



business

ARUP

Blueprint for a
Business-led **UK**
**COLLECTIVE
OFFSETTING
FUND**

July 2024

An aerial photograph of a rural landscape. The foreground and middle ground are dominated by vibrant green fields, some of which are divided into smaller plots by hedgerows. A small village with several buildings, including a church with a tall spire, is nestled in the middle ground. The background shows more rolling hills and fields, with a few more buildings visible in the distance. The overall scene is peaceful and scenic, with a mix of natural and built environments.

Contents

Foreword	3
Executive summary	4
Chapter 1 – Introduction	6
Chapter 2 – Offsetting Landscape	9
Chapter 3 – UK Carbon Offset Fund	13
Chapter 4 – London Local Planning Authority Offset Funds	20
Chapter 5 – Conclusion and next steps	22
Authors / Contributors	24



Foreword

For the UK to transition towards a net zero carbon future and restore our natural environment, every sector of the economy must dramatically decarbonise while enhancing our capacity to remove existing greenhouse gas (GHG) emissions from the atmosphere.

It is heartening to see the urgency to decarbonise is now well understood, with many UK organisations already taking significant steps towards achieving this goal. However, the equally crucial task of removing GHG emissions from the atmosphere has historically received less attention. Encouragingly, this is beginning to change as more UK organisations actively seek ways to support GHG removals, in alignment with the “Oxford Principles for Net Zero Aligned Carbon Offsetting”.

Many UK organisations find they cannot remove existing emissions within their own assets or value chains and must turn to the Voluntary Carbon Market (VCM) to purchase and retire offset credits. But there are not enough schemes to meet current market demand, let alone the projected needs to limit global temperature rise to 1.5°C.

When BusinessLDN and Arup set out to address this issue, it became clear that traditional approaches to purchasing carbon credits from the VCM needed disruption. The well-publicised shortcomings of the VCM have led to the terms “offsetting” and “carbon credits” being associated with greenwashing. There must be a better way to leverage the VCM to generate high-quality UK credits that combat

climate change and deliver tangible benefits to local communities and the environment.

To this end, BusinessLDN and Arup convened over 50 UK organisations—from local government to large private enterprises and emerging carbon offset schemes—with the ambition of positively disrupting this market. From these sessions emerged an initial blueprint for a collective approach to aggregate investment into UK offsetting schemes, providing the necessary finance to scale and deliver future credits back to UK organisations. We refer to this as the **UK Collective Offsetting Fund**.

We believe this represents an exciting opportunity for the UK. For the Fund to be successful, it needs to be simple and accessible to a wide range of UK organisations, and support offsetting schemes that promote real climate action while enhancing social value and biodiversity.


The UK cannot afford to wait any longer. UK organisations must find a responsible mechanism to address their annual residual emissions. By supporting a collective approach, businesses can confidently join forces to scale their impact far beyond individual capabilities.



BEN SMITH

Director – Climate and
Sustainability Services, Arup

Executive summary



This report sets out the benefits of adopting a collective approach to carbon offsetting, setting out a blueprint for creating a business-led UK Collective Offsetting Fund. The Fund would enable businesses to offset their residual emissions with confidence in UK offsetting schemes and for the UK to benefit from investment in climate action.

Driven by an increasing focus on ESG, many UK organisations are committing to actively reducing their carbon footprint in line with limiting global temperature to 1.5°C.

Despite climate leading organisations' continued efforts to eliminate their greenhouse gas (GHG) emissions, in most cases, the means to avoid emissions entirely are not yet available or depend on external factors that unfortunately cannot be influenced by individual businesses. Therefore, there remains an element of residual GHG emissions which need to be removed from the atmosphere. To address these hard-to-abate or residual emissions, and support climate ambitions, organisations have already started purchasing offset credits through the Voluntary Carbon Market (VCM).

BusinessLDN and Arup have explored ways that private sector collective investment can be most effectively used in the VCM to take responsible climate action. What started as a London-focused project, designed to leverage the capital's leadership role on ESG on the back of its ambitious 2030 net zero target and existing "offsetting" mechanism, quickly broadened in scope to become a more ambitious UK-wide project.

The VCM can be an important mechanism which offers multiple benefits if developed, delivered and monitored in the right way. It can help to address residual emissions and spur investment in transformative climate positive solutions while delivering social, economic and environmental benefits.

There are, however, concerns with the current offsetting process, particularly around the credits' effectiveness and credibility. Moreover, there is a tendency for UK organisations to purchase credits from schemes from overseas, mostly due to the lack of credible offsetting schemes that exist at scale across the country, slowing down domestic investment and the UK's ability to meet its climate targets.

A bold new opportunity exists for UK organisations to work collectively to offset their GHG emissions in the UK, supporting individual businesses climate goals whilst leveraging the potential for the VCM to deliver wider co-benefits. This report proposes this could be done by establishing a **business-led UK Collective Offsetting Fund** which would enable aggregated investment into high quality and impactful UK carbon offset schemes.

The Fund

The Fund would be open to UK organisations wishing to purchase UK offsets to address their residual emissions as part of their climate reporting. UK organisations participating in the Fund would need to:

- 1 Meet certain prerequisite requirements to be accepted into the Fund, including transparent reporting of emissions;
- 2 Select from a portfolio of predetermined UK schemes covering avoidance, reduction or removal carbon offset schemes to purchase credits from;
- 3 Wait for their purchased credits to mature, depending on the selected portfolio; and
- 4 Use these certified credits to demonstrate compliance with corporate reporting requirements against their climate related commitments.

The approach of a collective Fund can offer multiple benefits to UK organisations (purchasers), UK offsetting schemes (carbon credit providers) and the UK. By engaging with the Fund, UK organisations can demonstrate commitment to environmental responsibility and support wider climate goals while benefitting local communities. By aggregating UK organisations investment, the Fund offers near and long-term funding for impactful offsetting schemes in the UK, helping to meet current and future climate goals.

This report recognises that UK organisations cannot do this alone. Any engagement with the Fund should

be collaborative and supportive of local and national government programmes to ensure action is aligned with wider strategic initiatives.

This report also looks at ways to enhance a form of “offsetting” that already takes place in the UK, which is linked to the planning application process. Specifically in London, the London Plan requires that any shortfall to meet zero operational emissions by new major development must pay an “offset” tax to each Local Planning Authority’s (LPA’s) carbon offset fund through a cash-in-lieu contribution. Missed opportunities have been acknowledged in how LPAs are collecting and spending these funds, mostly due to reduced resourcing capacity, difficulties in identifying viable decarbonisation projects or internal governance limitations.

In alignment with the principles of collective action of the Fund proposition, a further opportunity has been identified.

In the near term:

- LPAs could look to pool their available funds to establish collective offsetting funds across authorities or sub-regionally to deliver a long-term portfolio of decarbonisation projects in local communities at scale.


In the longer-term, LPAs could choose to endorse and engage with this report’s proposed Fund by:

- directing monies into the Fund to help drive early investment into a portfolio of decarbonisation projects with higher social value and wider benefits for the local area; and/or

- proposing additional local, high quality offsetting schemes within their authority for investment and consideration by the Fund.

These options should ensure a transition from the current carbon tax mechanism to an instrument that generates certified offset credits for local authorities and developers.

The UK Collective Offsetting Fund offers a unique opportunity for collaboration between businesses, offsetting schemes and local authorities to deliver tangible economic, environmental and social benefits for the whole of the UK.



This is a call to action to UK organisations to work together to help improve and maximise the benefits of carbon offsetting in the UK through the establishment of the UK Collective Offsetting Fund.

