Beyond Targets

The Wider Benefits of Climate Action

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About UK100:

UK100 is the only climate network of locally elected leaders that focuses on the delivery of Net Zero. We bring together local authorities across the country to share knowledge, collaborate, and advocate to the UK government with their collective power. Our membership spans the UK, is cross-party, and represents all tiers of local government.

There are now 117 cross-party local leaders in our network committed to meeting Net Zero at least five years earlier than national targets. We represent over 60% of the UK population covering both urban and rural environments. We produce practical guides like this and enable leaders to speak collectively on how to accelerate the transition to clean energy locally and nationally. You can read more about us here: http://www.uk100.org

About Cambridge Climate:

This report was researched and co-written by Sheryl French of Cambridge Climate Ltd - a climate and renewable energy specialist with over 20 years' experience. Cambridge Climate Ltd works on the intersection between sustainability, technology and system change to help tackle climate risk and offers bespoke research and data analysis to aid decision makers in their environmental choices and support organisations with system change to reach their climate goals.

UK100, Sustainable Workspaces, Riverside Building, County Hall, 3rd, Westminster Bridge Rd, London, SE1 7PB

Foreword:

As local authorities' ambitious carbon reduction deadlines approach, they confront the challenging political and practical realities of delaying their climate delivery. This report offers a vital means of rethinking the narrative and changing the conversation around action to clean our air. Rather than viewing climate action solely through the lens of carbon reduction deadlines and clean air targets, we must recognise that local clean air initiatives are already delivering tangible, immediate benefits that are transforming people's daily lives.

Clean Air Fund understands the need to focus on the wider benefits of clean air measures — which often also benefit our climate. The clean air case studies in this report clearly illustrate these myriad benefits, with money and lives saved by ambitious action in cities like Birmingham, Bradford and London. This is local action directly delivering for communities today, not in some distant future.

This report's emphasis on the wider benefits provides the evidence base for a new local climate and clean air story — one that speaks to what residents experience and value. Whether it's warmer homes that reduce energy bills, green infrastructure that creates jobs and improves mental health, or transport measures that make the air cleaner and streets safer for children, these initiatives demonstrate that local action is fundamentally about improving our quality of life.

The case studies presented here show how local authorities can build public support by emphasising the immediate benefits of their work. This approach is particularly important given the current political challenges, with climate action often portrayed as a burden rather than an opportunity.

Local authorities need new tools to communicate their successes and maintain momentum. This report provides a robust framework for demonstrating how climate action and cleaner air create healthier, fairer and more prosperous communities. By embracing these wider benefits as central to their strategy, councils can build the public trust and political support needed to deliver the transformative change our communities need.

Nick Smith
Head of UK
Clean Air Fund

CLEAN AIR FUND

Foreword:

At UK Power Networks' Distribution System Operator (DSO), we see firsthand how critical local action is in delivering a secure, decarbonised energy system. Meeting national climate targets relies not only on the electricity network's infrastructure and new technologies, but also on the daily decisions of local leaders — shaping how energy is used, where it is needed, and who benefits. It is why UK Power Networks has invested in an independent DSO and the Local Net Zero team, I am proud to lead. Through this approach, we are building innovative tools, relationships and delivery partnerships with our customers and organisations like UK100 - that help unlock the co-benefits explored in this timely research.

This report highlights that local climate action achieves more than emissions reduction. It delivers multiple, measurable co-benefits — including cleaner air, lower energy bills, better public health, stronger local economies, and more resilient infrastructure. These wider impacts matter: they help secure public support, attract investment, and ensure a fair and inclusive transition to net zero.

As the electricity system becomes more decentralised, our role as a DSO is to work in partnership with local authorities — enabling low-carbon technologies, sharing data, and coordinating planning that reflects local needs and priorities. When local authorities are equipped to plan for co-benefits, they can make stronger business cases, secure funding from multiple sources, and deliver long-term value for their communities.

Local climate action is not only critical to energy decarbonisation — it is essential to building places where people can thrive. We are proud to support this work and remain committed to helping local partners realise the full potential of the net zero transition.

Lynne McDonald
Head of Local Net Zero
UK Power Networks DSO

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Maximising the wider benefits: A new approach to climate delivery

UK100 has been working with councils committed to net zero since 2016

Executive Summary:

All too often, climate action is framed around carbon reduction targets, along with the associated moral, political, and scientific imperatives for action. UK100 is an organisation founded on ambitious targets. We've been working with councils committed to net zero by 2030 since we launched in 2016. But the research in this report demonstrates that climate action is about so much more than hitting those deadlines. **It's how we keep our communities warm in winter, keep the air in our neighbourhoods clean, and how we bring life, and pride, back to post-industrial towns and cities, to kickstart our stagnating economy.** The problem is that's not the story we're telling locally, nationally, or internationally.

A singular focus on carbon tonnage and a lack of consideration for secondary impacts means we're losing sight of the wider benefits of climate action. It means communities are increasingly seeing action as disconnected from their daily lives, either too pessimistic that we are not going to meet them, or too utopian that if we just reach net zero by 2050 all our problems will be solved. We're seeing the consequences of this on a weekly basis, across our network, climate action is being pulled into the culture wars, and the overarching story is being told by the opponents of action. Those working hard to create thriving places are painted as the cause of our problems, not the solvers of them.

There is no realistic way to tackle cold homes, air pollution, and long-term economic growth that is not rooted in local climate action. But, enacting the economic and social catalyst opportunity of our generation requires us to tell a better story, informed through tracking the myriad of benefits that have emerged from years of delivery.

If we plan and quantify the wider benefits, the returns on climate investments multiply. Cutting emissions and building climate resilience creates jobs, reduces household bills, delivers air we can all breathe easily, reduces avoidable strain on our hospitals, and safeguards Britain's green and pleasant lands.

If we start to embed these "unintended consequences" in our planning and monitoring of all of the projects and programmes designed to meet our climate goals, not only do we start to change the story, we build support for, and investment in, the kind of action we need to accelerate our journey to a cleaner, healthier future.

And this isn't just hope in the face of increasing adversity, local authorities across the UK100 network, as you will see across the detailed case studies in this report, demonstrate that climate action pays off far beyond the headline figures for jobs, health, and for our communities. But, it's not part of the case we're making with any consistency, which means local leaders are not only struggling to convince the Treasury (and their own finance teams) but also investors of the feasibility of projects. These convoluted stories are struggling to build support from communities.

The problem is simple: local authorities lack the data and tools to routinely measure the wider benefits of climate action.

Without the tangible benefits to hand, backed by investor-friendly numbers, we cannot build convincing business cases, or demonstrate they are working to improve the immediate circumstances of our communities. This means projects get rejected, and communities miss out.

The solution is clear: systematically identify and track these benefits from day one to show how climate projects deliver on multiple priorities, including economic growth, public health, and social renewal.

Give local leaders the means to build the evidence base they need to secure funding and start telling a different, more inclusive story to their residents. We need a universal and rigorous methodology to quantify and value the positive changes we're already seeing our members deliver on a day-to-day basis. In turn, this will make advocating for climate action easier, whether it is at cabinet tables in Westminster and the town hall, or kitchen tables. The alternative to climate action is not just a more dangerous planet, it means families losing loved ones to winter cold, children rushed to hospital with breathing problems, and communities watching their prosperity decline.

Decades worth of dependence on fossil fuels, underinvestment in our infrastructure, and short-termism have caused the economic and social problems we're living with today. Let's not forget about the £44bn that was required to subsidise everyone's bills for one year after the invasion of Ukraine and the energy price spike. This money is gone, and we'll be paying it back for decades, but it had no lasting impact.

We cannot afford to maintain the status quo, or be fought every-step of the way. Which is why the next phase of climate action is so sorely needed.

The case for a wider benefits approach

Taking an approach that focuses on both identifying and maximising the wider benefits of climate action, means designing climate projects not as standalone carbon-cutting exercises or adaptation initiatives, but as solutions to wider community needs. For example, as our Cambridge City Council and Leeds City Council case studies show, insulating homes and decarbonising heat does not just reduce carbon emissions but also prevents illness from cold and damp housing, easing fuel poverty, and creating jobs in the retrofit industry. Likewise, Clean Air Zones (CAZ) and promoting cycling and walking reduces emissions, cuts air pollution, and lowers disease rates.

But, in just these cases alone, from clean air to insulation, the benefits of supporting our National Health Service (NHS) and our communities to stay healthy is not part of the story we normally tell, nor do the savings to the local health system ever really get recycled.

A review by the Grantham Institute in 2019 observed that climate mitigation in the UK

brings "considerable co-benefits – from improving public health and reducing NHS expenditure to increasing productivity, creating jobs, improving security, and reducing poverty and inequality".[1]

By considering these wider benefits from the start, we can unlock funding from across the public sector and better align it with the outcomes our communities want to see and feel. That is the process we have begun in Cardiff Council, through their citywide Local Area Energy Plan (LAEP), a tangible plan for growth and clean energy that has been created through detailed engagement, and is now ready for investment.

Traditionally, many of these benefits are spread across either different departmental budgets in local authorities, or felt across the broader local public sector, and are not often attributed back to climate initiatives unlocked by them, leading to under-investment in climate action. By explicitly mapping how a single project delivers on multiple policy agendas, councils can break down silos and develop better cross-departmental business cases which, crucially, have the means to tell the whole story.

We are seeing an ambition to do this across the UK100 network. Already, councils are joining up objectives on strategies, policies, and projects. For example, a housing retrofit programme can be planned in tandem with a public health campaign to target fuel poverty, or a transport plan can be co-developed with input from both the highways team and NHS partners. But often missing is the enabling infrastructure, capacity, joined-up governance, and the standardised data, baselines, and metrics needed to demonstrate delivery on wider policy objectives, and the wider impact on people and communities.

And we can't afford to lose sight of the people and communities at the heart of these projects, either. Local leaders recognise that telling the story of wider benefits helps build public consensus and maintain support. Based on wide public concern, and community-led campaigns, many councils declared a "climate emergency", joining UK100 to set their 2030 targets and adding climate goals to their already ambitious economic development, health and wellbeing targets, as well as taking a "wider benefits" approach, which is the place where these goals meet.

This report aims to help local leaders deliver against these goals while ensuring that communities are central to the ongoing climate action conversation, by taking stock of some of the most innovative projects delivered across the UK100 network and beyond.

Key findings from local authority delivery

A mixture of large and small projects were chosen to exemplify the wider benefits of climate action. 10 case studies were reviewed and analysed for evidence to illustrate how the design, delivery, and measuring of the wider benefits of projects positively impact business cases, and provide the foundation for positive stories to be shared with communities that don't always get the full story. Across the case studies, three key messages emerge:

- **Integrated climate actions yield tangible and measurable multifaceted returns,** when the wider benefits are identified and tracked.
- Failure to account for the wider benefits, whether due to insufficient data, skills, or capacity, leads to **under-investment in high-return opportunities.**
- **Immediate benefits that matter to communities can be evidenced** and communicated to build understanding and positive support for climate action among a multitude of stakeholders.

For example, in one of the most striking case studies, Birmingham City Council's CAZ is expected to avoid 7,500 hospital visits, while fossil fuel emissions from car travel were slashed by a fifth. That's good for the health of the planet, and the health of thousands of Birmingham residents.

Leeds City Council's PIPES District Heat Network lowered energy bills for social tenants by a quarter, alleviating poverty while reducing carbon emissions by up to 11,000 tonnes a year. While in Devon, adaptation strategies reduced flooding by one-fifth in the Culm catchment area, cutting train delays and saving Network Rail £96,000 in avoided damages.

Barriers to a wider benefits approach

Despite the wider benefits of climate action being discussed in academic and green sector circles for many years, the banner of "co-benefits", with its high-level analysis undertaken to identify and quantify the benefits of climate action, has stayed largely within those circles, while a credibility gap has continued to grow.

The gap is primarily fuelled by a lack of evidence and data that clearly demonstrates the wider benefits, particularly at the local level. What are the barriers to that evidence being widely available and easily accessible?

- Historically, siloed funding streams, departmental objectives that do not overlap (for example, climate action), might be funded by an environment budget, but its returns create savings across health, transport, and housing departments.
- Short local and national political cycles, because some benefits are long-term and take time to establish.
- Capacity for cross-sector collaboration to identify the wider benefits and outcomes.
- The level and quality of data to credibly evidence wider benefits and integrate into business cases (for example, the Green Book guidance supplied by HM Treasury, and appraisals and funding criteria), so that projects are evaluated on their full societal value, not just direct costs.

Insufficient skills, capacity, and resources in local authorities to identify wider benefits, establish baselines, monitor, collect and analyse data, and report findings in the entirety of their strategies.

Consistent and transparent wider benefits network

There is no consistent and transparent approach, or methodology, for a standard set of metrics and measurements to evidence the wider benefits across the broad range of climate action that all levels of government deliver, from town halls to Whitehall.

From the analysis within it, to working with our members to produce it, the single most impactful recommendation this report makes is that introducing standardised frameworks and toolkits that leverage The Green Book guidance and national objectives to measure the wider benefits of local climate action will help embed a "wider benefits" approach into decision-making across all the country.

Recommendations

Recommendations coming from the analysis in this report include:

1. **Make climate arguments that go "beyond targets",** helping national and local governments communicate the wider public benefits of climate action.
2. **Strengthen the Green Book by HM Treasury** and require its consistent use in funding decisions, expanding criteria to fully reflect societal value, not just direct costs.
3. **Embed wider benefits in future devolution deals for combined and strategic authorities,** underpinned by cross-sector partnership boards to drive progress in areas such as warm homes, green energy, and nature recovery.
4. **The government should ensure that legislation, strategies, and regulations are structured to maximise opportunities** to unlock the full range of wider benefits throughout planning and delivery.
5. **Develop national frameworks and tools** to support consistent tracking of climate outcomes and the wider benefits, and provide dedicated funding and capacity-building support for local governments to use them effectively.

Climate change remains an existential threat, which we must tackle, but in an age of political populism, polarisation, and volatility, a new approach to measuring, maximising, and talking about the wider benefits of local climate action can move it from a niche environmental issue, to a core and fundable tool to boost community wellbeing. Through this report, we make the case that now is the time for the government (local and national) to hear and heed it to maximise the benefits of local climate action.

1 Introduction

1.1 Context & Rationale

Climate change is beyond an environmental issue, it is a societal challenge that touches on the way we heat our homes, move about our towns, the places we work, the air we breathe, and the products we buy.

The UK's legal commitment to net zero by 2050[2] spurred a wave of local political leadership, resulting in climate emergencies being declared across the country and the development of local climate action plans. Yet, these plans are often compartmentalised, face competing priorities, and fall foul of trade-offs because of tight budgets.

A growing body of evidence shows that **addressing climate change can yield multiple co-benefits.** These include improved air quality and health, reduced National Health Service (NHS) costs, energy bill savings, job creation, enhanced energy security, and reduced inequalities. In other words, **well-designed climate actions can be a catalyst to achieve broader local priorities,** from cleaner air to economic regeneration. Recognising and maximising these wider benefits is essential to justify and accelerate climate investments with the current fiscal scarcity.

However, harnessing the wider benefits of climate action requires a gear-change. Traditionally, climate policies have been evaluated too narrowly, focusing on carbon metrics or compliance costs. Councils are big, multi-service strategic organisations. They also operate within departmental silos and have more than 1,300 statutory duties,[3] none of which explicitly include climate change.

This means that climate action is often pursued through ad-hoc projects reliant on special grants, and is also tied up in bureaucracy from Westminster and Whitehall. This can relegate climate initiatives to be dependent on securing grants, and self-financing or generating income, disconnecting it from core budgets and decision-making. The result is missed opportunities for social change and cost avoidance. For example, a housing department might retrofit homes solely to meet building standards, without accounting for the significant health improvements and NHS savings from warmer homes, or a transport plan that might overlook how promoting active travel reduces obesity and inequalities for people who do not own cars. There is a need to mainstream climate co-benefits into everyday policy design and investment decisions, treating them as integral to "best value" and "value for money" considerations, rather than optional ethereal extras.

Newly-planted trees on The Strand, Liverpool city centre

1.2 What is holding back local climate action?

As highlighted in UK100's **'Powers in Place: The handbook of local authority net zero powers'**[4] and the **'Local Net Zero 2.0: The moment to deliver'** report,[5] local authorities face several barriers, including:

- A lack of a defined role in net zero delivery.
- A policy framework that fails to enable and support local delivery.
- Conflicting remits of public agencies.
- Insufficient funding and resources delivered through short-term, competitive funding pots.

1.3 Why do co-benefits matter?

Recognising and integrating co-benefits helps local authorities unlock greater impact from climate action by aligning it with wider priorities. These wider benefits:

- Strengthen the economic case for investment by capturing the full range of social, environmental, and economic returns, demonstrating better value for money and wider cost avoidance across climate and non-climate programmes.
- Support cross-departmental policy alignment by linking climate action to broader public policy goals, such as public health, economic inclusion, and transport decarbonisation.
- Enhance political and public support by making the local, tangible benefits of climate action such as cleaner air, warmer homes, or job creation more visible and relevant to diverse audiences.
- Shift the narrative from cost to opportunity by showing that the long-term benefits of action, particularly when co-benefits are considered, far outweigh the costs of inaction.
- Enable better decision-making through integration of wider benefits into business cases, funding bids, and appraisal processes in line with The Green Book guidance issued by HM Treasury.

1.4 Why are wider benefits undervalued?

- Fragmented governance and siloed funding make it difficult to design and deliver joined-up approaches that capture and account for co-benefits across sectors.
- Short political and funding cycles discourage long-term planning and investment in initiatives where benefits may take time to materialise or fall outside traditional performance metrics.
- Lack of consistent frameworks and data means the wider benefits of climate action are often treated as secondary or anecdotal, rather than integrated into formal appraisal and evaluation processes.
- Insufficient analytical capacity and technical expertise within local and regional authorities limit the ability to develop robust, evidence-based business cases that fully account for co-benefits.
- The costs of climate action could be borne by one budget holder, while the financial savings or social returns accrue elsewhere, creating hesitation to invest even when the overall value is clear.

1.5 Why now? The political case for co-benefits

Climate action, while increasingly urgent, is not part of councils' core statutory duties and continues to rely on fragmented, short-term funding. Instead of being embedded in "business as usual", it is something councils must fight to fund. In some cases, officers find themselves having to re-make the case for their roles each year, a reflection of how fragile local climate capacity can be.

Politically, climate policy can seem like a secondary or intangible issue compared to more immediate concerns such as the cost of living, social care, or immediate service delivery. It is often perceived as requiring major lifestyle changes or top-down restrictions, creating a false tension between climate ambition and public support for being too preachy and not pragmatic enough. Yet polling consistently shows the public is more supportive of local climate action than many decision-makers assume, highlighting a gap between public sentiment and political perception.

Framing climate action through the lens of co-benefits can be critical to overcoming this disconnect. It provides a route to make climate politically relevant by connecting it to what residents and elected members already care about, such as safer streets, lower bills, better jobs, social inequalities, and

healthier communities. In a political landscape where clear outcomes and short-term wins matter, co-benefits strengthen the case that climate action is not a moral burden, but a route to delivering everyday priorities. With a new national government focused on growth, health, and devolution, now is the moment to shift the narrative from sacrifice to shared gains and to align climate investments with outcomes that cut across political portfolios and council departments.

Ultimately, investing in climate is investing in economic growth, community prosperity and wellbeing.

1.6 Purpose, objectives and scope

The purpose of this report is to make the case that local climate action not only delivers carbon reductions but also warmer homes, economic growth, and healthier communities, making a strong case for a co-benefits approach to public policy, which delivers "value for money". It draws on an extensive literature review and 10 in-depth case studies from our network to highlight existing activity on the ground, insights into the wider benefits being achieved, and identify both the barriers to scale-up and solutions needed to embed co-benefits thinking at all levels of governance.

This report aims to:

- Explain what the wider benefits are and why they matter for local and national policy goals.
- Present evidence that climate actions, when designed for multiple outcomes, deliver significant economic and social returns.
- Share highlights of detailed case studies on climate initiatives in housing, energy, transport, flood management, and nature that have achieved wider benefits.
- Analyse the common barriers encountered in realising wider benefits and how some have overcome them.
- Provide clear recommendations and share some existing tools for embedding a co-benefits approach into decision-making.

1.7 Methodology

The findings presented in this report derive from a dual approach:

- A review of academic research on climate co-benefits, and
- An analysis of specific UK projects, drawing on case study documents and semi-structured interviews with local authority representatives and other key stakeholders.

This mixed-methods approach facilitated a grounded understanding of how the wider benefits of climate action are currently identified, measured, and communicated across various contexts.

Phase 1 Literature and policy review: Establishing the evidence base

The first phase focused on reviewing the existing literature to map out current thinking and practices related to climate co-benefits. This included:

- Peer-reviewed academic papers on the economic, health, social, and environmental benefits of decarbonisation.
- Government and third-sector reports outlining national approaches to co-benefits measurement.
- Non-academic literature and guidance materials produced by think tanks, local government networks, and consultancies.

This phase helped identify commonly used indicators, gaps in the evidence base, and existing tools or frameworks for measuring and valuing co-benefits. It also provided context for how these wider benefits are currently understood and used.

Phase 2 Case study selection and analysis: Capturing real-world practice

The second phase involved a deep dive into selected UK case studies that represent a range of project types, local contexts, and scales from neighbourhood retrofit schemes to citywide transport and nature-based solutions. The sectors covered included energy, housing, transport and nature – which are some of the highest emitting sectors and priority intervention areas in the UK.

Some of the larger projects had integrated co-benefits tracking from the outset as part of funding or evaluation requirements, while others reflected on the wider benefits retrospectively, recognising the growing importance of capturing broader outcomes. While some projects were relatively small in scale, they offer valuable insights into what could be achieved more broadly if such approaches were adopted at scale.

Each case study was analysed using publicly available project documentation including local authority committee papers and evaluation reports, and where possible, was supplemented by interviews. These conversations surfaced insights into:

- The current thinking around the wider benefits of climate action, including the drivers and barriers.
- The challenges of quantifying and evidencing impact.
- The role these wider benefits played in building internal and external support for the project.

Phase 3 Data collection and analysis: Combining quantitative and qualitative evidence

The next phase focused on analysing existing data from the selected projects. While there is growing national and academic recognition of climate co-benefits, with abundant anecdotal examples and some macro-level modelling, what often gets lost is the detail of how these benefits play out on the ground or are sustained and carried forward into future projects.

This project-level lens is essential, it moves beyond broad claims to reveal the tangible outcomes that matter to local decision-makers. By grounding the analysis in real-world examples, this phase aimed to show not only that these wider benefits exist but that they can be evidenced, valued, and used to inform policy and investment choices.

Quantitative data on job creation, emissions reduction, modal shift, health impacts, and monetary valuations were collated from published evaluations and project summaries. Where possible, these were aligned with established metrics such as carbon values from the Department for Energy Security and Net Zero (DESNZ), monetised health benefits using the Department for Environment, Food & Rural Affairs (Defra) or NHS conversion factors, and employment multipliers used by the Ministry of Housing, Communities and Local Government (MHCLG) or Innovate UK.

In parallel, qualitative evidence was gathered from interviews and local authority papers. This helped capture dimensions of impact that are not easily quantified but remain critical to understanding the full value of climate action.

Where data gaps or inconsistencies emerged, these are noted in the text. In some cases, proxies were used to estimate benefits, and uncertainties flagged to reflect real-world limitations in data availability and methodological consistency across projects. The appendix lists the tools and models identified in the literature and case studies, providing a practical reference for measuring co-benefits and case study details.

The following sections explore in detail the findings from both literature and lived experience, highlighting what is already working and where more progress is needed.

2

The Case for a Co-Benefits Approach

Raising all UK homes to high energy efficiency by 2030 could avert 650,000 new cases of childhood asthma and save the NHS £2bn by 2030 through improved respiratory health

2.1 What are co-benefits and why do they matter?

In climate policy, **co-benefits** or **wider benefits** refer to the positive side-effects or ancillary benefits that result from actions primarily taken to reduce greenhouse gas emissions or manage climate impacts. These can span economic, social, and environmental domains.

For example:

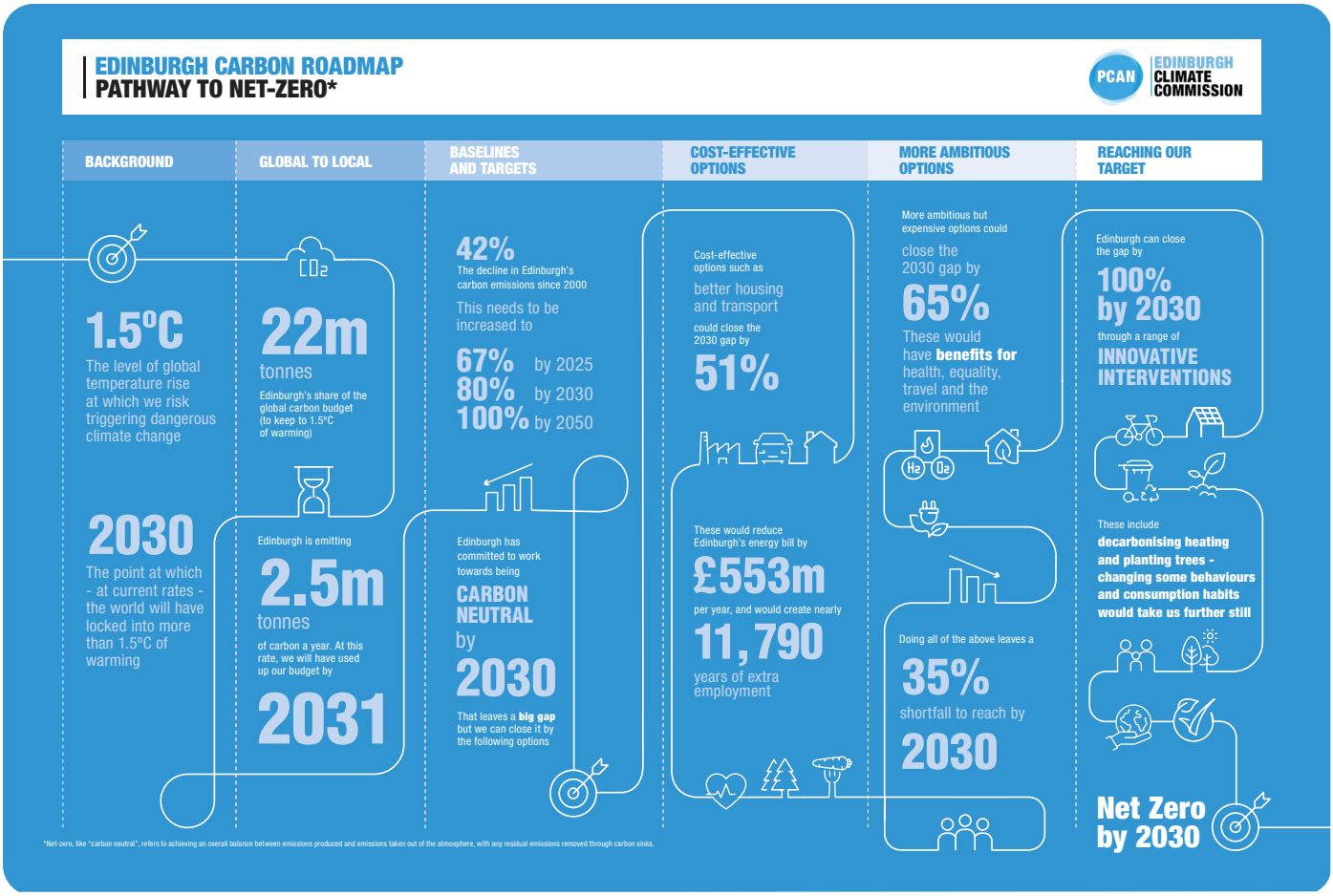
- Switching from cars to electric buses cuts carbon, traffic, and reduces air pollution, improving public health.
- Insulating homes lowers emissions and delivers warmer homes with lower energy bills.
- Community-owned energy schemes generate local revenue streams, create skilled jobs, and foster greater public support for climate action.

