Forest

Our review found that the majority (13 out of 15 authorities) of local authorities that operate a carbon offset scheme manage the carbon offset fund themselves. No one approach dominates in terms of the team with ultimate responsibility for managing the fund, with this task being devolved variously, to the Section 106 officer, the energy team, planning and sustainability teams.

Two authorities (Milton Keynes and Southampton) outsourced the management of their fund (to the National Energy Foundation and The Environment Centre). In both these cases, all funds appear to be spent on domestic fuel poverty and retrofitting projects.

Our interview with the officer from London Borough of Merton, author of *The Implementation of London's Zero Carbon Target and carbon pricing mechanisms*⁴⁹, revealed the importance of having council staff with the right skills and capacity to get their carbon offset regime up and running. He commented that all the London boroughs undertaking carbon offset work have internal teams, e.g. sustainability officers. The boroughs which have lost this capacity (specialist sustainability officers, and in-house skills for project delivery) don't have the capacity to run and administer a carbon offsetting regime. Given the uncertainty in local government funding it would be important to set up the scheme so that it is future-proofed to continue to operate under different staffing scenarios.

This respondent advised that we should think about how Bristol / Bath and North East Somerset / North Somerset / South Gloucestershire councils are structured and what capacity the authorities have. In the case that capacity is uneven across the authorities, could the authorities fund an officer between them? Or train and upskill existing teams? Once carbon offset projects are being delivered and running, authorities can charge an administrative cost, which could pay for the time of an officer to administer the scheme and enable further development of the fund and of innovative carbon saving projects.

New guidance⁵⁰ from the GLA on establishing carbon offset funds, published in October 2018 details how this might work:

"If an LPA determines that additional funds are needed to pay for staff to develop and manage identified offsetting projects, we recommend a maximum of 10 per cent of the fund is allocated to this, either annually or per project and this should be set out clearly in the agreement. Using offset funds for this purpose will reduce the funds available for projects directly and so we recommend using existing processes for administering and the monitoring the fund as far as possible. However, for LPAs at the earlier stages of setting up funds this 10 per cent could be used to establish the fund and supporting arrangements."

8.2 Case studies of approaches to carbon offsetting

8.2.1 London Borough of Merton

The London Borough of Merton have adopted the same policy targets as set out in the London Plan, have a carbon offset regime in operation and charge £60 per tonne CO2 offset. In our interview the officer from Merton council commented "*Most boroughs will be like us: we know that £60 per tonne is not enough, but no-one wants to take the risk of breaking from the pack. The few that have not necessarily had the easiest time of it. They've stuck their head above the parapet and developers go for them whenever they do.*"

⁴⁹ University College London - Bartlett School Of Planning - The implementation of London's Zero Carbon Target and carbon pricing policies

⁵⁰ Greater London Authority (October 2018) Carbon Offset Funds - guidance for London's Local Planning Authorities on establishing carbon offset funds - https://www.london.gov.uk/sites/default/files/carbon_offset_funds_guidance_2018.pdf

Merton Council have collected £280,000 over the last 8 months and project an income to their fund of £500,000 p.a.

Carbon offset contributions are worked out as part of the planning application. In some instances where an energy strategy is not provided, but the council wants to approve they ask applicant whether they will agree to a pre-commencement condition, securing a detailed energy strategy. Then the S.106 agreement states the cost of carbon is to be determined via the condition, with a further condition requiring the submission of as-built SAPs.

Merton require contributions to be paid on commencement of development. They used to be required upon the completion / occupation of the development, but this made timescales for receiving funding uncertain, and the forward planning and strategic delivery of carbon offset projects extremely challenging.

To comply with restrictions on pooling contributions from planning obligations, the specific carbon saving project to be delivered used to be specified in S.106, but they found this limited flexibility and the opportunity to respond to changing circumstances. Additionally, as the individual offset agreements were small, the scope for delivering larger projects which deliver high carbon savings was also limited.

Since September 2017 contributions have been directed to a ring-fenced Carbon Offset fund and then allocated on application to the fund, rather than specifying individual projects within S.106, allowing pooling of up to 5 contributions to a specific project.

The costs for administering the fund have been absorbed into the planning function, and the fund is administered by the Council's sustainability officer. Merton advise that once the fund is up and running, it is possible to ask for a 10% administration fee. Oversight is provided by the council's internal Climate Change Steering Group; a cross-departmental officer group chaired by the Director of Environment and Regeneration.

The carbon offset projects funded so far consist entirely of the installation of solar PV and solar thermal cells on existing buildings. The Greater London Authority have been supporting Merton with 4 other authorities on "solar together"⁵¹ a reverse auction for Solar PV providers, whereby suppliers bid to offer the most competitive price for solar PV installations. They ran a reverse auction on a very tight set of technical specifications for solar PV and Solar Century won. They are offering domestic PV at £600 per kW peak.

In future, the intention will be to direct carbon offset funds towards carbon saving measures in local public and council-owned community assets, and subsequently to help address fuel poverty by delivering energy improvements in local housing stock.

⁵¹ Solar Together -

https://solartogetherlondon.ichoosr.com/Product/index.rails?utm_source=camden&utm_medium=referral&utm_campaign=website&location=camden

The Council's most up to date approach to carbon offsetting is described in an un-adopted Explanatory Note: Approaches to Sustainable Design and Construction⁵² and in a report to cabinet from September 2017⁵³ which describes the application and assessment process. These documents appear to supersede a draft supplementary planning document in respect of planning obligations from 2014⁵⁴.

The Council's application form to the fund is attached at Appendix C. This is still in draft, so does not appear on the Council's website yet and it appears that a single application form is proposed for all project types. This also sets out the council's assessment criteria.

8.2.2 London Borough of Camden

The London Borough of Camden require carbon reductions of 35% for commercial developments over 1,000 sqm, 100% carbon reductions for major residential developments and 19% carbon reductions for residential developments of less than 10 units. They have a carbon offset regime in operation and charge £60 per tonne CO2 offset which is paid into a ring-fenced fund. Their regime has not been challenged by developers. The fund currently contains £230,000 and is expected to be significantly higher in 2018/19.

The carbon offset payment is calculated at the planning stage and payment is required prior to occupation.