Chapter 1

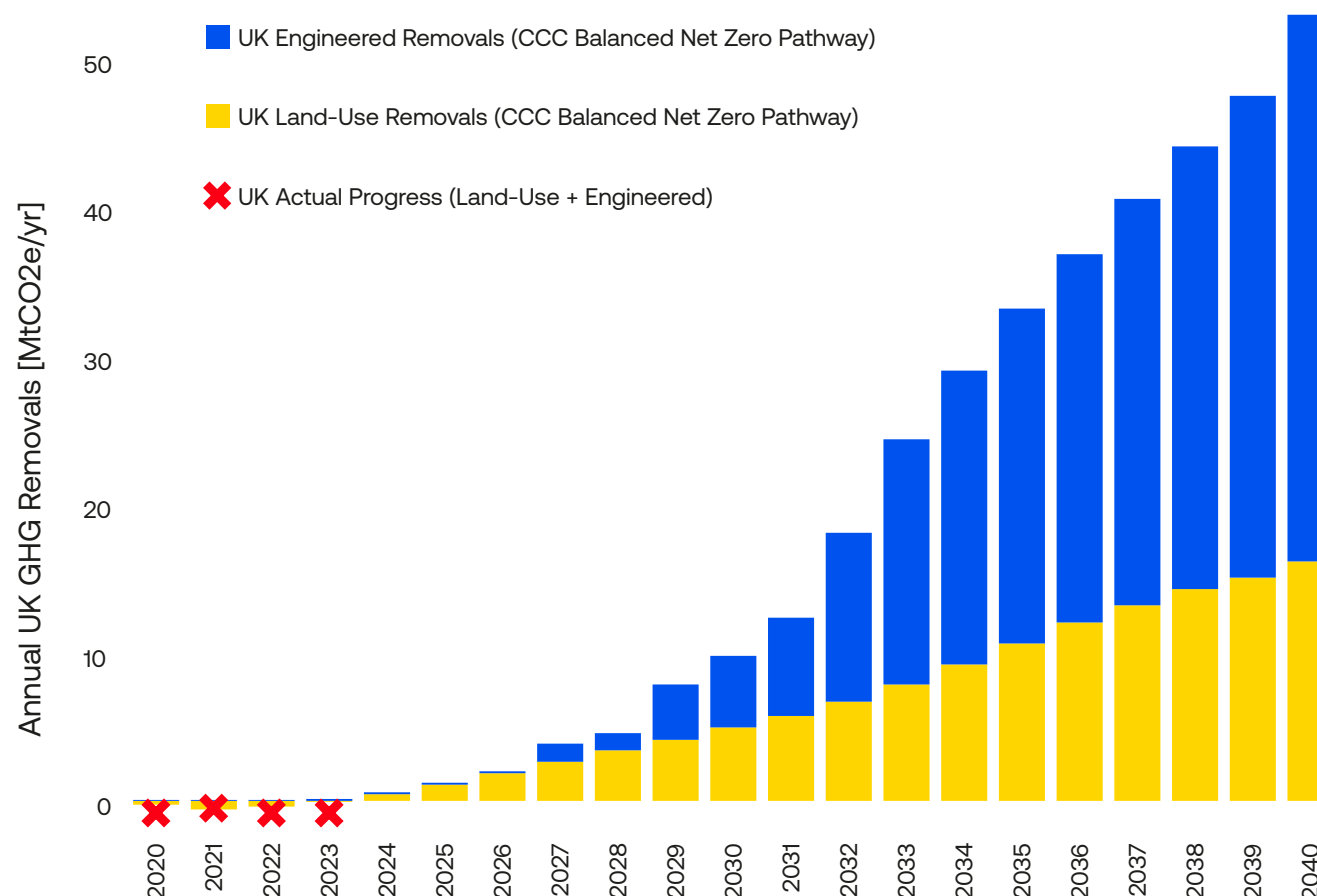
Introduction

The challenge

A drastic reduction in Greenhouse Gas (GHG) emissions and a simultaneous increase in the removal of residual GHG emissions from the atmosphere is required to limit global temperature to below +1.5°C since pre-industrial levels. In response to this global challenge, the UK set its own climate target – reaching net-zero emissions by 2050 – with London being even more ambitious and aiming for carbon neutrality by 2030.

The Climate Change Committee (CCC) forecasts that by 2050 the UK will need to annually remove a minimum volume of 90 million tCO₂e from the atmosphere¹ to meet its net-zero target. Between 2020 and 2050 the total volume of GHG removed by the UK will need to exceed 1,300 million tCO₂e. However, as shown in Figure 1, based on numbers from the CCC 2023 Progress Report, the UK is already cumulatively 1.5 million tCO₂e behind plan for removals and therefore needs to get back on track by increasing its annual capacity to remove GHG emissions from the atmosphere.

Figure 1 – CCC 2023 Annual Progress Report – GHG Removals²



Source: The Sixth Carbon Budget, The UK's path to Net Zero, Climate Change Committee, December 2020

To help address this challenge, UK organisations³ are setting ambitious climate action plans to reduce their carbon footprint (operations and value chain) and are offsetting part of their residual emissions.

To facilitate organisations removing GHG emissions outside of their own assets and value chain, the Voluntary Carbon Market (VCM – see Chapter 2) has been developed to support the purchasing of carbon offset credits. One certified carbon credit, or offset, is the equivalent of 1 tCO₂e (one tonne of carbon dioxide equivalents) removed, reduced or avoided. Purchased offset credits can then be used to support a UK organisation's climate claims. There are two primary concerns with this process.

Firstly, most UK organisations purchase emission avoidance and reduction credits from schemes outside of the UK. While this decision is made for a variety of reasons, one prominent factor is the lack of credible UK offsetting schemes that exist at scale.⁴ This trend hinders domestic investment and the development of a strategy that would otherwise increase carbon removals in the UK.

Secondly, the VCM has been criticised for the lack of self-regulation and external oversight which in turn raises concerns about the credits' effectiveness, credibility and additionality (see Chapter 2 for more detail).

However, the VCM is an important mechanism, helping to address residual emissions and

creating a fungible value to GHG emissions removed and avoided/reduced from the atmosphere. It spurs investment into renewable energy, energy efficiency, nature-based solutions and other emerging removal technologies while also, in some instances, delivering social, economic and environmental co-benefits to local communities and ecosystems.

The opportunity

BusinessLDN and Arup have explored ways that private sector collective investment can be most effectively used in the VCM to take responsible climate action. What started as a London-focused project, designed to leverage the capital's leadership role on ESG on the back of its ambitious 2030 net zero target and existing "offsetting" mechanism, quickly broadened in scope to become a more ambitious UK-wide project.

With demand for offsets expected to grow, as more UK organisations address their residual emissions and that within their value chain, there is an opportunity to evolve current offsetting practices while addressing concerns about the VCM and delivering meaningful climate action.

To that end, this report **sets out a blueprint for how UK organisations could collectively invest in UK offsetting schemes by establishing a business-led UK Collective Offsetting Fund.**

The advantages of such an approach are manifold

- **High quality credits:** the Fund would provide assurance to UK organisations that purchased carbon credits are of high quality, both in terms of their climate impacts and wider co-benefits.
- **Co-benefits:** it would unlock multiple social and environmental benefits to local communities while also boosting economic growth.
- **Collective action:** by pooling resources and efforts, UK organisations would enable larger-scale carbon offset schemes in the UK, with more significant impact, to grow. Group participation would reduce costs and complexity while the diverse nature of stakeholders involved could lead to innovative solutions and stronger advocacy efforts on UK carbon offsetting and broader climate action.
- **Local offsetting:** focusing on local offsetting opportunities would facilitate investments in public benefit schemes with increased social value that may struggle for funding through conventional means. It is a vital means to demonstrate tangible benefits.
- **Investment in long-term UK decarbonisation:** to be able to expand the current limited market of certified UK offsetting schemes and cultivate schemes with long gestation periods, it is imperative that investment is made now. This would yield the required volume of carbon credits over the next decades while generating jobs for the UK.