Tackling and adapting to climate change is a long-term challenge, and many of its benefits like reduced emissions or increased resilience can take time to materialise. Against the backdrop of immediate pressures like the cost of living crisis and other statutory duties, climate action often gets de-prioritised.

Co-benefits can help change that narrative by highlighting outcomes that matter to people, such as better health, lower bills, and safer homes. Framing climate action through these wider benefits helps bridge the gap between long-term goals and immediate public priorities.

2.2 The economic rationale: Strengthening the case

Research over the past two decades has consistently found that accounting for wider benefits greatly strengthens the economic and social rationale for climate action.[6,7] At the macro-economic level, co-benefits can shift a cost-benefit analysis from marginal to compelling. The Climate Action Network (CAN) Europe's 2024 report, found that for the EU as a whole, a 1.5°C-aligned climate action pathway would bring direct co-benefits worth at least €1tn by 2030, including improvements like avoided healthcare costs, energy savings, and job



Edinburgh's 2050 Carbon Roadmap

creation.[8] The UK's independent review of Net Zero emphasised that moving early on decarbonisation can deliver a net economic benefit by 2050, especially once co-benefits including new industries and avoided fuel costs are counted.[9]

The UK's Place-Based Climate Action Network (PCAN) delivered Net Zero Carbon Roadmaps for Edinburgh, Belfast, and Leeds. These set out the costs to reach net zero targets and the financial benefits of energy savings and additional jobs. For example, in Edinburgh's 2050 Carbon Roadmap produced in 2020, it was forecast that £553m savings per annum would be generated on Edinburgh city's energy bill, and 11,790 extra employment years would be created.[10] These roadmaps started to evidence that ambitious local climate investments generate significant other benefits too.

Analysis indicates that taking a place-based approach to net zero could save £137 billion in investment to cities, while also unlocking an estimated £431 billion in energy savings and broader social and economic benefits.[11] Between 2023 and 2024, the net zero economy grew by 10.1%, contributing £83.1 billion in Gross Value Added (GVA). For every £1 generated by the net zero economy, an additional £1.89 is created across the broader economy.[12]

A 2021 study projected that raising all UK homes to high energy efficiency by 2030 could avert 650,000 new cases of childhood asthma and save the NHS £2bn by 2030 through improved respiratory health.[13] **The health-related benefits of climate action are particularly well documented,** with the Lancet Countdown and others showing that Net Zero-aligned policies including dietary shifts and active transport, would yield substantial reductions in diseases and health costs independent of their climate benefits.[14,15] These are not marginal gains, they are major public health improvements that support overstretched health systems. There are no apparent alternatives in social policy that can achieve these changes.

2.3 Public support and political relevance

Surveys show the UK public cares about issues like jobs, cost of living, health, and clean air, and that framing climate policies around these concrete benefits boosts public support.[16,17] The Imperial College survey[18] in 2023 found strong public backing for climate measures when people understood that wider benefits would be delivered such as improved energy security and reduced flood risk. **87% of survey voters think that homes that are more affordable to heat are "important" or "very important" for the UK** - the most popular co-benefit in the survey followed closely by improved energy security.[19]

Across 15 different issues, the NHS ranked first as the major issue of concern, followed by cost of living and international conflict. However, destruction of nature and climate change ranked 4th and 5th in concerns ahead of pollution, housing, crime, immigration, terrorism, and employment. This is significant as populist narratives try to paint this as a fringe issue with minority support.[20]

2.4 Challenges and missed opportunities

Despite a strong strategic case for climate co-benefits, they remain under-recognised and undervalued in local decision-making. This is not due to a lack of interest but rather a result of systemic constraints in governance, funding, accountability structures, and technical capacity, all of which limit the routine integration of these wider benefits into local authority planning and investment decisions. In some cases, councils are still catching up with the pace of change, as emerging technologies and evolving policy demands outstrip existing capacity.

2.4.1 Structural misalignment of statutory functions and budgets

Local government funding structures make it difficult to prioritise co-benefits. This is in part due to the way local government funding is calculated and distributed. Councils are responsible for social care, waste, housing, and transport, but these duties do not require climate action. Climate and environmental ambitions often sit outside these duties, funded by short-term grants, one-off capital budgets, or income raising projects. This has led to a situation where these wider benefits are frequently acknowledged in theory but not systematically embedded in budgeting or appraisal.

Co-benefit estimates such as lives saved and jobs created can be mentioned in business cases to strengthen a bid, but rarely are they checked for suitability or tracked post-implementation. Few schemes have formal requirements to monitor whether predicted co-benefits materialise, resulting in limited accountability or learning. As a result, lessons are often lost rather than built upon when moving onto the next project or funding cycle.

2.4.2 Missed potential

Most local government spending is not explicitly directed at climate projects, but could be aligned to achieve climate goals as a co-benefit, yet often is not done, creating untapped potential. According to the Climate Change Committee's (CCC) Seventh Carbon Budget assessments, a significant and measurable co-benefit is the improvement in outdoor air quality, valued at approximately £2.7bn per year by 2040.

This is primarily the result of a shift to low-carbon heating, greater adoption of electric vehicles, and changes in transport modes.[21] For example, social housing upgrades, highway redesigns, or public health initiatives could integrate low-carbon measures at marginal extra cost and yield climate benefits, yet procurement and budget decisions often ignore these angles because they are not seen as core to service delivery.

Conversely, climate-specific funding streams including retrofit grants and EV infrastructure funds, might focus narrowly on carbon and ignore how to optimise social outcomes. One observation is that **most local investments are not routinely assessed for these wider benefits.** For example, there is no standard expectation

that a flood defence scheme should also evaluate benefits to biodiversity and community recreation, or that a transport project should quantify health outcomes from cleaner air. **This represents a systemic gap in "Best Value"[22] definitions as the public sector does not yet consistently define value-for-money to include the wider benefits from climate action or any public spend.**

2.4.3 Disconnected Benefits

Generating co-benefits often results in benefits accruing outside current local government remit altogether. For example, reduced NHS burden from climate action benefits the health system (a national service), not directly the local council's budget. This misalignment can disincentivise local investment in measures like air quality improvement or active travel, even if they save money society-wide and for the wider public purse.[23] Similarly, energy cost savings from retrofitting schools do not show up in a council's balance sheet but on the school operators from reduced bills.

These disconnects weaken the business case for local climate action, even when it delivers clear savings across the wider public sector. Without mechanisms to track, share or pool benefits across departments or tiers of government, there is less incentive for any one body to invest in them. This reinforces the need for cross-departmental and cross-government collaboration involving health, environment, local government, to plan and finance initiatives that deliver shared dividends.[24]

2.4.4 Technical barriers

Calculating these wider benefits often involves complex modelling and assumptions such as economic multipliers, health dose-response functions. This can result in varied estimates depending on methodology, leading to confusion and scepticism among decision-makers. If a retrofit programme claims it will create 50 jobs and save the NHS £X million, the figures may be seen as speculative unless grounded in consistent and transparent methods. Without clear standards, different studies produce different estimates, creating uncertainty that makes policymakers hesitant to rely on them in project plans. This has led to co-benefits being treated as "nice-to-have" theoretical anecdotes rather than rigorous evidence. Some of the case studies with larger budgets tackled this challenge through academic partnerships and established valuation tools.

Whilst the potential of co-benefits is significant, the current governance setup in the UK does not fully capitalise on it. Overcoming this requires addressing structural barriers so that it becomes standard practice.[25] It also requires visible examples of success to build confidence and demonstrate that climate action can deliver on local priorities—health, jobs, inequality, and public wellbeing—as well as emissions.

Community Wealth Building

Local authorities like Preston and Manchester are demonstrating how community wealth building can deliver social and economic benefits alongside local climate action. The Preston Model, developed with the Centre for Local Economic Strategies, redirected public spending to local businesses and cooperatives—keeping more money circulating in the local economy and supporting better wages.[26] Manchester's progressive procurement approach similarly prioritised local suppliers, increasing the proportion of council spending retained within the city. These approaches have not only tackled inequality and boosted local employment but also laid the groundwork for more resilient, low-carbon local economies. They show that procurement and investment decisions can support both social justice and sustainability goals when designed with community value in mind.[27]

2.5 Policy context for Case Study Selections

The urgency of achieving net zero emissions and adapting effectively to climate change necessitates unprecedented investment across sectors at pace.

This report systematically reviews and analyses 10 diverse climate action case studies to evidence delivery of wider policy benefits. The rationale for some of the case studies is highlighted below:

2.5.1 Heat and Buildings

The Warm Homes Plan promises around £3.2bn of investment from 2025 to 2026 from the government, social housing providers, and through supplier obligations. This is expected to lower bills and provide clean heating to 300,000 households.[28] Despite ambitious objectives and substantial funding exceeding £9bn across various targeted grants like the Home Upgrade Grant, Social Housing Decarbonisation Fund, Public Sector Decarbonisation Scheme, and Heat Network Transformation, there remains a critical gap in capturing and evidencing broader societal impacts achieved by this climate action. Analysis suggests that around 21.5% of excess winter deaths in the UK may be linked to cold homes—equating to approximately 5,000 deaths per year over the past decade. Improving energy efficiency in English homes could reduce this toll, with potential NHS savings of around £540 million annually.[29]

Research by The Institute For Public Policy Research (IPPR), shows that retrofitting every household in England could create 1.2m direct and 1.5m indirect jobs and cut household bills by £430 a year on average.[30] Buildings are responsible for around 21% of total emissions with the vast majority coming from heating.[31] Tackling the decarbonisation of homes is a significant retrofit challenge requiring high levels of investment. The Energy Security and Net Zero Committee in its May 2025 report on Retrofitting Homes for Net Zero states, "four in five homes that will be occupied in 2050 have already been built and most will need retrofitting with low-carbon heating systems and energy efficiency improvements for the UK to achieve net zero emissions."[32]

2.5.2 Energy

The UK Government set up Great British Energy (GB Energy), pledging £8.3billion investment over this parliament to achieve clean energy ambitions, economic growth, and job creation (more than 650,000 new jobs) across the UK.[33]

The Local Power Plan[34] will see Great British Energy partner with local communities to develop up to eight gigawatts (GW) of energy through community projects. £400 million of low interest loans will be made available to community groups and £600 million of funding for local and combined authorities to develop up to 20000 small and medium scale renewable energy projects.[35] The CCC's Seventh Carbon Budget highlights that improving energy efficiency can lower levels of excess cold and damp in homes, delivering an estimated net benefit of £650m by 2040. When focused on poorly insulated, low-income households, these measures can also play a key role in alleviating fuel poverty.[36]

2.5.3 Transport

In 2024, domestic transport was responsible for 30% of total greenhouse gas emissions, with the majority coming from petrol and diesel used in road vehicles.[37] The vision for a net zero transport system includes reducing dependence on fossil fuels, scaling up cleaner technologies and encouraging more sustainable ways of getting around. The government has announced that the sale of new petrol and diesel vehicles will end in the UK after 2030, with hybrid models permitted until 2035.[38] By then, all new cars and vans must be fully zero-emission. This transition is intended to support the UK's broader climate goals and accelerate the shift to low-carbon transport. It offers wider co-benefits, including improved air quality, public health, and energy security. The government is also developing an Integrated Transport Strategy to guide the overall approach to planning, constructing, and managing transport systems in England over the coming decade.[39] However, getting transport right across different places – particularly in rural areas – is essential. Additionally, around 10m people live in rural areas and roughly a third of England's local authorities are mainly or predominantly rural. Around 10 million people live in rural communities representing 19% of the total population.[40] While delivering low-carbon transport in these areas can be challenging, it also presents opportunities to address wider issues such as access to jobs, support for local businesses, and tackling loneliness.

2.5.4 Nature

Agriculture ranks as the fourth largest source of emissions within the UK economy and is responsible for 11% of the country's greenhouse gas emissions.[41] The UK is one of the most nature-depleted countries due to its long history of industrialisation and land use changes over millennia.[42]

The need for adaptation highlighted by the CCC's report on national preparedness, underscores the urgency of integrating systematic co-benefit assessment into adaptation measures. Policies for sectors such as housing, transport, and others significantly impact natural environments, making it crucial to embed nature protection and enhancement within these strategies. Doing so helps to maximise co-benefits for biodiversity, climate resilience, and human well-being. Examples of adaptation projects—such as natural flood risk management, urban greening, regenerative agriculture, and clean air initiatives—demonstrate how these actions can generate extensive co-benefits. These include improved public health, enhanced biodiversity, increased agricultural resilience, flood mitigation, and significant healthcare cost savings from reduced air pollution. Reports suggest that nature-based actions assessed generally offer strong co-benefits with no identified trade-offs for the adaptation and mitigation outcomes.[43]

2.6 Summary

Systematic evaluation of the wider benefits of climate action not only enhances transparency and accountability but also fundamentally reshapes the value proposition of climate investments, turning critical climate action into comprehensive societal gain.

3

Case studies: Co-benefits in practice

One of the best ways to understand the power of the wider benefits of climate action is through real world examples. This section profiles a set of climate action projects from different sectors and locations, highlighting their objectives, the wider benefits achieved (quantitative and qualitative), and the approaches used to measure and quantify the benefits. Each case study highlights challenges and lessons learned. The projects include topics such as urban air quality improvement, nature-based climate adaptation, housing retrofit for energy efficiency, district heating, catchment-scale flood management, and community energy. They demonstrate that whether the primary goal is mitigation or adaptation, deliberately designing for co-benefits multiplies a project's value. Each case is structured to show the inputs involved and the wider benefits it achieved.

Birmingham's Clean Air Zone

How local climate action delivered health and economic gains

Birmingham's Clean Air Zone (CAZ), launched in June 2021, shows how targeted action on air pollution can unlock broader public benefits. Operating 24/7 within the city's ring road and backed by £52 million in Government funding, the CAZ aims to bring nitrogen dioxide (NO_2) levels within legal limits as quickly as possible.

To ease the transition, the Council offered generous grants to help residents and businesses upgrade or replace polluting vehicles. The CAZ is about more than charges for non-compliance. It's about enabling change: making cleaner transport accessible, nudging behaviour, and unlocking wider benefits for people, place, and the public purse.

Inputs **£52m** (around **£14m** Infrastructure and **£38m** Grants for vehicle upgrades)

Health Impacts

Estimated **7,500** GP appointments & **50** hospital admissions prevented

£0.5m

Estimated savings per year to NHS

Environmental Impacts

Roadside NO_2 levels inside the zone fell by an average of **17%** compared to the 2019 pre-CAZ baseline

5-7% reduction in traffic related carbon emissions

Primary Objectives

Mitigation

Clean Air

Economic Impacts

£3.67m

a year in avoided climate damage

Fewer sick days and better productivity estimated at **£1.2m** a year

Active Travel

13%

Rise in cycling

Co-benefits Delivered

Health

Active travel

Economic savings

Birmingham's CAZ balances environmental goals with fairness for local people

3.1: Birmingham's Clean Air Zone: Climate, Health and Economic Co-Benefits from Cleaner Air

Project Overview

Birmingham's Clean Air Zone (CAZ) launched in June 2021, shows how targeted action on pollution can deliver far-reaching benefits beyond cleaner air. Backed by £52m in government funding, the CAZ covers the city centre ring road and operates 24/7, 365 days a year. The aim is to bring nitrogen dioxide (NO_2) within legal limits "in the shortest possible time," improving public health and the quality of life in one of the UK's most densely populated urban areas.

The funding budgeted for infrastructure including more than 300 automatic number plate recognition (ANPR) cameras, and a £38m grant scheme that helped residents and businesses upgrade older, polluting vehicles.

The success of Birmingham's CAZ hinges on a carefully designed policy that balances environmental goals with fairness for local people. Recognising the potential financial strain on residents and businesses, the council paired the CAZ with a generous grant scheme, helping thousands upgrade, retrofit, or replace older, more polluting vehicles. Under the Class D scheme, vehicles that don't meet Euro 6 diesel or Euro 4 petrol standards face a daily charge of £8 for cars and vans, and £50 for HGVs and buses.

But the CAZ is about much more than charges. It's about enabling change to make cleaner transport accessible, nudging behaviour, and unlocking wider benefits for people, place, and the public purse.

Wider Benefits Achieved

Air quality

Within just one year, Birmingham's CAZ delivered measurable improvements to air quality. Roadside NO_2 levels inside the zone fell by an average of 17% compared to the 2019 pre-CAZ baseline. In practical terms, that means monitors that once recorded ~45 $\mu g/m^3$ NO_2 now report closer to 37 $\mu g/m^3$.

Health benefits

- Improved air quality has direct health benefits. Birmingham collaborated with public health experts to estimate that every 1 μg/m³ NO_2 reduction can lead to a 2% drop in asthma flare-ups among children, making these changes meaningful, especially for vulnerable residents.

- Other cities offer a useful lens as well. Bradford's CAZ saw a 25% fall in respiratory-related GP visits, yielding an NHS cost saving of around £30,700 per month in the city. Extrapolating this methodology, Birmingham's cleaner air could be preventing around 7,500 GP appointments and 50 hospital admissions each year, saving around £100,000 in hospital costs per year. In 2019, there were 30,000 annual GP respiratory appointments and around 500 pollution-related admissions. Together with fewer GP visits, the NHS saving is projected at about £0.5m per year due to cleaner air.

- These are conservative estimates, and don't include long-term benefits like reduced chronic disease or improved life expectancy. Importantly, these health benefits accrue relatively quickly, within months of air quality improving fewer people suffer asthma attacks or heart stress, demonstrating tangible "here-and-now" returns from a climate action.

Shift to cleaner transport:

- Since launch, the proportion of compliant vehicles entering the zone has grown from 85% to 94%, signalling that thousands of older polluting vehicles have either been upgraded, retrofitted, or replaced altogether.

- Many residents and businesses took advantage of the grant scheme to scrap old vehicles or retrofit engines while others shifted to electric or hybrid vehicles. This support was crucial in easing the burden, making the transition to cleaner transport achievable rather than punitive.

- Traffic-related carbon emissions in the zone have dropped by 5–7% which is around 15,000 fewer tonnes of CO_2 annually. Based on government carbon values around £245 a tonne for non-traded central CO_2 in 2023, that's a saving of roughly £3.67m a year in avoided climate damage.

Active travel

There are encouraging signs of wider shifts, too. Cycling counts increased by 13% along key routes and bus use rose by 2%, with fewer miles being driven overall. These changes, supported by investments in active travel, hint at a healthier, lower-carbon future.

Economic benefits

- There were initial concerns about economic impacts of the CAZ. However, city-centre businesses report no significant drop in footfall, and 62% of those surveyed in 2023 said the area is now "more appealing to visitors and employees" after air quality improvements.

- Fewer sick days and improved worker productivity estimated at £1.2m in annual gains, round out the picture of a cleaner, healthier, more vibrant Birmingham. Productivity gains are harder to measure directly, but the findings in Birmingham align with other clean air initiatives around improved productivity and schoolchildren's performance.

How the Wider Benefits were Measured

Birmingham City Council's success in quantifying these co-benefits was designed in at the start. They invested in an extensive baseline established pre-CAZ by documenting traffic volumes, vehicle types, pollution levels at dozens of sites, and even health statistics for respiratory issues. Automatic air quality monitors and traffic ANPR cameras provided continuous data once the CAZ went live, enabling real-time tracking of outcomes and the council

Grove Park, Birmingham

set **clear Key Performance Indicators (KPIs)** beyond just legal NO_2 compliance to including targets for percentage reduction in non-compliant vehicles, reduction in NO_2 concentrations, and even health metrics like asthma admissions. By formally adopting these co-benefit indicators, the project team was accountable for them and resourced to monitor them.

Birmingham City Council collaborated with the University of Birmingham and health economists. These experts applied rigorous methods. For example, using a **synthetic control analysis** to isolate the CAZ's impact on pollution from other trends, and applying health impact models using dose-response functions from Public Health England's guidance to estimate medical outcomes. A peer-reviewed study of the CAZ's causal impact on air quality lent independent credibility to the findings. The council also **co-created new tools** with Birmingham researchers, such as an Air Quality – Public Health Evaluation Tool (AQ-PET), to convert pollution reductions into health outcomes and economic values. By leveraging national guidance including

Mums for Lungs: Safer streets, cleaner air

Mums for Lungs[44] is a network of people who care about air pollution and its impact on public health, supported by the Clean Air Fund. Founded in Brixton, London, in 2017, the group came together after learning about the dangerously high levels of air pollution on UK streets, particularly around schools. One of their key campaigns is to support and expand School Streets.

School Streets are timed traffic restrictions around school entrances during drop-off and pick-up hours. By limiting private motor traffic at these key times, they create safer, healthier routes for children to walk, cycle, or scoot to school. While local access is maintained for residents, businesses, and blue badge holders, the restrictions reduce through-traffic and improve the street environment and air quality.

These schemes tackle a major source of pollution and congestion, with an estimated 40% of primary school children in England driven to school.[45] Research shows that School Streets can cut nitrogen dioxide levels by up to 23%,[46] helping protect children who face five times more exposure to air pollution during the school run.[47] They also promote physical activity and road safety. Since 2019, School Streets have rapidly expanded in London from around 85 schemes to over 700 by early 2025. Outside the capital, uptake has been slower, with an estimated 200 schemes nationwide. Wider adoption could bring significant public health and environmental benefits.

Defra's damage costs for pollutants, and Public Health England's recommendations on health valuations, Birmingham City Council ensured the numbers it produced (e.g. £ saved for the NHS) were grounded in accepted methodologies.

Equally important was **transparency.** Birmingham City Council regularly publishes progress reports detailing not just emissions and compliance, but also health and economic indicators. This openness built public trust and allowed sceptics to see evidence of benefits. The commitment to share data helped counteract early misinformation that the CAZ was just a "stealth tax". Instead, as results came in such as the achievement of compliance with NO_2 limits in just one year, and stories of improved asthma conditions, public opinion grew more favourable.

Challenges & Lessons

Implementing the CAZ was not without challenges. Public resistance was a major early barrier – fears that it would hurt businesses or low-income drivers had to be managed. Birmingham addressed this by extensive engagement and a generous mitigation package (exemptions and grants), but also by emphasising the **public health rationale.** As data emerged showing real improvements (e.g. pollution down, hospital visits dropping), it validated the policy and helped shift the narrative from punitive charges to positive outcomes. Another challenge was that some emissions, like $PM_2.5$ (fine particulate matter), were less impacted by the CAZ since they come from sources like wood burning or tyre/brake wear. This highlighted that **further measures** beyond the CAZ are needed to tackle all air pollutants – e.g. incentives for cleaner home heating or tougher anti-idling enforcement.

The Council is now exploring a **Climate Co-Benefits Dashboard** – an open dashboard showing emissions, health stats, economic indicators for each major project, modeled on the success of the CAZ data dashboard.

A key lesson from Birmingham is the value of evidence in unlocking **further funding and policy change.** The quantification of the health benefits is now being used to argue for more support for local clean air measures and to justify stricter national air quality standards. In summary, Birmingham's CAZ identifies how **designing, measuring, and communicating co-benefits can turn climate action into a wider public success,** providing a template for integrated climate-health action.

Bradford's Clean Air Zone: Reducing pollution and improving public health

Introduced in September 2022, Bradford Council's CAZ spans 22.4 sq km, making it the second-largest in England.

Targeting older, more polluting commercial vehicles, but excluding private resident owned vehicles, the CAZ imposes charges to reduce nitrogen dioxide (NO_2) emissions. Within its first year, the initiative led to a 25% reduction in GP visits for respiratory illnesses and a 24% decrease for heart-related issues, amounting to approximately 732 fewer appointments monthly. This decline in health service usage translates to an estimated NHS saving of £30,700 each month.[48]

Air quality improvements were observed citywide, not just within the CAZ boundaries, due to widespread vehicle upgrades prompted by the scheme. Notably, Bradford Council now boasts the cleanest taxi fleet in the UK. These outcomes underscore the CAZ's role in enhancing public health, reducing healthcare burdens, and promoting environmental equity across Bradford.

Liverpool 'Urban GreenUP'

Nature-Based Solutions for Climate Resilience, Health & Economy

Liverpool's Urban GreenUP retrofitted over 40 nature-based interventions to tackle urban heat, flooding, active travel and biodiversity loss. From green roofs and rain gardens to pollinator corridors and floating ecosystems, the project tested practical ways to adapt the city to climate change.

Led by Liverpool City Council with local partners, it acted as a "living lab" — combining scientific monitoring with real-world implementation. The aim: to show that greener cities are not only more resilient but also healthier and more vibrant places to live.

Inputs **~£3.5m** grant leveraged **£63m** match funding

Climate Impacts

£46,965 saved from avoided carbon emissions

155 tCO_2 sequestered by trees (cumulative)

7.2°C surface temperature drop in summer

Economic Impacts

100,000+ estimated additional visitor-days

Estimated **£3m** in visitor spending

Reduced absenteeism worth **£100k+**

2 new land management businesses

60 FTE jobs in tourism

Primary Objectives

Adaptation

Overheating

Surface flooding

Social Impacts

500,000 local users of new space

Improved access to green spaces in poorer areas

Health Impacts

13.9% increase in walking

Localised temperature reductions on hot days

26 lives saved/ year due to air quality and active travel

Environmental Impacts

Over **5.2m** litres/year of stormwater diverted and **£4,799** saved/year from reduced stormwater processing

Cleaner air from greener traffic corridors

0.16ha land enhanced for biodiversity

Co-benefits Delivered

Flood management

Air quality

Active travel

Health

Productivity (less absenteeism)

Cooling

Biodiversity

Economy

3.2: Liverpool's Urban GreenUP Project: Nature-Based Solutions (NbS) for Climate Resilience, Health & Economy

Project Overview

Liverpool City Council's URBAN GreenUP project is a standout example of leveraging NbS for climate adaptation while delivering wide-ranging benefits. Funded through the EU's Horizon 2020 programme (2017–2023), the project retrofitted over 40 green and blue infrastructure interventions across the city with €3.4m (around £3.5m) in grant funding. From green roofs and walls, rain gardens, and permeable pavement tree pits for sustainable drainage, to pocket parks, pollinator corridors, and even floating ecosystems in the docks, the project tested a wide variety of NbS to address urban heat, flooding, and biodiversity loss.

