UKRI Innovate UK

Valuing & monetising outcomes in local projects

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Delivered for Innovate UK's Net Zero Living Programme by Bankers without Boundaries and City Science

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What are outcomes?

Outcomes are the additional positive impacts that occur alongside a policy's primary goal. For local authorities, this means that an investment aimed at climate mitigation, for example through expanding active transportation infrastructure, may also generate health, equity, and environmental outcomes such as cleaner air, improved public health, cost savings, or social improvements.

Crucially, many outcomes manifest at the local level, where interventions have immediate effects, so councils are well-placed to integrate them into decision-making.

What is the aim of this document?

This document aims to help local authorities understand and apply practical methods for identifying and valuing the wider outcomes of public investments, such as improved health, reduced inequality, and environmental gains. It provides a concise overview of key tools, guidance, and case studies to support better decision-making and stronger business cases across sectors like climate, transport, housing, and public health.

Why should we identify outcomes?

By recognising outcomes, local governments can build broader support for projects and ensure greater overall public value from spending.

For instance, a housing energy efficiency programme might primarily cut carbon emissions but also reduce fuel poverty and relieve pressure on the NHS through healthier homes. Emphasising these added values helps communicate a more compelling business case for action for a variety of potential stakeholders. Local government guidance (for example the UK Treasury's Green Book) accordingly encourages appraisals to consider all social, economic and environmental impacts, not just direct costs, to capture the full public welfare effects of a proposal.

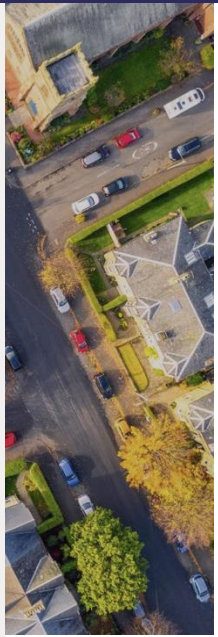
Why co-benefits? The context for this guidance

Net zero projects are primarily evaluated on their carbon reduction potential. But climate action consistently delivers wider outcomes alongside emissions cuts, including improved air quality, better health, reduced noise and improved safety (and sometimes adverse effects). These outcomes often go unmeasured and unmonetised, which means the full value of local investment is routinely undercounted in business cases and funding bids. This creates a systematic gap in how projects are appraised, funded and prioritised, operating under constrained budgets.

This is not a new observation. In 2023, the Climate Change Committee and PwC published a national methodology for quantifying and distributing the co-benefits of climate action across UK households, drawing on the Sixth Carbon Budget pathways. The report modelled 11 co-benefit categories spanning buildings, transport and diet, including air quality, excess cold and heat, dampness, noise, congestion, road safety and physical activity. It found that "the impacts of climate action co-benefits are large in scale. However, they are frequently unevenly distributed, as they depend on the uptake of low-carbon actions by individuals, but also by others." The report further noted that policy plays a key role in determining who benefits, and that considering co-benefits is essential to understanding how climate action complements or conflicts with other societal priorities.

> "The impacts of climate action co-benefits are large in scale. However, they are frequently unevenly distributed, as they depend on the uptake of low-carbon actions by individuals, but also by others."
>
> PwC & Climate Change Committee, The Distribution of Climate Action CoBenefits, 2023

This insight builds directly on that evidence base. Where the CCC and PwC work modelled outcomes at national scale across household archetypes, local authorities need tools calibrated to their own geographies, populations and project types. This insight translates that national picture into practical methods that councils can apply to their own investments, helping them identify which outcomes their projects create, how to value them, and how to use that evidence to build stronger business cases and attract a wider range of funders.

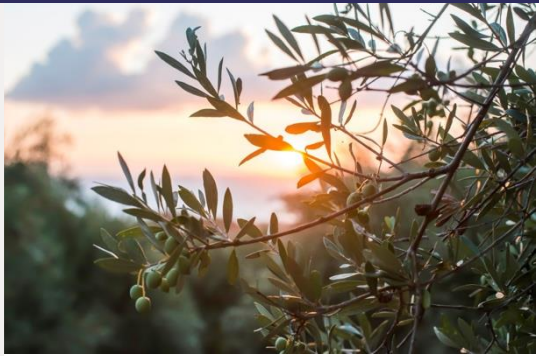


Why “outcomes” is a better framing than “co-benefits”

The term “co-benefits” tends to highlight only the positive side-effects of decarbonisation, such as cleaner air or health improvements. By contrast, the term "outcomes" is used in this document to emphasise that impacts should be assessed in their entirety and measured alongside carbon impacts rather than secondary to them. In practice, interventions can also create unintended negative consequences.

For example, cleaner vehicles may encourage people to drive more because they perceive their journey as less harmful, which in turn can increase congestion and undermine some of the expected benefits. Similarly, green infrastructure can improve local amenity and property values but also risk displacing lower-income households through rising rents.

Research such as the CO-BENS project shows that the wider impacts of climate action are highly sensitive to design and context, which raises the risk that some “outcomes” may be unevenly distributed or even have unintended adverse effects. Using the broader term “outcomes” is therefore more accurate: it captures not only the positive outcomes but also the potential trade-offs and negative consequences, ensuring that policies are assessed more holistically and with greater



Implications for local authorities

For local authorities, framing project in terms of *outcomes* rather than *co-benefits* shifts the focus toward more robust design, monitoring, and evaluation of projects. It signals that:

- not only should one estimate positive secondary effects but also anticipate negative or exclusionary ones.
- decisions should explicitly consider equity, distribution and unintended externalities.
- evaluation frameworks should include both what was supposed to happen **and** what did happen, including unforeseen effects.

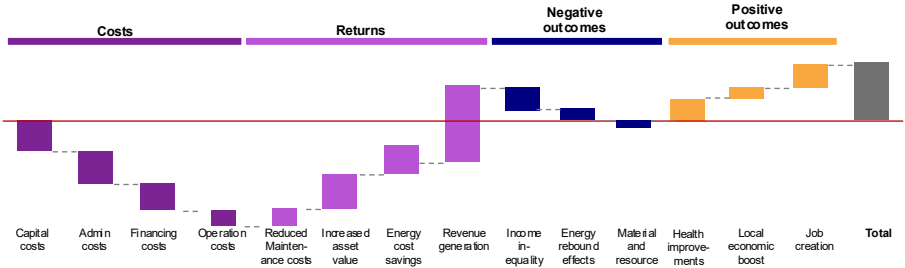
Embracing this approach helps avoid surprises, for example displaced traffic, increased costs for marginalised communities, and strengthens credibility when seeking funding.

Investment vs return: the role of outcomes

Place-based decarbonisation requires significant upfront investment across key sectors, with costs that are often not fully offset by direct financial returns. However, when positive outcomes such as health improvements, local economic growth, and job creation are also considered, these investments become economically and socially justifiable. At the same time, it is important to recognise potential long-term risks, including equity and affordability pressures where lower-income households may bear higher costs, material resource demands linked to the use of scarce minerals and manufacturing inputs, and rebound effects where efficiency gains can lead to increased overall consumption and partially offset climate benefits.

Total costs and returns compared to outcomes

These are additional outcomes resulting from actions to reduce greenhouse gas emissions - including positive effects such as improved health from vehicle electrification, as well as negative impacts such as affordability pressures, material resource demands, and rebound effects that should be considered for a balanced view.



These figures are illustrative

How are outcomes created?

Decarbonising local places not only reduces carbon emissions through investments in transportation, buildings, heating, and electricity, but also delivers significant outcomes, particularly in public health, without requiring additional expenditure. These include improved air quality, increased physical activity, reduced noise, and enhanced safety. While such outcomes often play a critical role in making the economic case and non-financial economic case for decarbonisation viable, it's important to recognise that the financial benefits may accrue across different sectors. The outcomes shown illustrate how decarbonisation projects across energy, transport, buildings, and heating generate a range of positive outcomes.