Aligning these benefits with the UK's wider climate agenda, the Fund could support broader policy objectives around biodiversity, social value and creating skilled jobs and, crucially, in a constrained public financial environment, help to fund these outcomes from the private sector.

The report

This report outlines a blueprint for establishing a business-led UK Collective Offsetting Fund.

Throughout the winter of 2023, extensive discussions were held with over 50 representatives from academia, business, London government and UK offsetting schemes to explore the opportunity for a new, collective, business-led approach to offsetting. While discussions initially focussed on action that could be solely taken in London it soon became clear that a national solution better suited the problem.

A UK-wide approach is needed as GHG removal schemes are unlikely to be effective at the scale needed just within an urban environment, particularly those associated with nature-based solutions.

The report is structured as follows: Chapter 2 explains the current offsetting landscape; Chapter 3 sets out a blueprint for establishing the UK Collective Offsetting Fund, including the benefits of this approach; Chapter 4 highlights how a form of offsetting already takes place through London's planning system and recommends improvements to the process, which could be linked to the UK Collective Offsetting Fund; and finally, Chapter 5 sets out a call to action and next steps.



Chapter 2

Offsetting Landscape

What is offsetting?

Offsetting is a mechanism used to compensate for GHG emissions released into the atmosphere. It works through purchasing a carbon credit from a scheme that has durably removed (preferred) or avoided/reduced an equivalent volume of GHG emissions from the atmosphere elsewhere.

One carbon credit, often referred to as an offset, is the equivalent of 1 metric tonne of CO₂e. The typical offsetting process for a UK organisation follows these steps:

- **Reduce emissions:** within an organisation's own operations and value chain.
- **Calculate emissions:** estimate or measure the residual GHG emissions generated.
- **Purchase offsets:** from verified and certified⁵ offset schemes from the VCM to address these residual emissions.
- **Retire and claim:** the offset is then retired so it cannot be sold or used by others. This retired credit can then be used to support an organisation's climate reporting.

Before considering, and ultimately using offsetting mechanisms, it is expected that UK organisations must first seek to dramatically reduce their residual emissions in line with the emissions management hierarchy.⁶

Offsetting typologies

Offsetting schemes can be broadly grouped into three main typologies:

- **Avoidance offsets:** these are based on the estimated GHG emissions that may have happened and have been “avoided” due to the investment in and subsequent development and operation of an avoidance scheme. Avoidance offsets typically come from schemes that protect and preserve existing carbon sinks, for example in forests or peatland, such as prevention of deforestations or rewilding methods such as wetland conservation.
- **Reduction offsets:** these are typically associated with schemes that introduce efficiencies in fossil fuel use, such as social housing retrofits, or GHG emissions release from agriculture or waste processing.
- **Removal offsets:** these are associated with schemes that physically remove and store GHG emissions from the atmosphere over their whole life cycle. These include nature-based solutions like reforestation and afforestation (woodland-planting and rewilding), as well as technological removals like direct air capture and storage, enhanced weathering (the process of removing CO₂ from the atmosphere by spreading large quantities of finely ground rock material onto large land areas, material that has the ability to store CO₂ in solid form) and biochar (a carbon-rich charcoal material that can store and stabilise carbon).

What are the types of offsets available?

Figure 2 – Typical types of offset mechanisms available

(Red: Avoidance/Reduction, Blue: Removals)



The most common offset schemes described in the report include:

Social housing retrofits (Avoidance / Reduction):

the upgrading and improving of existing affordable housing to make it more energy-efficient, comfortable and environmentally friendly.

Direct Air Capture + Storage (DAC+S) (Removal):

capturing CO₂ directly from ambient air using chemical processes or sorbent materials. The captured CO₂ can then be stored underground or used in various industrial processes.

Bioenergy with Carbon Capture and Storage (BECCS) (Removal):

combining bioenergy production (e.g., from biomass) with carbon capture and storage (CCS) technology. Biomass plants absorb CO₂ during growth, which is then captured during energy production and geologically stored.

Enhanced Mineral Weathering (Removal):

a technique which involves the acceleration of the natural process of weathering, which in turn includes the dissolution of minerals that react with CO₂ to form stable carbonates. By increasing the surface area of minerals or applying them to land, enhanced weathering can enhance CO₂ removal.

Biochar (Removal): this is a carbon-rich charcoal material, derived from the thermochemical treatment of organic materials, or biomass, in an oxygen-limited environment, typically following pyrolysis. This process stabilises carbon that would otherwise decompose and re-enter the carbon cycle.

Nature based solutions (NbS) (Removal or Avoidance):

NbS either avoid GHG emissions or sequester and store GHG emissions from the atmosphere. Common examples of NbS include: Afforestation (a NbS supporting the establishment of a forest or stand of trees (forestation) in an area where there was no recent tree cover); Reforestation (a NbS supporting intentional

restocking of existing forests and woodlands (forestation) that have been historically depleted, usually through deforestation); wetland and peatland conservation and restoration; and agroforestry (the integration of trees and shrubs into farming systems). Globally, avoidance of emissions includes prevention of deforestations or wetland conservation and restoration practices, whereas removal of carbon includes practices such as afforestation or reduced/no-till agricultural practices.

Rewilding (Removal): a subset of NbS, this is a conservation approach aimed at restoring and preserving natural ecosystems by reintroducing native plant and animal species to their historic habitats. The concept originated in the 20th century and gained popularity as a response to the degradation and fragmentation of ecosystems due to human activities such as habitat destruction, overhunting and introduction of invasive species. Key components of rewilding may include:

- **Ecological Restoration:** Rehabilitating degraded landscapes to resemble their natural state, which often involves removing barriers, replanting native vegetation and restoring natural water flows.
- **Species Reintroduction:** Reintroducing species that were once native to the area but have been extirpated or reduced in numbers. This can help restore ecological balance and improve biodiversity.
- **Habitat Connectivity:** Creating corridors or pathways that allow wildlife to move freely between fragmented habitats, facilitating genetic exchange and population growth.
- **Ecosystem Services:** Enhancing the capacity of ecosystems to provide essential services such as clean air and water, carbon sequestration and flood control.

The UK offsetting market

The offsetting market in the UK can be split between a compliance market and a voluntary market - the latter is focus of this report - as explained below:

Compliance: the UK Government created the UK Emissions Trading Scheme (UK-ETS) in 2021. The UK-ETS covers high GHG emitting sectors, including power generation, industry, and aviation. It sets ever decreasing annual emissions caps for participants, with certain allowances allocated to companies. Companies that exceed their allocated allowances must purchase additional permits from those that emitted within their allowance. This cap-and-trade market provides a legal and an economic framework to drive decarbonisation.