Liverpool City Council led the project with The Mersey Forest and University of Liverpool ensuring robust scientific monitoring was embedded. Baseline data on environmental conditions was collected and a comprehensive pre and post-monitoring programme was put in place. Urban GreenUP was essentially a "living lab" to demonstrate that greening a city yields tangible returns in resilience, citizen wellbeing, and economic activity, creating an evidence base to inform future investments.

Co-benefits Achieved

Flood management and water regulation

- By introducing green drainage features, the project significantly enhanced the city's ability to capture stormwater. Flow meters installed in pilot sustainable drainage (SuDS) sites measured **over 5.2m litres of stormwater diverted or retained per year** that would otherwise have overwhelmed sewers and led to surface flooding. This water retention translated into cost savings of roughly **£6,800 per year** saved in water treatment costs for the city, based on avoided sewer pumping and treatment fees. By reducing surface runoff, the project reduced local flood incidents and prevented costly emergency call outs and property damage. Using the GI-Val (Green Infrastructure Valuation) toolkit,[49] which aggregates benefits, **the energy and carbon emissions avoided from reduced stormwater processing were valued at an additional £4,799 per year.** These figures help make a **business case for NbS in urban drainage,** traditionally dominated by grey infrastructure.*

Carbon sequestration

- Tree planting and new green areas led to carbon sequestration. The project planted hundreds of trees, which together sequestered an estimated **32.8 tonnes of CO_2** during the project period with cumulative sequestration projected to reach 155 tCO_2 over their lifetimes.

- Using carbon valuations (HMT green book) from 2025 (£303/tCO_2 for UK), the direct climate benefit of the project's carbon sequestration was calculated at around **£46,965 in value.**

Health and Active Lifestyles

- One standout result was the project's impact on physical activity. By creating or enhancing green corridors and attractive walking routes, GreenUP encouraged more walking and cycling. Citywide data showed a **13.9% increase above baseline in walking levels** during the project period. Using the WHO's Health Economic Assessment Tool (HEAT) for walking, this was estimated at **26 lives saved per year** due to increased physical activity and potentially cleaner air.[50]

- **Absenteeism (sick days) among employees** in the demonstration areas

* Grey infrastructure refers to engineered, human-made structures like dams, road, pipes, etc.

Green wall in Parr Street, Liverpool city centre

dropped, surveyed by local businesses, they estimated 34–186 fewer sick days per 1,000 employees annually which is valued at roughly **£56,700 per annum in increased productivity** due to better health and reduced stress.

Urban cooling and comfort

- GreenUP's green spaces of trees and green roofs provide shade and cooling, mitigating urban heat island effects. Preliminary data showed localised temperature reductions on hot days. This improves thermal comfort for residents and could **reduce heat-related health risks** during heatwaves, a co-benefit likely to become more valuable in future climate scenarios. For example, Liverpool experienced extreme heat in the summer of 2022, and having more green cover is a direct adaptation that could save lives.

Biodiversity and Ecosystem Services

- GreenUP explicitly aimed to **"renature"** urban spaces, boosting biodiversity. The project created about **0.16 hectares of new or enhanced habitats** with wildflower meadows, wetlands, and pollinator gardens. These pockets have outsized importance. Wildflower plots led to observed increases in pollinator insects and bird counts improved.

- GI-Val analysis estimated that biodiversity improvements and new green amenities led to an increase in recreational use, attracting more people to parks and outdoor spaces, which correlates with better health and community cohesion. As a proxy, Liverpool City Council estimated **100,000 additional visitor-days** to the city's green spaces, attributable to the project with people spending more time outdoors in the improved areas. At an average local spend of around £30 per day, that implies **£3m in additional local tourism and leisure spending,** supporting hospitality and retail jobs.

- According to the GI-Val model, 60 FTE jobs in tourism and two new land management businesses were created due to the improved green infrastructure, highlighting how urban greening can feed into a city's economic regeneration and "liveability", making it more attractive for visitors, residents, and investors.

- In 2021, the Office for National Statistics (ONS) published evidence that homes near green space command a £2,500 premium on an average home, suggesting GreenUP's interventions of 817 more homes with a green view might have raised local property values by around £2m in total. While this is a private benefit, it bolsters council tax and investor confidence in green developments.

Community and Social Cohesion

- Liverpool City Council's baseline data showed stark contrasts in health outcomes between wards by focusing NbS in some of the poorer wards, the project intended to help **"level up" health and wellbeing disparities.** While harder to monetise, improved mental health from access to nature was evidenced from 12-week wellbeing activity programmes with an 18% increase in wellbeing.

Measurement & Evaluation

- Liverpool City Council took a robust, evidence-based approach to measuring the wider benefits, making URBAN GreenUP a model for NbS deployment. The GI-Val Toolkit (developed by The Mersey Forest) was used to translate local environmental data including litres of water captured and trees planted into monetary values. These included estimates for carbon sequestration, improved air quality, increased physical activity, and reduced absenteeism.

- The University of Liverpool added scientific rigour by designing monitoring protocols and analysing seasonal baseline versus post-implementation data. Indicators included temperature reduction known as "cooling degree hours", biodiversity scores, pollutant levels, and resident surveys on health and space usage, ensuring a clear link between interventions and impact.

- Some benefits such as tree growth and health improvements emerge over longer timescales than the project. To address this, the team used models to project long-term impacts, such as future carbon sequestration and health outcomes. They were transparent about uncertainties, noting that short-term data likely underestimates co-benefits' full value.

Lessons Learned

1 **The evidence gap remains a barrier – but can be partly overcome:** A major challenge for NbS is that benefits are harder to measure or materialise over longer periods (trees take time to grow). Liverpool City Council's experience partly overcame this evidence gap by monetising co-benefits and using tools like GI-Val to model returns. However, it still faced the hurdle that some decision makers and funders are sceptical of new approaches. Convincing budget holders to allocate funds up front remains difficult if they doubt the estimates of future gains.

2 **Making the case means seeing the bigger picture:** The business case for green infrastructure can become easier if you don't only focus on direct climate mitigation. For example, a £3.5m grant spend might seem hard to justify on carbon savings alone, but becomes compelling when climate, health, tourism, and leisure co-benefits are tallied together. This bigger-picture framing helped Liverpool City Council shift the narrative from "nice-to-have" to serious investment and cost avoidance.

3 **Aligning with city priorities builds support:** A key learning was the value of integrating the wider benefits of climate action into broader city strategies. By aligning GreenUP's aims with pressing local issues including health inequalities, job creation, and derelict land reuse, the project gained leadership buy-in beyond the environmental department. It helped advance multiple policy agendas at once in public health (reduced respiratory illness and more exercise), economic development (green jobs and tourism), transport (walkable streets), and levelling up deprived areas through new green amenities.

4 **Co-benefits create coalitions:** One of the project's biggest strengths was building broad coalitions of support. By emphasising the wider benefits, GreenUP appealed to multiple stakeholders including public health officials who were excited about health gains, the local enterprise partnerships who saw potential in jobs and tourism, and community groups who welcomed the quality-of-life improvements. This multi-faceted relevance made the project politically resilient and helped secure buy-in from across the city.

5 **NbS are also urban regeneration strategies:** GreenUP demonstrated the power of NbS not only as a climate strategy but as a tool for wider urban regeneration. Through careful planning and evaluation, Liverpool City Council made the case that greening is not just

environmental, it's also about resilience, public health, and inclusive economic growth. The success of the project is now feeding into a proposed citywide "Urban Nature Accelerator" and being shared nationally, offering other cities a blueprint for how to secure value and political support by centring co-benefits.

Barriers

- **Traditional cost-benefit bias:** Investors often favour grey infrastructure with clear short-term ROI. Green infrastructure offers dispersed, long-term benefits that are harder to quantify in conventional models. For example, planting trees may not show a financial return for years, unlike a car park with immediate revenue. Tools like GI-Val helped the city council make the case, but up-front investment remains a challenge where budget holders are sceptical of projected savings.
- **Funding silos and eligibility:** Co-benefits span sectors including health, transport, and environment, but budgets are siloed. No single department wants to fund a project where others benefit.
- **Capital v revenue funding mismatch:** While capital funding such as EU grants covered installation, securing long-term revenue funding for maintenance was harder. Under tight budgets, non-statutory services like parks are often cut first, undermining the longevity of the wider benefits.
- **Perceived risk and uncertainty:** NbS are still seen as unfamiliar or untested, with funders wary of performance risks and uncertain uptake.
- **Measurement and attribution challenges:** It wasn't always possible to isolate the impact of NbS from external factors like weather or traffic changes. Some benefits including carbon sequestration and public health gains emerge over longer timeframes than the project window, risking underestimation of value.
- **Technical constraints:** Urban environments posed physical challenges, such as underground utilities or structural limitations, and the specialised contractors required are not always available.
- **Community and social barriers:** Initial pushback from residents such as fears of subsidence or vandalism, delayed some interventions. Securing permissions on private land or in front of businesses also required negotiation and time.

Lewisham: Riverdale Sculpture Park

Lewisham Council is finding new ways to manage future flood risk around Riverdale Sculpture Park. Deprivation in the local neighbourhood is high—47.8% of residents experience deprivation in one or more areas, including health, employment, housing, or education (2021 Census). Access to green space is also limited.

However, the regeneration of Riverdale Sculpture Park presents an opportunity to address multiple local challenges simultaneously: managing flood risk, improving access to green space, increasing biodiversity, and improving health—by co-creating a welcoming place on people's doorsteps to visit and enjoy, starting the process by engaging communities on the issues that matter to them, gathering data to set baselines, and monitoring progress to demonstrate improvements provides a blueprint for effective climate action by integrating green and blue infrastructure with social and health benefits.[51]

Cambridgeshire Home Energy Retrofit

Warm Homes, Green Skills, and Economic Multipliers

The Cambridgeshire Energy Retrofit Partnership (CERP), led by Cambridge City Council, shows how retrofit programmes can deliver far-reaching local benefits beyond home upgrades. Between April 2023 and March 2025, £8.6 million was invested to improve energy efficiency in 494 privately-owned homes, funded by the Government's Home Upgrade Grant (HUG2) and the Cambridgeshire and Peterborough Combined Authority.

A key delivery partner, MacBrook Gas Ltd, delivered 195 upgrades worth £3.8 million and additional improvements through ECO4. The project unlocked £2.55 million in private sector investment, created 48 skilled jobs through this one provider alone, and funded the establishment of a new retrofit training facility—building long-term capacity for the local green economy.

Inputs £8.6m

Climate Impacts

490 tCO_2 a year saved

Environmental Impacts

1.14MW of solar PV installed (**455** homes)

Air source heat pump (**210** homes) total capacity **2.1 MWth**

2GWh of energy saved per year

Economic Impacts

£2.55m invested in local supply chain (48 FTE)

£3m supply chain skills growth (training facility)

4 FTE public sector

8 FTE with a further framework contractor

Training **2,000** tradespeople (500 per year)

100 full time apprenticeships delivered, **300** starting

£320 average home energy bill savings

Primary Objectives

Mitigation

Retrofit

Social Impacts

494 low-income private sector homes retrofitted

Reduced fuel poverty

Co-benefits Delivered

- Green jobs
- Supply chain
- Energy security
- Fuel poverty
- Air quality
- Renewable energy

3.3: Cambridgeshire's Home Energy Retrofit: Warm Homes, Green Skills, and Economic Multipliers

Project Overview

The Cambridgeshire Energy Retrofit Partnership (CERP), led by Cambridgeshire City Council, demonstrates how a retrofit programme delivers more than just home upgrades. Between April 2023 and March 2025, the partnership delivered £8.6m worth of home energy upgrades to 494 low-income privately-owned homes with poor energy performance (EPC rating D-G). Measures included insulation, efficient heating systems (heat pumps replacing old gas or electric heaters), solar panels, and ventilation improvements. This case showcases the transformative potential of government-funded retrofit programmes.

This £8.6m programme was funded through the government's Home Upgrade Grant (HUG 2) and the Cambridgeshire and Peterborough Combined Authority. The HUG 2 programme targeted private sector, low-income homes with total earnings under £34,000 and home energy efficiency ratings of D and lower, helping those most vulnerable to high energy costs.

The grant required tracking of the number and type of retrofit measures installed in homes but not carbon or co-benefit measurement or reporting. This case study is included to demonstrate how **local partnerships, collaboration, and trust, can build significant co-benefits.** It examines and quantifies the local economic impact delivered by MacBrookGas Ltd (MBG), one of five HUG 2 delivery partners. They delivered 195 home upgrades and additional retrofits via the Energy Company Obligation (ECO4) and the co-benefit analysis has been developed post-completion of the project in collaboration with Cambridge City Council and MBG.

Co-benefits Achieved

Green Jobs and Supply Chain Growth

- The HUG 2 grant funding acted as a catalyst for private sector investment and capacity-building in the local retrofit market. MBG **expanded its workforce between 2022-2025 by 48 FTEs.** This included trained installers (plumbers and electricians), retrofit assessors, customer support staff, and project managers. MBG took the step of **converting 20 of its regular subcontractors to in-house staff** to invest in upskilling and for greater control over quality standards and delivery timelines. Through the grant, this local company expanded by 65% in three years.

Cambridgeshire Energy Retrofit Partnership (CERP)

Cambridgeshire Energy Retrofit Partnership comprises Cambridge City Council, East Cambridgeshire District Council, Fenland District Council, Huntingdonshire District Council, South Cambridgeshire District Council, Cambridgeshire County Council and more recently Cambridgeshire and Peterborough Combined Authority. The partnership has been collaborating for over 10 years and has been successful drawing down £25m+ of funding for energy efficiency and retrofitting homes, building local capacity and skills for the retrofit challenge. It runs Action on Energy Cambridgeshire to provide advice to communities on how to maximise the energy efficiency of homes, save money on bills and cut carbon emissions.[52]

- Recognising the importance of homeowners as advocates for retrofitting and long-term business sustainability, this investment of bringing subcontractors in-house and recruiting customer support staff was an important step.

- In monetary terms, MBG calculates that **£2.55m of private sector money was invested directly into local supply chain and skills** as a direct co-benefit of the HUG 2 and ECO4 projects. This figure comes from comparing MBG staff budgets directly before and on completion of HUG 2.

- Beyond immediate employment, MBG identified a market opportunity to invest in a retrofit training facility. For an **investment of £200,000** and an ongoing cost of around £750,000 per year to run the facility, the training facility will build local retrofit capacity. Over four years, it is forecast that **2,000 tradespeople (500 per year)** in the region will be upskilled, plus 100 full-time apprenticeships delivered and a further 300 apprenticeships will be started. This investment of £3m (£750,000 over four years) is to build the talent pipeline in insulation, heat pump installation, solar installation, and retrofit to address the skills shortage, a major limiter to scaling up retrofit growth. In effect, the project's co-benefit is **seeding a long-term green skills base in the East of England.**

Future Energy Security and Resilience

- For the HUG 2 programme, 455 homes installed a total of 1.14MW of solar PV on their roofs. This reduces reliance on the grid, promotes energy independence and contributes to a more resilient energy system.

- 210 homes installed air source heat pumps totalling 2.10 MW which contributes to reducing reliance on fossil fuels and global gas markets.

- Insulation measures, heating controls and high heat retention storage heaters all helped to save an average of 2 GWh of electricity consumption per year (the equivalent of powering 2 million homes for one hour) for the 494 homes. The 2 GWh of bill saving equates to £158,249 per annum or approximately **£320 per home on average.** This enhances **energy security at the local level** – a timely co-benefit given recent volatility in energy markets. From a strategic view, reducing demand can **defer infrastructure costs as it reduces the 'peak' requirement.**

Environmental impacts

- Carbon emissions reductions of 490 tCO2e per annum have been saved through the installation of the retrofit measures, averaging just under one tonne of savings per home.

Quantification Approach

From the start, the project team recognized that while £8.6m was being spent on capital works including project administration, the spillover economic benefit could be a multiple of that. The **calculated economic co-benefit in terms of private sector direct investment was around £2.55m** on top of the grant. For each retrofitted home **£5,162 of monetised value is added to the local economy on average,** when considering jobs supported and local spending. This is equal effectively to a local multiplier effect of 1.32 on the public funding.

Data collection was done through the contractors' reporting (new hires, training hours, spend on local subcontractors) and through baseline vs post-retrofit comparisons of energy metrics. The programme used standardised assessment tools (like RdSAP energy assessments) to estimate baseline home energy use and model the post-retrofit savings. It also collected **resident feedback** on energy bills and comfort. A crucial component of success was **certainty of pipeline** rather than stop-start grants. **The government's ambition for sustainable**

Work taking place at the MBG training facility

economic growth is enabled by these co-benefits of delivering growth while tackling fuel poverty and putting money in people's pockets from bill savings. This language directly ties local outcomes to national priorities, strengthening the narrative for continuous support.

Challenges

The biggest challenge addressed was the **skills gap** – initially, lack of qualified retrofit installers threatened to slow delivery. The co-benefit approach turned this into a win by channelling investment into training, though it required MBG and partners to frontload some costs (the training centre) in expectation of future work. Another challenge was **householder engagement** – convincing sometimes sceptical private homeowners/landlords to accept grant upgrades. The promise of lower bills and warmer homes, plus community outreach, was vital.

Lessons Learned

- Clear multi-year commitments are needed to give delivery partners the confidence to invest in skills, staff, and supply chains, key foundations for scaling retrofit.
- Cambridge City Council's strong climate ambition has been a critical success factor. Its long-term investment in two full-time equivalent retrofit officers to lead work run the Cambridgeshire Retrofit Partnership (CERP), and secure funding has built deep local knowledge and delivery capability. SMEs often lack the capacity to navigate complex government schemes and meet customer expectations, and benefit significantly from the hands-on support and guidance of experienced local officers.
- Cambridgeshire County Council's experience underscores that **retrofit programmes can be designed not just to cut carbon, but to boost local economies and skills.** By embedding requirements for local labour and training in contracts, they ensured money recirculated regionally.
- It demonstrates to HM Treasury that **investing public funds in retrofits yields economic returns in jobs and tax revenue from new employmen**t that offset a good portion of the initial outlay. For the council, it is keen to mainstream co-benefit tracking into all housing and energy initiatives to capture the full value of climate action in homes.

Devon's 'Connecting the Culm'

Nature-Based Flood Management with Co-Benefits for Communities and Nature

Connecting the Culm is a landscape-scale climate adaptation project using nature-based solutions to reduce flood risk, improve water quality, and support biodiversity. Led by Blackdown Hills National Landscape with local and national partners, it focuses on strategic catchment planning and community co-creation. The River Culm catchment—home to vital infrastructure like the M5 and Great Western Railway—faces growing climate pressures, making these interventions both urgent and cost-effective.

Natural Devon's State of the Environment report (2018) projects flood damage costs rising from £81m per year to £1bn by 2100.

Inputs **£1m** EU grant **£20.21m** capital **£3.94m** annual maintenance

Climate Impacts

4,000 tCO_2 sequestered

Carbon sequestered valued at **£1.1m** a year

Economic Impacts

£96,000 a year avoided in flood damages (at Hele crossing for Network Rail)

Reduced treatment cost for downstream water users

Primary Objectives

Adaptation

Flood risk management

Environmental Impacts

16-21% reduced peak flood flow at critical points

Improved water quality - **20%** drop in nitrates/ phosphates, **35%** less sediment

Improve biodiversity - **10%** more habitats, **25%** rise in species populations

Reduced soil erosion by **40%**

Social Impacts

3,500 people engaged

Working with **26** communities

Co-benefits Delivered

- Community engagement
- Water quality
- Soil health
- Sequestered carbon
- Biodiversity

Connecting the Culm places the wider benefits of climate action at the core of its business case

3.4: Devon's Connecting the Culm Project: Nature-Based Flood Management with Co-Benefits for Communities and Nature

Project Overview

Connecting the Culm is a **landscape-scale climate adaptation project** that places the wider benefits of climate action at the core of its business case. Led by the Blackdown Hills National Landscape (BHNL), with partners including the Environment Agency, Devon County Council, Mid Devon District Council and the National Trust, it focuses on strategic catchment planning to build resilience to flooding and drought, improve water quality, and support biodiversity through community co-creation.

The River Culm catchment, home to key transport links like the M5 and the Great Western Main Line, faces growing flood risks and ecological strain from climate change and pollution. The Culm Catchment Blueprint proposes cost-effective NbS such as water storage, floodplain reconnection, soil infiltration improvements, tree and hedgerow planting, and bunds, to reduce flood probability and duration at key receptors such as Hele railway crossing. The Blueprint's estimated cost is £20.21m in capital and £3.94m in annual maintenance, including payments to landowners. Around 75% is expected from agri-environment grants, with the remainder through innovative blended finance, drawing on avoided damages, insurance savings, and developer contributions.

Connecting the Culm

Co-Benefits Expected and Demonstrated

Flood Risk Reduction

- At its core, CtC aims to reduce **flood risk for communities and infrastructure.** Modelling indicates that implementing NbS throughout the catchment can reduce the peak flood flow at critical points including the Hele railway crossing by **16–21%,** and the duration of flooding by 5–10 hours, reducing flood heights,

protecting properties, and keeping rail services operational more often. It also increases temporary water storage by 15%, reducing risk for both existing villages and new developments. Natural Devon's State of the Environment report (2018) projects flood damage costs rising from £81m per year to £1bn by 2100. CtC could deliver £1.2m in avoided flood damages based on historical impacts. While these benefits accrue during flood events, in a changing climate the frequency of such events is rising, making the intervention more and more valuable over the 25-year horizon.

- At Hele crossing, Network Rail could avoid £96,000 per year in damages. Avoided disruption on the Bristol to Exeter line is a major economic co-benefit, with fewer delays and cancellations reducing economic losses and public inconvenience.

Water Quality Improvements

- CtC tackles **water pollution issues** by intercepting and filtering runoff. One aspect is the creation of wetlands and buffer strips to catch farm runoff, especially near the M5 motorway where polluted runoff enters the Culm. These nature-based filters reduce nitrates and phosphates by 20% and sediment load by 35%, improving water quality.

- Cleaner water supports healthier aquatic ecosystems (benefiting fish and invertebrates), reduces water treatment costs for downstream water users, and enhances compliance with water quality standards (useful for regulatory goals).

Biodiversity and Habitat Restoration

- By planting trees and hedgerows, restoring wetlands, and reconnecting floodplains, the project also boosts biodiversity in the catchment and ecosystem health across the catchment. These measures provide habitats and wildlife corridors, support pollinators, birds, and small mammals, and improve soil health. Wetlands and wet meadows benefit amphibians, waterfowl, and diverse plant life.

- In a largely agricultural landscape, this project has led to habitat creation of up to 10% and supported a 25% rise in local species populations. The blueprint also boosts ecosystem services, carbon is sequestered in re-wetted soils, new woodland biomass is created, and soil structure is improved. Though primarily focused on adaptation, these NbS contribute an estimated £1.1m per year (at 2023 carbon values for appraisal) in carbon storage value and increased resilience to climate change.

Agricultural and landowner benefits

- Collaboration with **local land managers was vital,** and the NbS are designed to benefit both farm businesses as well as provide public good. For example, improved soil management such as enhanced infiltration can b**oost agricultural productivity** by retaining moisture in dry periods and reducing soil loss. The project has managed to **reduce soil erosion by 40%** on local farms.

- Hedgerows aid pollination and shelter livestock, while wetlands can be integrated into less productive areas and generate new income, such as payments for ecosystem services.

- The project covers "profits foregone" to ensure farmers are compensated for land use changes. Long-term, reduced flood risks and improved soil fertility mean more stable yields and less field damage.

Economic and Infrastructure Co-Benefits

- Beyond avoiding railway disruption, CtC can reduce infrastructure costs by using nature to manage flood risks, lessening the need for engineered defences and lowering road repair bills. Its blended finance model which engages insurers

Connecting the Culm increases temporary water storage by 15%, reducing risk for both existing villages and new developments

and beneficiaries, opens up new funding partnerships, helping to unlock investment and create local jobs in delivery and monitoring.

Measurement & Data

- The project has utilised detailed hydrological and hydraulic modelling to predict flood benefits, including peak flow and duration reductions for various scenarios. As NbS are implemented, **monitoring stations on the River Culm and its tributaries** will track changes in flow responses to rainfall.

- Measuring NbS effectiveness is challenging due to variability in weather and the complexity of natural processes, so long-term monitoring is central to CtC.

- CtC responds to a UK evidence gap on NbS by treating early interventions as demonstrations, and collecting extensive data with universities, research bodies, and citizen scientists. Over 25 years, the project will build robust evidence on how NbS in combination can reduce flood peaks from storms of varying intensity.

- For co-benefits, **baseline studies** are in place for flood frequency and damages, water quality metrics, biodiversity indices, and farm economics. They also intend to track the **value captured** for example, documenting how much financial contribution can be secured from avoided costs.

Barriers & Challenges

- CtC faces the common challenge that many of the wider benefits, especially environmental ones, are **hard to quantify and prove** upfront.

- The lack of long-term data on NbS means **trust in their effectiveness is not fully established** among all stakeholders. Traditional flood engineers might prefer known “hard” solutions due to this uncertainty. The project addresses this by using models to provide best estimates

The River Culm in Devon

and planning flexible interventions that can be adjusted. It also highlights that **no single measure is a silver bullet,** rather, a combination is needed. So, an adaptive management approach is required.

- Another barrier is **funding coordination,** with 75% expected from agri-environment schemes, policies including the Environmental Land Management Scheme (ELMS) are key. The remainder requires blending funds from diverse sources including water companies, developers, and climate funds, which is complex. CtC is actively developing a **blended finance strategy capturing value from avoided damages, insurance savings, and managing pollution contributions.** This is pioneering work, and not easy, but if successful it sets a template.

Lessons Learned

- CtC stands out by explicitly trying to **value and monetise the wider benefits to build the financial case.** By capturing the value of avoided infrastructure costs, compensation payments, insurance savings, and more, it puts a price on benefits traditionally seen as intangible. If successful it could revolutionise funding for NbS by showing concrete ROI.

- From a policy perspective, this project underscores the need for **cross-sector partnerships,** bringing together flood management, agriculture, environment, planning, and finance to deliver multiple outcomes. It provides a model for how to manage complex, multi-benefit projects by aligning different stakeholders' objectives. Aligning objectives of all parties and evidencing NbS performance adds complexity. The **initial £1m EU grant was crucial to convene and catalyse stakeholders to develop the plan,** without that seed funding, collaboration would have been hard. This suggests future policy should fund the process of planning integrated projects, not just the capital works.

Cardiff's Local Area Energy Plan (LAEP)

Delivering Warm Homes, Local Jobs, and a Greener City

To help meet Wales' net zero targets, the Welsh Government has funded Local Area Energy Plans (LAEPs) across all 22 local authorities. Cardiff's LAEP sets out a detailed, locally shaped roadmap to transform the city's energy system by 2050. It calls for 160,000 heat pumps, 91,000 home retrofits, 26,000 EV chargers, 510 MW of rooftop solar, 120 MW of ground-mounted solar, and 9 large wind turbines. Developed with community input, the plan aims to cut emissions while creating jobs, lowering bills, and improving health.