The fund is managed internally and Camden's planning team administers payments into the Fund. Camden's sustainability team determine carbon reduction projects and make payments. An audit trail from application through to installation is kept for each case. A database is also held with details of all installations, grant awards and associated estimated carbon savings. For renewables they identify carbon savings using details provided by the Micro generation certification scheme, for energy efficiency measures they determine internally through their Camden Climate Change Alliance tools.

How the administration costs are to be met is currently under discussion, but the GLA guidance is expected to recommend 10% of the fund goes to administration costs.

Carbon savings are delivered by applicants to the fund (rather than the council itself).

⁵² Merton Council - Explanatory Note: Approaches to Sustainable Design and Construction June 2017
https://www.merton.gov.uk/assets/Documents/merton_explanatory_note-sustainable_design_construction-1.0.pdf

⁵³ Merton Council - Cabinet report: 18 September 2017 - Neighbourhood Community Infrastructure Levy and Carbon Offset funds <https://democracy.merton.gov.uk/documents/s19182/2017-09-18%20Cabinet%20Neighbourhood%20CIL-Carbon%20Offset%20FINAL.pdf>

⁵⁴ Merton Council - Draft Planning Obligations: Supplementary Planning Document (SPD) October 2014
https://www2.merton.gov.uk/merton_draft_planning_obligations_spd_2014.pdf

Camden recommend making the process (of applying to the fund) as simple as possible if it's to be made available to residents/ communities/ businesses. They suggest launching it as a pilot to enable tweaks to be made if required.

The Camden Local Plan states that where the required reductions in carbon dioxide emissions cannot be met on site, financial contributions will be required to an agreed borough wide programme to provide for local low carbon projects. The borough wide programme will be connected to key projects identified in the Council's Green Action for Change⁵⁵, Camden's environmental sustainability plan. Carbon offsetting is also covered very briefly in non-statutory guidance note 1, Sustainability⁵⁶.

8.3 One Carbon Offset fund covering all four authorities, or four individual Carbon Offset funds?

Within the authorities we surveyed and read about, we found no cases where a number of local authorities clubbed together and operated a shared carbon offset regime. However we consider that there are obvious advantages in doing so, particularly given the joint approach adopted so far in considering the WoE planning policies.

Given the likely similarities in the planning policies adopted by the four authorities, which are being developed in partnership across the authorities, and on the assumption that all four authorities will adopt a carbon offset regime to make up carbon savings not achieved on site, there are advantages to operating a single shared carbon offset fund across the four authorities too.

Firstly, once developed many of the carbon offset approaches we've considered could be applied almost as easily to four authorities as one. For instance an application process enabling community groups to apply for development funding for community energy projects for example could be applicable across the WoE area. This could be straight forwardly expanded from the Bristol Community Energy Fund, currently run by Bristol City Council, whereas the other authorities would need to start from scratch. Such an approach would allow considerable administrative savings and enable the authorities to benefit from one another's strengths.

Operating a single shared fund would however raise governance and fairness issues which would need careful resolution, and we'd suggest the following principles:

- a. Allocating funding fairly across all four authorities proportionately with the development hosted.** Whilst climate change is a global problem, and therefore mitigation (in the form of

⁵⁵ Camden Green Action for Change - executive summary - <https://www.camden.gov.uk/ccm/content/environment/file-storage-item/green-action-for-change---executive-summary/>

⁵⁶ Camden planning guidance 1, sustainability ... - Camden Council https://www.camden.gov.uk/ccm/cms-service/download/asset?asset_id=2704860

carbon saving) could theoretically take place anywhere, the measures under consideration have the potential to offer significant social, economic and environmental benefits. It is reasonable therefore that carbon offset contributions should fund carbon offset projects within the area of the determining planning authority.

- b. Allowing variation according to local priorities.** Our suggestion (set out in the next section) is that a single fund is established and that a single administration structure is set up, formed from staff from all four authorities, with individual projects or programmes applying to the fund for support. This would allow efficiencies to be made and allow shared programmes to be established across all four authorities where there was support (for instance the example given above relating to renewable energy), but equally would allow programmes specific to each local authority to come forward as well, for example retrofitting projects tailored to the housing and social conditions in Bristol or Bath, which will differ widely.

This would also allow the authorities to define different carbon saving measures as eligible according to their priorities, for instance a tree planting programme operating only in one of the four authorities.

8.4 Mechanisms for administering the carbon offset regime in the West of England authorities

Our view is that the most appropriate mechanism for administering the fund will depend on the range and type of projects that are deemed to be eligible by the WoE authorities for carbon offset funding, the policy scenario adopted and therefore the size of the fund.

The total predicted fund size across the WoE area for 2019 – 2020 ranges from £1.2m for the weakest policy scenario (Zero regulated emissions, applied to all super major residential developments) to £40m for the strongest policy scenario (True zero carbon including regulated and unregulated emissions, applied to all residential development).

Therefore we are not able to advise definitively on what mechanism should be chosen at this stage; however there are two main approaches available:

1. The four authorities retain the responsibility for managing the fund including record keeping, sourcing carbon saving projects and monitoring project delivery and delivered carbon savings. A list of eligible projects is identified, and project funding is agreed scheme by scheme on an ad hoc basis as carbon offset funds are accrued.

This approach would be most suitable where the fund is aimed at a relatively small number of large council-run projects, for example mass retrofit projects and where the fund is limited in size. In such cases the project management and reporting processes will already be in place, and it will be a simpler process to allocate funding (or a proportion of the whole fund) to these projects, ensure that they meet the objectives of the carbon offset fund and monitor project deliverables. Given the potential size of the fund, it's likely that this might ultimately result in the need for further recruitment, as the workload would become too high for existing officers to incorporate into their current day jobs, though 10% of the fund can be used for staff costs.

2. A carbon offset provider takes over the day-to-day management of the fund as a whole on the basis of an agreed approach and reports regularly to a panel or board made up of representatives from the four authorities, similar to the approach adopted in Tower Hamlets, Merton and the London Legacy Corporation. The provider is responsible for promoting the fund, assessing applications to it and making recommendations to the board for funding, managing grants / loans, monitoring delivery (and delivered CO2 savings) and reporting back to the board / panel on progress.

An initial list of eligible projects types is defined and promoted, and funding applications are invited both from the community and from council departments. As well as guiding the preferred strategy for carbon savings to reflect corporate priorities and local circumstances, the panel would regularly review the Carbon Offset Price and fund management costs and determine applications to the fund, as and when they are received. Council staff would continue to project manage council carbon saving projects, where these are a continuation of previous work.