Voluntary: the VCM refers to the global marketplace where individuals, companies, and organisations voluntarily purchase carbon credits to compensate for their residual emissions. In 2021, it is estimated that UK companies purchased an estimated 20 million credits from the VCM, equivalent to £150 million, of which only 0.1% were sourced from UK offsetting schemes.⁷

Heathrow case study



Heathrow is committed to reaching net zero by 2050 and has clear targets in place including 2030 milestones to cut carbon by 15% “in the air” and 45% “on the ground”. It is already investing over £200m during its current 5-year regulatory period to cut carbon, progress towards net zero and benefit customers. Through its partner, CHOOOSE, Heathrow offers companies and passengers the chance to buy Sustainable Aviation Fuel offsets and it has been investing in “high integrity” nature-based carbon removal credits in the UK since 2020 through the Woodland Carbon Code and Peatland Code, following an initial peatland restoration pilot project in Lancashire in 2018.

Knepp Wildland case study



The Knepp Wildland Carbon Project aims to support UK nature projects in attracting private investment and sharing learnings with other initiatives. Led by the Knepp Estate, Arup, and Nattergal, the project collaborates with partners, including Queen Mary University London, and seeks to address significant data gaps in the scientific literature on carbon sequestration and storage in rewilding habitats. Using the Knepp Estate as a real-world case study, the project combines in situ measurements of carbon sequestration and storage with an analysis of the UK’s VCM, focusing on three key themes: research, application, and replicability. By following these themes, it aims to develop a comprehensive guide for UK nature restoration projects, detailing approaches to baselining, monitoring, reporting, and verification of carbon sequestration.

VCM challenges

As set out in Chapter 1, despite several initiatives within the VCM to improve the quality of credits⁸ and several different standards and registries,⁹ challenges in how the VCM operates remain.

On one hand, avoidance and reduction schemes can struggle to demonstrate additionality, i.e. GHG emissions would not have occurred in the absence of the offsetting scheme, and it is also challenging to measure their benefit.¹⁰ Therefore, the environmental credibility of these types of schemes has come under scrutiny, however, they may present wider socio-economic benefits for local communities.

On the other hand, and despite removal schemes being pivotal, particularly for sectors where elimination remains unattainable, there are a limited number of removal offsetting schemes in the UK. This is due to available technologies and land resources making it difficult for UK organisations to purchase removal credits from domestically based schemes. Removal schemes are also often significantly more expensive to implement compared to avoidance/reduction schemes.

Other frequently referenced weaknesses of the VCM mechanism include:

- **Credibility and transparency:** As the VCM is self-regulated and operates independently of UK legislation, it lacks external oversight and standards for

verification purposes. This raises concerns regarding its governance, as well as the credibility and environmental integrity of the carbon offset schemes.

- **Complexity and cost:** the verification and certification process for carbon offset schemes can be complex and costly, particularly for smaller or emerging schemes.
- **Additionality and double counting:** it is very challenging to ensure additionality – that a carbon offset scheme results in emissions removals or avoidance/reduction that would not have occurred otherwise. In addition, there is a risk of double counting, where the same emissions reductions/removals are claimed by multiple parties.
- **Price volatility:** the price of carbon credits in the VCM can be volatile, influenced by factors such as market demand, regulatory uncertainty and investor sentiment, making it harder for interested parties to make informed decisions around purchasing/selling credits.

Despite these concerns with the VCM, a high-integrity VCM is a critical tool to help mobilise and direct necessary funds towards impactful climate mitigation solutions that would otherwise struggle for funding. It is an important mechanism to allow organisations that are using certified schemes to credibly offset their residual emissions, while delivering social, economic and environmental co-benefits to local communities and ecosystems. This is especially the case in the UK VCM, which is small compared to the global market.

Other UK offsetting mechanisms

In London, a policy requirement in the London Plan¹¹ – the spatial development strategy for the capital – expects Local Planning Authorities (LPAs) to collect “carbon offset” fees through planning obligations (so called Section 106 agreements) placed on developers. The money goes to an LPA’s carbon offset fund to be spent on decarbonisation projects within the borough. This process is discussed in more detail in Chapter 4 along with suggestions for how it could be improved.

Despite some of the clear challenges associated with the current offsetting landscape, for the hard to abate sectors and until all essential zero carbon and climate positive means are widely established and available, there will still be a need for some forms of offsetting. What is needed is a way to disrupt the current status quo and advance enduring, high-quality UK offsetting schemes under a common umbrella. The next chapter outlines a blueprint of how this could work in practice through establishing a business-led UK Collective Offsetting Fund.

Chapter 3

UK Collective Offsetting Fund

The Fund

This chapter outlines the hypothetical high-level detail of the Fund – its purpose, objectives, benefits, structure, and operational details. The Fund would look to connect UK organisations to UK offsetting schemes, helping to instil confidence in those organisations seeking to offset emissions, support the provision of more offset schemes and deliver UK-wide benefits through investment in these schemes. It is acknowledged that significantly more work on the Fund is required to move from concept to reality by the eventual Fund operator. See Chapter 5 for next steps.

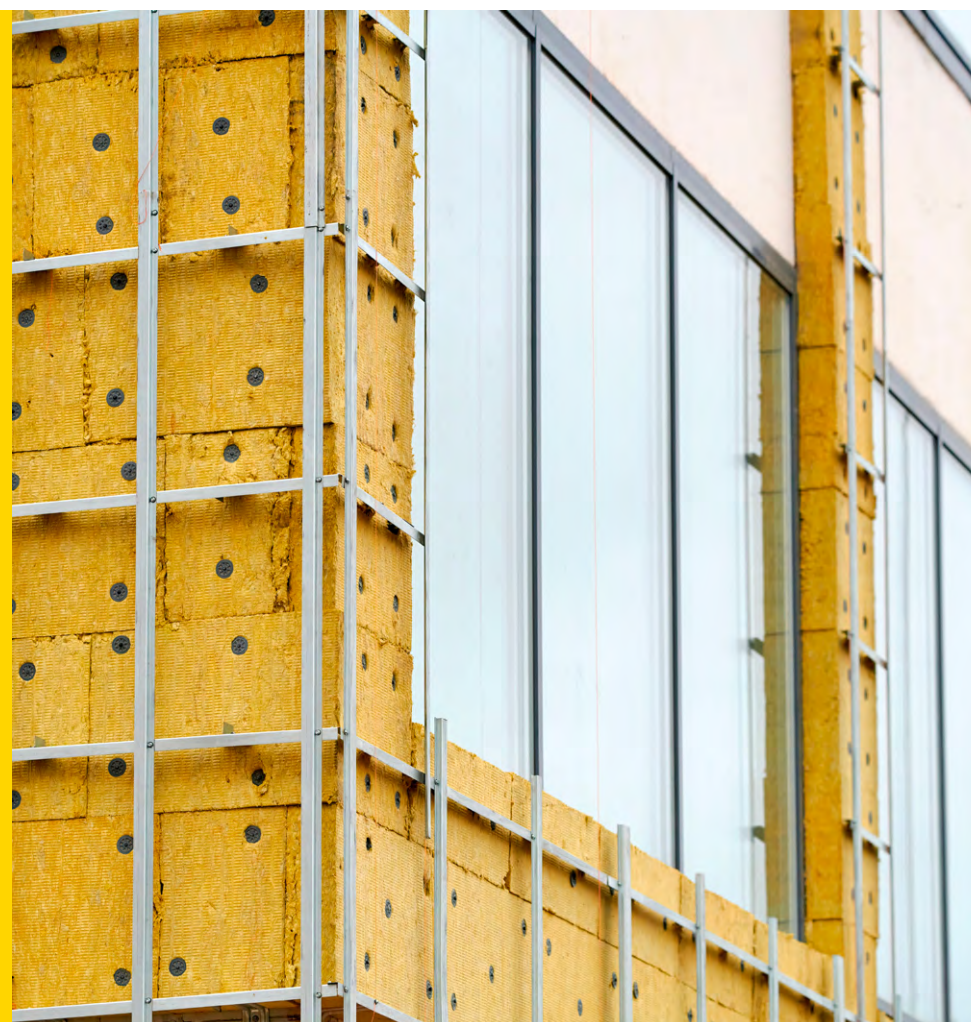
Purpose

The purpose of the Fund should be to make responsible offsetting easy and accessible for UK organisations, helping them meet their climate goals while making a positive environmental and social impact in the UK.