Illustrative outcomes from decarbonisation projects

Outcomes	Transport	Built environment	Energy systems	Green Infra / Nature-based Solutions (NbS)	Reason
Improved air quality	✓✓✓	✓✓	✓✓✓	✓	Lower fossil fuel emissions and tree planting decrease healthcare expenses
Reduced noise	✓✓	–	–	✓	Reduced vehicle usage and increased greenery limit ambient noise levels
Improved traffic safety	✓✓✓	–	–	✓	Lower vehicle volumes and speed reduce accidents and related medical costs
Improved physical health	✓✓✓	✓	–	✓✓	Active travel and green spaces promote healthier lifestyles, reducing health costs
Improved aesthetics & comfort	–	✓✓	–	✓✓	Nature-based solutions enhance public realm and property surroundings
Natural heating / cooling	–	✓	✓	✓✓	Trees and energy-efficient buildings regulate temperature and reduce demand
Natural water regulation	–	–	–	✓✓✓	Green infrastructure manages runoff and mitigates flood risks

Strong contribution | Moderate contribution | Some contribution | Not applicable

Valuing outcomes

Valuation of outcomes: key debates

These six pillars shed light on some of the key debates surrounding valuation of outcomes. Together, they highlight the need for context-specific methods, credible data, and strong institutional alignment to make valuation both practical and meaningful.

Public value vs private value

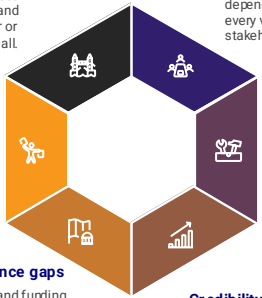
Public and private sector players measure value differently from each other. In general, public sector are incentivised by generating public value and private sector players are incentivised by their own business and financial objectives. Valuation methodologies and toolkits tend to cater to either the public sector or private sector, but rarely are a one-size fits all.

Capacity is a key bottleneck

Tailoring valuations and maintaining monitoring systems require skills and resources that many local authorities do not have. Limited capacity often leads to inconsistent results and weak evidence. Shared support models or template frameworks could help bridge this gap.

Evidence gaps

Even when analysis is strong, current policy and funding systems do not always have clear routes for monetisation of outcome-based evidence. As such, it is not always clear which valuation methodology or framework is the most relevant to pursue a successful monetisation strategy, leading to limited resources potentially being spent on valuation exercises without successfully crystallising additional funding or finance.



Valuation depends on the stakeholder

What counts as "value" varies depending on who is measuring it and why. Even within public and private sector bodies, what counts as value varies significantly and depends on who values what and why. The key is to start every valuation exercise with clarity about who the target stakeholder is and their relationship with the outcome.

No single best practice, only a toolkit

There is no universal method that works for all projects or stakeholders. Many tools exist, but each suits a specific context. Rather than chasing one standard, valuation should use a flexible toolkit of approaches that match the stakeholder, the sector, and the available data.

Credibility relies on data and monitoring

No matter which tool is used, the strength of the valuation depends on robust baselines and credible data. Without consistent monitoring, results lose legitimacy and cannot support investment or policy decisions.

Why valuing outcomes matters

While outcomes are widely acknowledged as critical outcomes of place-based climate action, they are rarely quantified in ways that influence funding decisions. Valuing these outcomes helps surface their relevance to stakeholders by translating intangible advantages into measurable outcomes, not as a standalone solution, but as a tool to make a more complete business case. Valuing these outcomes transforms them from intangible advantages into measurable values, helping to justify interventions, unlock new sources of funding, and engage a broader range of stakeholders. For example, retrofitting social housing may appear uneconomical based on energy savings alone. But when outcomes like improved public health, reduced hospital admissions, and reduced absenteeism are monetised, the overall value case becomes compelling for both local governments and healthcare payers.

Problem	Tool: valuation	Outcome: actionability
Outcomes are often not invisible in financial models	Valuation makes outcomes visible and quantifiable	Enables design of innovative financing mechanisms (for example, outcome-based finance)
Perceived as “nice to have”, not essential	Builds a full economic case for projects	Identifies and engages interested stakeholders as potential funders
Leads to underinvestment in high-impact, low-return projects	Highlights hidden value to improve investment rationale	Supports blended finance and long-term funding partnerships
Funders struggle to justify spending on indirect or diffuse benefits	Encourages multi-sector collaboration (for example, health co-funding climate projects)	Accelerates project delivery and uptake by making indirect value explicit

Valuation framework: tools & data

This framework maps the pathway from raw data points to informed local authority decisions. Verified data sources can feed into specialist tools that quantify specific outcomes across health, social, economic, environment, and risk domains. These tool outputs can then be integrated using valuation methodologies such as cost-benefit analysis (CBA), social return on investment (SROI), or multi-criteria analysis (MCA).

Inputs

The starting point for any valuation. This includes basic project information such as the scheme's objectives and location, cost breakdowns, the population it affects, baseline data, and any key risks or assumptions that will shape the analysis.

Data sources

The evidence base that feeds into the tools. These are published datasets and government guidance documents covering health outcomes, wellbeing, air quality, carbon values, climate projections and more, providing the unit costs and damage values needed to put a number on each outcome.

Tools

Specialist models and calculators that take the data and turn it into quantified outcome values. Different tools cover different domains, including transport and health, urban trees, flood risk, ecosystems and wellbeing, each producing a monetary or measurable value for a specific type of outcome.

Integrator frameworks

The methodologies that bring all the tool outputs together into one coherent appraisal. These frameworks, such as cost-benefit analysis, social return on investment, or multi-criteria analysis, combine the individual outcome values into an overall picture of a project's worth.

Valuation framework: tools & data (inputs)

Before any valuation can begin, a clear picture of the project is needed. The inputs below set out the key information to gather at the start, covering what the project is, what it costs, who it affects and what uncertainties need to be accounted for.

- **Project overview:** short summary of the scheme, its objectives, location, and mapped boundary.
- **Scenario definitions:** clear description of 'do minimum' (without project) and 'do something' (with project) cases, including the opening year and appraisal period.
- **Financial profile:** yearly breakdown of capital, operating, and renewal costs, plus funding sources and phasing.
- **Beneficiary and baseline information:** affected population, existing demand or usage levels, and relevant health, safety, and environmental baselines.
- **Risk and sensitivity assumptions:** summary of key project risks, optimism bias factors, equality considerations, and planned sensitivity tests (for example, varying costs or uptake rates).

Valuation framework: tools & data (data sources)

Good valuation depends on credible, published evidence. The data sources below provide the unit costs, damage values and baseline statistics that feed into the specialist tools, organised by outcome domain.

COMEAP
Air pollution health effects functions

ONS wellbeing data
Life satisfaction and wellbeing statistics

Green Book wellbeing guidance
WELLBY use in health/wellbeing appraisal

Defra air quality damage costs
£ per tonne pollutant factors

ENCA
Natural capital approach + databooks

BEIS carbon values
Cost of carbon for appraisal

ONS wellbeing data
Life satisfaction measures

Understanding society
Longitudinal UK wellbeing and social outcomes survey

UKCP18 climate projections
UK climate hazard scenarios

Green Book collection
Central UK appraisal rules and parameters

Common **Health** **Economic** **Social** **Risk** **Environment**

All links on this slide are clickable for direct access to the relevant tool or data source.
This list is not exhaustive as additional resources may also be relevant depending on project scope and context.

Valuation framework: tools & data (tools)

Good valuation depends on credible, published evidence. The data sources below provide the unit costs, damage values and baseline statistics that feed into the specialist tools, organised by outcome domain.