This approach would be most suitable where a large number of applications to the fund are expected for relatively small projects, for instance for community energy projects or community retrofitting projects and where the fund is significant in scale. This approach would be likely to imply greater staff costs in assessing applications and monitoring scheme progress, but less time would be required creating new carbon saving projects, as these would come in from the community. Additionally, the council would effectively be outsourcing the management and delivery of carbon offset projects themselves, except where council projects are already in delivery.

Given the high level of interest in community energy projects in the region, we would recommend that applications to the fund are allowed from community groups. As the brief for the project is to recommend a scheme which is simple (*for the WoE authorities*) to administer, this would suggest that the second option is taken, outsourcing day-to-day management of the fund to an external provider. The external provider would:

- administer and promote the fund;
- manage the application process to the fund;
- summarise recommendations for funding to the Panel;
- monitor scheme progress and installations, and on large projects, releases funding in tranches, dependent on interim progress
- monitor projects proportionately to their size and report carbon savings to the panel

Once planning policies are adopted and in place and funds are being collected, it would be advantageous to create a Panel made up of senior members from the WoE authorities to oversee the operation of the carbon offsetting Fund to:

- Regularly review reports submitted by the funder provider or manager;
- Decide on the priorities for the allocation of funds;
- Determine applications to the fund (including from Council departments)
- Review the Carbon Offset Price and Carbon Offset Ratio;
- Review fund management costs;

This would ensure the WoE authorities retain control of the fund as a whole and can regularly review the fit of the fund to corporate priorities. To ensure that all projects funded deliver the objectives of the fund and that requests for contributions (and the carbon offset regime as a whole) are resistant to challenge, we would recommend that council projects seeking funding go through the same application process as applications from the community. This would help provide a robust audit trail of past fund spending and the carbon savings achieved and maximum transparency on the projects funded and the application process. This will help ensure that requests for carbon offset contributions can be easily defended and justified in planning application appeals and to enable the funds' achievements to be promoted and celebrated publicly.

The application process would allow carbon savings to be apportioned fairly to projects (according to the proportion of funding delivered) and to ensure that a planning obligation allocating funds to a specific project was fully compliant with relevant legislation⁵⁷.

8.5 Eligibility and marking criteria for applications to the carbon offset fund

8.5.1 Criteria for assessing applications

Researching those authorities which have published the criteria they use to allocate funding to offsetting projects, the following criteria are the most popular.

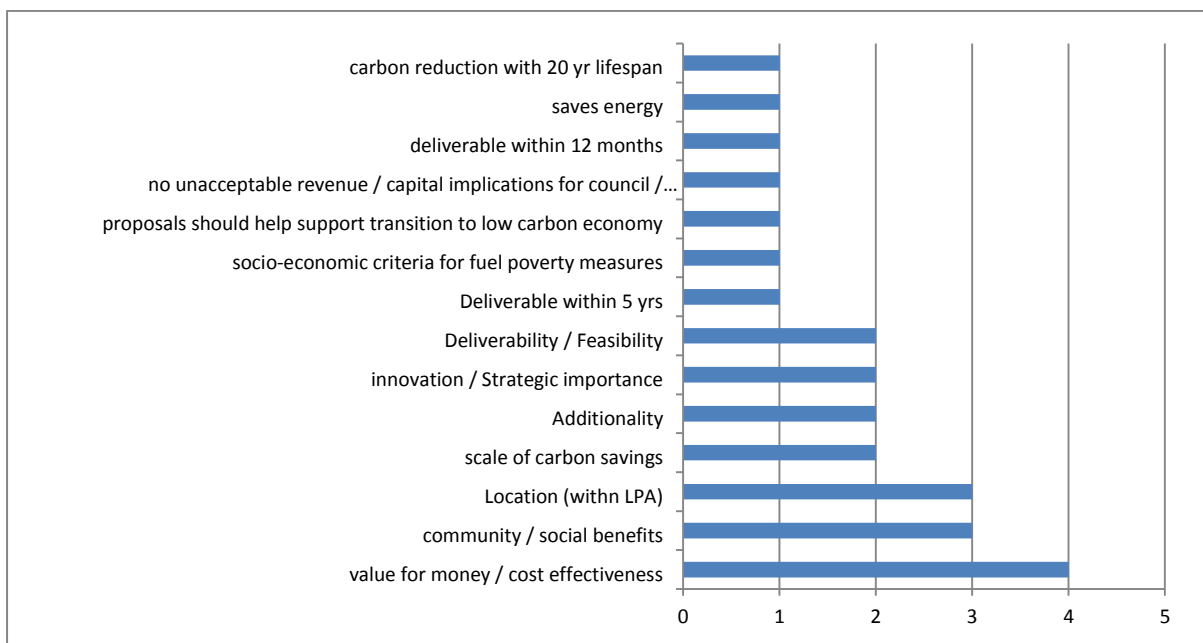


Figure 15 - Assessment criteria used by authorities in allocating carbon offset funding – Number of authorities using each criterion

⁵⁷ Currently paragraph 122 of the Community Infrastructure Levy Regulations - the three tests that an obligation is (a)necessary to make the development acceptable in planning terms; (b)directly related to the development; and (c)fairly and reasonably related in scale and kind to the development

The following commentary is relevant regarding the different criteria used.

8.5.2 Additionality

Additionality assesses the degree to which the carbon savings would have occurred without the carbon offset fund. The Tower Hamlets study differentiates between full and partial additionality:

- Full additionality: none of the carbon savings would have occurred within a reasonable timescale without the funding. In this case, it can be said that the Carbon Offset Fund has acted as the mechanism for delivering carbon savings. 'Full additionality' means that there is no conflict between the London Borough of Tower Hamlets Carbon Offset Fund and other funding mechanisms on a particular project;
- Partial additionality: the Carbon Offset Fund complements other funding streams and enables the project to go ahead. In this case, it can be said that the Carbon Offset Fund has helped to trigger carbon savings. 'Partial additionality' means that there is a level of synergy between the Carbon Offset Fund and other funding mechanisms on a particular project.

This has consequences for how carbon emission savings are attributed. Where the fund meets 50% of the costs of a project, it is reasonable that only 50% of the carbon savings can be attributed to the fund.