Social Impacts

Highly insulated homes to cut heat demand and costs by 2050, easing fuel poverty and improving affordability

£500m

saved in cumulative energy bills by 2050

Economic Impacts

9,800 high-quality local jobs by 2050 in construction, engineering, and clean energy

Will boost the local economy through investment in clean energy & efficiency

Expanding renewables will strengthen energy security & grid resilience

Primary Objectives

Mitigation

Adaptation

Carbon reductions

Health Impacts

91,000

warmer, healthier homes with insulation and modern heating, reducing illness and winter deaths

Environmental Impacts

£470 -530m

avoided in air quality-related costs by 2050

Co-benefits Delivered

Green jobs

Health

Air quality

Fuel poverty

Energy security

Economic savings

3.5: Cardiff Local Area Energy Planning: Delivering Warm Homes, Local Jobs, and a Greener City

Project Overview

To help meet Wales' ambitious net zero targets of cutting emissions by 63% by 2030 and reaching net zero by 2050, the Welsh government has rolled out LAEP across all 22 local authority areas. These plans are funded nationally but shaped and created locally.

Cardiff Council's LAEP sets out a clear, data-driven roadmap for transforming the city's energy system across buildings, transport, power, and industry by 2050. Developed with input from local residents, businesses, network operators, and council officers, the plan maps out what needs to happen, when it needs to happen, and who's responsible for it. By 2050, the plan calls for:

- 120 MW of new ground-mounted solar farms.
- 510 MW of rooftop solar.
- 9 large wind turbines.
- 26,000 electric vehicle chargers.
- 160,000 heat pumps.
- 91,000 home retrofits.

Beyond emissions cuts, the LAEP highlights wider benefits, from job creation and energy bill savings, to better air quality and healthier homes, laying the foundation for a greener, fairer Cardiff.

Co-Benefits Expected

Job creation

The LAEP estimates around 9,800 high-quality new local jobs could be created by 2050 in construction, engineering, and clean energy maintenance. These are gross figures, reflecting new roles in growing low-carbon sectors such as retrofitting, solar, and heat pump installation, without accounting for potential losses in high-carbon industries.

Local Economic Growth

The Cardiff LAEP projects that investing in clean energy and efficiency will inject hundreds of millions into the local economy. For example, each retrofit or MW of renewable energy installed boosts demand for local materials, skilled labour, and ongoing services, driving long-term growth and supporting the supply chain.

Energy Security and Grid Resilience

By expanding renewables and reducing reliance on fossil fuel imports, Cardiff Council can shield itself from price shocks and supply risks. Grid upgrades and added storage will boost reliability, reduce outages, and create a more resilient energy system for homes and businesses.

Healthier Homes

Upgrading around 91,000 homes with insulation and modern heating will eliminate cold, damp conditions—improving comfort, cutting respiratory illness, and reducing excess winter deaths.

Fuel Poverty

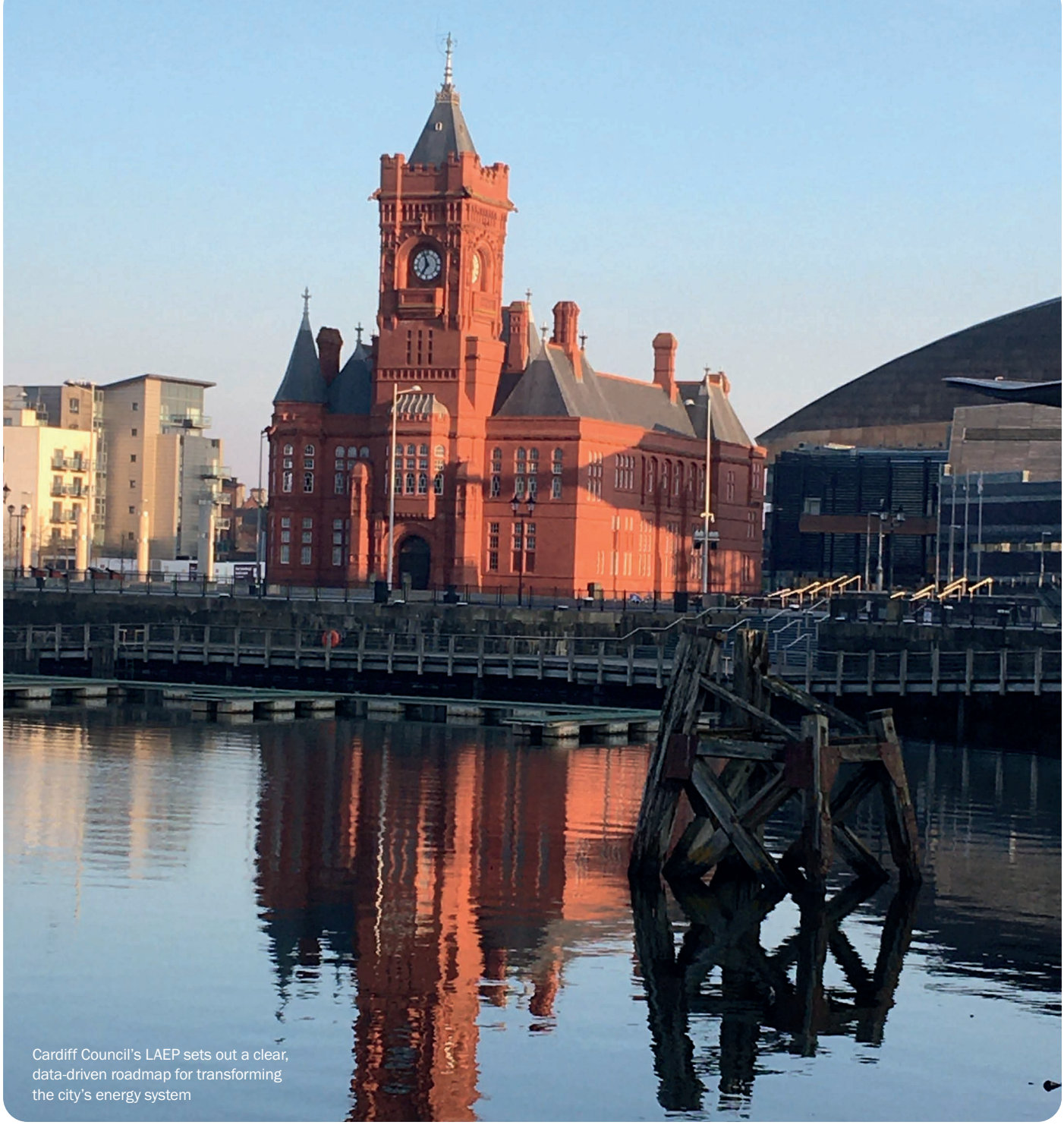
By 2030, early measures like loft insulation and smart heating controls will begin lowering energy use. By 2050, highly insulated homes will cut heat demand significantly, easing fuel poverty and improving affordability in low-income areas.

Energy Savings and Affordability

Cardiff's LAEP estimates around **£500 million in cumulative energy bill savings by 2050,** due to improved energy efficiency (e.g. insulation, efficient appliances) and lower running costs from technologies like heat pumps and EVs.

Air Quality Improvements

Cardiff Council's transition to a net zero energy system is expected to avoid approximately £470–£530m in air quality-



Cardiff Council's LAEP sets out a clear, data-driven roadmap for transforming the city's energy system

related costs between 2023 and 2050 (in undiscounted 2022 prices), compared to a "do-nothing" scenario. Cleaner air could save around half-a-billion pounds by 2050 due to fewer pollution-related diseases and deaths.

Key analytical tools and methods

Cardiff Council's LAEP drew on a mix of national scenarios such as Future Energy Scenarios (FES) and Distribution Future Energy Scenarios (DFES), local policy documents, and stakeholder insights to shape its projections. It included data on national policy commitments for the phase-out of gas boilers and petrol cars, as well as local plans and community knowledge.

- **Local Data Gaps:** In some cases, detailed Cardiff-specific data was limited. For example, information on the energy performance of buildings relies on imperfect proxies like Energy Performance Certificates, which do not cover every home.

- **Long-Term Uncertainty:** Projections to 2050 involve assumptions around technology costs, policy shifts, and public behaviour, which carry uncertainty.

- **Hard-to-Measure Co-benefits:** While jobs, savings, and air quality are quantified, benefits like community well-being and biodiversity are harder to measure and remain qualitative.

- **Monitoring Needed:** Establishing a baseline for the wider benefits is challenging. For example, to track health improvements from better housing, baseline data including cold-related hospital admissions is needed and must be linked to LAEP actions. Cardiff's LAEP plans to develop a monitoring framework using existing data such as fuel poverty rates, air quality, and green jobs, to fill gaps and measure these wider benefits over time.

Challenges & Lessons

Peer learning from other councils

Cardiff's LAEP was part of a wider Welsh programme, and the city benefitted from experiences in other councils. These examples provided useful benchmarks. For example, the Vale of Glamorgan identified up to £607m in savings and over 5,000 jobs through their LAEP, helping Cardiff shape its approach and co-benefits framing. Illustrating the value of the Welsh government's approach to LAEPs, and UK100's position that a version of this model should, and could, be extended to England.

Stronger case with co-benefits

Evaluating the LAEP using The Green Book principles, which includes the wider benefits, provided a positive Benefit-Cost Ratio (BCR) as compared to traditional analyses focused only on carbon or energy. Factoring in wider societal value made a stronger case for investment and helped the council demonstrate "value for money".

Upfront costs vs long-term payoffs

Many LAEP measures require large initial investment but benefits accrue over time. This mismatch can make it difficult to secure funding, especially when budgets and political terms operate on short-term political policy and funding cycles. Delivering the LAEP involves multiple actors including local authorities, communities, businesses, and regulators, making coordination difficult with no single body in charge.

Investor confidence matters

The success of many LAEP projects relies on unlocking and shaping private investment, such as homeowners retrofitting or businesses developing renewables. Investors need policy certainty. Shifts in incentives (e.g. for heat pumps) or regulatory changes (e.g. grid charges) can reduce confidence and stall delivery.

Difficult to isolate impacts

Tracking the benefits of LAEP actions is complex. If air quality improves or jobs increase, it's hard to determine how much is due to LAEP interventions v national policies or unrelated trends.

Challenges valuing non-market benefits

Some co-benefits including enhanced biodiversity and mental wellbeing, are difficult to assign monetary value. This limits their visibility in cost-benefit analyses, even though they matter greatly to communities

Complex evidence, simple messages

Even when these wider benefits are measured, they must be communicated clearly to councillors, funders, and residents. Turning technical findings into compelling stories remains an important, ongoing task.

DSO support for local authorities' net zero goals

With the creation of GB Energy, including the emerging Local Power Plan, and the rollout of Regional Energy Strategic Planners (RESPs), local authorities will have a stronger voice in shaping the energy system.

Many are already turning to strategic methodologies like the LAEPs to take a place-based, whole-system approach to decarbonisation and strategic energy planning for their region. This supports a more coordinated and cost-effective decarbonisation but also helps unlock wider benefits, from lower energy bills and warmer homes, to improved health and local job creation.

In response, some Distribution System Operators (DSOs) have established dedicated teams to support local authorities with developing their net zero plans. Local authorities can identify their electricity distribution company through the **Energy Networks Association's website**.[53]

Getting support on council's decarbonisation plans with UK Power Networks DSO Local Net Zero team

UK Power Networks' **Local Net Zero Team**[54] supports local authorities across its region to undertake long-term energy planning. Through a combination of hands-on support and their free digital planning tool **LAEP+,**[55] they help councils develop LAEPs tailored to their local context. LAEP+ allows local authorities to quickly model a range of low-carbon technology rollout strategies, offering scenario modelling and deployment tools designed specifically for council officers.

UK Power Networks estimates that LAEP+ reduces the cost of compiling a LAEP by at least 20%, and has so far delivered £2.1m in benefits to participating authorities.

As of 2025, 73 of the 133 local authorities in the UK Power Networks region are actively preparing LAEPs, more than double the number from the previous year. This reflects both the growing importance councils place on strategic energy planning and the value of the dedicated support available to them.

UK100 has worked closely with UK Power Networks DSO for a number of years, including producing a toolkit, **Navigating the Net Zero Energy Transition,**[56] and UK100 strongly believe that there should be a framework and funding for LAEPs in England.

In addition to LAEP+, UK Power Networks also has the **Your Local Net Zero Hub**[57] that offers practical guidance, introductory materials, and case studies to help councils get started. Their **LAEP Open Data Page**[58] provides access to over 170 datasets from both internal and external sources to support local energy area planning. These tools and resources not only reduce the technical and financial barriers to planning but also help local authorities unlock wider co-benefits, from more targeted local investment and job creation, to cleaner air and lower energy costs.

If your local authority is in the area covered by UK Power Networks, you can book a dedicated 30-min session with the team[59] or email them at LAEP@ukpowernetworks.co.uk to learn more.

Providing Flexibility

'Flexibility' is the ability to change electricity generation or consumption patterns to reduce the pressure on the electricity network at certain times, such as during the evening when demand is typically high. Flexibility can come from a variety of sources, including electric vehicle charge points, electric heating and cooling, batteries, and distributed generation. By enabling greater local participation in flexibility markets, local authorities can not only support a more resilient and efficient energy system, but also unlock co-benefits such as lower energy costs, new revenue streams for communities, and reduced need for costly infrastructure upgrades.

In order to increase awareness and understanding, UK Power Networks DSO worked with local authorities to create a simple **guide to Flexibility**[61] and introduced the subject through webinars and in-person events.

If your local authority is in the area covered by UK Power Networks', you can get more information about Flexibility from the Local Net Zero Team at LAEP@ukpowernetworks.co.uk.

They provide data and digital tools designed to help councils explore options, communicate their plans, and gather feedback more effectively.

LAEP Support Framework

UK Power Networks DSO has developed a **LAEP Support Framework**[60] to integrate local authority energy plans into its own network planning. The framework enables whole-system insights from councils to directly inform investment decisions. As a result, LAEPs from 32 areas have been incorporated into network plans this year, helping to accelerate 70 asset investments across the region. This approach provides a national blueprint for how Distribution Network Operators (DNOs) can align investment with local priorities and decarbonisation goals. It is already shaping the development of Strategic Development Plans across UK Power Networks' regions, ensuring they reflect local input via the new RESPs and are due to deliver their first outputs in 2025/26.

To ensure consistency and coordination across regions, UK Power Networks is also working closely with neighbouring DNOs of Scottish and Southern Electricity Networks (SSEN) and National Grid Electricity Distribution (NGED), as well as with National Grid Electricity Transmission (NGET) and the Gas Distribution Networks (GDNs). This joined-up approach supports more efficient planning and investment across the whole energy system, helping to unlock timely, locally driven net zero delivery.

Leeds 'PIPES' District Heating Network

Affordable Warmth, Emissions Cuts, and Urban Renewal

Leeds PIPES is a citywide district heat network that uses waste heat from the Recycling and Energy Recovery Facility to provide low-carbon heating to buildings. Led by Leeds City Council and Vital Energi, the project aims to cut carbon, reduce fuel poverty, and improve air quality. Launched in 2019, Phase 1 connected 1,983 council homes and civic buildings to a low-carbon heat network. Now expanding to 3,000 more homes, it delivered 23,700 MW of heat in 2024.

Inputs £45m

Climate Impacts

~6,467 tCO2 saved in 2024

~11,000 tCO_2 saved/ year estimated post Phases 2&3

£3.95m /year avoided in climate damage costs by 2030

Economic Impacts

10-25% reduction in energy bills

£200+k /year fuel savings for residents

60% of **£45m** initial spend stayed local

430 new jobs and **36** apprentices

Primary Objectives

Mitigation

CO_2

Heat decarbonisation

Social Impacts

Circular economy – energy from waste

Reduction in fuel poverty

Health Impacts

Warmer homes improve respiratory health in vulnerable groups

Environmental Impacts

Improved air quality

Co-benefits Delivered

- Emission reduction
- Air quality
- Health
- Fuel poverty
- Economic savings
- Green jobs
- Circular economy

3.6: Leeds PIPES District Heating Network: Affordable Warmth, Emissions Cuts, and Urban Renewal

Project Overview

Leeds PIPES is a citywide **district heating network** that integrates heat decarbonisation with social and economic outcomes. The network sources waste heat from the Leeds Recycling and Energy Recovery Facility (RERF), a major plant that burns non-recyclable waste and distributes it via insulated pipelines to provide low-carbon hot water for heating buildings.

Phase 1 launched in 2019, initially connecting 1,983 council homes in energy-inefficient high-rise buildings, along with several civic buildings in the city centre. Further phases are now adding 3,000 additional homes and 28 large buildings to extend the network. In 2024, 23,700 MW of heat was delivered, replacing the need for individual gas boilers or electric heating in connected properties. The project's goals included **reducing carbon emissions, tackling fuel poverty, and improving air quality** in the city. The project is a partnership between Leeds City Council and Vital Energi (the network operator), with funding from the government's Heat Networks Investment Project and council capital with an initial cost of £45m.

Co-Benefits Achieved

Carbon Emission Reductions

Leeds PIPES has delivered major CO_2 savings by replacing individual heating systems (mainly gas boilers or old electric heaters) with low-carbon heat from the city's waste incineration plant that would otherwise be wasted.

- In the early years, with limited connections, it saved around 2,000 tonnes of CO_2 annually. As the network expanded, the annual CO_2 savings grew threefold to around 6,467 tonnes in 2024.
- Once Phase 2 and Phase 3 are fully connected (around 2,800 homes plus civic buildings), projected carbon savings will reach around 11,000 tonnes a year, equal to removing over 5,000 cars worth of emissions.
- Monetised, the forecast 11,000 tCO_2 a year, when the additional homes and buildings are connected, equates to £3.95m a year in avoided climate damage costs (based on The Green Book guidance, Greenhouse Gas Appraisals (GHG), and central value, including the GDP deflator of £359 a tonne in 2030).

Improved Air Quality and Public Health

Leeds PIPES supports cleaner air and better health outcomes by replacing individual gas boilers and creating warm homes for vulnerable residents.

- By displacing thousands of gas boilers (a major NO_2 source), the network reduces local air pollution, especially in high-density housing blocks and the city centre.
- The RERF energy plant operates under strict emissions controls with a stack located away from residential areas, resulting in lower population exposure per unit of heat.
- Pre-connection, many low-income residents underheated their homes, leading to cold and damp conditions linked to respiratory issues. Residents now report being able to heat their homes properly, reducing risks of asthma, bronchitis, and damp-related illnesses. Surveys show 97.44% of customers are happy with the service.

An engineer working on the Leeds PIPES project

- While direct health data (e.g. hospital admissions) is not yet available, the council's Equality Impact Assessment anticipated significant health gains for vulnerable groups.

Fuel Poverty Alleviation & Affordable Warmth

A core success of Leeds PIPES has been making heating more affordable for residents who were previously struggling.

- Baseline data showed that **over 34,000 households in Leeds were in fuel poverty** before the project, many of them living in electrically-heated high-rises (where old storage heaters were inefficient and costly).

- After connecting 1,983 council flats to the heat network in Phase 1, **tenants reported substantially lower bills** with typically **10–25% reductions in energy costs.** In real terms, that's around £100–£250 (assuming average annual heating costs of £800–£1,000) per year saved per household. Across the initial 1,983 homes, this represents approximately £200,000+ per year kept in residents' pockets, money that can be spent in the local economy to support other needs. In 2024, connected customers collectively saved £490,000.

- Heat from Leeds PIPES is cheaper than fossil gas or low-carbon electric systems for most buildings because it uses local waste energy, which means its price is less exposed to global fuel price volatility.

Local Economic Benefits and Green Jobs

- Construction and operation of the heat network supported economic activity and employment in Leeds. The project set targets for local labour and apprentices in its contracts. 60% of the £45m spend was local, with 50% of labour hired locally, aligning with Leeds' inclusive growth goals

To date, it's reported that **over 430 people have been employed in the local low-carbon heat sector through Leeds PIPES,** including **36 apprentices.** This number includes construction crews (for digging and laying pipes), engineers designing and installing heat exchangers, and project managers, as well as indirect jobs in the supply chain. Notably, the jobs are not just short term, operating the network and maintaining equipment is ongoing, providing sustained employment. The project also contracted local firms for civil works and maintenance, boosting local businesses.

Improved Living Conditions and Safety

- Through the upgrade, 1,983 council flats were fitted with modern heating systems for the first time, including Heat Interface Units, radiators, and smart controls, replacing outdated and inefficient electric heaters. Residents now have reliable, on-demand heating and hot water, with much greater comfort and control.

- The project also added fire safety sprinklers during installation, improving safety with minimal extra disruption.

- 97.44% of residents are satisfied with the new service, appreciating ease of use, transparent metering, and the ability to manage bills via an app or the internet.

Efficient Use of Waste Resources

Leeds PIPES exemplifies the principles of the circular economy by capturing energy from the city's waste stream. The Veolia-operated RERF can process up to 150,000 tonnes of household waste annually to generate electricity and heat. Prior to the district heating scheme, much of the usable heat from waste incineration would have been vented or only used for power generation. By integrating the RERF with the heat network, Leeds ensures no energy is wasted.

Low-Carbon Heat Infrastructure for the Future

By building a citywide heat network, Leeds City Council has created a platform for future environmental gains. The pipes laid and energy centres built can later be connected to other low or zero-carbon heat sources, such as large heat pumps, geothermal heat, or waste heat from the industry. In other words, Leeds PIPES is an enabler for long-term decarbonisation.

Measurement & Data

Leeds City Council has been diligent in establishing baselines and metrics for each co-benefit. For carbon, they calculated what emissions would have been if the buildings used individual boilers or standard electric heating (using standard emission factors for gas and grid electricity). Then, annually, they use metered heat delivered and the RERF's fuel input to compute actual emissions and emissions avoided. For fuel poverty, they identified target clusters including high-rises with high baseline energy costs, and they estimated the heating costs and income percentage prior to connection. Post-connection, they monitored the prices charged for network heat (which the council can partly control) and actual usage via heat meters to calculate bills. Surveys and resident feedback provide qualitative validation that bills are indeed lower and comfort higher. The council also monitors **indoor environmental conditions** in sample flats to ensure that people are not underheating, data showed that homes maintain comfortable temperatures, confirming the efficiency gain rather than reduced usage.

For air quality, the Environmental Impact Assessment (EIA) modelling and citywide monitors form the evidence. It is known how much NO_2 a gas boiler emits by decommissioning dozens of boilers (for example, at the Town Hall or blocks of 100+ flats), with local emissions dropping accordingly. Citywide air quality data can verify trends over time. Health improvements are tracked in a qualitative way, for example, the public health department noting any reduction in winter ailments from those blocks, and possibly through future health studies, too. While direct quantification is pending, the expected direction of impact is clearly positive, and case studies of tenants anecdotally reporting fewer illnesses and sharing feedback that "I don't have damp walls anymore" are being gathered.

Challenges & Solutions

- High capital cost was a key barrier because laying heat network pipes is expensive. The council reduced the risk by connecting its own buildings first, creating essential "anchor loads" to justify investment and enable wider rollout. Leeds offered long-term heat contracts to public buildings (for example, the Town Hall and library) and pitched to private

customers by highlighting lower, stable prices of 10%+ below gas, and improved carbon performance.

- There was also some tenant apprehension in convincing residents to switch to a new heating system and accept a different billing method. The council managed this by guaranteeing fair heat prices (pegged below typical electricity costs) and extensive engagement explaining the benefits. As with any innovation, there is the risk of technical issues, however, reliability has been high, and backup systems exist (some buildings kept backup boilers, though seldom needed).

- The project team leveraged co-benefits to unlock grant funding and public investment that do not demand short-term commercial returns, by showcasing the social and environmental returns in carbon savings, fuel poverty reduction, and jobs created, Leeds City Council successfully applied for public grants including Local Enterprise Partnerships LEPs), the European Regional Development Fund (ERDF), and the Heat Networks Investment Project (HNIP), which covered a significant portion of the capital.

- The council's business case showed a positive Net Present Social Value when factoring in carbon and health impacts, which helped win political support and public investment.

Key Lessons

- Leeds PIPES illustrates the importance of integrated planning: the council's sustainability, housing, and economic development teams worked together, embedding co-benefits in project KPIs (e.g., jobs, health). This ensured that, in evaluating the project's performance, all departments saw wins.

- Another lesson is the value of data transparency – publishing outcomes (CO_2 saved, cost to tenants, etc.) has built trust and momentum for further phases.

- Monitoring and evaluation (M&E) was planned and budgeted from the start, with baseline data (on heat costs, emissions, air quality) used to model impacts and guide funding bids; each co-benefit had clear metrics and accountability and outcomes were tracked through smart meters, surveys, and emissions data.

South Westminster Heat Network

The South Westminster Area Network (SWAN) is set to become one of the largest heat networks in the UK, delivering low-carbon heating across Westminster. The project is led by the SWAN Partnership, and backed by DESNZ Westminster City Council, and the London Heritage Quarter which will invest £100m in the first three years and up to £1bn by 2050.

Once complete, SWAN is expected to save 75,000 tonnes of CO_2 each year, the equivalent of removing 40,000 cars from the road, cutting nitrogen oxides emissions by 99%, significantly improving local air quality. The first phase will harness natural heat from the River Thames using water-source heat pumps. In time, the network will connect to local waste heat sources, providing clean and affordable energy. At least 500 direct jobs will be created, with more across the supply chain. DESNZ identified Westminster as one of the most cost-effective routes to decarbonisation and London's LAEP which was also recently developed had similar findings. In time, the network could also support Westminster's retrofit programme, providing low-cost, low-carbon heating for homes, and helping to decarbonise heat while delivering warmer, more efficient homes, especially for vulnerable residents.

Community Energy Pathways

Scaling the co-benefits of Community Energy Initiatives

Community Energy Pathways (CEP) is working with the University of Sheffield, the Social Value Portal, and community energy groups to create a **shared framework for measuring the co-benefits of community energy** — such as jobs, fuel poverty reduction, and local investment. This will use the widely recognised National TOMs methodology to assign social value to outcomes, helping projects demonstrate their full impact. By creating standardised metrics, the initiative will enable consistent reporting, strengthen the case for funding, and help community energy sit alongside other sectors in procurement and policy decisions.

The UK's 583 community energy groups involve over 69,000 members, run 398 MW of renewable capacity producing 617 GWh/year, have attracted £225m in investment, and support around 800 jobs.

The framework covers the following co-benefits:

Skills & volunteering
Captures accredited training and volunteer hours that build local capacity.

Local jobs created or sustained
Counts local full-time equivalent (FTE) jobs supported by community energy projects.

Environmental improvements
Records local actions that enhance nature, biodiversity, and air quality.