WHO HEAT
Health benefits of walking/cycling (mortality, morbidity)

ITHIM
Transport and health impact modelling

DfT TAG Unit A4.1
Social and health impacts in transport appraisal

NICE methods manual
A Quality-Adjusted Life Year (QALY) value methods

FCERM appraisal guidance
Flood and coastal scheme appraisal

Multi-coloured Manual
Flood damages and benefit calculation

CLIMADA
Climate risk and adaptation valuation

HACT UK social value bank
£ values for social outcomes (housing, mental health)

Social value engine
Local social value modelling

Green Book wellbeing supplement
Monetising wellbeing (WELLBY)

Defra LAQM EFT
Road transport emissions

i-Tree Eco
Value of urban trees (carbon, air quality, cooling)

ORVal
Recreation visits and welfare values

NEVO
Ecosystem services from land use change

CIRIA BeST
SuDS and blue-green infra benefits

DfT TAG hub
Main transport appraisal guidance

TAG data book
Parameters for economic appraisal

TUBA
Travel time and vehicle operating cost benefits

COBALT
Collision and accident benefits valuation

AMAT
Active mode appraisal toolkit

Common **Health** **Economic** **Social** **Risk** **Environment**

All links on this slide are clickable for direct access to the relevant tool or data source.
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Valuation framework: tools & data (integrator frameworks)

With individual outcome values calculated, an integrator framework brings everything together into a single appraisal. The frameworks below offer different approaches depending on the nature of the project and the audience it needs to speak to.

Cost-benefit analysis (CBA)
Values all relevant project costs and benefits to calculate overall net present economic value. Green Book Compliant.

Social return on investment (SROI)
Measures and values social outcomes, weighting importance to reflect stakeholder priorities accurately.

Multi-criteria analysis (MCA)
Evaluates mixed qualitative impacts, weighting categories for transparent decision-making processes.

Common **Health** **Economic** **Social** **Risk** **Environment**

All links on this slide are clickable for direct access to the relevant tool or data source.
This list is not exhaustive as additional resources may also be relevant depending on project scope and context.

Examples of outcome valuation in practice

The following slides walk through four real-world examples of how outcome valuation has been applied in practice. Each example demonstrates a different valuation method and context.

1. **The Local Sustainable Transport Fund (LSTF)** aimed to promote sustainable transport through investments in walking, cycling, and public transport access across 96 local authority areas in England. The programme's dual objectives were to support economic growth and reduce carbon emissions. They evaluated the national impacts of these projects using a mix of monetised benefits (based on DfT guidance) and programme-wide metrics in 2017, resembling a Cost-Benefit Analysis (CBA) in how it attributes social, environmental, and economic value to various outcomes. See slide 18.

2. The **Connswater Community Greenway (CCG)** is a 9-kilometre linear park and regeneration project in East Belfast, designed to improve environmental quality, encourage physical activity, reduce flood risk, and connect communities. Beyond its physical transformation of the urban landscape, the project aimed to deliver long-term social, environmental, and economic benefits to the surrounding area. To better understand and quantify these wider impacts, a Social Return on Investment (SROI) approach was applied in 2023; enabling the project team to evaluate not just what was built, but the real value it created for people and place over time. See slide 19.

3. **The i-Tree Eco London report** presents a comprehensive valuation of Greater London's urban forest, estimating the total number of trees, their structure, and the ecosystem services they provide. Rather than viewing trees as aesthetic or optional infrastructure, this study uses the i-Tree Eco model to assign monetary values to the benefits trees deliver, such as carbon storage, pollution removal, avoided runoff, and improved air quality. This enables urban planners and policymakers to make informed, investment-grade decisions, showing how urban nature contributes tangible value to environmental quality, public health, and climate resilience. See slide 20.

4. In 2019, King's College London and UK100 evaluated the **health and economic costs of air pollution in Birmingham**, focusing on two major pollutants: fine particulate matter ($PM_{2.5}$) and nitrogen dioxide (NO_2). Using national health data and local pollution modelling, the report quantifies the benefits of reducing these pollutants to safe levels, in terms of avoided deaths, reduced hospital admissions, fewer asthma cases, and increased productivity. The analysis applies health economics tools such as the Value of Statistical Life (VSL), QALYs, and NHS cost tariffs to estimate a total potential benefit of £2.48 billion, demonstrating the strong case for clean air investment through a public health valuation lens. See slide 21.

1

BCR (benefit-cost ratio) = (Congestion relief + Improved access to employment + Health benefits from active travel + Journey time reliability + Carbon emission reduction) / Total programme cost = **5.2 to 6.1**

Congestion relief

Time savings (in hours) × Value of time (£ per hour) × Number of users

- Value of time is based on **DFT webtag rates** (such as ~£31/hr for business, ~£7/hr for commuting). Assumes that time saved is productive or valuable.
- The number of users benefiting is estimated through modelled traffic flow changes across LSTF locations.

Journey time reliability

Reduced journey time variability × Reliability factor × Value of time × Number of journeys

- Uses a DFTreliability factor, typically 0.8 x the value of time.
- Estimated from before/after journey time standard deviations
- Only applied where reliability interventions were implemented (for example, urban corridors).

Total programme cost

DFT funding + Local authorities

£540 million + £460 million = £1 billion

Improved access to employment

Number of additional people able to access jobs × Average wage increase × Participation adjustment

- Derived from improvements in travel time to major centres.
- Average wage uplift is drawn from local income data.
- Employment and reliability improvements were observed qualitatively (for example, access to jobs, reduced delays) but not monetised in the core BCR.

Carbon emission reduction

- Emission reduction calculated using standard emissions per km per vehicle. Carbon price used was ~£60/tonne (from DECC/BEIS shadow pricing at the time).
- This was one of the smallest benefits in financial terms but still important for environmental impact.

Tonnes of CO_2 avoided × Carbon price (£ per tonne)

Scenario context

The LSTF evaluation compared ex-ante and ex-post benefit-cost ratios (both around 5.2 to 6.1) and evaluated outcomes against comparator areas, providing an implicit test of robustness across differing project conditions and data sources. For future local appraisals, authorities can apply scenario analysis following DFT TAG unit M4. This means testing how results change under alternative assumptions for behavioural response, project cost, or timing of benefits, to demonstrate that overall value for money remains strong under a range of conditions.

Health benefits from active travel

Additional active travel (minutes/week) × Risk Reduction × Population affected × Value per QALY

- Assumes an average increase in walking/cycling minutes per person per year, based on survey and model data.
- Uses a a quality-adjusted life year (QALY) value of £60,000, as recommended by NICE.
- Applies population-level data to estimate the number of lives or years saved.

The equations show how such impacts are typically quantified using dft/TAG appraisal standards, and not all were directly modelled in LSTF

2

SROI (Social Return on Investment) = (Property Value Benefit + Flood Alleviation Benefit + Tourism benefit + Biodiversity benefit + Climate change benefit) / (Construction cost + Maintenance cost) = *1.34 to 1.59*

Property value benefit

Number of properties × Avg. property price × % Increase × Discount factor

- They looked at **19,761 homes within 500m** of the Greenway.
- The average house price in the area was **£135,398**.
- Based on a UK government report (**ONS 2018**), living near green space increases house prices by **0.60% to 1.07%**.

Tourism benefit

Extra visitors per year × Willingness to pay (WTP) per visit × Discount factor

- After the Greenway opened, there were **56,589 more visits** over 6 years
- People are **willing to pay £1.54 to £5.36 per visit** to places like parks (**Sen et al., 2014**).

Construction cost

£40,000,000

Maintenance cost

£100,000×DF =£2.24M

Biodiversity Benefit

Extra visitors × WTP for biodiversity × WTP for tourism × Discount factor

- Biodiversity (more birds, plants, etc.) has value to visitors.
- Willing to Pay (WTP) amount: People are willing to pay **£9.38 to £13.48 more per year** for a 10% increase in biodiversity (**Dallimer et al., 2014**).
- They **subtracted WTP for tourism to avoid double-counting**.

Flood Alleviation Benefit

- The Greenway includes flood defences that **protect 1,741 homes**.
- **Jacobs Engineering** estimated that this avoids **£54.7 million** in damage over 100 years.
- They used DEFRA's discounting guidance to calculate **£1.95 million saved each year.**

Annual avoided damage × Discount factor

What's excluded:

- **Health**: No significant improvements observed in physical activity or mental wellbeing (PARC study).
- **Crime**: Crime fell, but trends mirrored the wider region - can't attribute directly to Greenway.
- **Employment:** No reliable data on job creation or productivity changes caused by the project.

Climate Change Benefit

Cars avoided × Distance × CO2/Km × Working days × Carbon price × Discount factor

- Because more people cycle, **116 car trips per day** were avoided.
- Average trip: **12.1 km**, and each car emits **0.29 kg of CO_2/km**. Used **230 working days/year**, assuming 6 weeks off.
- Carbon is valued at **£4.13/tonne CO_2** (UK Government figure).