Finding some way to proportionately attribute the carbon savings to the grant contribution is important in terms of the legality of the planning obligation. The legal tests state that in order to be a legitimate justification for granting planning permission, planning obligations must be necessary to make the development acceptable in planning terms; directly related to the development; and fairly and reasonably related in scale and kind to the development. If therefore the carbon savings would have happened anyway without carbon offset funding, the contribution cannot be necessary.

Additionality can also be seen in wider terms, as the benefit the scheme can deliver (with grant funding) over and above that which would be created through existing market mechanisms. Merton Council give a weighted score from 1 to 5, depending on the degree of additionality achieved using the guidelines below:

Additionality test

- *Financial additionality*
- *Regulatory additionality*
- *Common practice*
- *Barrier analysis*

Demonstrates Additionality

1. *Project can be shown to happen on a routine basis. Business case for project without carbon finance is viable. Project could be fully funded from other sources*
2. *Project has been demonstrated in other areas or other organisations; case for carbon finance is weak. Passes one of the four additionality tests*
3. *Case has been made for the additionality of funding. Co-funding case made for the use of funding from other sources. Passes two of the four additionality tests*

4. *Clear for additionality, business case not workable under other circumstances. Passes three of the four additionality tests*
5. *Unique project that could not be undertaken without carbon finance; passes most or all of the additionality test. Passes four of the additionality tests.*

8.5.3 Low Carbon Transition

The criterion that *Proposals should help support the transition to a low carbon economy*, adopted by Merton Council is of interest. In our interview, Merton advised that this criterion was useful in aligning projects with the ultimate objectives of the fund. For instance initiatives to improve local air quality are likely to be attractive environmental improvements, but might not score highly in terms of this objective. Conversely, allocating funding to community engagement and consultant support for the development of supportive policies for onshore wind might score poorly given the lack of clarity on the scale of carbon savings to be delivered and the long timespan, but would score highly when assessed in terms of its contribution to this criteria. This objective could be incorporated into the criterion relating to additionality.

8.5.4 Innovative and Strategic Importance

Similarly to the previous criterion, the London Legacy Development Corporation takes into account the degree to which projects are of *strategic importance in demonstrating best practice, or new approaches to cost-effective carbon saving*. By subsidising projects and initiatives which are not currently economically viable through existing market mechanisms, the fund has considerable potential to enable innovation, which can then inform market activities. This objective could be incorporated into the criterion relating to additionality.

8.5.5 Community / Social Benefits

Preference should be given to projects which both deliver carbon abatement and other co-benefits. Merton Council give a weighted score from 1 to 5 as follows:

Demonstrates additional social benefits

1. *No social benefit. All financial benefits held by individual or business based outside of Merton*
2. *Displays some additional social benefits,*
3. *Displays some social benefit and aligns with the boroughs strategic social targets*
4. *Displays a high level of social benefits and closely aligns with the boroughs strategic social targets*
5. *Displays a high level of social benefits and targeting the boroughs social targets that are hardest to achieve.*

8.5.6 Value for Money / Carbon Ratio

Value for money / cost effectiveness was the most popular criteria adopted by councils in determining the schemes which should receive grant funding.

This can be measured objectively in terms of the carbon offset ratio, which is defined in the Tower Hamlets study as the ratio between the lifetime carbon savings achieved by a measure funded by the Carbon Offset Fund and the lifetime residual CO₂ emissions to be offset.

- A 1:1 Carbon Offset ratio means that the carbon savings delivered by the Carbon Offset Fund are equivalent to the residual CO2 emissions which need to be offset.
- A 2:1 Carbon Offset ratio means that the carbon savings delivered by the Carbon Offset Fund are twice the CO2 emissions which need to be offset.
- A 1:2 Carbon Offset ratio means that the carbon savings delivered by the Carbon Offset Fund are half of the CO2 emissions which need to be offset.

Our interview with Merton Council stressed the trade-offs between objectives to seek value for money, and encourage innovation and achieve additionality in allocating funding to projects. If, in deciding how funds are to be allocated to projects, great weight is placed upon value for money (£ per tonne carbon saved), less innovation is likely to take place, and lower levels of additionality are likely to be seen, over and above what would have happened through market mechanisms.

The Sustainable Design and Construction SPD, published by the GLA comments:

“unless the price set for carbon dioxide fully reflects the delivery of the identified carbon dioxide reduction projects, it is not considered necessary that the ratio of carbon dioxide saving to the off-setting price has to be 1:1. That is, the cost of the measure to save one tonne of carbon dioxide does not have to be equal to the off-set price per one tonne of carbon dioxide. The benefit of the fund is in unlocking carbon dioxide saving measures. If a 1:1 ratio is set, only the simplest retrofitting measures are likely to be carried out. This would potentially still leave the more complicated measures without adequate funding.”

This guidance has been repeated in the recent guidance from the GLA from October 2018⁵⁸.

Merton Council give a weighted score from 1 to 5 according to the carbon ratio achieved by the proposed measure:

1. 1:000.1
2. 1:00.1
3. 1:0.1
4. 1:1
5. 1:<1

8.5.7 Delivery timescales

Different approaches seem to be taken to the timescales within which carbon saving projects are required to be delivered. Setting a time limit of 5 years is likely to relate to the power within the Town and Country Planning Act 1990 to modify a planning obligation where it “no longer serves a useful purpose”. If after a 5 year period the contribution had still not been spent, such an argument can be made.

⁵⁸ GLA (2018) Carbon Offset Funds - guidance for London’s Local Planning Authorities on establishing carbon offset funds - https://www.london.gov.uk/sites/default/files/carbon_offset_funds_guidance_2018.pdf

Logically the off-site abatement of carbon should be achieved concurrently with the rate of on-site emissions, particularly where contributions are required prior to the commencement of development, and so ideally the carbon abatement project would be delivered within 12 months. Longer periods would however be reasonable either with very large carbon abatement projects, or in connection with large multi-phased developments, which can themselves be developed over multiple years.

8.5.8 Project Lifespans

The GLA Sustainable Design and Construction SPD advises:

Where the overall contribution is calculated over 30 years, boroughs should take into consideration the lifespan of the retro-fit measures that are being funded.