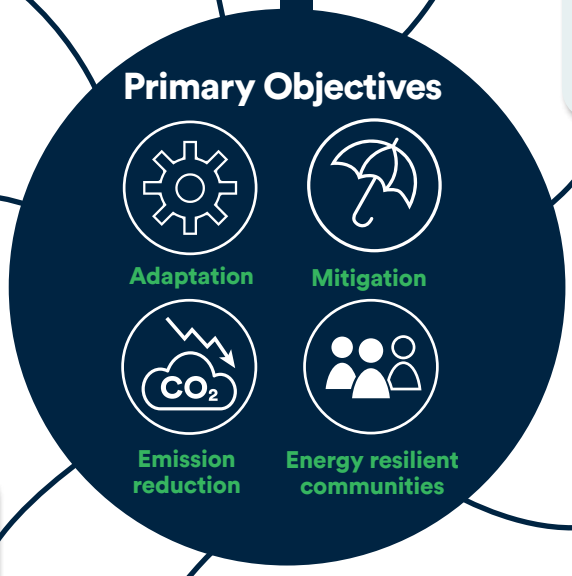
Innovative climate solutions
Recognises pioneering low-carbon ideas and early-stage innovation.

Carbon savings (climate action)
Quantifies CO_2 reductions from renewables and energy efficiency.

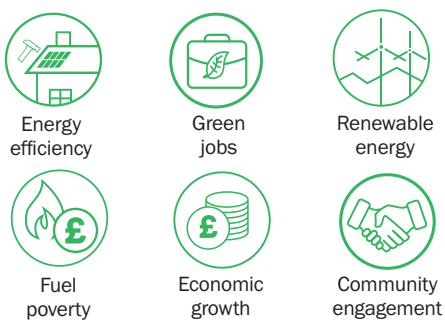
Fuel poverty alleviation
Tracks bill savings and households supported out of fuel poverty.

Local resilience and community cohesion
Measures activities that bring people together and strengthen communities.

Inclusive employment opportunities
Tracks jobs for disadvantaged groups, supporting equity and access.



Co-benefits Delivered



3.7: Community Energy Pathways: Scaling the co-benefits of Community Energy Initiatives

Project Overview

Community Energy Pathways (CEP) is a regional network of community energy groups in southern England which has partnered with academics and the Social Value Portal (SVP) to develop a **framework that systematically measures the co-benefits of community energy projects.**

As a broad snapshot, The UK Community Energy State of the Sector Report 2024, identified 583 community energy organisations with over 69,000 members, operating solar panels, wind turbines, hydro schemes and more, totalling 398 MW of capacity and producing 617 GWh a year. These initiatives attracted £225m in investment and employed around 800 FTE staff.

Crucially, community energy enterprises reinvest profits locally. For example, funding fuel poverty advice, home retrofits, and grants for community facilities. In 2023 alone, UK community energy groups contributed an estimated **£12.9m to local economies** through community benefit funds, and more, delivering **£4.4m in annual bill savings** via energy efficiency and advice programmes.[62]

The project aims to create a **common measurement framework with 8–9 KPIs** that encompass the broad social, economic, and environmental outcomes or co-benefits of community energy. By integrating co-benefits into project KPIs, community energy initiatives can demonstrate wider value, attract funding, and align with local priorities beyond just carbon reduction. Using the **SVP, an online tool widely used by councils and businesses** to measure social value in procurement, CES leverages the UK's National TOMs (Themes, Outcomes and Measures) methodology to translate community energy outcomes into monetary social value terms. This effectively puts community energy on the same playing field as other projects when councils or investors assess "value for money" and social return.

The project is supported by researchers from the University of Sheffield for academic rigour and is engaging the Department for Energy Security and Net Zero and GB Energy, for insights on scaling up support for community energy.

Co-Benefits and Metrics Tracked

The framework covers a comprehensive set of co-benefits:

- **Local jobs created or sustained:** This measures the number of local people employed (as FTE) in community energy initiatives, including roles in project management, installation, maintenance, and outreach. Quantifying these jobs, especially when filled by local or underemployed people, helps capture economic benefits.
- **Inclusive employment opportunities:** This tracks roles filled by individuals from disadvantaged groups including disabled people and the long-term unemployed. Many community energy groups support inclusion through training or employment, highlighting social inclusion and equality.
- **Skills and volunteering:** This quantifies the number of staff or volunteers receiving accredited training, and the total of volunteer hours contributed. Community energy depends on volunteers, often building local skills in areas like installation or energy advice, boosting social and human capital.


Solar farm, Essex

- **Local resilience and community cohesion:** This looks at initiatives that strengthen the local community. For example, educational workshops, climate forums, and energy cafes, before assigning values to them. These foster local engagement and shared purpose. Proxies, such as event numbers and attendance, help indicate improved social resilience.

- **Environmental improvements:** This counts projects or actions that protect or improve the local environment. Some groups plant trees for offsetting, or link EV car-shares to air quality, tracking co-benefits to nature and environment.

- **Carbon savings (climate action):** This measures quantified reductions in CO_2 emissions from community renewable generation and energy efficiency measures. Many projects save carbon, such as solar panels and retrofits, and converting tCO_2 into £ (using carbon values) shows climate co-benefits in monetary terms.

- **Innovative climate solutions:** This is a bespoke metric for innovation. For example, measuring the investment of time or money into pioneering low-carbon initiatives, as community energy often pilots new ideas such as community battery storage and local energy markets.

- **Fuel poverty alleviation:** This is implicitly captured via metrics like bill savings and households helped with energy advice. Many community energy groups specifically target fuel poverty. For example, using revenues from solar farms to fund free home energy audits or running collective buying schemes for heating, and tracks outcomes such as households lifted out of fuel poverty and total energy cost savings.

In addition to these social KPIs, the framework also records technical outputs: total renewable capacity installed (MW), renewable energy generated (MWh), and energy saved through efficiency (kWh). While these technical measures are not given a social monetary value in standard TOMs, CES plans to develop proxy values so that, for instance, each MWh of clean energy can be associated with a carbon value and a community value (like the marginal profit that goes into a community fund). By doing so, even the pure energy outputs get translated into social value (considering carbon avoided, bill savings, etc.).

Data Collection Template

CES uses a structured template for community groups to report data on these 9 metrics. Each metric has a clear definition and method to calculate its proxy financial value. For example, 1

Some groups link EV car-shares to air quality

volunteer hour might be valued at the living wage rate (a common proxy for volunteer time). One person completing accredited training might be assigned a value based on government guidance for the value of gaining a qualification. Community organisations input their figures quarterly or annually. CES then validates and compiles this information, and uploads it to the Social Value Portal platform. SVP acts as a "proxy bank" – a set of monetary values for different outcomes as per the National TOMs. It automatically calculates the total **financial social value** of the inputs. The Portal then generates quarterly reports for each project or aggregated by county, so local authorities can easily see the impacts from community energy investments.

Why it Matters (Measuring Co-Benefits)

Establishing a common KPI framework for community energy's social value has several co-benefits in itself:

- It **enables aggregation and communication of impact** across multiple projects and areas. Instead of isolated success stories, the sector can present a united front. For example, "Community energy in our region delivered £Xm in social value last year, including "Y" jobs and "Z" tonnes of CO_2 saved." This is powerful for advocacy.

- It **translates grassroots impact into the language of government and finance for "value for money".** By quantifying in financial terms, it becomes easier to compare community projects with mainstream investments, showing that investing in community-led energy is not just about kilowatts, but about social return, too.

- Over time, it can **professionalise the sector and help it compete for funding or contracts.** If community groups can reliably demonstrate their outcomes, they might win contracts (for example, to deliver local energy services) where social value is part of procurement scoring. In the UK, public procurement often has a 10% weighting for social value, so having quantifiable metrics gives community enterprises an edge.

- It builds **evidence for policy support.** For example, if CES can show that community energy projects create local jobs and reduce energy poverty, DESNZ may justify reinstating stronger support schemes (since recent years saw cuts to feed-in tariffs, etc.). GB Energy could partner with community groups to scale projects, armed with data that yields socio-economic benefits.

- It ensures community energy's contributions are **recognised in local and national statistics.** Historically, much of their impact was anecdotal. Now, it could feed into local authority annual reports or even the ONS data if formalised, giving the sector more visibility.

Initial Findings

While the framework is new, initial piloting with a few groups shows encouraging numbers. For example, a single community solar farm (5 MW) in Sussex generated £50,000 of community fund payments and saved 1,200 tCO_2 (with a £ value of around £100,000), employed two local staff and 10 volunteers (with a value of around £80,000), and gave £20,000 in energy grants to local schools, summing to a social value of several hundred thousand pounds per year, far above what a purely commercial solar farm might contribute locally. Such comparisons underscore the co-benefit of the community ownership model itself.

Challenges

Standardising and agreeing a set of initial metrics across very diverse projects such as solar co-ops, energy efficiency clubs, and EV car shares, is tricky because the KPIs cover most projects but some unique outcomes might be missed. Data collection relies on volunteer-led groups filling forms, which needs capacity building (hence making the process as easy as possible with templates). There's a **risk of over-quantification,** though, which will need to be monitored.

Another challenge is ensuring **credibility of the proxies** that will be used to quantify benefits. Although they align with government models, some might argue whether a volunteer hour is really worth £14, or a job has exactly £30,000 of social value. The key is consistency, not absolute perfection, so that trends can be seen and sums computed in a defensible way.

Lessons Learned: Scaling Up

If every community energy group in the UK reports using this framework, the sector can produce an annual social impact report which will have credibility, that could be used to argue for supportive policies such as reinstating tax reliefs, simplifying grid access for community projects, or seed funding a national community energy programme, because the government would be able to see quantifiable returns.

The CEP case shows an important strategic approach to scaling co-benefits from lots of community energy groups and will show **the value of measuring value.**

Essex County Council: Scaling collective impact

Community Energy

Essex County Council has played a leading role in building a thriving community energy ecosystem. Starting in March 2020, with an assessment of local potential, skills, and barriers to entry, the council developed a bespoke mentoring programme to support new and emerging groups, providing tailored advice, grant access, and networking opportunities.

By 2022, four community energy organisations had been established. By 2025, the network of groups included nine community energy organisations established and a wider network of 25 groups at varying stages of development. These groups have already supported over 1,600 residents with energy advice, including more than 100 in-person home visits. In 2023, the first community share offer by a Community energy group in Essex, Tollesbury Climate Partnership, raised £250,000 in local investment. The programme prioritises removing barriers to community energy, building local capacity, supporting project development, and fostering strategic partnerships. This approach ensures local communities are empowered to lead on sustainable energy projects that cut emissions and boost local resilience.[63]

Solar Together

Alongside its community energy work, Essex County Council launched the **Solar Together Essex**,[64] a group-buying scheme that helps households and SMEs access affordable solar PV. By harnessing collective purchasing power, the scheme offers participants significant cost savings while ensuring vetted suppliers and high-quality installations.

So far, the programme has delivered 2,752 solar PV systems, battery storage units, and EV chargers across Essex. These installations are saving over 2,400 tonnes of CO_2 each year which is equivalent to over 60,800 tonnes avoided over their lifetime. In 2024, it managed to get an average saving of around 35% on market prices. In 2024, the council launched Switch Together, a bulk-purchase scheme for heat pumps. Together, these initiatives are building local energy security while supporting the transition to net zero.

Net Zero New Build Homes

More Than Just Low Carbon

Well-designed net zero housing doesn't just cut emissions—it can also deliver real benefits for people, places, and the economy. From lower bills and healthier living to local jobs and carbon savings, these four exemplar schemes show what's possible.

Active Homes Neath, Wales

16 homes – social rent

Milton Heights, Oxfordshire

42 homes – open market + affordable

Broomfield Farm, Whitby

49 homes – social rent + shared ownership

Goldsmith Street, Norwich

105 homes – social housing development

Carbon Reductions

- **Active Homes** - reduces operational CO_2 emissions by **80-90%**
- **Goldsmith Street** - **9,000** tonnes of CO_2 avoided over 30 years

Energy Bill Savings

- **Active Homes** - **£600** annually
- **Milton Heights** - **£600–1,000** annually
- **Broomfield Farm** - **£600** annually
- **Goldsmith Street** - **£1,000** annually

Primary Objective

Mitigation

Carbon reductions

Economic Impacts

- Local **contractors**
- Building **local expertise** (Passivhaus)
- Local **workforce**
- Building local **supply chain**

Health Impacts*

- Lower **GP visits**
- Reduced **hospitalisations**
- Increased **productivity**

* Expected

Energy Infrastructure

- Solar PV with batteries, help **reduce peak demand**
- At scale, it can help **defer costly grid investments**

Co-benefits Delivered

Green jobs

Health

Energy efficiency

Economic savings

Local economy

Air quality

3.8: Net Zero New Build Homes: More Than Just Low Carbon

Project Overview

New homes built under the Future Homes Standard (FHS) are expected to produce 75–80% fewer carbon emissions compared to current regulations.[65] It focuses on energy efficiency and carbon emissions reductions through high-levels of insulation and low carbon heating.

This case study presents four exemplar housing schemes, two completed and two in development, that meet or exceed the FHS. They demonstrate the potential of net zero homes to deliver co-benefits across economic, social, environmental, and health dimensions.

- **Active Homes Neath, Wales:** A completed 16-home development (completed in 2019) for social rent by Pobl Group, funded by the Welsh Government's Innovative Housing Programme and Social Housing Grant. These energy-positive homes generate more energy than they use.
- **Milton Heights, Oxfordshire:** A private development of 42 homes (27 on the open market and 15 affordable) by Greencore Homes, due to start construction in 2025. The scheme is designed to be climate-positive, combining Passivhaus standards[66] with bio-based timber frame construction.
- **Broomfield Farm, Whitby, North Yorkshire:** A publicly funded net zero housing project of 49 affordable homes (combined of social rent and shared ownership) led by North Yorkshire Council's development arm, Brierley Homes. Funded by a £2.6m Towns Fund grant and £2m from the council, the project aims for 90% carbon emissions reduction.
- **Goldsmith Street, Norwich:** A multi-award-winning 105-home social housing development (completed in 2018) commissioned by Norwich City Council. Built to full Passivhaus certification, it remains the UK's largest Passivhaus residential scheme. This pioneering project demonstrates the viability of low-energy social housing within tight public budgets.

Co-benefits achieved

The key co-benefits recurring in all four projects are fuel cost savings, health improvements, enhanced comfort, social inclusion and Just Transition, local job creation and upskilling, environmental quality gains (in air and biodiversity), and energy system efficiencies. These align with many policy goals beyond climate, from public health to economic development, showing that net zero homes deliver on many policy objectives.

Energy bill savings

- Across the UK, housing schemes are already delivering or exceeding the Future Homes Standard. These four projects demonstrate how high-performance homes can reduce emissions, cut bills, improve affordability and tackle fuel poverty. A pre-construction analysis for Active Homes, indicated that integrating solar generation and storage could cut household energy use by 60%, saving the average household over £600 per year on bills in 2019, and insulate residents from energy price volatility.

- **Active Homes Neath, Wales:** 16 energy-positive social homes save tenants over £600 a year, cutting energy use by up to 60%.

- **Milton Heights, Oxfordshire:** 42 Passivhaus homes, net carbon negative in construction and expected to save £600–£1,000+ annually on energy bills.

- **Broomfield Farm, Whitby:** 49 net zero affordable homes targeting 90% energy reduction and £500–£600 a year savings on bills.

- **Goldsmith Street, Norwich:** 105 Passivhaus social homes with tenant energy bills as low as £5 a week, saving just under £1,000 a year.

Health benefits:

All schemes deliver healthier living conditions by eliminating cold, damp, and mould, which reduces respiratory illnesses linked to poor housing.

- Residents at **Goldsmith Street** reported better health and less medication thanks to improved warmth and air quality.

- Warmer homes in **Neath** and **Whitby** are expected to lower GP visits and hospitalisations from cold-related conditions. BRE estimates the NHS saves £857m a year if the UK cold homes issue is solved.

- **Goldsmith Street's** Passivhaus design ensures stable indoor temperatures, quietness, and excellent ventilation. Residents say it "feels like summer even on cold days."

- Overall, the benefits of a warm home extend beyond comfort to include lower healthcare costs, increased productivity by reducing illness and discomfort, and an enhanced quality of life.

Just transition

Net zero developments promote stronger communities and social equity. In council-led projects, providing high-quality eco-homes to social tenants ensures that low-income households, not just wealthier early-adopters, benefit from sustainable technologies.

Local economic development

All projects actively support local employment and skills development, contributing to the green economy and regional growth. Key highlights include:

- In **Neath,** local contractors were used, and a collaboration with Tata Steel created to produce heat generating steel wall panels, creating green innovation jobs.

- **Norwich's** project enabled a local contractor to gain Passivhaus expertise, building a skilled local workforce for future sustainable projects.

- Greencore's **Oxfordshire** scheme manufactures panels in a nearby factory, creating jobs and aiming to establish a hub for sustainable construction.

- **Whitby's** Town Deal focuses on local supply chains and apprenticeships, providing construction opportunities for young people.

Together, these efforts advance the green economy transition and support levelling-up by bringing investment and future-proof employment to local communities.

Carbon emissions reductions

Net zero housing schemes deliver significant cuts in carbon emissions, helping to meet climate targets.

- Each home in **Neath** reduces operational CO_2 emissions by an estimated 80–90% compared to a standard new build (2018).

- The entire **Neath** development was forecast to save around 2,500–3,000 tonnes of CO_2 over its lifespan, valued at approximately £700,000 in societal terms (2018).

- At **Goldsmith Street,** 105 homes save an estimated 300 tonnes of CO_2 annually. Each new home emits 2.8 tonnes compared to the UK average of around 4 tonnes. Over 30 years, this equates to roughly 9,000 tonnes of CO_2 avoided. Both schemes also significantly reduce peak heating demand on the grid, easing overall energy load.

Environmental gains beyond carbon

All schemes deliver benefits beyond carbon reduction, improving local air quality and biodiversity. By eliminating gas combustion and promoting electric vehicles, they reduce harmful NO_x and particulate emissions, supporting cleaner air and air quality targets.

In **Oxfordshire**, the project created new habitats by planting woodlands, hedgerows, and meadows, aiming for nearly 20% Biodiversity Net Gain, double the 10% statutory requirement. **Goldsmith Street,** an urban infill development, also increased on-site tree cover and biodiversity, enhancing the local environment and managing over heating in the summer.

Grid and energy system benefits:

Net zero homes support the wider energy system by saving energy or installing solar PV with batteries which reduce peak demand. For example, **Active Homes Neath** uses high fabric efficiency and solar panels and batteries to lower peak grid loads.

Scaling up such projects could significantly cut peak power demand, potentially eliminating the need for new, large power stations. This demand-side management improves energy security and reduces infrastructure costs, offering substantial economic benefits by deferring costly grid investments.

Measurement and data

- For **Active Homes Neath,** the project's baseline and impact were established using several tools. During design, energy modeling via **SAP** (Standard Assessment Procedure) and **PHPP** (Passive House Planning Package) was done to predict performance. Post-completion, **smart meters and sensors** log real energy flows (PV output, battery charge and discharge, grid import and export) and indoor conditions, feeding into a database for analysis. **Resident interviews** and **thermal imaging** tests evaluate actual performance v design.

- **Oxfordshire's** approach has relied on advanced modelling to ensure Passivhaus criteria, annual energy balance, and **dynamic thermal modelling. Life Cycle Assessment (LCA) tools** have also been used to quantify embodied carbon of materials, guiding specifications of low-carbon products. Monitoring of co-benefits is planned with smart energy monitors in each home to verify actual energy generation and use, and air quality sensors to demonstrate improved indoor air quality, with the construction process tracked through MMC (Modern Methods of Construction) quality assurance data.

- In Whitby, the baseline was created by comparing the proposed 49 homes to Part L Building Regulations (2013) for gas heating. **Energy modelling (SAP and dynamic models)** were used to predict consumption and to size the PV to offset it. During operation, data collection will be via smart meters and an online dashboard to monitor energy use of a sample of homes. For co-benefits, Whitby Town Council will gather health and wellbeing data indirectly via the local NHS and housing surveys (for the number of GP visits or self-reported health improvements after moving from a poor home to these new ones) and look to track **rent arrears or financial stress** among tenants as an indicator (lower energy bills might correlate with fewer arrears) of fuel poverty improvement.

Barriers and challenges

- Dedicated budget and resources beyond the end of a project completion are needed to monitor long-term benefits or opportunities are missed.

- A lack of a standardised framework for measuring housing co-benefits makes it difficult to compare projects or aggregate measurement for policy impacts.

- Accessing localised health data is challenging due to privacy and data sharing concerns.

- Co-benefits straddle departmental boundaries leading to data not being captured as responsibility for this is unclear.

Lessons learnt

- Ahead of the Future Homes Standard (FHS) coming into force, there is already good practice out there to learn from and emulate.

- Homes are for people, and they want to know about bill savings and comfort, rather than airtightness and carbon emissions, so getting the messaging right is key.

- Working more closely with the NHS on housing will improve monitoring and reporting of health impacts as they know what data is already being captured on a local level.

- The additional cost to deliver high efficiency, low-carbon new-build homes by approximately 15% lower than the cost of retrofitting them in the future, and the cumulative bill savings.

Sunshine and Green

Suffolk County Council's Food Production and Regenerative Farming

Sunshine & Green is a 1.6-hectare regenerative farm in Suffolk, growing organic fruit and veg for local markets and weekly veg boxes. Founded in 2020, it shortens supply chains and strengthens community ties through direct-to-consumer sales.

The farm follows low-emission, nature-friendly practices that support the UK's Net Zero goals. By avoiding synthetic inputs and building healthy soils, it boosts biodiversity, cuts carbon, and builds climate resilience.

As one of 126 tenant farms on Suffolk's estate, it contributes to £1m+ in annual council revenue—scaling regenerative practices across 4,960 hectares could help turn farming into a net carbon sink.

Inputs **1.6** hectares of land — Regenerative farming skills and knowledge

Climate Impacts

1 ton of CO_2/year sequestered in the soil

Lower emissions by avoiding synthetic fertilisers (nitrous oxide emissions)

Economic Impacts

£6,250+ weekly local economy boost

Council revenue from rent

Local jobs: **1** full-time, **1** part-time

Primary Objectives

- Adaptation
- Regenerative farming

Health Impacts

Local **organic** food

Environmental Impacts

Rebuilds soil organic matter

Biodiversity – organic farms support around **50%** more wildlife

Low food miles

Co-benefits Delivered

- Green jobs
- Local economy
- Health
- Soil health
- Biodiversity

3.9: Sunshine and Green: Suffolk County Council's food production and regenerative farming

Project Overview

Sunshine and Green is a small regenerative farm in Cavendish, Suffolk, operating as a tenant on Suffolk County Council's farms estate. Founded in 2020 by first-generation farmer Greg Harrison it operates on 1.6 hectares of Suffolk County Council land at Ark Farm, producing organic fruits and vegetables for local farmers' markets and delivers weekly veg boxes, too. By focusing on local distribution and direct-to-consumer sales, the farm shortens supply chains and strengthens community connections to food.

The farm employs regenerative farming practices aligned with the UK Net Zero Strategy, integrating food production with environmental stewardship. By avoiding synthetic fertilizers and minimizing diesel machinery use, Sunshine and Green reduces emissions, enhances soil health, supports biodiversity, and builds climate resilience, contributing to both climate mitigation and adaptation efforts.

As one of 126 social tenant farmers of Suffolk County Council's farmland estate, it contributes to the £1m+ annual council revenue from the farm estate, funding vital public services. Scaling regenerative practices to more of the county's 4,960 hectares of council farms estate (and beyond to private farms) means agriculture could become a net sink of carbon rather than a source.

Co-Benefits Achieved

Economic co-benefits:

- Sunshine and Green boosts the local economy by creating jobs, supporting local businesses, and keeping financial value circulating within the community. As a thriving small business, it supports its founder and a part-time worker, with plans to hire a full-time apprentice who could one day run their own farm.

- The New Economics Foundation finds that every £10 spent on local veg boxes generates about £25 for the local economy compared to just £14 at supermarkets. With 140-150 weekly veg boxes sold by Sunshine and Green generating £2,500-£2,750 in sales, the farm creates an estimated £6,250+ local economic boost each week.

Social co-benefits:

- Sunshine and Green reconnects communities with their food by bringing customers face-to-face with the farmer at weekly markets and sharing the stories behind their produce. The farm is also seeking to nurture the next generation of growers through apprenticeships and by promoting more smallholdings on council land. By building a network of new farmers who can replicate its approach, Sunshine and Green fosters peer support and strengthens community resilience. If expanded, this model could boost social inclusion through volunteer programs and educational visits, aligning perfectly with Suffolk's Public Health & Wellbeing goals around community engagement and reducing isolation.

Health co-benefits:

- Sunshine and Green improves local diets by supplying fresh, organic, seasonal fruits and vegetables that encourage healthier eating at an affordable cost. Weekly vegetable boxes expose customers to a wider variety of nutritious produce, harvested at peak ripeness to preserve nutrients. This supports public health goals, including reducing obesity and diet-related diseases, aligning with Suffolk's prevention-focused health strategy.

Sunshine and Green's farm in Cavendish, Suffolk

Environmental co-benefits

Soil health and carbon sequestration:

- Organic methods feed the soil rather than just the crops. By using composted manure, cover cropping, and avoiding synthetic inputs, Sunshine and Green has rebuilt soil organic matter on formerly depleted land. Healthier soils improve structure, water retention, and fertility, creating a positive cycle that boosts both yields and ecosystem services.

- Studies show that converting land to organic management in the UK can sequester roughly 500–600kg of carbon per hectare, per year in soil. On Sunshine and Green's 1.6 hectares, this could store just under 1 tonne of CO_2 equivalent annually, contributing to Suffolk's net zero emissions targets for agriculture.

- The monetary value of carbon sequestered by the farm is estimated at around £292 per year (using The Green Book estimates), a modest but meaningful climate service that, if scaled across Suffolk or the UK, could have a significant impact.

Biodiversity and nature recovery:

- By avoiding pesticides, the farm supports beneficial insects including bees, butterflies, and ladybirds, and soil fauna, creating diverse habitats through mixed cropping, hedgerows, and orchards. Organic farms typically have 50% more wildlife than conventional farms, which also benefits surrounding ecosystems.

Water and air quality

- Without synthetic fertilisers, Sunshine and Green prevents nitrate runoff, protecting local waterways and reducing downstream flood management costs.

Reduced greenhouse gas emissions:

- The farm lowers emissions by avoiding energy-intensive synthetic fertilisers and nitrous oxide emissions, using locally sourced compost, minimal fuel, and reducing food miles with local sales.

Measurement and Data

- Tracking soil health is essential for Sunshine and Green but as a small holding, there isn't yet capacity and money to undertake all the formal measurement and monitoring to show improvements. Crop yield improvements are the result of soil improvements, but Sunshine and Green are keen to see the results of formal monitoring undertaken via soil testing kits and lab analyses to monitor key indicators like soil organic carbon, nutrient levels, pH, and biological activity. Additionally, farm-scale carbon calculators such as the Cool Farm Tool or Farm Carbon Toolkit are great tools to input land management data, such as cover cropping, tillage, and inputs, and securing help from local colleges and universities to estimate greenhouse gas emissions and carbon sequestration is very welcome.