Objectives

The Fund should set itself apart from others by exclusively supporting the advancement of enduring, robust UK offsetting schemes. It is recommended that the Fund has three primary objectives:

- 1 Procuring robust UK carbon credits for UK organisations seeking to claim and report credible climate action.
- 2 Supporting the scaling and development of credible offsetting schemes in the UK to meet the increasing demand for UK offsetting credits.
- 3 Through the investment in offsetting schemes, deliver wider co-benefits and support growth in the UK, as set out below.



Benefits

There are multiple benefits from the establishment of such a Fund for all associated parties: to the organisations providing the capital, to the offsetting schemes receiving funding, through to the UK as a whole. These are outlined below.

ORGANISATIONS	OFFSETTING SCHEMES	THE UK
Decarbonisation commitment: demonstrates a commitment to environmental responsibility and sustainability within the UK and supports organisations in meeting their climate reporting requirements.	Magnitude of impact: collective action enables larger-scale carbon offset schemes in the UK, which can have a more significant impact on removing and avoiding/reducing emissions, support scaling up quicker and with more certainty.	Global leadership: Enhances the financial and operational capabilities of schemes, positioning the UK as a global leader with a robust regulatory framework, helping to bolster investor confidence and attract additional investment.
Quality assurance: provides assurance that carbon credits are of high quality, in terms of their climate and wider co-benefit impacts, which organisations use as part of their strategies to tackle climate change.	Near-term support: financial backing to offsetting schemes, helping to meet present demand.	Cross sector collaboration: facilitates engagement between different sectors and organisations of all sizes, boosting collaboration, and research, whilst driving innovation.
Costs and complexity: facilitates easy procurement of certified carbon credits within the UK, allowing organisations to offset residual emissions effortlessly. Collective participation can also help with cost-effectiveness by reducing costs and price volatility per carbon credit encouraging broader engagement.	Long-term funding: gives selected schemes the long-term financial support and confidence to develop, scale and support the UK's transition to becoming climate positive, helping alleviate funding gaps and lack of urgency from Government.	Community investment and social value: supports the communities and ecosystems in which these schemes are based, helping to demonstrate the social value of local offsetting for other countries around the world to follow.
Supporting local communities and the UK: empowers organisations to actively contribute to climate change mitigation in the communities, regions and country they are rooted in.	Establishes credibility: through due diligence and comprehensive scrutiny of schemes, concerns about greenwashing will be minimised, which in turn, will foster the growth and impact of schemes.	Further decarbonisation: increased environmental impact which in turn provides a competitive and financial advantage to the UK, being at the vanguard of emissions reduction and removal.

Structure

The exact structure of the Fund, its governance arrangements and management structure would need to be determined by the eventual Fund manager or executive leadership. While BusinessLDN and Arup have not founded this Fund, we have worked together to propose a hypothetical high-level blueprint of its operational detail, set out below, to deliver on the opportunities listed above. Further work would be required, as a next step, to operationalise and build on this proposal to ensure it provides the right levels of transparency and robustness for both UK organisations and UK offset schemes.

The Fund's portfolio

It has been assumed that the Fund would be based around the Revised Oxford Offsetting Principles.¹² It would comprise three different portfolios for UK organisations to purchase credits from. These three distinct portfolios offer organisations the option to procure a combination of credits aligned to their business objectives and climate ambitions. Each portfolio would encompass various offsetting schemes, strategically designed to mitigate risk, distribute impact across the UK and optimise cost management – see Figure 3.

Figure 3 – The Fund's indicative offsetting portfolios

Retrofit Portfolio: Avoidance/Reduction

- Retrofit avoidance/reduction schemes supporting social value and a fair and just transition
- Credits mature from 1 to 25 years
- Unit price above the UK Government Central Series

Nature Portfolio: Removals

- Protected nature-based removal schemes supporting biodiversity and ecosystem protection
- Credits mature from 10 to 50 years
- Unit price above the UK Government Low Series

Engineered Portfolio: Removals

- Engineered removal and highly durable geological storage of sequestered GHG emissions
- Credits mature from 1 to 10 years
- Unit price above the UK Government Central Series

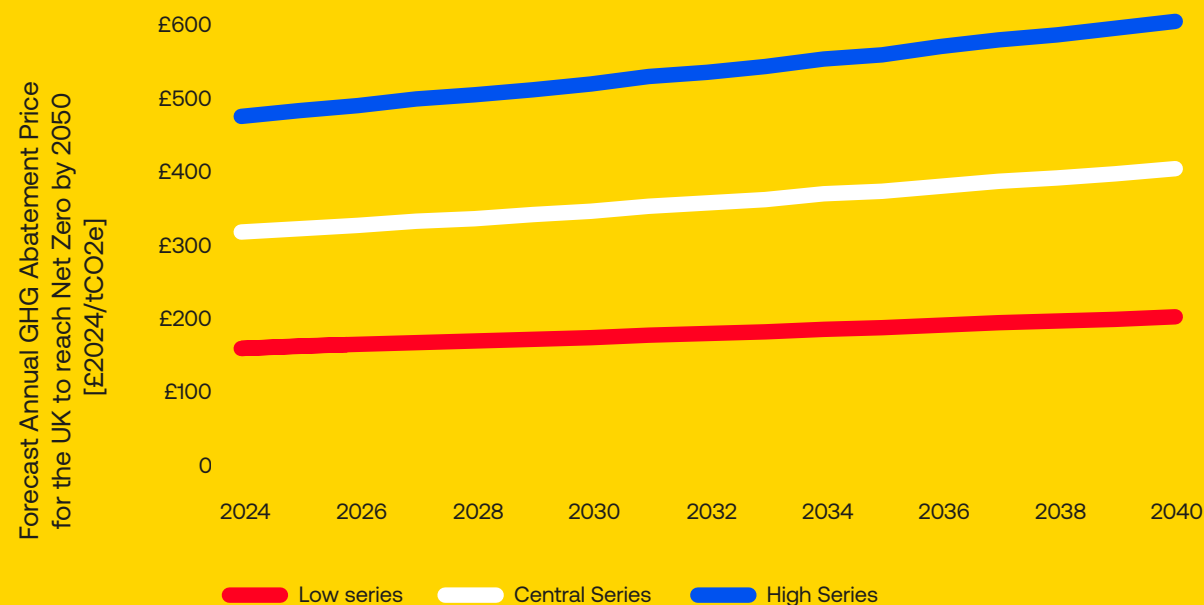
With regards to the pricing of the Fund's portfolio, the UK Government has an established Internal Carbon Price (ICP) approach which attributes a monetary value against the reduction of one ton of CO₂e. There are three main series (Low, Central, High) with UK organisations in hard to abate sectors, like the built environment and aviation, being towards the higher series, whereas organisations in easier to abate sectors, like financial services being towards the lower series. The indicative portfolios set out in Figure 3 have a proposed unit price relative to these three main series.

What is the UK's Internal Carbon Price (ICP)?