Discount Factor

All future benefits are **discounted to present value** using a **3.5% annual discount rate**, as per UK government guidance (HM Treasury Green Book).

3

Total urban forest value = Carbon storage value + Air pollution removal + Avoided surface runoff + Annual carbon sequestration = ***~£133.6 million/year***

One-off asset value = Structural replacement cost = ***£6.12 billion***

Carbon storage value

Total carbon stored × Carbon price

- Trees capture and store carbon in wood and soil.
- 2,367,000 tonnes of carbon stored. **Valued at**: ~£147 million
- Calculated using US forest service's **i-tree eco software**, adjusted for UK context.

Avoided surface runoff

Volume avoided × Drainage cost per m^3

- Trees stop rainfall, reducing pressure on stormwater infra. 3,414,000 m^3/year avoided. **Valued at**: £2.8 million/year
- Drainage cost = estimated at **~£0.80/m^3** from reports
- Based on typical urban catchment models

Sensitivity to assumptions

The valuation is sensitive to assumptions such as carbon prices, damage costs per pollutant, and drainage costs. For instance, using a higher social cost of carbon or updated health impact estimates can significantly increase the total value.

Air pollution removal

Amount of pollutant removed × Damage cost per kg

- Trees remove pollutants like PM10, NO_2, SO_2, O_3 through leaf surfaces.
- Each kg of pollutant removed = health/clean-up cost avoided.
- ~2,241 tonnes/year of pollutants removed. **Valued at**: £126 million/year. Damage costs from **UK dept. For environment.**

Annual carbon sequestration

Annual carbon sequestered × Carbon price

- Sequestration = net carbon gain after subtracting decay
- Measures **new carbon captured by tree growth each year**. 77,200 tonnes of CO_2/year (≈21,045 tc/year). **Valued at**: ~£4.79 million/year.

Structural asset value (replacement cost)

∑ (Replacement cost per tree)

- Represents the **one-off cost** to replace all trees (materials + labour).Like insuring trees as infrastructure.
- £6.12 billion (for 8.42 million trees)
- Based on tree size, species, and condition
- Calculated using **council of tree and landscape appraisers (CTLA)** approach

Discount factor

Annual benefits can be projected over a **40-year period** and discounted using **a 3.5% rate** (**HM treasury green book**), resulting in a present value multiplier of ~**21.48.** This allows the ecosystem services to be incorporated into investment-grade business cases

Case study: i-Tree Eco London report

More

4

Total benefits =

- Avoided mortality + Reduced respiratory hospital admissions
- Reduction in new childhood asthma cases + Lost productivity from working age mortality
- Reduced cardiovascular hospital admissions + Lost productivity from childhood illness

= *£2.48 billion*

Avoided mortality

Number of prevented premature deaths × Value of statistical life (VSL)

- 952 deaths annually attributable to $PM_{2.5}$ in Birmingham. Uses COMEAP (committee on the medical effects of air pollution) methodology.
- Each prevented death valued using UK standard vsl (value of statistical life, which puts a value on preventing a fatality to reflect the social economic cost.)

Lost productivity from working age mortality

Working age deaths prevented × Years of productive life lost × Average annual earnings

- Early death among working-age adults reduces overall economic productivity. Valued using average wage over expected years of working life. Earnings based on ONS median income.
- Includes adjustment for employment rates and discounting.

Reduced respiratory hospital admissions

Estimated reduction in admissions × NHS cost per admission

- Admissions modelled using ERF-based population exposure and relative risk estimates from epidemiological studies.
- NHS tariff costs used to monetise per case avoided (for example. £3,000-£4,500 per admission).

Reduced cardiovascular hospital admissions

Reduction in cardiac admissions × Unit NHS cost per event

Air pollution exacerbates heart diseases. Cutting NO_2 and $PM_{2.5}$ reduces the incidence of hospitalisations for heart attacks. Based on COMEAP RR. NHS cost per case from national hospital episode statistics.

Reduction in new childhood asthma cases

Reduction in childhood exposure × Estimated cases prevented × Lifetime treatment cost

- Based on exposure-response function from Aphekom and other cohort studies.
- Long-term cost per asthma case includes direct treatment and indirect productivity loss.

Lost productivity from childhood illness

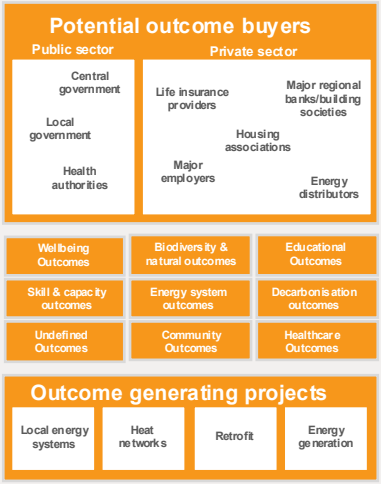
Asthma-affected children × School absence days × Hourly wage × Parental work loss

- Parents of children with asthma may miss work for doctor visits or care, resulting in lost income.
- Absence days per case drawn from NICE & asthma UK reports. Wage assumption = £15/hour

Valuation tools

- **VSL**: puts a money value on avoiding one early death.
- **Qalys**: combines years of life gained and health quality.
- **NHS costs**: standard hospital costs used to price avoided illness.
- **Risk ratios**: show how pollution raises disease or death risk.
- **Productivity loss**: measures earnings lost from illness or death.
- **Lifetime cost**: total cost to treat a long-term illness like asthma.

Turning local outcomes into investment opportunities



Outcome buyers and the outcomes they seek

The local transition projects that are being delivered by local authorities, including local energy systems, heat networks, retrofit, and energy generation, create a wide range of valuable outcomes. These include improved wellbeing, biodiversity gains, decarbonisation, energy system resilience, healthcare improvements, and more. These outcomes are essential for communities but also present indirect value for organisations that benefit from improved local conditions.

These organisations, which can be collectively termed as outcome buyers, include both public and private sector stakeholders. Public sector actors such as central government, local authorities, and health authorities benefit from enhanced public health, reduced service pressures, and progress toward national climate goals. In the private sector, groups like life insurance providers, major employers, banks, building societies, housing associations, and energy distributors stand to gain through lower costs, increased economic activity, workforce resilience, and alignment with sustainability goals.

This process identifies which outcome buyers benefit most from specific projects and outcomes, quantifies the value they receive, and positions them as potential investors or funders. This approach turns local outcomes into investable propositions, enabling long-term funding partnerships that can scale up impact and accelerate the transition.

What to do after valuing?

After the valuation exercise, the relevant stakeholders who could benefit from the outcomes generated by the intervention can be mapped, as they may be potential funders for sustaining or scaling those outcomes.

Stakeholder	Category	Potential incentive to fund/invest
Local government	Public sector (local government)	Increased local tax revenue, reduced fuel poverty, enhanced public service efficiency, achievement of societal benefits
National government	Public sector (national government)	Achieving carbon neutrality goals, reducing public healthcare burden, strengthening the local and national economy
Public health authorities	Public sector (public health)	Lower healthcare costs from improved housing conditions, fewer emergency hospital admissions
Housing associations	Private sector (more accustomed to working with the public sector)	Lower maintenance costs, improved tenant retention
Major regional banks/building societies	Private sector (less accustomed to working with the public sector)	Increased demand for mortgages and loans as disposable income rises, increased lending opportunities due to rising property values and economic growth
Major employers	Private sector (less accustomed to working with the public sector)	Higher workforce efficiency, reputational benefits, alignment with corporate sustainability goals
Energy distributors	Private sector (more accustomed to working with the public sector)	Infrastructure modernisation funding, reduced strain on energy networks, potential subsidies
Life insurance providers	Private sector (less accustomed to working with the public sector)	Potential for lower claim payouts on life and health insurance policies, depending on the balance between premiums and payouts
Retrofit providers	Private sector (more accustomed to working with the public sector)	Increased business opportunities from large-scale retrofitting programs, more people available for hire due to job creation
Construction companies	Private sector (more accustomed to working with the public sector)	More business opportunities from retrofit and housing upgrades, access to a larger workforce due to job creation

Monetisation of outcomes

The difference between valuing outcomes and monetising outcomes

Valuing outcomes

Valuing outcomes is about recognising their worth and expressing it in monetary units

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Monetising outcomes

Monetising outcomes is about realising that worth as actual funding

It is important to distinguish between **valuing** an outcome and **monetising** an outcome.