- Availability of user-friendly tools is important, having a simple app or spreadsheet for recording metrics increases the likelihood of consistent measurement. Suffolk County Council could partner with local groups or colleges to support tenants by providing a "co-benefits reporting toolkit," a checklist of sustainable practices to capture metrics such as yield changes or community engagement anecdotes.

Barriers and Challenges

- **Land availability:** A major limitation is finding enough suitable land and willing farmers. Much UK farmland is held by larger enterprises who may be reluctant to break off land for smallholdings.

- **Economic viability in scaling:** While Sunshine and Green is viable at small scale with direct sales, and no subsidies, not every region may have a sufficient market of consumers ready to support a proliferation of similar farms. There is a risk of saturating local demand for veg boxes or farmers' market produce if too many small farms cluster in one area. Another challenge is finding land at an affordable cost.

- **Labour and skills shortage:** Regenerative horticulture is labour-intensive. One barrier to adopting this model is the availability and cost of labour. For larger conventional farms thinking of transitioning, the idea of managing a more complex, labour-heavy system can be daunting if their experience is in mechanised mono-cropping.

- **Agronomic transition risks:** Moving to regenerative methods often involves trial and error. Farmers may face short-term yield drops or new pest challenges after removing synthetic chemicals. These risks can deter transition, particularly if financial returns are expected quickly.

Lessons Learnt

- Regenerative benefits like improved soil carbon or training outcomes take years to show. Secure, multi-year leases give farmers the confidence to invest in practices that will not pay off overnight. Early results can be mixed, soil carbon, for instance, may dip before it rises.

- Expanding regenerative methods across Suffolk's 4,960 hectares of council farmland and eventually to private farms could turn agriculture from a carbon source into a net sink, making a serious dent in local carbon budgets.

- Regenerative farms face more income variability than conventional farms, which often benefit from predictable yields and subsidy streams. This makes it harder for new entrants to secure loans or investment, especially without a land asset.

- Council land is limited, and persuading private landowners to lease to small regen farms remains difficult, especially if they can get higher rent from a conventional farmer. Sunshine and Green's success is partly due to the council's vision to support regenerative farmers without which it would be a struggle to find land to invest in.

- Sunshine and Green sells directly to consumers willing to pay for organic, but not every region has a strong enough local market. Market gardens risk oversupply or limited demand depending on location.

- Sunshine and Green could eventually sell carbon or biodiversity credits, but that depends on having robust frameworks—such as clear standards, reliable measurement tools (like the developing soil carbon code), and stronger incentives to grow the market.

Demand Responsive Transport

Connecting Communities, Cutting Emissions, Creating Opportunity in Rural Gloucestershire

Transport makes up 43% of Gloucestershire's CO_2 emissions, making reduced car use essential for climate goals. As a rural county, reliable public transport is also key to access jobs, education, healthcare, and social activities. The Robin is a demand-responsive transport (DRT) service launched by Gloucestershire County Council in 2022 with support from the Department for Transport. Funded through the Rural Mobility Fund (2021–2024), it now operates in six rural zones, covering areas of deprivation within rural Gloucestershire. The Robin offers flexible, sustainable travel using app, web, or phone-based bookings. Local operators run the service, with software by Padam Mobility that optimises routes in real time on a first-come, first-served basis.

Social Impacts

Improving access for residents with no viable public transport

Launched with 2 zones (late 2022), expanded to 6 zones (June 2025), serving around

319,200

residents

Reduced isolation and improved social inclusion

Reliable service:

~1,200

more trips in Jan-Mar 2025 vs. 2024 (2 of 6 zones)

Economic Impacts

Increased access to rural attractions & services. Supports local spending and tourism. ~7,110 passenger trips Nov–Dec 2024 (prime shopping season)

Improved access to jobs and services for villages with limited or no public transport

Employs 13-15 full-time drivers

Primary Objectives

- Adaptation
- Mitigation
- Sustainable transport

Health Impacts

Dependable transport for GP and hospital visits

Environmental Impacts

Reduced car dependency and lower carbon emissions

Reduced air pollution through pooling journeys

Co-benefits Delivered

- Green jobs
- Economic growth
- Health
- Local economy
- Mental health
- Air quality

3.10: Demand responsive transport: Connecting communities, cutting emissions, creating opportunity in rural Gloucestershire*

Project Overview

Transport accounts for around 43% of Gloucestershire's territorial CO_2 emissions, so reducing car dependency is key to meeting climate targets. As a largely rural county, public transport is vital for jobs, education, healthcare, and social opportunities. In their Bus Service Improvement Plan (BSIP),[67] Gloucestershire County Council (GCC) present their commitments and aspirations for an improved, integrated transport network, including a specific, strategic focus on rural areas.

One solution is **"The Robin", an innovative Demand-Responsive Transport (DRT)** service funded by Gloucestershire County Council and the Department for Transport (including the Rural Mobility Fund, 2021-2024). Launched in late 2022, The Robin hit the road in two rural areas, including areas of deprivation and now (June 2025) has expanded to six zones, offering flexible sustainable travel.

The Robin uses on-demand technology, a minibus service bookable via app, website, or phone. Local bus operators, including community transport providers, work with GCC to provide the service. Users can book up to two weeks ahead or up to 30 minutes before (subject to availability). The software optimises routes in real time on a first-come, first-served basis. Padam Mobility supplies the DRT software, including the booking platform, and works with GCC to optimise the service.

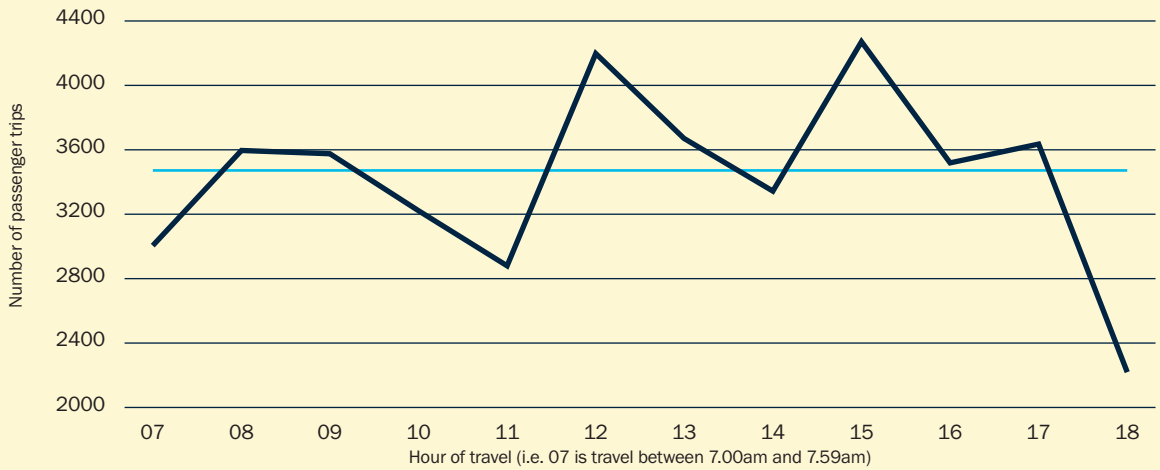
The DfT is currently developing DRT best practice guidance. This will provide local authorities with a guide to setting up and deploying DRT schemes. It draws on the expertise of Local Authorities with DRT experience, together with the findings from the Rural Mobility Fund DRT process evaluation. DfT expect the first version of the guidance to be available late 2025.

Co-Benefits Expected and Achieved

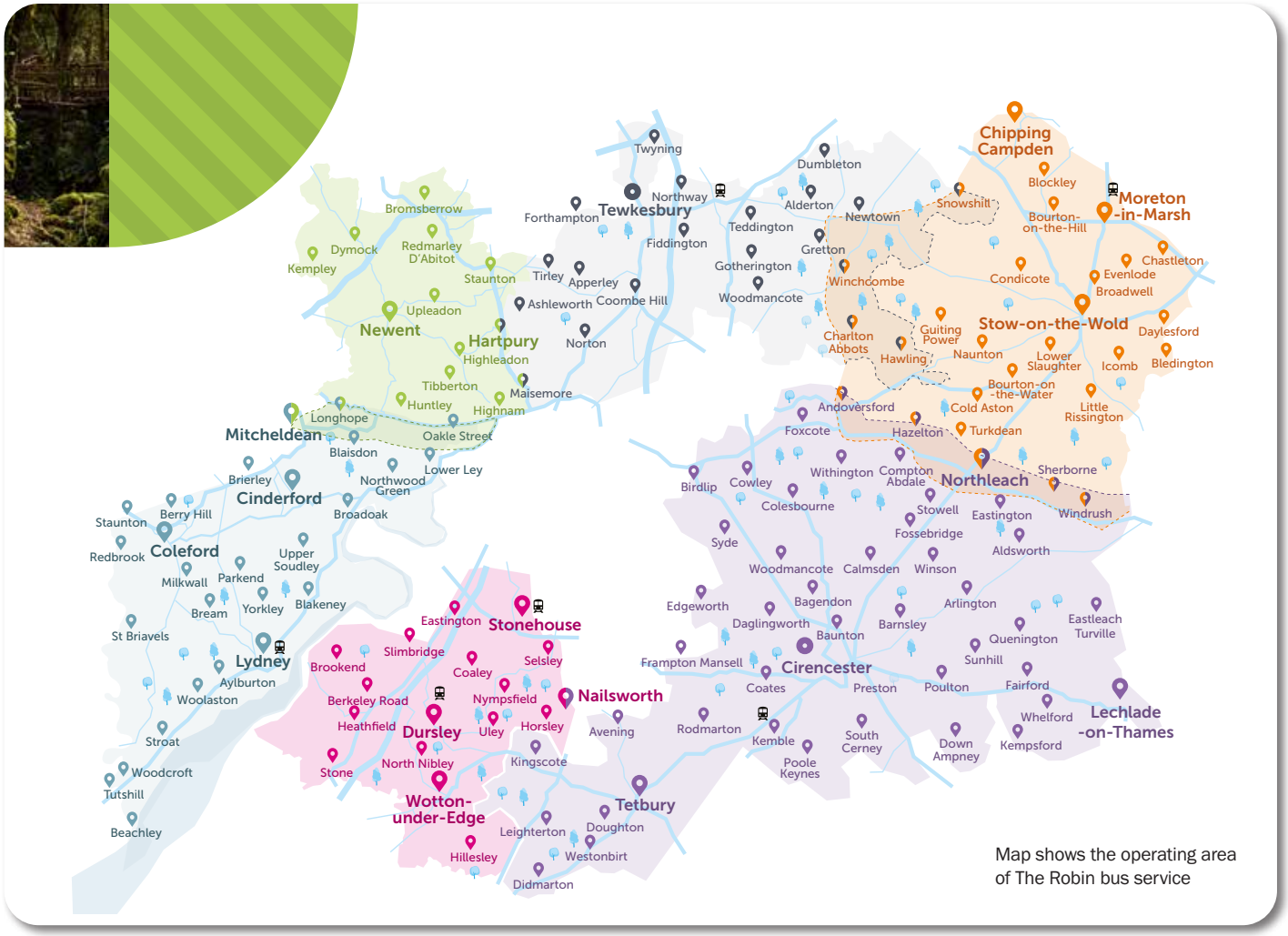
The Robin's primary objective is to provide rural mobility to match demand, but it also delivers co-benefits spanning economic, health, social, and environmental domains.

- **Improved access to jobs and services:** Before launch, some villages had no public transport, some only one service per week, and so residents depended on

Passenger trips over the hours of the daily Robin service. Blue line shows the average[72]



* This case study was authored by UK100 with support from Gloucestershire County Council.



Map shows the operating area of The Robin bus service

cars, taxis or lift sharing. Data shows consistent usage of The Robin during peak commute times. Numbers in the graph below left show most travel between 08:00 and 09:59, and between 15:00 and 17:59. There is also significant travel between 12:00 and 12:59.

- **Boosting local businesses and tourism:** Anyone can use The Robin, including visitors, to reach rural attractions or services e.g. small towns. This can stimulate local spending and may mitigate some of the negative effects of transport such as congested high streets and limited available parking. In rural areas, timetabled bus services can be limited in terms of frequency and tend to use the more major roads, only stopping at villages of a certain size. Communities close to but not on the main corridors, might have zero public transport, all which would limit flexibility of movement and getting to a wider range of locations (especially from car-less households or those relying on public transport).

  - » In November and December 2024, **roughly 7,110** passenger trips on The Robin were recorded during prime shopping season.[68] Even if only a fraction were tourist/shopping trips, that's hundreds of visits generated monthly.

  - » Using the Department for Digital, Culture, Media & Sport (DCMS) tourism data, rural day-trip visitors might spend on average £20–£45 per trip (covering retail, food, tickets).

- **Local jobs:** The routes are run by bus operators, contracted through a tender process. This creates local jobs (in June 2025, there are between 13 to 15 drivers employed full time, including 11 or more who work for Community Transport charities).

Social Co-Benefits

- **Improving access for residents:** Before The Robin, for some there was no viable public transport, or just one weekly bus service. With only one return service per day, residents could have to spend the entire day away from home just to attend a 30-minute healthcare appointment.

- **Reliable transport:** The Robin is a consistent service, with software optimises routing and scheduling. The resulting reliability of the service shows, with around 1,200 more passenger trips in Jan-Mar 2025 than Jan-Mar 2024 in only two of the now six Robin areas.

- **Expansion of the network:** The Robin started with two zones and now covers all major rural areas of the county. The Robin is available to a residential population of over around 319,200.[69] Funding has included the Rural Mobility Fund, BSIP funding and other GCC funding streams. Its current operation is a long-term trial project which will continue till the end of May 2026, by which point a decision on future operations will have been made.

- **Reduced isolation and improved social inclusion:** Lack of transport can contribute to deprivation, loneliness and isolation. The Robin provides a travel option which accepts the English bus pass for free travel,[70] is accessible to those using a wheelchair, and has a low fare price, helpful for low-income households. Before The Robin, there were pockets of severe isolation. Some older rural residents without cars might go days without leaving home. The Robin has seen consistent usage by concessionary bus pass holders (age-related and disabled) and usage across a wide range of demographics is increasing. HMT's Green Book recognises the cost of loneliness. A recent study by DCMS (using the wellbeing approach) estimates that moving someone from "sometimes lonely" to "rarely/never lonely" is worth £7,000–£8,100 per year in social value.

Health Co-Benefits

- The Robin could be used by residents and visitors to attend all types of appointments, including healthcare appointments. There are roughly 35 GPs and 8 A&E and Minor Injury and Illness Unit hospitals across the six Robin areas.[71] A key goal of the NHS is to reduce missed medical appointments, and one way to help people to attend is by ensuring there is appropriate public transport to healthcare. On average a missed NHS appointment costs £120.

Environmental Co-Benefits

- **Reduced car dependency and lower carbon emissions:** By replacing single-occupancy car trips with shared minibuses, The Robin cuts overall vehicle miles and hence CO_2. The Robin minibuses are currently (June 2025) all low-emission Euro VI vehicles, and EV enhancements are always considered for any new vehicles.

- **Reduced air pollution:** By pooling multiple passengers in the same vehicle, replacing car and taxi trips and using newer, well-maintained minibuses, The Robin can improve local air quality. Rural districts generally have cleaner air than urban areas, but local hotspots existed. Without any intervention, car traffic (especially older diesel cars) contributed to NO_x (nitrogen oxides) and PM (particulate) emissions along those corridors.

Measurement and Data

- Understanding and tracking The Robin's impacts relies on digital data from the booking platform, user surveys, and official statistics. By integrating these, LTAs who have operational DRT are building a robust evidence base to link the service to improved outcomes—informing design decisions (e.g. adjusting hours or vehicle numbers) and demonstrating wider policy benefits.

- Measuring how many car journeys are replaced or appointments avoided is imprecise, as surveys rely on self-reporting and travel behaviour can also be affected by external factors like fuel prices.

- Long-term outcomes—such as health improvements, well-being, and community cohesion—often take years to emerge, while pilot evaluations occur within months.

- Monetisation remains complex. Government frameworks like the Green Book provide methods to value carbon and some social impacts, but not all outcomes (e.g. reduced isolation) have universally accepted metrics.

Barriers and Challenges

- Education – some people may not know how to book DRT, or realise that it could meet their needs. Across the UK, DRT schemes with old fashioned vehicles and/or branding have been perceived by some as a concessionary-only service, or "shopper service", despite it sometimes being a brand new DRT service , potentially with a smart-phone App for booking.

- In the DRT sector, transition to EV will be slower over time than in the traditional fixed-line bus market, due to many DRT schemes needing to travel for longer journeys more frequently, at higher average speeds (rurality and distances and more direct travel are all higher for DRT).

Before The Robin, for some rural residents in Gloucestershire there was no viable public transport

- **Low predicted ridership:** Traditional cost-benefit analyses can undervalue rural schemes, as population density are lower, and passenger numbers may be lower, than in urban contexts.

- **Operational costs:** DRT services can require ongoing subsidies to remain affordable. Public transport costs are rising across the UK.

Lessons Learned

- **Effective technology:** DRT depends on advanced routing software to manage bookings efficiently.

- **Adaptability in delivery:** GCC rolled out consistent and clear service parameters (e.g. service hours, wait times, pick-up stops), and certain elements (including new stops) may be adjusted in response to user feedback. The software enables ongoing improvements and building public trust.

- **Integration with conventional services:** The Robin is coordinated with fixed line bus network and rail network, to support first/last-mile connections.

- **Compelling business case with co-benefits:** Gloucestershire's Rural Mobility Fund (RMF) bid went beyond ridership forecasts, highlighting how the service would reduce carbon, improve health access, and tackle social isolation. Co-benefit data (e.g. CO_2 savings, social inclusion metrics) are also clear in the Bus Service Improvement Plan (BSIP), which has helped support The Robin's rollout to new areas and extended the trial.

- **Local partnership and buy-in: Local councils** (district and parish) support The Robin publicity and help with pick-up bus stop locations, while Community Transport groups have contributed operational expertise, helping guide the launch of a new service model in previously unserved areas.

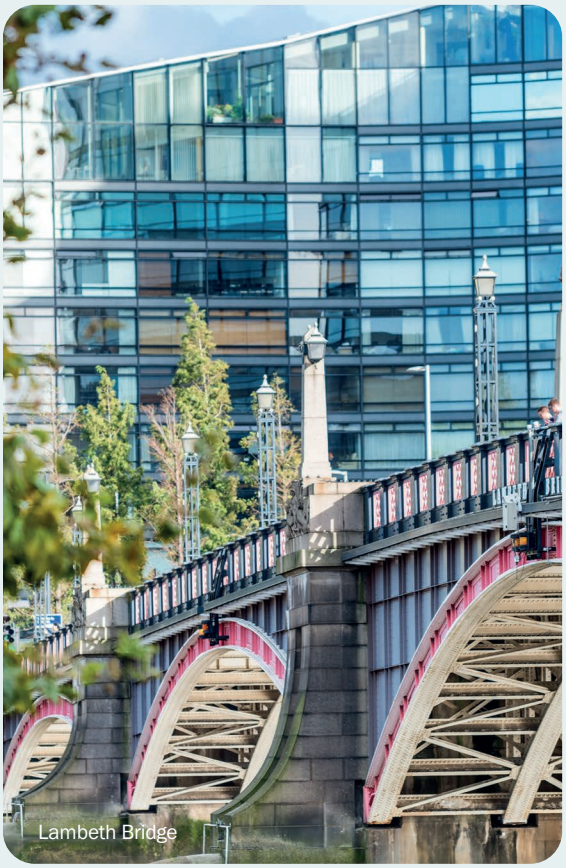
Lambeth kerbside strategy: Reclaiming space for people, climate and community

In Lambeth, over 60% of households (more than 81,000) do not have access to a car, making accessible and low-emission transport essential. With transport emissions accounting for 24% of the borough's carbon footprint, and a target to reach net zero by 2030, Lambeth Council aims to reduce traffic by 27%. Their Kerbside Strategy[73] sets a goal for 25% of kerbside space to be sustainably allocated by 2030, reallocating 110km of space through a programme called Kerbside Basics.

Priority 1: Accessible and active travel is a key focus, with free cycle parking installed every 50 meters and continued development of walking, scooting, and wheeling streets through the Healthy Routes programme. Secure cycle parking is planned every 100 metres, with 266 new cycle hangars containing 1596 cycle spaces delivered since the launch of the Kerbside Strategy. The borough has also added 2.8km of new cycle tracks to encourage active transport. To further encourage cycling, the cost of a cycle hangar space was reduced from £42 to £30 per year.

Priority 2: Create places for people to enhance community space by allowing residents to apply for parklets on their streets. To support this, six community parklets have been installed in areas experiencing both socio-economic and green space deprivation, providing outdoor, green, and social spaces that strengthen community cohesion.

Priority 3: Increase climate resilience to focus on environmental improvements within the kerbside. Lambeth Council has planted over 1,800 new street trees and 11 new SuDS schemes. Lambeth's objective is for permeable surfaces including de-paving, wildflowers, and sustainable drainage systems to cover 10% of kerbside space. These measures help manage flooding risks and improve local biodiversity, too.


Lambeth Bridge

Priority 4: Reducing traffic and transport emissions which is being addressed through a borough-wide network of electric vehicle charging points, with more than 348 chargers installed since the Kerbside Strategy was adopted in 2023. The borough aims to have shared cargo bike hire services on high streets and provide full electric car club vehicles on every street.

Progress is tracked using the Appyway Kerb BI Dashboard, which monitors kerbside usage Lambeth Council's Kerbside Strategy demonstrates how targeted, community-focused actions can support climate goals, improve public health, and enhance social inclusion, building a more resilient and sustainable borough.

Supporting the electric vehicle transition - UK Power Networks DSO

Local authorities have a crucial role in enabling the transition to electric vehicles — from delivering public charging infrastructure to ensuring it aligns with wider transport and community priorities. To support councils in identifying suitable charge point locations and developing effective plans — and to help them access funding through the Local Electric Vehicle Infrastructure (LEVI) fund — UK Power Networks DSO Local Net Zero team developed the **ChargePoint Navigator.**[74]

This is a free, web-based tool that helps local authorities under UK Power Networks coverage to plan their public EV charging infrastructure more quickly and effectively. The tool provides detailed, location-specific information. Since its introduction, ChargePoint Navigator has helped local authorities achieve a 100% success rate in LEVI funding applications — up from just 37% prior to the tool — unlocking £20.5 million to support local EV infrastructure.

By making charging infrastructure planning more accessible and data-driven, ChargePoint Navigator helps local authorities deliver EV infrastructure rollouts that are better targeted, more equitable, and aligned with local transport needs. This also brings wider co-benefits, such as improved air quality, reduced transport emissions, and increased access to clean transport options in underserved communities.

If your local authority is in the area covered by UK Power Networks, you can email the Local Net Zero Team at LAEP@ukpowernetworks.co.uk to learn more about the ChargePoint Navigator and all the data and digital tools they offer to help local authorities on their decarbonisation plans.

4

Co-benefit Analysis

4.1 Quantified outcomes and 'value for money'

Across the case studies there is a clear pattern that **integrated climate actions provide multifaceted returns.** Whether it's cleaner air, warmer homes, greener streets, or empowered communities, the quantified outcomes demonstrate that the benefits of climate initiatives extend well beyond carbon metrics. A few themes include:

- **Economic multipliers and job creation:** Climate projects often stimulate local economies and create jobs. With 30m homes in the UK needing retrofitting, our case studies show jobs are being created by current policies and funding. For example, 48 new green jobs in Cambridgeshire County Councils HUG 2 programme, 430 jobs via Leeds heat network, and potentially 9,800 jobs in Cardiff Council's energy transition to 2050. Not just retrofitting but dozens of tourism jobs from urban greening can be created following Liverpool's Urban GreenUP project. In effect, climate action serves as an economic stimulus.

- **Health savings and quality of life improvements:** The health benefits quantified for Birmingham City Councils CAZ is leading to hundreds of fewer GP and hospital visits with estimated annual savings to local NHS providers of £0.5m a year and productivity gains for employers from reduced sick leave. Warmer homes in Leeds and high-quality new-build homes means fewer cold-related illnesses and mental stress, which, although not yet fully costed will translate to reduced healthcare demand and improved wellbeing. Liverpool City Council estimates 26 lives are saved per year from more active lifestyles supported by green infrastructure and Gloucestershire County Council's demand-responsive transport improves access to health services reducing missed GP appointments and saving the NHS time and money.

- **Social equity and poverty reduction:** Many co-benefits directly address social inequalities. Projects targeting fuel poverty in Leeds and Cambridgeshire are lifting low-income households out of energy poverty, reducing the percentage of income they must spend on heat and improving comfort. Similarly, community energy projects often focus on energy justice, providing cheap renewable power or funding energy advice for those in need. Clean air zones and active travel benefits lower-income neighbourhoods that often suffer worse air quality and have lower car ownership. And NbS in cities such as Liverpool's green corridors which intentionally invested in deprived wards lacking green space, helping to level-up health disparities. Climate action, if designed with equity in mind, can be a powerful tool to reduce social disparities, turning an environmental programme into a social inclusion programme.

- **Environmental and climate resilience gains:** All the projects delivered on their core environmental goals of reducing emissions (for example, thousands of tonnes of CO_2 saved in Leeds and Cambridge), enhancing biodiversity (in Liverpool and Devon), and building resilience against climate impacts (for example, Devon's flood mitigation and Liverpool's cooling effect). These outcomes have their own value, for example, avoided carbon emissions have a monetised value used in appraisals (of government carbon values), which can be added to benefit-cost calculations. Beyond monetisation, these environmental co-benefits address long-term strategic goals and reduce future risks (a more biodiverse catchment is more robust to extreme weather).

- **Benefit-cost ratios and "no regrets" investments:** When co-benefits are added up, many of the projects have attractive benefit-cost ratios (BCRs). For example, Liverpool City Council's integrated valuation suggested the BCR "becomes highly attractive" once health

Urban rewilding enhances biodiversity in Liverpool. Picture by Nick Harrison

and economic gains are included. These figures flip the narrative, climate action is not a cost burden, it's an investment with high returns, arguably **better than many traditional investments.** The government often accepts infrastructure projects with BCRs just over 1 or 2, here we see potential BCRs in the range of 4-9 when co-benefits are included. This evidence positions climate projects as "no regrets" or even net-positive economically. Decision-makers should note that failing to account for co-benefits might lead to under-investment in these high-return opportunities.

- **Cross-sector benefits in breaking policy silos:** Each case demonstrated value across multiple sectors. Housing projects yielding health and economic benefits, transport emissions policy yielding business and tourism benefits, and environmental schemes benefiting agriculture, nature, and infrastructure. This highlights that co-benefits **bridge departmental divides.** For example, climate action funded by an environment budget provides returns into health savings, economic development, and social care. A transport intervention contributes to public health targets, and a housing energy project contributes to economic growth objectives.