It is reasonable that where a contribution is made to fund off-site carbon abatement over a 30 year timespan, the project delivered should have a similar timespan. Reasonable allowances should however be made for speed of technological advancement, where product lifespans are commonly less than 30 years, or where typically only temporary planning consents are issued. For example, it is usual for onshore wind farms and solar farms to only be given a temporary consent of 25 years. Allowances might also be given for highly cost effective measures which only have short lifespans, for example the installation of low cost draught proofing, retrofitting and energy saving measures.

8.6 Recommendations in respect of assessment criteria

We would suggest that the following criteria are considered for the purposes of assessing applications to the fund:

- deliverability / feasibility
- timescale for delivery / completion (ideally delivery within 12 months)
- value for money / cost effectiveness (£ per tonne CO2)
- wider benefits: community / social / economic
- scale of carbon savings
- additionality, incorporating innovation and strategic importance, and the degree to which proposals support the transition to a low carbon economy
- lifespan of carbon reduction measures (ideally 30 yr lifespan, though lesser timespans for some retrofitting measures may be reasonable)

To be eligible, projects should be located within the area covered by the four West of England local authorities, although a caveat should be added that if funds aren't spent within 4 years, they may be spent on carbon offsetting measures outside the area of the four authorities to avoid them expiring.

8.7 Application forms for the fund

We have found 3 examples of application forms published by local authorities for people to access carbon offset funding.

Council and link to application forms	Approach and content
---------------------------------------	----------------------

London Legacy Development Corporation ⁵⁹	Application form contained within SPD. Single application form with sections for the following eligible project types: <ul style="list-style-type: none"> • Energy efficiency • Renewable energy • Embodied energy • Behaviour change
Camden Climate Fund ⁶⁰	Online application forms within their climate fund website. Separate application forms for: <ul style="list-style-type: none"> • Household fund • Community energy fund • Business fund
Merton	Draft application form for all carbon offset projects, with marking criteria. Eligible project types not defined. The application form is in draft and therefore is not available online. It is attached at Appendix C.

Table 8 - Carbon offset fund application forms

The applications process should be proportionate to scale of the funding provided, the carbon emissions secured and the likelihood of carbon savings being delivered. For instance whilst a council department should be required to apply to the fund to deliver a domestic retrofitting and fuel poverty alleviation programme, and would be assessed against all the criteria listed in section 8 (as amended), an individual household benefitting from that programme should go through a much simpler process.

8.8 Monitoring of carbon offset projects

The tests set out in respect of planning obligations⁶¹ (that obligations must be necessary, directly related to the development; and related in scale and kind to the development) mean that projects should be monitored so that the authorities can show an audit trail demonstrating the carbon savings that occurred.

⁵⁹ Carbon Offset Local Plan - Supplementary Planning Document (including application forms to the fund) - www.queenelizabetholympicpark.co.uk/-/media/lldc/planning/supplementary-planning-documents/carbon-offset-spd-august-2016.ashx?la=en

⁶⁰ Camden Climate Fund – application forms <https://www.camden.gov.uk/ccm/content/environment/green/saving-energy-and-keeping-warm/CCF/?page=3#section-3>

⁶¹ Paragraph 122, The Community Infrastructure Levy Regulations: www.legislation.gov.uk/ukdsi/2010/9780111492390/regulation/122

We asked the local authorities we interviewed how CO2 savings were identified and whether standard assumptions were used or post installation monitoring was carried out of actual carbon savings?

Of the nine Local Authorities who answered this question, six advised that standard assumptions were used and only two required post-installation monitoring.

Camden kept an audit trail from application through to installation for each case, with a database recording details of all installations, grant awards and associated estimated carbon savings.

Waltham Forest ask applicants for monitoring reports to be provided at agreed intervals as per their funding agreement and post-completion, and will ask them to report against main objectives of the project. They currently plan to ask for monitoring reports for up to 5 years, though it does not appear that this has been done yet.

Merton stressed that there's a need to demonstrate that some carbon has been saved, but the monitoring should be proportionate to the contribution. At a carbon cost of £60 or £95 a tonne, Merton Council's view is that "in-depth monitoring requirements could easily kill a scheme". For this reason Merton Council are of the view that such a scheme should not insist on funded projects achieving carbon equivalence of 1:1. Merton also stressed how lightweight the monitoring of the energy performance of all new developments is, with often a 50% margin between predicted and actual performance.

Our view is that bearing in mind Merton's comments, a proportionate approach should be set out to monitoring carbon savings, according to the scale of funding and scale of the project:

- Large scale retrofitting projects run by the council should maintain records of the number and location of properties retrofitted, with standard assumptions being given for carbon savings by project type allowing them to report carbon savings quarterly, but post installation monitoring should not be required. Larger projects to retrofit council buildings should report real life carbon savings.
- Small scale retrofitting projects carried out by third parties (for example retrofitting community buildings) should provide evidence that the works were carried out, with standard assumptions being applied for carbon savings
- Large and medium scale renewable energy projects (for example community energy projects) should monitor real life carbon savings.

8.8 Summary of recommendations from Section 8. Mechanisms for administering the carbon offset regime

- Direct contributions into a ring-fenced carbon offset fund to provide maximum flexibility and minimise administrative costs, rather than having to specify actual projects funded within individual legal agreements.
- Consider operating a shared carbon offset fund across all the WoE authorities and maximise the benefit of sharing skills and expertise
- The most appropriate administration mechanism will depend on the range and type of projects that are deemed to be eligible for funding and the scale of the fund. If a large number of applications are expected from the community for relatively small projects, for instance for energy retrofitting projects, there may be benefits to outsourcing the day to day administration of the fund, with the provider reporting to a panel of representatives from the four authorities.
- Given the high level of community activity related to energy in the region which should be harnessed and encouraged through the carbon offset fund, this suggests out-sourcing day-to day administration.
- Require every project or programme of projects funded (including Council projects) to go through an application process and be assessed against published criteria derived from the legal tests relating to S. 106 agreements.
- Applications to the fund should be proportionate to the scale of the funding provided the emissions to be saved and the likelihood of carbon savings being delivered. The application process should be as simple as possible for residents/ communities/ businesses.
- Work with a partner who is already working closely with the council on fuel poverty projects allows funding to be combined to assist vulnerable households who would otherwise not be able to afford to carry out retrofitting measures.
- Treat the first funded projects as pilots, and ensure you collect good monitoring data and feedback. Don't invest too much up front in the scheme governance until you have sufficient offset funds to justify this. Try to use any relevant existing boards to manage the initial funds (e.g. wider S106 spending)
- Estimate what the potential offset revenues might be – along with the phasing of income. The structure set up to deliver projects should then be matched to the scale of the potential fund.
- Follow your own local and political priorities for energy. You don't have to target 'like-for-like' CO2 reductions if you have other priorities.
- As in-depth monitoring carbon savings from projects could easily take up a large proportion of the funding available, adopt a proportionate approach should be adopted to monitoring according to the scale of funding and scale of the project, with large projects reporting actual carbon savings and standard assumptions being applied to small projects.