Valuing an outcome means estimating its worth in monetary terms for analysis or appraisal purposes. In practice, this often involves using financial models to assign a pound value to an outcome. Such valuations help quantify benefits, even if no money actually changes hands.

For example, Defra provides guidance to quantify intangible benefits like noise reduction by assigning them a monetary value, so they can be included in project appraisals, as outlined in the previous section.

By contrast, **monetising an outcome** means converting that benefit into an actual revenue stream or finding an external buyer willing to pay for it which can then be used to support the upfront and/or ongoing costs of achieving those benefits. In other words, the outcome is not just given an implicit value but is turned into a source of funding that can help finance a project. This typically requires some form of market or payment mechanism for the benefit.

For example, instead of merely valuing improved water quality in pounds, a local authority might secure payment from a water company or an insurer that benefits from that water quality improvement.

This is far more challenging, as many outcomes are public goods with no traditional market. However, monetising outcomes can make projects more financially attractive and even be necessary to make some projects viable.

Factors affecting the monetisation of outcomes

Not all outcomes can be easily monetised. Several key factors determine whether an outcome can move from having a value on paper to generating real financial contributions:

Factor	How this factor affects the monetisation of outcomes
Market demand	There must be someone who sees the outcome as valuable enough to pay for it. This person is the buyer or funder. Market demand can come from public agencies, private companies or consumers. For example, if improved air quality leads to healthcare savings, the NHS or health insurers might value and potentially pay for interventions that deliver those savings. Without clear demand or willingness-to-pay, the outcome remains non-monetisable.
Measurability	The outcome must be measurable and verifiable. Buyers will only pay for outcomes they can see quantified and trust. This means robust metrics and monitoring are needed. However, outcomes are often harder to quantify consistently because they involve intangible outcomes and lack standard measurement. Improving measurability through better data or models is thus critical for monetisation.
Cause and effect	Closely tied to measurability is the ability to attribute the benefit to a project's actions. To convince a buyer, one must demonstrate that the intervention actually caused the benefit, rather than other external factors. This is essentially proving cause and effect. Without clear attribution, a potential buyer might doubt whether paying for a project will truly deliver the promised outcome, undermining monetisation.
Market mechanism	Even if there is demand and measurable outcomes, there needs to be a mechanism or platform to facilitate the transaction. This could be a formal market, like carbon credits or emerging biodiversity net gain markets, or a contractual arrangement, such as impact bonds. The existence or the possibility for the creation of a market mechanism greatly impacts monetisation feasibility.
Regulation	Regulations and policies can either enable or hinder the monetisation of outcomes. For example, regulation can create demand by putting a price on externalities or mandating outputs; for example, the biodiversity net gain regulation requires developers in England to offset biodiversity losses, effectively creating a market for biodiversity. Conversely, strict public finance rules can hinder monetisation. For instance, a council might save NHS costs by improving insulation, leading to improved physical health as an outcome, but siloed budgets hinder NHS from transferring those savings from the health budget to the council. In this case, the outcome, while valued, remains un-monetised.

Case study: biodiversity net gain

From February 2024, the Biodiversity Net Gain (BNG) policy requires developments to deliver a minimum of 10% increase in biodiversity as compensation when natural environments are impacted. Developers can meet this requirement through on-site improvements or by purchasing biodiversity units from habitat banks which are designated areas managed to deliver nature gains over time.

BNG illustrates the interaction of all five factors affecting monetisation: **Market demand** is created by developers needing to comply with the 10% net gain requirement. **Measurability** is ensured through a standardised biodiversity metric that quantifies habitat quality and area, enabling consistent unit valuation. **Cause and effect** is established by linking purchased units to specific habitat interventions, with monitoring and verification providing assurance of delivery. A **market mechanism** now exists in the form of habitat banks and brokers facilitating transactions between developers and land managers. Finally, **regulation** underpins the entire system by mandating net gain, without which there might be little incentive for voluntary transactions.

This case demonstrates how strong regulatory drivers, combined with credible measurement and trading infrastructure, can transform an externality into a monetisable outcome.

Are all five factors required for monetisation?

Not every factor needs to be perfectly in place for monetisation to occur but the extent to which they are fulfilled determines both feasibility and scale. Market demand is essential: without a buyer, monetisation is effectively impossible.

If measurability and attribution are weak, buyers may still exist, but they are unlikely to pay with confidence unless proxy values, conservative assumptions or similar are accepted. Equally, absent market mechanisms or limited regulations may still allow small-scale or ad hoc transactions, yet they constrain investor confidence and long-term viability.

In practice, the closer an outcome comes to satisfying all five factors, the more likely it is to attract sustained, large-scale monetisation.

Improved air quality: monetisation

One of the most significant outcomes of many decarbonisation initiatives is improved air quality. Reducing the burning of fossil fuels cuts emissions of nitrogen oxides (NOx), particulate matter (for example, $PM_{2.5}$) and other pollutants, yielding cleaner and healthier air in communities. For local authorities, better air quality can help achieve statutory pollution limits and bring public health gains such as fewer respiratory issues.
Below is an overview of the feasibility of monetising clean air benefits:

Market demand: The benefits of improved air quality accrue broadly, such as to residents. There is strong societal demand for clean air, reflected in public support for measures like Clean Air Zones, but direct market demand is nascent. Typically, individuals do not pay for clean air directly and it is considered a public good. However, innovative outcome-based financing models are being explored; a recent report suggests using social impact bonds where investors fund air quality measures and are repaid by the NHS or councils based on measured reduction in respiratory cases.

Measurability: Air quality is relatively straightforward to measure in physical terms; local authorities routinely monitor concentrations of NOx etc. Moreover, Defra publishes damage cost per tonne of pollutant emitted, reflecting health and environmental costs.

Market mechanism: Currently, there is no dedicated trading market for "clean air credits" or similar mechanisms in the way carbon credits exist. Thus, monetisation likely needs bespoke agreements or leveraging of other markets.

Cause and effect: Many things such as weather affect air quality, thus, one must isolate the effect of the intervention. Attribution is of moderate difficulty and is feasible for some projects. Before-and-after monitoring near busy roads can show drops in pollutants attributable to cleaner buses.

Regulation: The regulatory context in the UK reinforces the value of clean air but stops short of creating private markets. The Environment Act 2021 sets binding targets for $PM_{2.5}$ but no specific regulation mandates private entities paying for air improvements yet.

Summary: Improved air quality is one of the most valuable outcomes of decarbonisation for local authorities, with well-developed methods to value it in monetary terms. However, turning that value into cash flow is still in early stages.

Improved air quality: case study

To illustrative a creative approach: The Greater Cambridge Impact Initiative proposed Impact Fund with the goal to tackle inequality, seeking to raise £10 million over 10 years. Designed as a form of social impact bond, the model would see private investors finance interventions such as active travel infrastructure. The outcomes, reduced levels of air pollution and associated reductions in respiratory illness, would be measured. If agreed targets were achieved, the NHS and council would repay the investors from the financial saving realised, reflecting lower healthcare costs. This effectively monetises clean air by capturing a portion of the health system savings as a revenue stream. While this specific scheme is not yet implemented, it demonstrates a viable pathway.

Key statistics

£11 billion per year in NHS costs (lung diseases)

£8,148 damage costs (£/t) for NOx in 2023

£16,616 damage costs (£/t) for SO_2 in 2023

£74,769 damage costs (£/t) for $PM_{2.5}$ in 2023

Lessons for local authorities

This case study illustrates how monetisation could be achieved when attribution and measurability are robust, and a clear payer is identified. By linking reduced hospital admissions and improved public health directly to environmental interventions, the mechanism creates a financial value chain where healthcare savings flow back into funding decarbonisation measures.