4.2 Key barriers to realising co-benefits

Despite the clear advantages of co-benefits, several barriers currently limit their full realisation in policy and practice. These challenges are institutional, financial, and technical in nature. This section identifies common issues across the case studies and literature on how to overcome them.

4.2.1 Policy and institutional silos

A key barrier is the **siloed structure of government, council responsibilities and budgets.** Climate action does not fall within a single department's remit. For example, a council's housing department may not feel responsible for carbon emissions, focusing only on its housing stock conditions and a transport team might prioritise congestion relief over air quality or health. Without a statutory duty for climate change in local government, services like housing, transport, waste, and social care, each with their own targets and funding, typically do not plan for or measure climate co-benefits. This means there is no formal requirement to consider carbon reduction in new adult care facilities or health outcomes in housing retrofit programmes unless individuals choose to do so. **As a result, opportunities for co-benefits are missed because they fall "between the cracks" of departmental mandates.**

Linked to this is the budgeting problem because **costs and benefits fall to different actors.** One department or agency may bear the cost of a climate action while another reaps the rewards, making it hard to justify the spend in siloed budgets. Examples include (i) an Education Authority invests in higher energy efficiency standards for a new school but the school operator (Academy Trust) gets the benefits in lower energy bills. The Education Authority has no mechanism to recoup the higher upfront capital costs or (ii) a government department or council might fund or support an insulation scheme, but the NHS reaps the healthcare savings. The council's budget does not see a direct return, so from its narrow perspective the investment might not meet strict value-for-money tests. (iii) Similarly, a transport authority might incur costs for cleaner buses, while residents and the national health service get the health benefits.

Without mechanisms to share costs and benefits across silos, there is a disincentive for any one body to invest in measures where many of the gains accrue elsewhere.

Overcoming silos is challenging. Pooling budgets according to the benefits or outcomes (sometimes called "blended" or "braided" funding) allows an integrated approach, using different funds for specific components of a project and a share in the benefit. Liverpool's GreenUP project, aligned multiple city council agendas across health, transport, and regeneration, that cross departmental boundaries to get buy-in to its project and outcomes. Some councils already bring officers together from public health, planning, environment, and finance to jointly appraise projects. In Devon's CtC project, the Environment Agency, County Council, and Network Rail collaborate and co-fund NbS because they each have a stake in the outcomes.

There are early moves towards this "braided funding" approach where some regions are exploring joint budgeting between health and housing for retrofit programs, since warm homes offer health service savings, effectively, health bodies invest in insulation as preventative spending.

National policy can encourage this behaviour by requiring or incentivising co-benefit analysis in funding bids. Currently, many government grants remain siloed (for example, transport fund doesn't explicitly ask about health impacts). Changing grant criteria to explicitly reward co-benefits would nudge authorities to plan jointly. **The Green Book** already encourages considering wider social costs and benefits, but in practice many business cases do not do this well either from lack of data, evidence, or know-how. To improve business cases with co-benefit evidence needs training and consistency so that every significant project appraisal asks "What are the co-benefits, and have they been maximised?" If a proposal doesn't fully consider them, it should be sent back for revision.

4.2.2 Funding constraints and misaligned incentives

Even where co-benefits are recognised, funding barriers can prevent action. Many climate-related initiatives rely on short-term, competitive grants and pilots, rather

than stable, long-term funding. This "stop-start" funding makes it difficult to sustain programmes or invest in monitoring co-benefits. For instance, home retrofit efforts have faced boom and bust cycles with changing government schemes, undermining continuity in the supply chain and workforce training.[75] The Cambridgeshire County Council's retrofit case study identified that the private sector needs the confidence of a forward pipeline of projects of four years or more to inform their business planning and any investments in upskilling and apprenticeships.

In the Devon case study stakeholders are looking to pool resources for funding the 25-year NbS blueprint. However, current funding models, for example, water companies regulated by Ofwat, do not always provide clear mechanisms for cost-sharing without structural reforms. Regulatory funding models are often structured around short-term performance with easily measurable outputs yet nature-based solutions offer multi-faceted benefits over time and across multiple sectors, requiring a broader approach to valuation. Because natural flood management typically unfolds over decades, aligning regulatory and price setting cycles of five years means the timelines to capture lifecycle costs and benefits is difficult.

A further challenge includes the issue of capital v operational expenditure, where traditional concrete structures often count as capital expenditure and are easier to justify within a standard regulatory mechanism. By contrast, NbS require operational expenditure (OPEX) for ongoing maintenance of wetlands and woodlands. The funding frameworks and accounting rules can make it less attractive to commit to natural flood risk management especially if the solutions raise bills immediately, as a water company must then be able demonstrate that customers are willing to pay more now, yet a future generation gets the benefit. This highlights a misaligned incentive with regulators and political masters prioritising short-term affordability over long-term value, which makes it hard to fund preventative, cross-cutting projects. Similarly, in health care, budgets are allocated to treat current illnesses; yet insulation programmes that prevent illnesses don't show immediate results so are challenging to justify in annual budget cycles. For the NHS, money is tied-up dealing with current patients, making it

challenging to free resources for prevention that yields benefits beyond the current financial year.

Overcoming funding barriers: One key recommendation is moving toward **longer-term funding settlements and integrated funding streams.** UK100 in its **Powers in Place** and **Local Net Zero 2.0: The Moment to Deliver** reports, argued for exactly that, a multi-year settlement and single framework to reduce administrative complexity and give certainty beyond 2028. A place-based approach like this could save £140bn and deliver significant co-benefits. Practically, this could mean consolidating various short-term grants (for retrofit, air quality, and green infrastructure) into a block of funding for local climate action that a council or region can plan over five to 10 years.

Innovative financing mechanisms are also needed to capture the value of co-benefits. The CtC project is pioneering a blended finance approach of quantifying avoided costs to infrastructure (such as rail disruptions avoided), water quality issues (such as polluted surface water run off from major roads) and insurance savings (such as fewer claims). Essentially, it is **monetising co-benefits upfront** such as Network Rail's £96,000 annual savings from reduced compensation claims resulting from reduced flooding. Another example is "social impact bonds" or outcome-based contracts. For example, the **Greater Cambridge Impact Initiative**, Greater Cambridge Impact Fund,[76] aims to tackle inequality through education, social mobility, health, and homelessness, seeking to raise £10m over 10 years and deliver measurable change. This type of bond could focus on funding tree-planting, air quality projects, and repayments to investors made by the NHS and council based on the measured reduction in respiratory cases and carbon (since both are monetary savings). These are complex to set up but could align incentives across sectors.

At a more straightforward level, internal council budgeting can assign a portion of savings to reinvestment. If a housing retrofit generates energy savings for the council in social housing and reduces tenant arrears or health service usage, some of those savings could be channelled into a revolving fund to finance more retrofits. One barrier is that departmental budgets usually do not allow transferring funds easily (for example, the housing department cannot touch public health budgets) or in some cases, between years. High-level agreement (for example, through city-region deals or combined authorities) is needed to facilitate such cross-budget investment.

The issue of short political cycles ties in here, too. Elected officials often look for quick wins within their term. Co-benefits like tree planting for heat relief or prevention of diabetes via active travel may manifest beyond a four-year election cycle, making it more challenging for politicians to champion them. For example, trees planted today give shade in 10 years, possibly when another official is in office. Overcoming this issue requires a reframing of the narrative to ensure short-term co-benefits can be paired with long-term ones in project design. For example, Liverpool's Urban GreenUP project that addresses immediate community needs in beautification and jobs, as well as long-term climate resilience, ensuring there are both near-term and future deliverables.

In short, aligning funding with co-benefits demands structural changes with longer planning horizons for funding, collaborative financing models, and governance arrangements that allow multiple beneficiaries to jointly invest in preventative, co-beneficial measures.

4.3 Capacity and skills gaps

Another barrier is the **limited capacity and expertise within local authorities to plan, deliver, and evaluate co-benefits.** Several councils, especially smaller ones, lack dedicated climate or analytics teams. The skillset required is multidisciplinary, data analytics is key, and wider understanding of The Green Book calculations, along with sector knowledge such as carbon accounting

or health economics. The literature review identified sufficient staff trained in all the areas for co-benefit assessment as an issue.

For larger projects with bigger budgets, a solution is to partner with universities or consultancies. Birmingham's case showed how partnering with academics provided access to advanced methods including pollution modelling and health econometrics and machine learning tools to determine causality that the council teams alone could not have delivered. Similarly, Community Energy Pathways partnered with the University of Sheffield to bring academic rigour into the social value offer and Devon County Council partnered with Cardiff University.

These partnering arrangements make a very positive impact on the acceptance and credibility of data frameworks for large

projects and should be encouraged. However, for smaller projects with limited budgets, other solutions are needed that are more affordable such as standard templates, tools, and techniques that can be used through upskilling officers.

Beyond analytical skills, project management capacity is also stretched. Many co-benefit projects are complex involving multiple stakeholders in inter-department working and community co-production, which takes staff time and coordination.

Yet, climate or sustainability teams in councils are often small. A survey by the Local Government Association (LGA) found councils consistently mentioned that the lack of funding or resources means achieving net zero is much more difficult.[77] In addition, hiring and retaining staff is difficult due to public sector pay constraints, political commitments, and competition from private sector for roles like energy analysts or data scientists.[78]

Overcoming capacity gaps: Investment in capacity-building is essential. This can take several forms:

- **Dedicated funding for staff and training:** Government has invested in five Net Zero Hubs across England to provide regional support to Councils for project development including data and project management. But this is not sufficient and the reality is every council needs to build this expertise. Training existing staff in co-benefit assessment (for example, training officers in The Green Book's Valuation of Environment and Health effects guidance will help mainstream these skills. Funding can also come through ring fencing, a small allocation of grant funding specifically for data baselining, collection, and analysis, to inform co-benefits.

- **Knowledge sharing and toolkits:** Creating easy-to-use tools and templates can support non-expert staff to estimate co-benefits without reinventing the wheel such as templates for calculating health savings from insulation (such as using standard reduction in DALYs per improved home). If one council develops a successful way to integrate social value in procurement for climate projects, that model contract can be shared widely. Standardisation of approaches (so that each council doesn't need a bespoke method) reduces the skill and time barrier.

- **University partnerships and secondments:** Encouraging more partnerships between local authorities and nearby universities or colleges can fill skill gaps. For example, a council might sponsor MSc students or interns to work on real-world co-benefit evaluations. The cities involved in PCAN co-produced climate economics research between the universities and councils, which is a helpful model.

- **External technical assistance:** One option is to create a **National Co-Benefits Lab** made of a team of economists, scientists, and policy analysts who can help any local area run numbers and design co-benefit monitoring, akin to a consultancy but publicly funded. Similar examples are ClimateView[79] in Scotland or the Clean Helpdesk.[80] This would ensure even small councils can access high-quality analysis on, health impacts of a new cycleway or the Gross Value Added (GVA) impact of a green industry cluster.

- The scale of intervention v monitoring burden brings a capacity issue. There is a balance to strike between gathering enough data to prove co-benefits and not overburdening projects with costly evaluation. A principle could be proportionality which requires robust co-benefit evaluation for large projects or programmes, whereas smaller ones can use ready-made benchmarks (for example, assume a standard £ per tree planted in health value based on national data). This way, capacity is focused where it offers the most insight.

Cycle and train commuting on Liverpool's Merseyrail

4.4 Data and evidence gaps

Many co-benefits, especially environmental and social ones, suffer from **data gaps or uncertainty in evidence.** For example, if citywide cycling increased by 13.9% in Liverpool during the Urban GreenUP project, how much of this increase was due to the project versus other trends? If respiratory hospital admissions drop in Birmingham, how do we know it wasn't due to another policy? These attribution questions have made decision-makers cautious.

Another example in the Devon County Council case study was the absence of monitored data for ecosystem resilience. This accrues over a long timeframe and so using modelled data was the only means to inform decisions on some measures. Generally, co-benefits that accrue over long periods, such as avoided chronic illness or ecosystem resilience, are harder to evidence within typical project timeframes. This leads to a tendency to undercount or discount these co-benefits in appraisals because they are seen as too speculative or "intangible".

Lacking consistent metrics: Different studies use different methods. For example, a local authority officer might be unsure which carbon price to use for benefits, or how to value a statistical life saved for health benefits. These technicalities can lead to inconsistent or non-comparable evaluations and lead decision makers to either ignore them or not have the confidence in the metrics to support the business case.

Overcoming data gaps: Several strategies can improve this situation.

- **Standardisation of measurement frameworks**: There has been a long history of literature on co-benefits and their valuation and calling for standardisation frameworks. The Community Energy Pathways case study is leading towards a **common measurement framework with**

independent oversight for the community energy sector which will greatly enhance consistency and its influence. For health, the ONS Health Index is mentioned as a tool that could be used more widely across sectors. Similarly, using nationally recognised models including DEFRA's damage cost toolkit for air pollution and DESNZ carbon values as standard inputs gives credibility and comparability. If every council uses the same proxy (for example, £70,000 for the value of preventing one disability-adjusted life-year lost, following The Green Book guidance), then results can be compared and aggregated meaningfully.

- **Improved M&E design:** Building monitoring into project design from the start is crucial, as the case studies for Birmingham City Council, Liverpool City Council, Gloucestershire County Council and Cardiff Council show. This often means allocating a percentage of project budgets to M&E which funders need to provide or allow. It also means establishing baselines for all relevant indicators before the project starts so change can be measured. Many projects fail to capture co-benefits because they didn't collect baseline data in advance (for example, on community health or employment). Making baseline collection a condition of funding and providing resources for it will help.

- **Longitudinal studies and ex-post evaluations:** For NbS, a network of demonstration catchments with consistent monitoring over 10+ years (which the Environment Agency is pursuing) will build the evidence base needed and capture the co-benefits that manifest over a longer term than a single project. Another example would be government funding a national evaluation of the health impacts of multiple home retrofit schemes which could then be used for business cases and blended funding solutions rather than each council trying to do its own small study.

- **Data sharing and analytics tools:** Often, relevant data exists but is not shared. For example, health data by locality might be held by the NHS and not be easily accessible to council project managers due to privacy or compatibility issues. Creating data-sharing agreements and secure platforms (for example, through integrated care systems) that enable councils to access anonymised health outcomes for their populations, would facilitate better tracking of co-benefits such as reduced hospital admissions. Similarly, collaborating with utilities to obtain energy consumption data can help verify the co-benefits of energy savings. Modern IT platforms and dashboards could track key indicators in real time, pulling from various data streams.

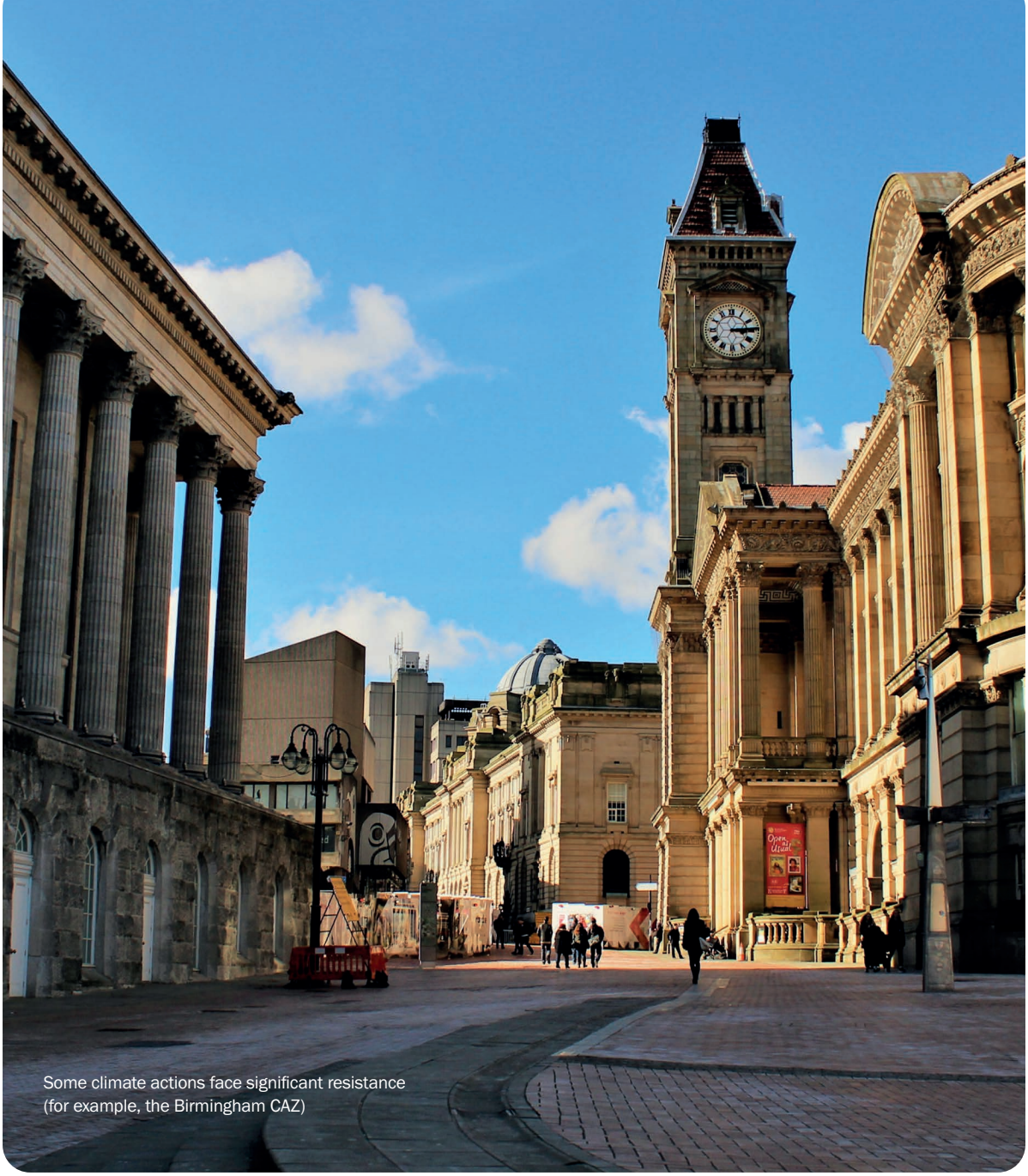
Finally, the **credibility gap.** Some decision-makers remain sceptical of co-benefit estimates either due to poor experience or unclear reporting. Part of unpicking this issue is improving communication to present co-benefit data in clear, relatable terms (for example, "732 fewer doctor visits per month" instead of abstract statistical terms, and highlighting independent verification from peer reviews, and academic endorsements to counter scepticism.

Over time, as more real-world examples accumulate, the default attitude will shift to expecting co-benefits rather than doubting them.

4.5 Political and cultural hurdles

Beyond technical matters, there are **political and cultural barriers** to adopting a co-benefits approach. One barrier is the **short-term political imperative.**

Elected officials need results they can point to in the near term. Co-benefits could help if communicated effectively but some benefits inevitably accrue in the long term (for example, tree planting and climate risk reduction). Legally binding targets maintain focus beyond a single administration's term,



Some climate actions face significant resistance (for example, the Birmingham CAZ)

and exploring ways to devolve or agree local targets, such as through Locally Determined Contributions, will help manage short-termism.

Public perception and acceptance can also be a barrier. Some climate actions face significant resistance (for example, the Birmingham CAZ). If the public is not aware of co-benefits, they often oppose measures, thinking they only incur cost or inconvenience for a distant climate goal. A cultural challenge is to raise public understanding that climate action and its co-benefits will benefit them here and now, and local media including public dashboards that show pollution dropping, or pilot homes that show energy bill reductions can help to shift public opinion.

Finally, there is a **bias towards traditional approaches** in organisations to do things the way they've always been done, focusing on single-issue success metrics (for example, number of carbon ppm or number of potholes filled). To change this culture, leadership must explicitly champion an integrated approach. Embedding co-benefits into the definition of "best value" for public money could help to formalise this cultural shift.

Whilst there are barriers to realising co-benefits, the case studies show that many of the issues are being considered and addressed. Some of the case studies already show the opportunity of a more robust co-benefit framework offers, and the "value for money" climate action delivers.

5 Recommendations & Conclusion

The case studies in this report show how climate action, when designed with co-benefits in mind, can unlock wide-ranging and tangible outcomes. From clean air zones that improve health and boost productivity, to home retrofits that cut bills and strengthen local supply chains, to community energy schemes and heat networks that deliver clean and affordable power, and to nature-based solutions that restore ecosystems and protect against flooding, each example highlights the real-world potential of joined-up action. A co-benefits approach reveals the full value of these interventions and offers a replicable framework that can be applied across sectors and scales. It is this practical insight from delivery that underpins the recommendations that follow.

Realising the full potential of co-benefits requires deliberate changes in policy, financing, and governance. The following recommendations provide a pathway for national, regional, and local leaders to mainstream co-benefits in climate action. The recommendations are informed by the delivery experience and aim to create an enabling environment where joined-up benefits are routinely planned for, measured, and capitalised upon.

We have developed five overarching recommendations:

1 **Support climate conversations that go "beyond targets",** helping national and local government communicate the wider public benefits of climate action.

2 **Strengthen the Green Book by HM Treasury** and require its consistent use in funding decisions, expanding criteria to fully reflect societal value, not just direct costs.

3 **Embed co-benefits in future devolution deals for combined and strategic authorities,** underpinned by cross-sector Partnership Boards to drive progress in areas such as warm homes, green energy, and nature recovery.

4 **The government should ensure that legislation, strategies, and regulations are structured to maximise opportunities** to unlock the full range of co-benefits throughout planning and delivery.

5 **Develop national frameworks and tools** to support consistent tracking of climate outcomes and co-benefits, and provide dedicated funding and capacity-building support for local government to use them effectively.

5.1 Support climate conversations that go "beyond targets", helping national and local government communicate the wider public benefits of climate action.

- **Shifting the climate narrative:** Achieving the full potential of co-benefits requires not only policies and projects but also a cultural shift in how we discuss and approach climate action. Leaders at all levels must consistently frame climate initiatives as opportunities to deliver multiple benefits, shifting the focus to their wider value and tackling misinformation. Central government and local authorities must present climate action as a practical investment, akin to public health campaigns, that delivers tangible benefits now, not just in the long term. Equally, the risks of inaction, such as missing out on good jobs, better health, warm homes, clean air, and economic growth, must be communicated clearly. This approach could help build broader public support and shift climate action out of the realm of sacrifice.

- **Embed co-benefits in leadership messaging:** Government ministers, mayors, council leaders, and CEOs should make a point of highlighting co-benefits in all climate-related communications. For example, when announcing a new policy or project, explicitly state the co-benefits. Senior officials and politicians from across political parties should be briefed on key co-benefit impacts to include in their speeches and communication strategies.

- **Community engagement:** Actively involve local communities in climate decision-making to ensure policies reflect their needs and priorities. Meaningful engagement builds trust, uncovers valuable local insights, and fosters broader support for climate initiatives. Early involvement of local communities helps identify co-benefits that matter most to them. By communicating how climate actions deliver tangible benefits, it builds stronger buy-in and ensures solutions are relevant and widely supported. The developing DESNZ Public Participation Strategy could embed a clear focus on co-benefits to strengthen the case for action and ensure engagement delivers outcomes that matter locally. Resources such as UK100 and Involve's toolkit for effective public engagement in decision-making[81] highlights how communities can be involved. Their soon-to-be-launched resource hub has practical tools and proven approaches that can help councils deliver meaningful public engagement with real results.

- **Leverage influencers and community voices:** Sometimes, messages land better from trusted non-government voices. Engaging health professionals, business leaders, or community figures to champion the broader benefits of climate action publicly could generate broader support. For example, a GP saying "Insulating homes is one of the best prescriptions I can give for respiratory health" would resonate more with communities and decision-makers. In Cardiff Council's case, the LAEP gained credibility by involving respected academics and consultants, which made it easier to champion co-benefits publicly.

5.2 Strengthen the Green Book by HM Treasury and require its consistent use in funding decisions, expanding criteria to fully reflect societal value, not just direct costs.

- **Using the Green Book to unlock wider public value:** National government should embed co-benefits across all strategies, not just climate, to enable departments and local authorities to deliver solutions with wider public value. The Green Book offers a key opportunity to account for wider benefits through benefit-cost ratios (BCRs). The challenge is twofold: (i) it requires consistent use across government business cases to ensure co-benefits are calculated alongside core outcomes, and (ii) building the credible evidence base and data needed to populate BCRs. This means all climate-relevant policies and projects from transport plans to housing schemes, should assess their impacts on health, the environment, and the economy in one place so decision-makers can see the full value of investment and avoid missed opportunities. Departments can use existing valuation tools (for example, DEFRA's environmental values, DfT's active travel benefits, and NHS cost savings) to streamline analysis.

- **Build evidence and data:** Central government funding programmes (for example, grants and competitive bids) should include co-benefits in their scoring criteria. For example, retrofit or flood schemes could award extra points to bids demonstrating wider value in health, job creation, or biodiversity. This would incentivise local authorities to design projects with multi-outcome goals.

- **Funding for monitoring and evaluation:** To ensure co-benefits are properly measured, a portion of programme funding should be ring-fenced for monitoring and evaluation. This prevents local authorities from having to divert delivery budgets and supports consistent, credible evidence on the wider impact of climate interventions.

5.3 Embed co-benefits in future devolution deals for combined and strategic authorities, underpinned by cross-sector Partnership Boards to drive progress in areas such as warm homes, green energy, and nature recovery.

- **Embed co-benefits into devolution deals and regional strategies:** Future devolution deals could also include provisions that devolved funding must be used in ways that maximise co-benefits. The government is proposing wholesale local government reorganisation in England, where it is proposed in many parts of the country that new unitary authorities will take over from two-tier structures. The final shape of the local government map is yet to be determined, and is contested, but this is an ideal opportunity to build the right structures within these new councils to deliver on the co-benefit opportunities offered by local climate action. For many places this will be the first time that public health, transport, climate, planning, and housing to name but a few of the policy areas covered in this report, will be with one tier of local government. For example, a region receiving a transport grant could be required to demonstrate how the investment will also improve public health and productivity. Oversight and progress could be reported into the new Mayoral Council for England and Council of Nations and Regions.

- **Promote local cross-department collaboration.** Make shared outcomes everyone's business to ensure place based, cross-sector action is not a "no-man's land," helping to assign clear ownership for co-benefit outcomes. Councils are beginning to track climate co-benefits through corporate indicators, but decision-making remains siloed. Climate Boards that bring together directors from public health, economic development, and environment should be empowered to share budgets and targets. For example, UK100 has advocated for a statutory climate duty, within which a formal duty to collaborate could

The government is proposing wholesale local government reorganisation in England

be introduced between public health and environment teams on air quality improvement, or economic development teams could be made to co-own green job creation targets alongside climate officers.

- **Align local strategies in health, economics, and environment:** Councils typically have separate strategies – a Health & Wellbeing Strategy, an Economic Development Strategy, and a Climate Strategy. Cross-referencing between these strategies is becoming a more common practice, but there is still room for improvement. For example, improving air quality or ensuring warm homes should become the norm within Health & Wellbeing Board priorities, recognising their role in reducing health inequalities and supporting climate goals. Over time, this could lead to more integrated delivery teams, pooled budgets, and shared metrics.