9. Draft wording for S106, payment timescales and supporting documentation

9.1 Draft wording for Section 106 agreements / Unilateral undertaking

We attach at appendix D and E examples of Section 106 agreement and unilateral undertakings used in Merton Borough Council and Islington Council respectively to secure carbon offset payments.

The key differences between unilateral undertakings and full planning obligations are that unilateral undertakings bind only the landowner(s), require less involvement from the council's legal team, and are generally only used for simple money payments, whereas planning obligations can be used to require the council to undertake required actions. In the context of carbon offset payments, this means that a unilateral agreement could secure the payment of carbon offset payments to the council by a certain trigger point, but could not for instance bind the council to return the money if it hadn't been spent by a certain point, as would be possible through a full planning obligation.

On smaller schemes (requiring offsite carbon abatement but where a full Section 106 legal agreement would not otherwise be required) it would be advantageous to encourage the submission of a completed unilateral undertaking with the planning application itself (this could be made a validation requirement, along with a fully completed energy statement), in order to avoid introducing further delays to the process.

It would also be possible to include formulas within the section 106 agreement which would provide the basis for subsequently calculating a contribution, see the wording at Appendix F sourced from the London Legacy Development Corporation. This would be suitable in cases where an outline application is submitted, where the detailed design of the development and its energy performance are matters reserved for latter approval.

9.2 Payment timescales

Reviewing the literature, 45% of the authorities we found details on required contributions to the carbon offset fund to be paid on the commencement of development, with 33% requiring payment on completion of development. The remaining two authorities (Ashford and Hackney) allow payment on completion and in phases on large projects.

A 2017 cabinet report from the London Borough of Merton specifically discusses the timing of carbon offset payments, commenting

While the opportunity and level of funding has increased, the delivery of carbon saving projects in Merton is currently limited. Carbon offset funding is typically collected upon completion/occupation of the scheme, so the timescales for receiving funding are uncertain. This makes the forward planning and strategic delivery of carbon offset projects extremely challenging.

The cabinet accepted the recommendation that instead carbon offset funding be collected at commencement. Our interview with Merton touched on the same subject:

We started talking to developers suggesting we collect 50% on commencement, and 50% on completion, the theory being that developers would have a continued financial incentive to

add in additional carbon savings. Actually, with the volumes of cash we're talking, even if they were able to secure additional carbon savings they'd save more money by not having to employ lawyers and planners to renegotiate. The developers we spoke to didn't want more processes to discharge (conditions). They just wanted to pay the money at the beginning or the end.

For the majority of schemes there is a very strong logic for requiring payment on commencement of development. The payment is required to abate carbon generated through the occupation of the development off-site, but most carbon offset projects will themselves need time to be planned and implemented from the time that funding is secured. It is reasonable therefore that where inadequate carbon reduction has taken place on-site, payments should be made upon commencement of development, to allow the off-site abatement of emissions to happen in parallel with the generation of the emissions themselves. Following the same principle, it is reasonable that for very large, phased projects being developed over an extended timespan it would be reasonable to allow payments to be made in proportionate tranches on the commencement of each phase of development.

9.3 Draft conditions

We have found some examples of conditions relevant to securing carbon emission reductions and carbon offset payments attached at Appendix G. As set out in our commentary on the right hand side of this matrix, the examples could be improved. Therefore, using these as examples, the guidance within the Bristol City Council practice note⁶² and the anticipated structure of emerging local plan policies, we've drafted the following condition wording. The suggested condition wording will need further work and refinement, and it may be possible to simplify the wording if a supplementary planning document or other guidance is published, for example if Bristol's practice note is revised.

Condition wording, purpose and source	CSE commentary
<p>Outline consent - Carbon emissions reductions to be secured from reserved matters applications + documentation to be included</p> <p>Each application for the approval of Reserved Matters shall be accompanied by an energy statement for the written approval of the Local Planning Authority and no Development shall be commenced pursuant to the relevant Reserved Matters approval until the energy statement has also been approved. Each energy statement shall to the extent relevant to the subject matter of the Reserved Matters application detail how the development complies with the requirements of policy __ of the __ Local Plan and the prevailing development plans policy at the time. as follows:</p> <ul style="list-style-type: none"> - A minimum of 10% reductions in carbon dioxide emissions beyond Part L of the 2013 Building Regulations, achieved through fabric energy efficiency improvements - and - An overall 35% /50% reduction in carbon dioxide emissions beyond the requirements of Part L of the Building Regulations, achieved through the installation of renewable and low carbon energy generation on site. 	

⁶²Bristol City Council (2012) Climate Change and Sustainability Practice Note -

www.bristol.gov.uk/documents/20182/239435/Climate+Change+and+Sustainability+Practice+Note+%28December+2012+v2%29.pdf/322600c7-e3bf-4cae-92fd-12f14c966a3e