An Internal Carbon Price (ICP) serves as a tool for UK organisations to integrate the cost of GHG emissions into their decision-making processes. By assigning a monetary value to residual emissions via offsetting, UK organisations can account for their environmental impact. An ICP represents the cost of offsetting emissions through suitable quality schemes aligned with the UK organisation's goals and climate claims.

The UK Government's approach attributes a monetary value against the reduction of one tonne of CO₂e. This monetary value is calculated as the abatement cost associated with meeting UK Government targets that have been set to align with limiting global temperature rise to 1.5°C. This is given for low, central and high series and does not consider offsetting costs. See Figure 4 below.

Figure 4 – Estimated price (£/tCO₂e) for low, central and high series for UK's ICP



Source: <https://www.gov.uk/government/publications/valuing-greenhouse-gas-emissions-in-policy-appraisal/valuation-of-greenhouse-gas-emissions-for-policy-appraisal-and-evaluation>

Participating in the Fund: UK organisations

We envisage that the Fund would serve as a vital resource for any UK organisations seeking to procure UK offsets to address their residual emissions. Access to the Fund should be as inclusive as possible, accommodating a range of organisations such as businesses of all sizes, public bodies, institutions and charities.¹³

It is recommended that organisations participating in the Fund would follow a simple process, though with elements of rigour to ensure the integrity of the Fund. The process would be as follows:

- 1 Meet prerequisite requirements:** demonstrate compliance with the Fund's decarbonisation prerequisites (see page 18), with these prerequisites requiring a higher level of compliance the larger the volume of purchase(s).
- 2 Select portfolio:** as outlined above, choose from themed portfolios to purchase credits from:
 - Retrofit Avoidance/Reduction
 - Nature Removals
 - Engineered Removals
- 3 Wait for credit maturation:** credits will not be immediately available for retirement. This is a contrast to the current practice of purchasing and retiring offset credits via the VCM's spot market. Instead, the Fund will invest in robust UK offsetting schemes and support the scaling-up of existing and new technology. As a result, credits could typically take

Figure 5 – Principles of operation of the Fund



between 2 to 40 years to mature before they could be retired depending on the typology of the scheme.

- 4 Certified credit usage:** once credits have matured and have been retired, the UK organisation can use them towards their reporting against their corporate climate commitments. The Fund would formally retire these offsetting credits so that they could not be re-sold in the future and therefore avoid double-counting.

Figure 5 illustrates the operational principles of the Fund and its role in bridging the gap between organisations and offsetting schemes.

The Fund would not require exclusivity from organisations in terms of where credits are procured from, allowing organisations to use the Fund in tandem with other carbon credit providers or schemes within the VCM.

Participating in the Fund: UK offsetting schemes

Our starting assumption is that the Fund would welcome participation from offsetting schemes engaged in emissions avoidance, reduction, or removal. Whether well-established or in nascent stages, schemes would qualify for funding by demonstrating adherence to certain quality and co-benefits criteria (see page 19).

To be considered to receive investment from the Fund, schemes would need to be based in the UK. While schemes spanning multiple countries would be eligible, their Fund investment would have to be exclusively on UK schemes.

The process for offsetting schemes to engage with the Fund could be as follows:

- 1 Invitation for proposals:** the Fund would invite offsetting schemes to submit proposals through a formal request.
- 2 Proposal submission:** responding schemes would, at minimum, provide a detailed explanation of their scheme, proposed methodology, funding requirements and projected timelines for credit return.
- 3 Evaluation and initial funding:** the Fund would rigorously review each proposal, conducting its own due diligence on the scheme. If deemed suitable, the Fund would allocate the initial tranche of agreed funding.

4 Commencement and disbursement of funding: upon receiving funding, the scheme would commence and provide regular progress updates to the Fund, with intermittent funding disbursed as per an agreed schedule. Existing schemes could also be entitled to further finance – a detail to be determined by the Fund.

5 Credit certification and return: when offsetting credits have matured and are certified by accredited bodies, the scheme issues these credits to the Fund.

Operational detail

How will the Fund operate?

It is recommended, that the Fund would be an independent entity with its own operational framework.

Given the nature of the Fund's financial transactions, future commodities of offset credits and to ensure financial stability, the Fund should be regulated and adhere to regulations overseen by the Financial Conduct Authority and the Financial Services and Markets Act. In addition, it is strongly suggested that the Fund is further regulated by an independent third party specialised in climate change or government body – either existing or newly formed for this purpose.

To support transparency, the Fund should undertake annual reporting on both financial performance and progress in addressing climate change. It is recommended that these reports would be publicly available and would seek to set a benchmark for exemplary climate reporting standards.

To manage the Fund efficiently, support from external organisations will be essential and will need to be procured through a transparent process. The anticipated support required includes, but not limited to, capital management, insurance, legal advisory and sustainability consulting. These partners would help undertake crucial functions of the Fund, such as evaluating organisations seeking to participate in the Fund, procuring and monitoring offsetting schemes, conducting due diligence throughout, and managing credit exchange and retirement of credits.

Demonstrating commitment: prerequisites for organisations

It is suggested that to help maintain transparency and the credibility of the Fund's environmental credentials, organisations that wish to purchase credits from the Fund must demonstrate commitment to decarbonisation and climate action. It is recommended that these UK organisations look to annually demonstrate:

- a sustained effort toward decarbonisation of their own activities in line with limiting global temperature rise to 1.5°C; and
- transparent reporting of GHG emissions alongside active leadership supporting the climate agenda.

It is anticipated that these prerequisites will need to adapt over time as organisations progress in their journey towards climate positive and wider environmental standards rise.

Ensuring quality: prerequisites for offsetting schemes

As outlined above, the Fund would offer a choice of purchasing both avoidance/reduction and removal carbon credits. Irrespective of typology, it is recommended that all offsetting schemes involved in the Fund would need to adhere to the highest standards of quality and integrity. Consequently, compliance with the following international schemes and guidance would be a prerequisite:

- Mandatory: aligned to the 10 Core Carbon Principles developed by the Integrity Council for the Voluntary Carbon Market (ICVCM);
- Mandatory: sourced from a standard and registry that is endorsed, or conditionally endorsed, by the International Carbon Reduction and Offset Alliance (ICROA);
- Mandatory: would aspire towards achieving a minimum independent rating from BeZero¹⁴ AA – Very High Likelihood that a given offsetting credit achieves a tonne of CO₂e avoided/reduced or removed or Sylvera¹⁵ equivalent; and
- Desired: in compliance with the criteria of Carbon Offsetting and Reduction Scheme for International Aviation's (CORSIA) unit eligibility criteria and the Airport Carbon Accreditation (ACA) requirements.¹⁶

As more standards and guidance are produced to support the integrity and quality of offsetting schemes, the Fund would need to annually review and adapt its prerequisites.

The Fund must look to encourage offsetting schemes to demonstrate sustainability beyond climate action alone, helping to support wider UN Sustainable Development Goals. Evidence of tangible co-benefits for both the UK as a whole and local communities could encompass a range of factors, including but not limited to:

- delivering social and economic value
- encouraging health and well-being
- supporting biodiversity net gain
- promoting equality, diversity and inclusion
- enabling innovation and education

As part of the selection process for determining which schemes to support, the Fund may require adherence to additional criteria.

Transparency

To encourage transparency, offsetting schemes would need to publicly disclose the work associated with the Fund on an annual basis in accordance with their certification standard. In addition, organisations procuring credits from the Fund should be allowed to visit participating schemes, helping to foster relationships between schemes and buyers.