For local authorities, this suggested approach shows that framing air quality improvements as health investments can unlock new revenue streams and reduce pressure on public budgets. Councils seeking to monetise air quality outcomes can explore outcome-based contracts with the NHS or insurers. Investor-based structures such as bonds can bridge upfront funding gaps while tying repayment to verified savings.

CAZ: Charging for cleaner air

The Ultra Low Emission Zone (ULEZ) and Clean Air Zones (CAZs) are regulatory schemes that charge vehicles which do not meet specified emissions standards for entering designated areas.
ULEZ, implemented in London, applies a daily charge to higher polluting cars while CAZ schemes in cities such as Bath target the most polluting vehicles to improve local air quality. While CAZ is the more general term used for such areas, ULEZ refers to the specific type implemented in London.
These schemes can be understood as forms of air quality monetisation because they place a direct price on vehicle emissions. Drivers of higher-polluting vehicles effectively "pay for" the additional air pollution they cause, and the revenues are used to fund cleaner transport and air quality improvements.
They are a little different from other monetisation models, however, in that payment is regulatory and compulsory rather than voluntary. Moreover, instead of a willing buyer purchasing a benefit such as the NHS funding health savings, ULEZ and CAZs operate by penalising harmful behaviour to generate revenue.
This makes them powerful tools for driving rapid change but also distinct from market-based approaches where air quality outcomes are traded or contracted as services.

Case studies: Bradford's Clean Air Zone and London's Ultra Low Emission Zone

In 2022, Bradford introduced a 22.4 sq km Clean Air Zone targeting high-polluting vehicles like buses and coaches. Within the first year, the scheme helped reduce nitrogen dioxide levels (NO_2) significantly and is estimated to have saved the National Health Service (NHS) about £30,700 a month due to drops in GP visits. As of September 2025, charges to non-compliant vehicles are £7 to £50 per day. By 2023, Bradford Metropolitan District Council had collected more than £10.8 million in daily charges and fines from the CAZ.
London's Ultra Low Emission Zone, introduced in 2019 and expanded across all boroughs by 2023, levies a daily charge on older, higher emitting vehicles. The London-wide zone measures 1,500 km^2 and covers nine million people. This regulatory measure has been highly effective: NO_2 concentrations have dropped by 27% citywide, with $PM_{2.5}$ emissions reduced by 31% in outer London.

Reduced noise: monetisation

Traffic, industrial activity, and construction associate with carbon-intensive infrastructure often create noise pollution. Decarbonisation projects such as promoting electric vehicles or retrofit can yield the outcome of reduced noise levels in communities. Noise reduction improves quality of life, reduces health risks and can even enhance property values.
Below is an overview of the feasibility of monetising clean air benefits.

Market demand: The demand for quiet environments is evident in how people value their homes and in complaints about noise, but direct market players are few. Typically, no one buys "reduced noise". Instead, noise mitigation is usually a regulatory compliance issue or community expectation. However, certain stakeholders do effectively pay for noise reduction. Such an example is demonstrated by the real estate market; quieter locations command higher property prices. An US study showed that noise mitigation raised property prices by 10% to12%.

Measurability: Noise is quantified in decibels (dB) and changes in noise levels due to an intervention can be measured with reasonable precision. The UK's appraisal guidance includes monetary value for noise changes. For instance, Defra provides an economic valuation of noise.

Market mechanism: No open exchange or credit system exist for noise, so monetisation is on a case-by-case basis through regulatory compliance or innovative contracting. Councils might focus on leveraging reduced noise in funding bids instead.

Cause and effect: Noise attribution is more straightforward since it is specific to sources. To isolate an intervention's effect, careful monitoring and baseline data can help. This high attributability leads to easy verification of an intervention's performance that aims to reduce noise.

Regulation: The UK has a Noise Policy Statement for England but unlike air pollutants, there are no legally binding local limit values that needs to be met. This means there is some pressure to reduce noise but does not provide a direct pay-for-performance scheme.

Summary: While there is no direct market for buying noise reduction outcomes, monetisation occurs via compliance and internalisation of noise costs by those responsible for noise (e.g., developers, transport operators).

Reduced noise: case study

Heathrow Airport's "Quieter Neighbourhood Support" is a package of noise insulation and home relocation support, aiming to improve the wellbeing of residents affected the most by the airport's noise.
The airport funds the full cost of sound insulation measures for eligible households, covering the supply and installation of replacement windows, secondary glazing and doors, new ventilation, loft insulation and ceiling upgrades.
Moreover, the scheme also offer financial support to homeowner living in the noisiest areas around Heathrow if they decided to move. As compensation, the airport pays out a lump sum of £10,000, plus 1% of the sale price of the property up to a maximum of £20,000.

Key case study statistics

~20,000 household targeted

£10,000 compensation paid to an eligible resident

100% of sounds insulation measures refunded

975 homes offered funding in 2024

Lessons for local authorities

The Heathrow case demonstrates how reduced noise can be explicitly valued and funded when attribution, measurement, and a clear payer are in place.
Local authorities could apply similar principles, for example by designing grant schemes that channel developer or transport operator contributions towards low-carbon interventions that lower noise levels as an outcome.
The key lesson is that noise impacts can be quantified, assigned a financial value and addressed through direct payments or in-kind support. By establishing a mechanism that links the generator of the noise to the costs of mitigation, councils can not only protect community wellbeing but also create replicable models of monetising reduced noise as an outcome.

Improved traffic safety: monetisation

Many decarbonisation measures, especially in transport, carry the outcome of improved traffic safety. For example, creating pedestrian zones, bicycle lanes, or reducing car usage also tends to reduce traffic accidents and injuries.
Below is an overview of the feasibility of monetising benefits of improved traffic safety.

Market demand: Technically, everyone demands road safety. However, improved traffic safety is largely a public good with no private market. There are some exceptions: for instance, insurers benefit financially from fewer accidents in theory since the payouts decrease. There have been discussions about whether insurers might invest in road safety measures. To date, this is limited as insurers tend to focus on pricing risk rather than paying to reduce third-party accidents. But some insurers sponsor driver safety campaigns, which can be seen a form of investing in traffic safety.

Measurability: Traffic safety improvements are measured by reductions in collisions and casualties. The UK has excellent data on road accidents, and the Transport Analysis Guidance (TAG) makes valuating safety into a well-established practice.

Market mechanism: There is no commodity market for improved traffic safety. However, potential mechanism for monetisation could include: government grants, insurance rebates, social impact bonds, legal/fiscal mechanisms (such as levies on heavy vehicles).

Cause and effect: Linking an intervention to safety outcomes can be straightforward for targeted ones but can be difficult for broader ones. For example, creating a pedestrianised town centre to save emissions have an obvious effect on vehicle-pedestrian collisions in that zone.

Regulation: The UK has a longstanding commitment to road safety. There is an entire frame of traffic laws such as speed limits or vehicle safety standards that aim to reduce accidents. While these do not create markets, they do create accountability.

Summary: Improved traffic safety is an outcome that local authority can quantify straightforwardly, strengthening the case for decarbonisation measures. While not traded in a market, there is opportunity to monetise it with innovative models.

Improved traffic safety: monetisation

The city of LeClaire, Iowa, in the United States implemented a "Complete Streets" project that redesigned local roads with features such as bicycle lanes and enhanced pedestrian walkways.
These interventions were estimated to reduce traffic accidents by around 40%, representing a significant improvement in public safety. A benefit-cost-analysis translated this into $5.1 million in undiscounted savings from avoided collisions and injuries, or $1.4 million in present value terms at a 7% discount rate.
This approach demonstrates how a local authority can monetise the outcome of improved traffic safety: by quantifying reductions in crashes, the city was able to justify upfront investment in safer road infrastructure.