<p>- To full zero carbon (<i>regulated / regulated and unregulated</i>) through off-site carbon abatement.</p> <p>The energy statement shall set out:</p> <ol style="list-style-type: none"> The Part L Building Regulations compliant “Baseline” including details of energy demand (kWh pa), regulated CO2 emissions (kg pa) using the Standard Assessment Procedure (residential) or SBEM (non-residential) and unregulated emissions Proposed scheme after energy efficiency measures and CHP (“Residual” energy demand & emissions) including details of energy demand (kWh pa) and regulated CO₂ emissions (kg pa) using the Standard Assessment Procedure (residential) or SBEM (non-residential) Residual energy demand (kWh pa) and CO₂ emissions (kg pa) after on-site renewables, and full plans and details of the renewable energy plant to be installed including installed capacity (kW) Residual energy demand (kWh pa) and CO₂ emissions (kg pa) and unregulated emissions to be offset via financial contribution to Carbon offset fund <p>The development shall be carried out in full accordance with the details agreed.</p> <p>Reason: To ensure that the development achieves the energy performance standards and carbon reductions required by policy __ of the __ Local Plan, and the 2008 Climate Act, in the interests of mitigation of climate change and achieving sustainable development.</p>	
<p>Full consent – missing energy statement</p> <p>Prior to the commencement of development, an energy statement shall be submitted to and agreed in writing by the Local Planning Authority. This shall detail how the development complies with the requirements of policy __ of the __ Local Plan as follows:</p> <ul style="list-style-type: none"> - 10% reductions in carbon dioxide emissions beyond Part L of the 2013 Building Regulations, achieved through fabric energy efficiency improvements - and - An overall 35% reduction in carbon dioxide emissions beyond the requirements of Part L of the Building Regulations, achieved through the installation of renewable and low carbon energy generation on site. - To full carbon zero (<i>regulated unregulated?</i>) through off-site carbon abatement. 	<p><i>Require contributions to the Carbon Offset fund to be worked out through the planning application stage within a detailed energy strategy. Better yet, raise your zero carbon policies and the potential for contributions to off-site carbon abatement with developers at the pre-app stage, in order to influence design decisions and maximise carbon savings through building fabric and integrated renewables. Raised early, these additional liabilities can also be</i></p>

<p>The energy statement shall set out:</p> <ol style="list-style-type: none"> a. The Part L Building Regulations compliant “Baseline” including details of energy demand (kWh pa), regulated CO₂ emissions (kg pa) using the Standard Assessment Procedure (residential) or SBEM (non-residential) and unregulated emissions b. Proposed scheme after energy efficiency measures and CHP (“Residual” energy demand & emissions) including details of energy demand (kWh pa) and regulated CO₂ emissions (kg pa) using the Standard Assessment Procedure (residential) or SBEM (non-residential) c. Residual energy demand (kWh pa) and CO₂ emissions (kg pa) after on-site renewables, and full plans and details of the renewable energy plant to be installed including installed capacity (kW) d. Residual energy demand (kWh pa) and CO₂ emissions (kg pa) to be offset via financial contribution to Carbon offset fund <p>The development shall be carried out in accordance with the details so agreed and shall be retained as such thereafter.</p> <p>Reason: To ensure that the development achieves the energy performance standards and carbon reductions required by policy __ of the __ Local Plan, and the 2008 Climate Act, in the interests of mitigation of climate change and achieving sustainable development.</p>	<p><i>factored into developers’ land valuation processes, and come off the value offered to landowners, making negotiations simpler with the development industry.)</i></p> <p><i>Most of the time therefore you should refuse applications where an energy statement is missing, or even better refuse to validate them until it is submitted, however there may be cases (particularly during the transition where the policy is bedding) when this might be used.</i></p> <p><i>The final sentence of the condition is the only clause which requires the renewable energy plant to be installed and used. I’m not sure that it’s strong enough. However the clawback mechanism I’m suggesting in the legal agreement would provide a financial incentive to maintain the standards predicted.</i></p>
<p>Implementation of agreed carbon reduction measures + renewable energy aspects and monitoring</p> <p>Prior to the occupation of the development, a statement shall be submitted to and approved in writing comparing the predicted energy performance of the development (set out in the approved energy statement) and the as built performance of the completed development, comprising:</p> <ol style="list-style-type: none"> a. The Part L Building Regulations compliant “Baseline” including details of energy demand (kWh pa), regulated CO₂ emissions (kg pa) using the Standard Assessment Procedure (residential) or SBEM (non-residential) and unregulated emissions b. “Residual” energy demand & emissions of the as-built development after energy efficiency measures and CHP, including details of energy demand (kWh pa) and regulated CO₂ emissions (kg pa) using the 	

<p>Standard Assessment Procedure (residential) or SBEM (non-residential)</p> <ul style="list-style-type: none"> c. "Residual" energy demand and CO₂ emissions after on-site renewables, and confirmation that the renewable energy plant has been installed, such as certification through the Microgeneration Certification Scheme (MCS) d. Confirmation of the residual energy demand and CO₂ emissions to be offset via financial contribution to Carbon offset fund <p>The development hereby approved shall not be occupied until the statement is submitted to and approved by the Local Planning Authority, and until the renewable energy plant is generating renewable or low carbon electricity or heat and connected to the building and / or heat or electrical grid, as specified in the energy statement.</p> <p>Reason: To ensure that the development achieves the energy performance standards and carbon reduction standards described in the application, as required by policy __ of the __ Local Plan, and the 2008 Climate Act, in the interests of mitigation of climate change and achieving sustainable development.</p>	
<p>Informative relating to S. 106 clawback clauses (carbon offset fund)</p> <p>Where the carbon emission savings set out in the agreed energy statement (achieved through the fabric performance of the development and the integration of renewable energy) do not achieve the standards set out in the approved energy statement, the planning obligation requires that additional payments are made into the West of England carbon offset fund to pay for the residual carbon savings to be achieved off-site.</p>	<p><i>A decision is to be taken here as to whether monitoring / enforcement (and the S. 106 clawback) is to be carried out prior to occupation, or prior to occupation and after occupation (e.g. after 12 months). I think a pragmatic approach might be to monitor and enforce (and clawback additional carbon offset payments) prior to the occupation of the building, at least then the developer is still around to take action against.</i></p> <p><i>The suggested condition requiring monitoring after 12 months is more about tracking the success of the policy. I'm not convinced its proportionate to continue monitoring beyond 12 months. What</i></p>
<p>Monitoring</p> <p>Within 18 months of the development being first occupied, a statement shall be submitted to and approved in writing by the local planning authority comparing the as-built and as-occupied performance of the development over a continuous calendar year, comprising:</p> <ul style="list-style-type: none"> a. The in-use energy demand & emissions of the development after energy efficiency measures and CHP, including details of energy demand (kWh pa) and regulated CO₂ emissions (kg pa) using <i>(insert methodology here)</i> b. Proof of the in-use energy generation from the renewable energy plant fitted, comprising <i>(insert</i> 	

<p><i>details here)</i></p> <p>Reason: To ensure that the development achieves the energy performance standards and carbon reduction standards described in the application, as required by policy __ of the __ Local Plan, and the 2008 Climate Act, in the interests of mitigation of climate change and achieving sustainable development.</p>	<p><i>would 5 years monitoring demonstrate that a year's monitoring wouldn't?</i></p>
--	---

Table 9 - Suggested planning conditions, drafted by CSE.