Chapter 4

London Local Planning Authority Offset Funds

Background¹⁷

In London, the London Plan requires all major developments (i.e., developments of 10 or more residential units and/or floorspace larger than 1000 m²) to be “net zero” in operation by achieving a minimum 35% reduction in carbon emissions on-site against Building Regulations. Once on-site operational carbon savings have been maximised, any shortfall to zero needs to be “offset” to the LPA’s carbon offset fund, where developers are required to make a cash-in-lieu contribution.

The recommended carbon price by the Greater London Authority (GLA), and the most common across LPAs, is £95/tCO₂e. However, LPAs can choose to set their own carbon price.¹⁸ The total “carbon offset” fee paid to each LPA’s fund is calculated over 30 years and is collected by LPAs through a Section 106 planning agreement.

All of London’s LPAs¹⁹ have established local “Offset Funds”. The Funds are ring-fenced and the money is spent on carbon reduction projects within the respective LPA areas. Initiatives supported include urban greening, renewable energy projects, as well as energy efficiency measures in existing buildings where operational carbon savings are more challenging.²⁰



Between 2016 and 2022, a total of around £32 million out of a possible £242 million has been spent on decarbonisation projects in the local areas they have been collected from. These monies have been spent on a variety of local schemes ranging from improving bus stations to leisure centres and workshop buildings to social housing. The rest of this money is either currently unspent, as it is earmarked or waiting to be allocated to future projects, or has not yet been collected. There are a range of factors given for the relatively modest expenditure including difficulties in identifying viable project pipelines, insufficient staffing resources, the need to await the accumulation of

adequate funds to undertake projects of significant scale or internal governance limitations.

Although referred to as an “Offset Fund”, the money paid by developers does not return a certified offset credit that can be used to support climate claims or company reporting. As such, developers seeking to mitigate their residual emissions beyond their operational scope must further procure offset credits from the VCM. This process generates a double financial commitment, creating a common frustration in the market.

Proposal

Recognising the current shortcomings, this report proposes to improve the existing mechanism, which has helped to drive decarbonisation efforts by developers and supports investment in local schemes. If properly harnessed, the LPA carbon offset funds provide real opportunity for investment in local decarbonisation. To that end, a dual solution is proposed.

In the near to medium term:

- LPAs could pool their available funds to establish collective offsetting funds across other authorities.²¹ In London, for example, one route could be on a sub-regional basis through the existing sub-regional partnership in the capital.²² Through economies of scale and greater collaboration, these partnerships would stand a better chance of creating and delivering a long-term portfolio of decarbonisation projects.

In the longer term:

- LPAs should endorse, support and engage with the development of private collective offsetting approaches such as the Fund, to complement LPAs' existing initiatives.
- LPAs could engage with the Fund by directing monies into the Fund to help drive early investment into a portfolio of decarbonisation projects with higher social value and wider benefits for the local area: and/or



- proposing additional local, high quality offsetting schemes for sponsorship and consideration by the Fund.

In any event, the LPA carbon offset process should transition from purely a carbon tax, into an instrument that generates certified offset credits. To achieve certification, schemes would need to follow enhanced measurement, reporting and verification processes which would ultimately improve the credibility of these schemes. By following this route, it enables either the LPA to claim the offset credit to support their respective climate commitments, or to return this credit to the project developer, who contributed to the LPA offset Fund, via the original Section 106 payment.

Particularly in London, given that LPA offset funds have been established because of the London Plan, the GLA should play a central role in delivering the above recommendations. For example, facilitating collaboration between sub-regional partnerships to start pooling contributions and ensure the money is being utilised effectively. Similar to the recommendations for individual LPAs, the GLA could also act as an investor and/or offsetting scheme “provider” into the UK Collective Offsetting Fund. To support this process the report recommends the Mayor should help galvanise and champion the Fund.

Chapter 5

Conclusion and next steps

UK organisations have a significant role to play in driving climate action with many companies keen to decarbonise their businesses and supply chains. By joining forces and establishing a UK Collective Offsetting Fund, UK organisations can help address their own climate commitments while also generating wider social, environmental and economic benefits across the UK.

The Fund would spur new and bold carbon offsetting schemes that could deliver a plethora of benefits to UK organisations, the environment and the economy, across the public and private sectors and within local communities. This report has made the case for creating the Fund, setting out a blueprint for how it could work, but more detailed thought is required to move from theory to practice.

A call to action

UK organisations (Businesses) should:

- Work together to pool purchasing power and act as first movers in the creation and support of a UK Collective Offsetting Fund to take more impactful climate action within the UK.

- Review their current offsetting strategies and consider increasing the volume of offsets purchased from robust UK Offsetting Schemes.

UK local government should:

- Endorse, support and engage with the development of private collective offsetting approaches such as the Fund, to complement existing initiatives. Appropriate ways could be either through driving early investment into a portfolio of decarbonisation projects of the Fund or by acting as “providers” of local, high quality offsetting schemes by putting forward schemes for sponsorship and consideration by the Fund.

Greater London Authority (GLA) should:

- Champion the Fund’s purpose galvanising interest from across the public and private sectors in the capital to ensure London can anchor the Fund with investment and offsetting schemes.
- Facilitate collaboration between sub-regional partnerships to start pooling contributions from London LPAs’ existing carbon offset funds and ensure that the money is being utilised appropriately.

- Drive early investment into a portfolio of decarbonisation projects covered by the Fund and work with London LPAs to support them in putting offsetting schemes forward.
- Act as primary investor and/or offsetting scheme “provider” into the Fund.

London LPAs should:

- Ensure that all schemes being funded from LPA Offset Funds, are generating certified offset credits.
- In the near-term, pool available monies to establish collective offsetting funds across authorities to drive decarbonisation at scale. Specifically in London one route could be on a sub-regional basis through the existing sub-regional partnership in the capital.
- Endorse, support and engage with the development of private collective offsetting approaches such as the Fund, to complement existing initiatives. Appropriate ways could be either through using these funds as seed funding for the Fund to help drive early investment into a portfolio of decarbonisation projects or by acting as “providers” of local, high quality offsetting schemes by putting forward schemes for sponsorship and consideration by the Fund.

Next steps

As part of the project's next steps, further analysis about the detail of the Fund will be undertaken, including:

- the governance of the Fund, to ensure that it avoids conflicts of interest and meets the expectations of both UK organisations and UK offsetting schemes;
- the necessary regulatory approvals and insurance mechanisms to manage financial transactions of a significant size; and
- the procurement route of credits when UK offsetting schemes apply for investment, to ensure the appropriate due diligence is carried out.

BusinessLDN and Arup invite interested parties to engage with us to explore these next steps and consider how they can work with us to help improve and maximise the benefits of carbon offsetting in the UK.



Authors / Contributors



STEPHEN THOMPSON

Arup



IOANNA MYTILINAIU

BusinessLDN

Special thanks are extended to Jonathan Seager (BusinessLDN), Daniel Bevan (Arup), Ben Smith (Arup) and Steven Lloyd (Arup) for their own contributions to the review of this report.

The authors would also like to thank the Steering Group and to all those who attended and joined in the discussion at the roundtables.