Key case study statistics

40% reduction in traffic accidents

$5.1 million in savings from avoided accidents

$203 million total generated project benefits

2.14 Benefit-Cost-Ratio

Lessons for local authorities

The LeClaire case illustrates that traffic safety improvements can be treated as an investable outcome when their economic value is made explicit. For local authorities, one insight of monetising this outcome lies in demonstrating how decarbonisation projects such as active travel schemes, low-traffic neighbourhoods or street resigns directly reduce accidents. By quantifying avoided health care costs, reduced insurance claims and increased productivity, council can present safety not just as a social benefit but as a financial return. This framing creates opportunity to secure funding from NHS, transport authorities, and even private insurers or employers who all gain from fewer road incidents. Embedding safety benefits into cost-benefit-analyses strengthens the investment case for decarbonisation measures.

Improved physical health: monetisation

Decarbonisation projects often lead to improved physical health in communities. This category of outcome is broad and overlaps with others, but key aspects include: increased physical activity from active travel projects, better respiratory and cardiovascular health from lower pollution, improved thermal comfort leading to fewer cold-related or heat-related illnesses, and general well-being increase from greener, quieter surroundings.
Below is an overview of the feasibility of monetising benefits of improved physical health.

Market demand: Health is one area where monetisation conversations are quite advanced, because healthcare costs are monetised by nature – if a projects yields healthier people, the NHS saves money. There is therefore a notional buyer: the health system. Another potential buyer are employers – a healthier population means increased productivity and lower sick leave costs. Thus, large employers have an interest in schemes that can get people to be physically active. For instance, some employers sponsor cycle-to-work schemes or gym memberships.

Measurability: Measuring health outcomes from projects can be complex because health is influenced by many factors and often changes slowly. Linking measures to health outcomes often requires models but these are fairly established, e.g. Quality-Adjusted Life Years.

Market mechanism: Mechanisms to monetise health outcomes are emerging, such as outcome-based contracts with the NHS. An example of such is the Warmth on Prescription model that allows NHS professionals to refer a patient to energy advisers.

Cause and effect: Attributing health improvements to a specific intervention is difficult, but possible. One example is the Walking and Cycling Index which showed how increase in walking and cycling led to prevention of serious long-term health conditions and created millions in economic benefit.

Regulation: No specific regulation encourages money to be exchanged for the improved physical health outcome yet, but current policy strongly support health as an outcome. This suggests that institutional norms are aligning to support monetising health outcomes.

Summary: Improved physical health is a far-reaching outcome and is one of the most consequential outcomes in economic terms. Consequently, among outcomes, health is a front-runner for innovative monetisation approaches.

Improved physical health: case study

Gentoo Social Housing and Sustainability Group's "Boiler on Prescription" pilot in Sunderland is a strong illustration of how improved physical health can be directly monetised.
Funded through an NHS innovation grant, the scheme allowed doctors to "prescribe" new boilers and heating upgrades to patients with chronic obstructive pulmonary disease living in cold, damp homes. Following installation, GP and outpatient visits were reduced significantly, and trial participants reported improvements of their health and wellbeing.

Key case study statistics

60% reduction in GP appointments

30% decrease of A&E attendances

2% self-reported increase in happiness

£50,000 funding provided by NHS to fund trial

Lessons for local authorities

This case shows that health-related outcomes can be monetised by framing interventions as preventive healthcare. By partnering with NHS bodies, councils can position decarbonisation measures such as retrofit as interventions that reduce hospital admissions and ease pressure on healthcare budgets. Key enables are robust data to evidence outcomes, strong attribution to targeted interventions, and clear cost-benefits analysis that highlights savings to the health sector or major private employers.
Councils could adapt this model by using public health funding streams or outcome-based commissioning frameworks to secure direct investment. In doing so, decarbonisation can be aligned with healthcare priorities, turning health outcomes into tangible financial flows that support ongoing decarbonisation.

Improved aesthetics & comfort: monetisation

Decarbonisation measures can enhance the aesthetic appeal and comfort of local environments and buildings. Examples include adding green spaces and trees as part of climate adaption or carbon sequestration efforts. There is a somewhat intangible but important outcome in making places more pleasant and comfortable for residents. This can translate into well-being improvements and even economic uplift through higher property values or tourism.
Below is an overview of the feasibility of monetising benefits of improved aesthetics and comfort.

Market demand: Demand for aesthetics or comfort is substantial in society – people will pay more for homes and spaces that provide these benefits. For instance, the Office for National Statistics published evidence in 2021 that homes within close proximity to green space are on average £2,500 higher in value than comparable homes without access to green spaces. Higher comfort, such as increased energy efficiency, raises the property price by 6.9% on average per 100 kWh/m2a improvement. The challenge, however, is converting that into a financing mechanism for projects.

Measurability: Aesthetics and comfort are somewhat subjective and harder to quantify than pollutants or collisions. Nevertheless, there are some frequently used proxies, such as surveys and wellbeing metrics. Overall, the measurement of this outcome may be partly qualitative.

Market mechanism: There is no trade for aesthetics and comfort improvements. But if a project will make an area nicer, those who stand to gain can sometimes be convinced to contribute financially; for example, residents might crowdfund to add trees to their street.

Cause and effect: If a project physically changes the environment, attributing aesthetic improvements to it is usually direct. The challenge is attributing subsequent outcomes like improved community wellbeing to that aesthetic change specifically. Careful study design or comparisons may help.

Regulation: The UK planning system does consider design and appearance but there is not much direct regulation for aesthetics outsides of planning policies. In summary, regulatory influence is limited for the improved aesthetics and comfort outcome.

Summary: Monetising this outcome often relies on capturing value indirectly through e.g. higher land values, tourism or by persuading stakeholders such as residents to invest in improved aesthetics and comfort.

Improved aesthetics & comfort: case study

The Cheonggyecheon Stream Restoration is an example of monetising urban aesthetics as an outcome. The city of Seoul in South Korea invested around 386 billion won (~ £220 million) to uncover and restore a central stream into a public park. The results were transformative: nearby office rents rose by 13%, while land prices in surrounding districts increased by 35% to 80%. The stream attracts on average 64,000 visitors daily, of which 1,400 are estimated to be foreign tourists who contribute up to 2.1 billion won (~ £1.1 million) in visitor spending to the Seoul economy. This surge in land and rental values, alongside increased tourism, demonstrates how an urban beautification project can deliver direct financial returns to private landowners and the city through increased tax revenues and economic activity.

Key case study statistics

13% increase in nearby office rents

35-80% increase in surrounding land prices

64,000 daily visitors attracted on average

2x business growth compared to other Seoul areas

Lessons for local authorities

The Cheonggyecheon Stream case shows that investments in such projects can yield measurable and substantial economic returns by enhancing aesthetics and comfort. For UK local authorities, the lesson lies in recognising that such outcomes can be captured indirectly through higher business rates, council tax and development contributions when property values rise. By leveraging these uplifts, councils can monetise aesthetic outcomes in ways that partly or fully offset public investment costs.This case study illustrates that when interventions are ambitious and visible, they not only improve liveability but also generate financial flows that can sustain further urban improvements.

Natural heating / cooling: monetisation

Certain decarbonisation strategies leverage or enhance natural heating and cooling of environments. For instance, urban tree planning can lead to shades and cooling. These measures can reduce energy demand through less need for air conditioning or heating and increase comfort during extreme weather.

Below is an overview of the feasibility of monetising natural heating or cooling benefits.

Market demand: Market demand for natural heating / cooling arises primarily where there are clear cost savings or risk reductions. Building owners and occupants capture direct benefits through reduced energy bills. Utilities and grid operators may also value demand reduction at scale, though such mechanisms remain largely conceptual in the UK. Wider resilience benefits, such as reducing heatwave-related health risks, create potential demand from public health bodies and insurers, while developers and landlords can monetise improved comfort through higher rents or property values.

Measurability: Measurability is fairly strong for direct impacts such as energy savings and lower temperature but moderate for indirect outcomes such as health or productivity. Some councils are already utilising these benefits as part of their green infrastructure valuation.

Market mechanism: Integration into energy markets and public-private-partnerships may be the key. For instance, when measures lead to energy savings, it can potentially piggyback on energy efficiency finance mechanisms, such as ESCO contracts.