9.4 Summary of recommendations from Section 9

- **Require contributions to the Carbon Offset fund to be worked out through the planning application stage within a detailed energy strategy. Ideally raise your zero carbon policies at pre-app stage, in order to maximise their influence on design decisions and the carbon savings achieved through building fabric and integrated renewables.**
- **Require the submission of an energy statement as a validation requirement for the submission of planning applications. Where no energy strategy is submitted, consider refusing permission. If there is a wish to approve the application anyway (or in the transition period, for instance, applying newly adopted policies to already submitted applications) secure the submission of an energy strategy using a pre-commencement planning conditions.**
- **In the majority of cases (excluding small sites where cash-flows are a problem and very large sites where it is reasonable to phase contributions in parallel with the build programme), assume that carbon offset contributions are to be paid prior to the commencement of development.**
- **Include within planning conditions a requirement for as-built SAP measurements to be submitted, to ensure predicted performance standards are achieved. Linked to this, include within the S. 106 agreement the ability to claw back additional carbon offset contributions where the predicted energy performance standards are not achieved.**
- **For smaller scale, simpler applications where only a cash payment needs to be made, maximise the use of unilateral undertakings, and publish template agreements for use.**

10. Supporting text for carbon offset, for insertion within Local Plan documents

We have prepared the following draft supporting text, which may require modification according to your finalised policy wording:

“Contributions will be paid to fund the abatement of any remaining CO2 emissions off-site within the authority area.

Planning applications (and pre-application submissions) should include an Energy Statement setting out full SAP calculations, the amount of CO2 to be offset over the estimated building life (30 years) and the resulting financial contribution, to be calculated using the formula below. For all major developments the financial contribution is based on an established price (currently set at £95). The carbon price will be index linked and reviewed on a five-yearly basis.

$$\text{shortfall in CO2 tonnes} \times \text{carbon price (currently £95)} \times 30 \text{ years}$$

Cash payment in lieu will be accepted only if it can be demonstrated by evidence to the satisfaction of the council that it is technically unfeasible to deliver this reduction on site. New development is expected to get as close as possible to zero-carbon on-site through fabric performance and the inclusion of renewable energy, rather than relying on offset fund payments to make up any shortfall in emissions. However, offset funds do have the potential to unlock carbon savings. The contributions will be paid into the West of England (or LPA specific) Carbon Offset Fund, a ring-fenced fund for off-site carbon emission reduction projects.

Where the planning agreement consists only of the transfer of funds, developers should submit a completed, signed unilateral undertaking with their application, using the template on the council’s website. In other cases the contribution shall be secured via a section 106 planning obligation, again using the template on the council’s website. In the case of large schemes with phased delivery over an extended timespan, the concurrent payment of carbon offset contributions would be considered reasonable. In other cases, the contributions should be provided on commencement of development. This is to ensure that where insufficient carbon reductions have been secured on-site, off-site carbon abatement happens in step with the generation of the emissions themselves, so far as is possible.

Funding is collected and managed by the West of England Authorities for carbon reduction / sequestration projects such as:

1. Domestic energy efficiency retrofit projects run by the council: for example loft insulation / cavity wall insulation / external wall insulation / boilers and heating controls
2. Energy advice service run or commissioned by the council, in conjunction with the installation of minor carbon saving measures: e.g. LED lightbulbs, draught proofing and secondary glazing
3. Non-domestic retrofitting - Energy Efficiency Improvements to Council Buildings and to Community Buildings
4. Community owned, domestic and commercial renewable energy projects
5. Council run renewable energy installations.

This fund will be open to internal council departments, residents, not-for-profit organisations, and community groups. All applications to the fund including programmes from council departments will be assessed against criteria including:

- deliverability / feasibility
- timescale for delivery / completion (ideally delivery within 12 months. All projects to be delivered within 5 years.)
- value for money / cost effectiveness (£ per tonne CO2)
- wider benefits: community / social / economic
- scale of carbon savings
- additionality, incorporating innovation and strategic importance, and the degree to which proposals support the transition to a low carbon economy
- lifespan of carbon reduction measures (ideally 30 yr lifespan)
- projects to be located within the area covered by the four west of England local authorities

The application forms, full list of finalised selection criteria, process and post-implementation monitoring requirements will be published on the Council’s website. Applications to the fund will be assessed by a panel made up of Council staff and appointed external experts, and the fund will be monitored through the authority’s-monitoring report.”

10.1 Potential content of Supplementary Planning Guidance or informal guidance note

Arguably the complexity of Carbon offsetting could justify the preparation of Supplementary Planning guidance (as has been prepared in Ashford Council and the London Legacy Corporation), although we note that other authorities such as Kingston upon Thames, Waltham Forest and Westminster have approached this via informal guidance notes on their websites. The timescales and budget allowed mean that the preparation of such guidance is outside of the scope of this project, however we would suggest that the following guidance is provided in some form:

Purpose and content
Planning Application assessment
- Resources to assist developers and the council to calculate the residual carbon to be offset and the offset payments to be made including excel worksheet and worked examples, to enable case officers and developers to calculate whether a project is policy compliant, and the size of the carbon offset payment payable, if any. See the example excel worksheet at Appendix H, based on the London Plan policy requirements and a carbon price of £60 per tonne, which we created for a previous project.
- Template Unilateral Agreement / Template Planning Obligation text.
Applications to the Carbon offset fund and Administration of the Carbon Offset Fund
- Application forms for applications to the fund (different application forms may be required for the different project types.)
- Eligibility Criteria and assessment approach for Carbon Offset projects
- Template contract for carbon offset project, detailing project type and location, funding and funding tranches, timescale to completion, reporting requirements. (Large scale projects and grants only)
- Administration and strategic management of the fund
Monitoring of carbon offset projects
- Large scale projects and grants only - update report template, monitoring steps towards completion of carbon offset project and release of funding

- Large scale projects and grants only - Project closedown report – confirmation of completion, costs and delivery of CO2 savings
- Approach to annual monitoring of fund as a whole
Update on portfolio of carbon saving projects – carbon savings achieved, cost per measure type. Review of carbon cost, eligible measures and application process.

Table 10 - content of supplementary planning guidance or informal guidance relating to carbon offset regime