- **Facilitate partnerships between public, private, and community sectors:** Cross-sector collaboration extends beyond government. Many co-benefits require partnerships with businesses, NGOs, and communities. For example, Liverpool City Council engaged local businesses on urban greening's impact on tourism and quality of life, building buy-in. Community stakeholder panels can be formed to identify valued co-benefits that matter to residents. And national government funding could encourage facilitation and capacity for co-benefit projects involving broad partnerships.

- **Integrate co-benefit criteria in local decision processes:** Councils could revise their decision-making templates and impact assessment tools to explicitly include co-benefits. While some already include climate implications in committee papers, this could be expanded to include outcomes such as health, or local economic development. Planning processes for spatial plans or new developments could require developers to outline co-benefits of proposals (for example, a new housing development could detail how it will enhance green space and active travel). Councils could define co-benefit metrics as part of project or programme KPIs from the outset, alongside primary outputs.

5.4 The government should ensure that legislation, strategies, and regulations are structured to maximise opportunities to unlock the full range of co-benefits throughout planning and delivery.

- **Maximising impact amid accelerated government delivery:** The government has an ambitious legislative and regulatory programme, including reform, devolution, growth, and mission-based government creating new organisations, duties, and strategies. The pace of action is increasing, and now is the moment to

ensure that delivery across government is as impactful, targeted, and effective as possible, especially at a time when government funding is under pressure. Specifically for climate, embedding co-benefits within this accelerated agenda ensures that climate action also advances social and economic goals, making every investment count. Failing to integrate these opportunities risks undermining progress, missing vital benefits for communities, and weakening the overall effectiveness of government initiatives.

- **Implement long-term, joined-up funding mechanisms:** Short-term, siloed grants should be replaced with flexible, multi-year funding that allows places to plan and invest holistically. As part of the next stage of devolution, the government could work with councils to produce regional "co-benefits funds" that combine budgets in transport, housing, and air quality. For example, the £19m Local Net Zero Accelerator is already testing this in Greater Manchester and the West Midlands, enabling combined authorities to fund a range of green projects across sectors based on local benefits. The stability and flexibility of this type of funding will allow local authorities to pursue larger-scale, joined-up programmes, such as area-wide retrofits which are linked to health and local economic growth, but currently fall through the cracks of fragmented funds.

- **Establish co-benefit task forces or working groups:** At national and regional levels, cross-departmental teams could be formed that focus on high-impact initiatives where co-benefits are most tangible. For example, a "Healthy Homes & Climate Task Force" could include officials from the Department for Energy Security & Net Zero, Department of Health, and Ministry of Housing, Communities, and local government, to ensure programmes like the Warm Homes Plan drive retrofit programs, but also bring together climate and health goals. These groups would need to set shared targets and align departmental objectives which will foster a culture of co-ownership of outcomes. Regular reporting to a high-level body, such as a Select Committee on Climate and Society, would ensure transparency and accountability.

- **Align regulatory strategies with co-benefits:** Regulators can play a key role in balancing short and long-term priorities. For example, Ofwat and the Environment Agency could encourage water companies to invest in nature-based flood measures by recognising the long-term customer benefit through tools like cost spreading over a longer period, or regulatory credits. The NHS could expand programmes such as Social Prescribing and Prevention funding to include climate-related interventions (for example, prescribing insulation or air quality improvements for patients with respiratory issues.)

5.5 Develop national frameworks and tools to support consistent tracking of climate outcomes and co-benefits, and provide dedicated funding and capacity-building support for local government to use them effectively.

- **Develop national guidance and toolkits:** To help local authorities, a co-benefit assessment guideline could be developed and tailored to local use. This could include ready calculators (for example, a simple tool to estimate health savings from emissions reductions) and templates for data collection. By standardising tools, it lowers the technical barrier for councils and creates consistency.

- **Capacity building and peer learning:** Distribution of these tools should be accompanied by training sessions, webinars, and workshops for council officers and elected leaders. For example, cross-sector business case sessions for finance, housing, and climate teams to support delivery of the Warm Homes Plan. A forum would allow practitioners to regularly share experiences, challenges,

Opportunities to embed co-benefits across policy and legislation

The government has a wide-ranging reform agenda. Embedding climate, health, and economic co-benefits into these emerging strategies and bills will maximise impact, especially in a tight fiscal environment.

Policy and strategy	Primary focus	Co-benefits opportunity
GB Energy	Public clean energy generation	Align investment with local jobs, skills, and ownership
GB Energy Local Power Plan	Community energy rollout	Deliver energy savings, energy security, and public participation
Regional Energy Strategic Plans	Area-wide decarbonisation plans	Coordinate energy, housing, and transport co-benefits at scale
Warm Homes Plan	Home retrofit and energy saving	Improve energy security, health outcomes, increase energy security, create jobs and growth, and cut bills
Air Quality Strategy	Pollution reduction	Link cleaner air to improved health outcomes, NHS savings, and productivity gains
Skills England	Workforce development	Tie climate goals to reskilling and inclusive economic growth
NHS Strategy	Health service delivery	Embed climate resilience and prevention (for example, through warm homes)
DESNZ Public Participation Strategy	Community engagement	Use local insight to communicate high-impact co-benefits, tackle misinformation, and build support
English Devolution Bill	Local powers and governance	Include duties to consider joined-up benefits across portfolios
The Green Book	Treasury investment guidance	Expand criteria to reflect full societal value, not just direct costs
Local Government Reorganisation	Structural change	Embed climate and co-benefits into new local authorities and their responsibilities
Integrated National Transport Strategy	National transport planning	Integrate health, air quality, and emissions into investment priorities
Bus Services Bill	Local bus networks	Design services that tackle transport inequalities, health, growth, and access

and solutions, helping to keep the toolkits and resources updated with practical insights. The regional Net Zero Hubs could co-ordinate this wider co-benefits programme, building into a national co-benefits hub.

- **Establish a national co-benefits evidence hub:** The government, with academic partners, could set up a central co-benefits data observatory to gather, analyse, and disseminate data on co-benefits. It would track key metrics (including air quality, health, and jobs) across areas delivering climate action, and publish annual reports and case studies. The national hub, working with regional hubs, could maintain a shared library of valuation metrics (including the value of NO_2 reductions), improving consistency across project appraisals. Local authorities could feed in project data using standard templates and receive analysis and benchmarking in return. Having a respected, independent entity curating this data will improve confidence in co-benefit estimates.

- **Incorporate co-benefit metrics in local and national dashboards:** National and local government should develop public-facing dashboards that include co-benefit indicators. Existing climate dashboards should be expanded with wider co-benefits metrics to show integrated progress. If the public and officials see these numbers regularly, it reinforces their importance. The ONS should create a national "Net Zero Co-Benefits Index" to track and visualise socio-economic gains alongside emissions reductions.

- **Greater adoption of social value procurement for climate goals:** Social value, under the Public Services (Social Value) Act 2012, requires public authorities to consider broader economic, social, and environmental wellbeing when awarding contracts. Many councils have included environmental objectives in scope, encompassing net zero commitments, waste reduction, biodiversity gains, and climate resilience using tools like the SVP and TOMS framework to track co-benefits. More broadly, procurement strategies should seek outcomes beyond financial efficiency, aiming to deliver long-term community wellbeing, environmental sustainability, and inclusive economic growth. UK100 member West Midlands Combined Authority (WMCA) uses robust social value measurement frameworks (such as the SVP), integrating climate-related metrics to capture the cumulative impact of procurement.

- **Leverage technology and citizen science:** Modern technology can make co-benefit monitoring easier and cheaper. This includes low-cost sensors (such as air quality and temperature sensors), apps for citizen reporting (such as health surveys), and big data integration (anonymised NHS or mobility data). Innovation challenges should be funded to link climate actions with health and economic outcomes, such as apps tracking retrofit impacts on bills, and GP visits. Citizen science efforts like local air and biodiversity monitoring should be supported to generate data and boost public engagement. Overall, monitoring should be more participatory and tech-enabled to improve data quality and community involvement.

- **Empower communities and grassroots delivery:** Many co-benefits are best achieved with community involvement (for example, energy saving requires behavioural change, and green spaces can only thrive with local stewardship. Providing small grants or technical support to community groups can amplify co-benefits at a grassroots level.

Mapping Co-Benefits Across Project Types

To support councils in turning these recommendations into action, we propose a simple guiding framework to help identify and track potential co-benefits across different types of local projects **(see Page 98)**. This is not a technical tool or a one-

size-fits-all checklist. It is a starting point to prompt reflection, plan and think holistically about the wider value of their climate action. By incorporating it early in the design process, stakeholders can more effectively articulate the broader value of climate action, inform business cases, and guide decisions on what to measure. It encourages local authorities to shift from viewing climate work as a siloed or compliance-driven task, to recognising it as a powerful lever for delivering on wider social, economic and public health goals.

Over time, it can help embed a more joined-up, outcome-focused approach to climate delivery—one that speaks directly to local priorities and residents' everyday lives.

Conclusion

Climate action is far more than a carbon reduction exercise, it is an opportunity to improve lives, regenerate communities, and build a sustainable economy. It is challenging to identify another catalyst that has the power to transform millions of lives. This report shows through evidence and examples that when we plan for co-benefits, **the returns on climate investments multiply.** Cutting emissions can create jobs for local people, reduce household bills, and restore nature. Conversely, pursuing social and economic goals through a climate-lens can accelerate our path to net zero.

To realise co-benefits at scale, leadership, innovation, and breaking out of conventional silos is required. Policymakers need to be collaborative and forward-thinking, fund prevention and shared outcomes, and trust the growing evidence that **the "prizes" of climate action are tangible, and some impacts are immediate.** It requires building capacity on the ground, giving those charged with delivery the tools, data, and skills to capture and communicate the full value of their work.

Recommendations in Chapter 5 offer a pathway to embed co-benefits into decision-making. By cooperating at all levels, better appraisal methods could lead to better-designed projects, and better evidence and transparency could build public and political support leading to integrated projects that deliver "value for money" on multiple policy objectives, including climate. As these changes take root, climate action will increasingly be viewed not as a cost but as a **high-return investment.** With tight public finances, complex challenges, and growing public frustration, this efficiency is crucial. It is our challenge to deliver it.

Project Type	Climate Objective	Co-benefits of climate action													
		Economic Benefits					Health Benefits				Social Benefits		Nature/Environment		
	Mitigation/ Adaptation	Green Jobs	Supply Chain	Sustainable Infrastructure Investment	Energy Security	Economic Growth/ Savings	Respiratory Health	Temperature related Illness	Obesity/ Weight	Mental Health	Fuel Poverty	Engagement or Knowledge Sharing	Biodiversity	Air Quality	Water Quality/ Management
Energy related															
Building/Housing Retrofit	M&A	✓	✓		✓	✓	✓	✓		✓	✓	✓			
District Heating	M&A	✓	✓	✓	✓	✓	✓	✓			✓	✓		✓	
Community Energy	M	✓	✓	✓	✓	✓					✓	✓			
Renewable Energy	M	✓	✓	✓	✓	✓								✓	
Energy efficiency		✓	✓		✓	✓	✓	✓			✓			✓	
Transport related															
Clean Air Zones	M	✓				✓	✓		✓			✓		✓	
Active Travel - cycling and walking	M			✓			✓		✓	✓		✓		✓	
EV charge points	M	✓	✓	✓	✓	✓								✓	
Transport - rural demand responsive transport	M&A	✓		✓						✓		✓		✓	
Natural Capital related															
Natural Flood Risk Management	A	✓	✓	✓		✓						✓	✓		✓
Urban Greening	M&A	✓	✓			✓		✓		✓		✓	✓	✓	✓
Farming/Agriculture	M&A	✓	✓			✓			✓			✓	✓	✓	✓
Policy related															
New build Zero carbon homes	M	✓	✓	✓	✓	✓	✓				✓	✓	✓		✓
Sustainable procurement	M&A	✓	✓			✓						✓	✓		
Strategic Plans e.g LAEPs, LDCs	M&A	✓	✓	✓	✓	✓	✓				✓	✓		✓	

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Acknowledgements:

Clean Air Fund

The Clean Air Fund is a global philanthropic organisation that works with governments, campaigners, researchers, funders, and businesses to create a world where everyone breathes clean air.

Find out more at www.cleanairfund.org/

UK Power Networks

UK Power Networks is a Distribution Network Operator (DNO) that owns and maintains the cables and substations which deliver electricity from the National Grid to 8.5m homes and businesses across London, the South East and the East of England, serving approximately 20m people and 133 local authorities.

In 2023, UK Power Networks launched the UK's first independent Distribution System Operator (DSO) to ensure the network is ready for the transition to net zero. The DSO works to incentivise customers to shift their energy consumption or generation to maximise use of its existing electricity grid infrastructure, and facilitate the lowest cost transition for customers adopting low carbon technologies. The objective is to ensure there is the right capacity in the right place, at the right time, and at the lowest cost for their customers, with local authorities as one of their key customer groups.

With Local authorities being one of their key customer groups, they established the Local Net Zero team; a dedicated team created to support local authorities with their long-term net zero planning and development of LAEPs.

Find out more at ukpowernetworks.co.uk, dso.ukpowernetworks.co.uk, and yourlocalnetzerohub.co.uk

Appendices

Appendix A: Tools and Templates for Measuring Co-benefits

This appendix provides practical resources gathered from the literature review spreadsheet and case studies. It is designed as a beginner-friendly guide for local authorities and community organisations to start measuring and evidencing co-benefits of climate actions. It includes descriptions of recommended tools, models, and data templates, along with references to sources for further detail.

A.1 Co-benefit assessment tools and models

The Green Book cost-benefit analysis (CBA) template:

A standard template following The Green Book guidance from HM Treasury, expanded to include social and environmental co-benefits in the net present value calculation. This Excel-based tool allows you to list project costs and then input monetised benefits (such as carbon savings, health improvements, and more) with appropriate assumptions.

Use case: Preparing business cases for funding ensures all co-benefits are valued in accordance with the government's appraisal guidance.

Reference: HM Treasury Green Book guidance (2022 update) – includes sections on valuing environmental impact. (Last updated 30 November 2023)

- Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal - GOV.UK[82]
- Guide for Effective Benefits Management in Major Projects[83]

Multi-Criteria Analysis (MCA) Framework

When not all benefits can be easily monetised, MCA helps evaluate options against multiple criteria (including economic, social, and environmental) qualitatively or semi-quantitatively. This tool often uses scoring and weighting for different co-benefits.

Use case: Ranking project options (such as different flood schemes) by how well they deliver co-benefits as well as the primary goal.

Tip: Include stakeholders in setting weights to reflect local priorities (for example, "health" might be weighted higher in one community over another).

Reference: DCLG guide on Multi-Criteria Analysis (2009) and academic literature on MCDA for sustainability.

- Multi-criteria analysis manual for making government policy - GOV.UK[84]

Integrated Assessment Models (IAMs)

These are more complex models that simulate interactions between economy, energy, and environment. Some IAMs can be downscaled to regional level to gauge co-benefits of policy (for example, a model that projects emissions, air quality, and health outcomes under different scenarios).

Use case: Strategic planning to understand long-term co-benefits of pathways (for example, a 2035 net zero industrial strategy and its GDP and health implications.

Examples: The UK TIMES model or Region Energy System models (used by NESO's Clean Power 2030 analysis).[85]

Note: These require expertise, so consider partnering with academia.

- Integrated Assessment Models (IAMs) and Energy-Environment-Economy (E3) models | UNFCCC[86]

SVP and TOMs for climate co-benefits

The SVP's online platform, which is already used by councils for procurement, can be adapted to log climate project outcomes. It uses the **National TOMs (Themes, Outcomes, Measures)** framework which assigns financial proxies to outcomes like local jobs, apprentices, volunteer hours, carbon savings, and air quality improvements.

Reference: Social Value Portal | Measure, report and amplify your Social Value[87]

Use case: Ongoing monitoring. A council or community group can input, say, "five people gained NVQ retrofit training" and "200 tonnes CO_2 saved" and SVP will calculate a £ for social value.

Benefit: Results are automatically formatted for reports.

Access: Many councils have SVP subscriptions. SVP also publishes an annual TOMs handbook (you can check the latest edition for climate-related metrics).

Local Government Association: Social value is defined through the Public Services (Social Value) Act (2012) which requires all public sector organisations and their suppliers to look beyond the financial cost of a contract to consider how the services they commission and procure can improve the economic, social, and environmental wellbeing of an area.

References: A Social Value Toolkit for District Councils[88] and Social Value Climate Change Emergency.[89]

GI-Val Toolkit

Funded by five Regional Development Agencies in 2011 and developed by the Mersey Forest and partners, **GI-Val** is a spreadsheet-based tool specifically for **monetising the benefits of green infrastructure** such as trees, parks, and SuDS. It covers outputs like climate regulation (including carbon storage and cooling), flood attenuation, air quality, recreation, biodiversity proxies, and associated economic value.

Note: At the time of this report the values in the GI-Val are from 2018 and need updating.

Use case: Evaluate an urban greening project or NbS in £ terms for benefits like avoided runoff (from sewer cost savings), pollution removal (a health cost saved), property value uplift, and more. Liverpool City Council used the GI-Val Toolkit extensively to quantify NbS benefits.

Reference: Green Infrastructure Valuation Toolkit,[90] GI-Val User Guide,[91] Supplementary Notes,[92] and the Calculator.[93]

WHO HEAT Tool

A user-friendly online tool with an accompanying guide developed by WHO, to calculate the economic value of health benefits from physical activity and air pollution reduction.

Use case: Liverpool City Council used the HEAT Tool to estimate the number of lives saved from increased walking. By implementing an active travel scheme, and collecting data for input into HEAT, the tool provided an output of an annual economic benefit by calculating the number of lives that could be saved.

Reference: Health economic assessment tool (HEAT) for walking and cycling (v5.3.0, updated July 2024).[94]

Defra Air Quality Damage Cost Calculator

Defra provides damage cost values per tonne of pollutant (NOx, $PM_{2.5}$, and more) which can be used to estimate health-economic benefits of emission reductions.

Use case: A local authority can input "x tonnes NO_2 reduced per year" (for example, from CAZ data or cleaner buses) and multiply it by the damage cost (~£<small>per tonne</small>) to get £ per year of health benefits.

Source: Defra Air Quality Appraisal

Liverpool City Council used the HEAT Tool to estimate the number of lives saved from increased walking

Guidance, which includes a damage cost toolkit (figures updated periodically). Air quality appraisal: damage cost guidance - GOV.UK (Updated 2023)[95] and Air quality appraisal: impact pathways approach - GOV.UK.[96]

Carbon accounting and valuation tools

For carbon co-benefits, you can use standard tools like the **DESNZ Carbon Values Tool,** which calculates non-traded and traded carbon by £ per tonne series up to 2050, which are official and should be used for consistency.

Reference: The Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal - GOV.UK (Updated November 2023).[97]

In terms of accounting, tools like the SCATTER model (used for local emissions baseline and scenarios can provide before and after emissions of a district heating network or a fleet electrification. To model the data, input the CO_2 saved and apply DESNZ £/t to value it.

Reference: SCATTER[98]

Scenario analysis templates

A structured approach you can use to explore different futures.

Reference: Futures Toolkit from Government Office for Science[99]

Use case: Visioning exercises or climate strategy development to show stakeholders the difference co-benefits can make to long-term local outcome. Net zero societies: Driver Mapping and Scenarios, Government Office for Science - GOV.UK[100] and Future of environmental monitoring: Policy stress-testing, Environment Agency - GOV.UK[101]

Tip: The literature suggests using scenarios to reflect uncertainty and optionality.

A.2 Data collection templates

Climate action co-benefits toolkit for city regions and local authorities

Developed by Ashden, this toolkit[102] is designed to support local authority officers in briefing elected members, mayors, and senior leaders. It presents key facts, local data sources, and case studies to highlight the co-benefits of climate action, offering practical examples and business cases to help build support for local initiatives.

Co-Benefits Baseline & Monitoring Plan Template

This is a simple table format to plan data collection, it lists each intended co-benefit (for example, "reduction in respiratory hospital admissions"), the baseline value (for example, current annual admissions in the target area), the data source for baselines (for example, local NHS data[103]), the target or expected change, and how and when it will be measured post-implementation.

Use case: Attach the template from Project Definition & Benefit Templates[104] to every project plan so that from day one, the team knows what data to gather. For example, Leeds City Council tracked baseline heating costs and indoor temperatures before connecting homes to the heat network: Benefits Management | Change@Leeds[105]

Tip: Include responsibility by assigning a person or partner for each metric (for example, "The Public Health department will provide hospital data annually").

Community Survey Template for Co-benefits

A ready-made questionnaire that can be used to capture qualitative and quantitative data from residents about co-benefits. It can cover things like self-reported health status, comfort levels in the home, travel behaviour, perception of neighbourhood (for example, in terms of safety and greenery), and more, both before and after a project.

Use case: In fuel poverty and retrofit schemes, surveying participants about health and comfort pre and post-intervention provided evidence of improved wellbeing. Similarly, Liverpool City Council collected resident feedback on comfort and usage of green spaces. The Community Survey Template for Co-benefits ensures key questions aren't missed. For example,asking if people noticed changes in air quality, or if they spent the money they had saved from the schemes locally.

Volunteer and Training Log Template

For projects involving community volunteers or training (common in community energy and tree planting), you can use a log to record number of volunteers, hours contributed, any certifications earned, and demographic info, if relevant.

Use case: Community Energy Pathways tracked volunteers and training as part of their KPIs. A simple spreadsheet with columns: Name/ID, Activity (for example, volunteer solar panel installation), Date, Hours, and Outcome (for example, "Trained in PAT testing"), which can then be tallied for reporting. For example, "X" volunteers gave "Y" hours, "Z" gained skills. This feeds into the social value calculation of volunteers.

Health Data Sharing Protocol Template

A template agreement (MoU) between a council, local NHS practice, and Public Health England for sharing relevant health data (which is anonymized) to evaluate co-benefits. It sets what data (for example, A&E visits for asthma in certain postcode areas, GP prescriptions for inhalers, and more) will be shared, and in what format and frequency, while respecting privacy.

Use case: Air quality or insulation programs looking to measure health outcomes. This template, cleared by legal and GDPR officers, can save time in negotiating data access. For example, Bradford Council's CAZ work, linked health records to measure a 25% drop in doctor visits because of a data sharing plan which enabled the analysis.

KPIs and outcomes dashboard templates

You could create a simple Excel or Google Sheets dashboard where raw data from various sources is compiled and visualised (for example, using graphs and traffic lights) that can be shared with project managers and stakeholders. It might have sections for environment (such as emissions and air pollution levels), the economy (such as jobs and GVA), or social (such as survey scores and health stats).

Use case: Monthly and quarterly project meetings. If stakeholders can see co-benefit metrics alongside the project outputs, it can help them manage for co-benefits. For example, Birmingham City Council's team had dashboards for NO_2 levels, compliance rates, and likely health indicators.

A.3 Reference data and conversion factors

Here is a handy list of some key reference values and data sources that are commonly needed to quantify co-benefits.

Carbon values

Use DESNZ central non-traded carbon price for year of analysis. For example, £248 per tonne of CO_2 in 2023, and rising over time.

Source: DESNZ "Valuation of greenhouse gas emissions" tables (updated annually).

Health economics values

Public Health England suggests a value of £20,000-£30,000 per Quality-Adjusted Life Year (QALY) saved (based on NICE thresholds). Also, the cost of an average GP visit (of £40) and average hospital admission (of around £5,000) can be used to monetize changes in service usage.

Source: Public Health England and NHS unit costs of health and social care.

Air pollution damage costs

Per tonne of pollutant (2020 prices): NO_x of around £6,000 (in transport average), $PM_{2.5}$ of around £100,000 (these are illustrative; refer to Defra for the latest). These incorporate health and environmental damage, too.

Source: Defra Air Quality damage cost guidance.

Physical activity to health

The WHO HEAT tool's default is one regular cyclist (cycling about 100km a week) has an economic health benefit of around £1,100 per year due to mortality risk reduction. And those walking have an economic health benefit of around £400 per year for 8km a day. Scale linearly by distance and users.

Source: WHO HEAT documentation (2017 values).

Employment and GVA Multipliers

For estimating indirect jobs and GVA from investments, you can use input-output multipliers. For example, every £1m in energy efficiency creates around £1.3m GVA and 16 jobs. For local use, the CBI Economics model or ONS multipliers by sector can be referenced. If they aren't available, simply record direct jobs and note additional jobs likely in the supply chain qualitatively.

Energy savings to NHS impact

Research (for example, BRE) suggests that bringing an unhealthy home to a healthy standard (of EPC C) yields NHS savings of around £7,000 per home over 10 years due to reduced cold-related illnesses. Other examples include, curing fuel poverty for all which could save the NHS up to £1.4bn a year. You can use these benchmarks to estimate health co-benefits of retrofit programs (for example, pro rata by number of homes improved and severity).

Flood risk avoided damages

The Multi-Coloured Manual,[106] produced by the Flood Hazard Research Centre (FHRC) provides average annual damage costs for properties and infrastructure per flood probability. You can use it to value reduced flood likelihood. For example, reducing the probability of a 1-in-20 flood to 1-in-30 might save "X" per property per year (often

hundreds of pounds). The value of avoiding rail disruption can also be used. Network Rail has data on cost per hour of delay on the mainline, which can be included as a co-benefit if the project reduces flood delays.

Biodiversity and wellbeing

Though tricky to monetize, some proxies, including recreation value per visit to green spaces (of around £2-£5 per person visiting as per the Travel Cost method), and wellbeing value of frequent nature visits (White et al. 2019 found it's the equivalent of £1,350 a year in wellbeing value), can be used to justify green space co-benefits qualitatively, or with indicative figures.

A.4 Further reading and resources

The Green Book guidance from HM Treasury (2022) – especially their annex on environmental valuation and distributional analysis.

Defra and PHE Toolkit: Air Quality – Estimating Health Benefits (2018) – for a step-by-step guide for local authorities.

Local Partnerships: Health and Housing Cost-Benefit Analysis Tool – an Excel tool to quantify health savings from housing improvements.

CAN Europe (2024), "Paris Pact: Co-benefits of Climate Action" – provides methodology and EU-level findings linking climate ambition with economic outcome.

UK100 (2021), "Economic Benefits of Local Climate Action" – get UK-specific statistics for evidence base (including jobs and savings).

NHS England (2023), "Delivering a Net Zero NHS – Green Plan Guidance" – includes rationale and case studies of health co-benefits (for example, EV fleet savings.

By utilising these tools and data sources, even those new to co-benefit analysis can start to quantify and communicate the broader value of their climate projects.

Begin with small steps, pick one project and try out one or two tools to build your confidence, iteratively improving your approach as you go.

The key is to make co-benefit evaluation a routine part of your project planning and reporting. Over time, this will not only strengthen the case for climate action within your community, but also contribute to the growing national evidence base.

Appendix B: Case Study References

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