Steering group

Ben Smith	Arup
Daniel Bevan	
Jonathan Seager	BusinessLDN
Emma Marsland	Isometric
Matthew Webster	
Michael Meadows	British Land
Qasim Akhtar	Camden Council
Dougie Sutherland	Cory Group
Stefanie Sahla-Jones	Eversheds Sutherland LLP
Philip Spyropoulos	
Arun Rao	Greater London Authority
Lisa Pfannenmuller	Heathrow Airport Limited
Professor Frans Berkhout	Kings College London
Alexia Laird	Landsec
Karl Desai	Lendlease
Zak Bond	London Councils
Fiona Ross	Pinsent Masons

Contributors

Andy Tims, Arcadis

Liz Mason, Canary Wharf Group

Aled Thomas, City of London Corporation

Christina Rehnberg, Delancey

Robert Jenkins, Delancey

Frank Blande, GPE

Charlotte Hopkinson, Grainger plc

Andy Haigh, Grosvenor

Andrew Day, Hill

Richard James, JLL

Ushna Mughal, Knight Dragon

Eddie Elcomb, Knight Dragon

Andrew Todd, KONE Plc

Emma Sinclair, Lloyds Banking

Mark Edwards, London Gatwick Airport

Tobiloba Elusakin, Mace Group

Duncan Preston, Mission Zero Technologies

Dain Robinson, New West End Company

Charlie Beard, Pension Insurance Corporation

Simon Turek, PNZ Carbon / HACT

Matthew Sherwood, Quod

Tom Dobson, Quod

Stephen Roscoe, O.C.O Technology Ltd

John O'Dwyer, Telford Homes

Rosa Han, The Portman Estate

Barry Evans, Turley

Andrew Tod, Turner & Townsend

Tom Wigg, UKGBC

Chris Zair, UNDO

Zanna Casement, UNDO

Sarah Brownlie, Wilder Carbon

Emma Stewart, Woodland Carbon code

Chris Waterfield, Woodland Carbon code

Charlotte Downes, WSP

Endnotes

- 1 *The Sixth Carbon Budget, The UK's path to Net Zero, Climate Change Committee, December 2020.*
- 2 *The CCC splits the categorisation of GHG removals between land-use (typically nature-based removals) and engineered (using technological solutions involving capture and storage of GHG emissions).*
- 3 *For the purposes of this report, UK organisations refers primarily to businesses based in the UK. While it is envisaged that the Fund, discussed in Chapter 3, will be business-led this would not preclude the public sector, such as local authorities, from contributing to the Fund as well. However, for ease, the asks included in Chapter 5 have been set out separately for businesses and for the public sector.*
- 4 *There are guidance documents which have been produced to help UK organisations offset in a more responsible manner and these include: the Oxford Principles for Net Zero Aligned Carbon Offsetting (Oxford Offsetting Principles, or OOP) which supports organisations, cities and financial institutions in purchasing carbon credits to offset their residual emissions. The Voluntary Carbon Markets Integrity Initiative (VCMI) Claims Code of Practice provides clear requirements, recommendations and supporting guidance to UK organisations on how they can credibly make voluntary use of carbon credits as part of their near and long-term net zero commitments. The Science Based Target Initiative (SBTi) Beyond Value Chain Mitigation (BVCM) outlines how UK organisations can use carbon offsetting as part of their Scope 3 emissions strategies. The UK Green Building Council's (UKGBC) Carbon Offsetting and Pricing Guidance supports those UK organisations engaged within the built environment to deliver an ambitious approach to carbon offsetting and associated carbon pricing. The International Civil Aviation Organization (ICAO) established Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA); under CORSIA, aeroplane operators must address their residual emissions with the purchase and retirement of eligible offsets covered by the CORSIA scheme.*
- 5 *The methodology needs to be verified that it has achieved what it claims so that then the credit certificate can be created.*
- 6 *1. Remove GHG within own operations; 2. Remove GHG within value chain; 3. Remove GHG outside value chain i.e. address remaining residual emissions through the purchase of carbon removal credits.*
- 7 *Supply and Demand in the UK Voluntary Carbon Market, Allied Offsets, July 2022.*
- 8 *The Integrity Council for the Voluntary Carbon Market (ICVCM) released their Core Carbon Principles in 2023 with the aim to raise the bar for carbon credit quality, making it easier for buyers to identify and purchase robust carbon credits. These set out ten fundamental principles which are grouped into the categories of Governance, Emissions Impact and Sustainable impact. The International Carbon Reduction and Offset Alliance (ICROA) also published Carbon Crediting Endorsement in 2024 which recognises robust carbon crediting programmes in the VCM.*
- 9 *Examples include but are not limited to the International Civil Aviation Organisation's (ICAO's) Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), the Gold Standard, Verified Carbon Standard, Woodland Carbon Code and others.*
- 10 *The main challenge being that these schemes are often based on the principle of comparing emissions against an estimation of what would have been emitted had the schemes not taken place. As a result, their credibility has come under scrutiny.*
- 11 *The London Plan 2021, Policy SI 2 Minimising greenhouse gas emissions*
- 12 *The Oxford Principles for Net Zero Aligned Carbon Offsetting (Oxford Offsetting Principles, or OOP) which supports organisations, cities and financial institutions in purchasing carbon credits to offset their residual emissions.*
- 13 *Once established, the Fund could potentially expand to accepting funding from individuals, though this would require a different and proportionate participation process to the one outlined above.*
- 14 *BeZero is a carbon credit ratings agency for the VCM providing independent ratings of offset schemes.*
- 15 *Sylvera is a carbon credit ratings agency for the VCM providing independent ratings of offset schemes. <https://www.sylvera.com/blog/carbon-credit-ratings-frameworks-and-processes-white-paper>*
- 16 *As per the ACA Technical documents (<https://www.airportcarbonaccreditation.org/technical-documents/>)*
- 17 *Information in this sub section has been taken from, Carbon Offset Funds: Monitoring Report 2022, Greater London Authority: March 2024.*
- 18 *For instance, Lewisham is using a carbon price of £104/tonne/year based on a commissioned study.*
- 19 *Every London borough, the City of London Corporation and the two Mayoral Development Corporations – the London Legacy Development Corporation and the Old Oak and Park Royal Development Corporation.*
- 20 *For case studies see pages 19–21, Carbon Offset Funds: Monitoring Report 2022, Greater London Authority: March 2024.*
- 21 *As also recently has been highlighted in the latest GLA Carbon Offset Funds: Monitoring Report 2022, March 2024. One of the report's recommendations is for LPAs to consider strategic opportunities to pool funds and this should be the immediate next step for London LPAs.*
- 22 *London's four sub-regional partnerships are: West London Alliance (west London); South London Partnership (south-west London); Central London Forward (central London) and Local London (east focussed including south-east and north-east).*

Our mission

At BusinessLDN, our mission is to make london the best city in the world in which to do business, working with and for the whole uk.

We work to deliver the bigger picture, campaigning to tackle today's challenges and to secure the future promise of London.

We harness the power of our members, from sectors that span the economy, to shape the future of the capital so Londoners thrive and businesses prosper. We support business to succeed — locally, nationally, globally. We link up with other cities around the UK, to ensure the capital supports a thriving country.

We campaigned for the creation of the office of London Mayor and Transport for London, for the Elizabeth Line, for congestion charging, we incubated Teach First and run the UK's largest annual jobs and careers fair, Skills London.

We create opportunities for our members, from sharing insights to providing platforms, from making introductions to finding new talent. We facilitate collective, organisational, and individual ambition.

Becoming a member of BusinessLDN helps to keep London and the UK working — for business, for Londoners, for the whole country.

ARUP

Contact us

Matthew Fell

*Director of Competitiveness
BusinessLDN*

matthew.fell@businessldn.co.uk

020 7665 1508

One Oliver's Yard, 55-71 City Road,
London EC1Y 1HQ

Stephen Thompson

Associate, Arup

stephen-r.thompson@arup.com

020 7755 4118

8 Fitzroy Street, London, W1T 4BJ