Cause and effect: Multiple factors can contribute to cooling. For example, if the summer is cooler one year, one might wrongly attribute reduced heat stress to new trees when it was the weather. Thus, evaluation over several years or using modelling to isolate the effect are needed.

Regulation: Regulations in England requires builders to include cooling measures to prevent overheating. This essentially mandates this outcome as a requirement. While not monetising it directly, it encourages investment in the outcome by developers.

Summary: This outcome primarily manifests as cost savings and thus, can be monetised by identifying who saves the money. Although not expressed through format markets, willingness-to-pay for passive temperature regulation is growing.

Natural heating / cooling: case study

Unicorn Grocery, a worker-owned cooperative in Manchester, installed a green roof at a cost of £41,000. Beyond its environmental benefits, the roof delivers clear monetised outcomes. The cooperative achieved energy savings of around 13,700 kWh annually, equating to approximately £1,070 per year off heating and cooling bills. In addition, the green roof enhanced the property's aesthetic and amenity value, with the asset value estimated to rise by about 2.9%. By directly reducing operational costs and indirectly increasing the building's market value, the cooperative effectively "paid itself back", translating natural heating / cooling into measurable financial gains.

Key case study statistics

£41,000 installation cost for the green roof

13,700 kWh saved annually

£1,070 per year saved in heating / cooling bills

2.9% increase in building market value

Lessons for local authorities

This case suggests several pathways to monetisation. Energy savings from natural heating / cooling measures such as green roofs can be directly quantified and used to attract funding from utility companies, health bodies or government programmes seeking to, for example, reduce peak demand. At the same time, property value uplifts can be captured indirectly through higher council tax receipts, business rates, or development levies. By creating frameworks that recognise and reward these outcomes, councils can encourage private investment while also securing a return on public expenditure. The broader lesson is that natural heating and cooling can be treated not only as an environmental good but also as a service with measure economic value that can support funding for decarbonisation projects.

Natural water regulation: monetisation

Natural water regulation includes things like improved water quality and natural flood management resulting from decarbonisation or nature-based projects.
Peatland restoration, tree planting and wetland creation for example can improve groundwater recharge and filter pollutants, protecting communities from floods and reducing water treatment needs. Below is an overview of the feasibility of monetising natural water regulation benefits.

Market demand: Market demand for this outcome is driven by clear regulatory requirements and significant cost savings. UK water companies have led the way through catchment management schemes such as United Utilities' SCaMP and South West Water's Upstream Thinking, where farmers are paid to improve water quality. Public agencies increasingly fund natural flood management to reduce downstream flood risk, with insurers showing early interest where it lowers potential claims. Developers are also obliged to purchase nutrient offset credits in sensitive catchments, creating a market.

Measurability: Flood and water quality science is advanced, but natural variance exists. However, regulators accept modelled estimates when approving offset credits. Thus, as long as one follows accepted methodologies, outcomes can be quantified sufficiently for monetisation.

Market mechanism: Market mechanisms for water outcomes are among the most developed in the UK's environmental services. Real transactions, established programmes (such as SCaMP) and evolving markets for nutrient and biodiversity can already be observed.

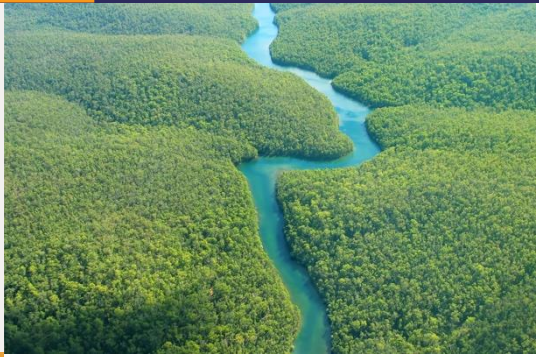
Cause and effect: Attribution is possible but often reliant on models and probabilistic thinking. To increase confidence, robust pilot studies and long-term data help. When monetising in formal markets, often a regulator or verifier will ensure accepted methodologies for attribution are followed.

Regulation: Regulations in the water sector and environmental protection strongly underpins monetisation. It either mandates outcomes that require funding, thus creating demand, or explicitly encourages using market mechanisms to achieve such goals.

Summary: Natural water regulation outcomes are among the most tangible and monetisable environmental outcomes for local authorities. Clear demand, measurable and attributable outcomes and supportive regulation are largely in place.

Natural water regulation: case study

"Connecting the Culm" project in partnership with Devon County Council illustrates how natural water regulation outcomes can be monetised. The project secured funding from Network Rail by demonstrating the potential economic advantages it offers. Specifically, the implementation of nature-based solutions within the area could reduce the frequency and duration of flooding-related closures on the Great Western Railway line. This was estimated to generate an average annual benefit of £96,000 through savings in delay-related costs and compensation payments.



Key case study statistics

£96,000 in annual benefits for Network Rail

13x Great Western Railway flooded since 2008

30,000 residents in the catchment area

480 trees planted during 3 years of the project

Lessons for local authorities

The "Connecting the Culm" initiative shows that councils can unlock new funding by framing natural flood management as a cost-effective alternative to cost or compensation payments. Key lessons include the importance of using robust modelling to evidence avoided costs, and leveraging public-private-partnerships. Councils elsewhere can adopt similar approaches by identifying catchments where natural interventions reduce public or private expenditure on flood defences. By quantifying these benefits and demonstrating attribution, local authorities can create mechanisms for utility companies such as water companies, insurers, Network Rail, or developers to contribute financially to projects that deliver water regulation as an outcome, transforming environmental interventions to investable propositions.

Monetisation feasibility

Below is a comparative overview of the discussed outcomes, indicating in qualitative terms the relative strength or feasibility of each factor for monetisation in the current UK context:

Summarisation of monetisation feasibility

Outcome	Market Demand	Measurability	Attribution	Market mechanisms	Regulatory support
Improved air quality	Strong societal value but few direct buyer	Robust metrics and government "damage cost" values	Attribution possible but influenced by external factors	Innovative models and pilots, but also established models such as CAZ	Binding air quality targets but no private sector mandate
Reduced noise	Valued by residents but rarely transacted	Easily measured in dB, with monetary values per dB given	Source-specific, attribution mostly straightforward	No established market, but private companies have established programmes	Planning and nuisance law require mitigation but no specific limits
Improved traffic safety	High public demand but mainly funded by government	Casualties tracked and prevention values well established	Clear for targeted schemes, difficult for county- / city-wide	Monetised in appraisals but limited private market	Statutory duties but no private sector mandate
Improved physical health	NHS and private entities willing to pay	Health outcomes measurable through models and cost savings	Attribution achievable for targeted schemes	Innovative models emerging but not yet common	Health prioritised in policies but no private sector mandate
Improved aesthetics & comfort	People pay more for nice areas (property values)	Subjective but measurable via surveys and proxies	Aesthetic changes visible but attribution of further improvements challenging	Indirect via land value capture or crowdfunding	Limited regulations and no direct funding mandates
Natural heating / cooling	Demand from building owners, utility companies and NHS emerging	Energy savings and temperature regulation quantifiable	Clear at building level, needs to be modelled at city-scale	Could be integrated into energy efficiency finance but niche	Building regulations encourage inclusion but only limited to new builds
Natural water regulation	Active demand from water companies, developers, public bodies, insurers	Water quality and flow measurable with accepted methods	Attribution requires modelling but accepted methodologies exist	Established programmes, nutrient credits trading and habitat banks	Regulatory framework drives investment

Strong feasibility | Moderate feasibility | Some feasibility

Who should pay for non-monetisable outcomes?

Not all outcomes of decarbonisation projects can be readily monetised, and some may never be. This does not make such projects less valuable; cleaner air, safer streets, or improved wellbeing remain important public goals. The challenge lies in identifying who should pay for these outcomes when there is no obvious market mechanism.

As previously discussed, logic suggests that those who benefit most should contribute to the cost. Yet this is not always straightforward: Benefits are often spread across multiple groups and individuals. Equally, those that benefit may also not have the means to contribute (for example, low-income households), but that doesn't mean they are less worthy of the health and wellbeing benefits that can be accrued from some projects.

Where direct payment from beneficiaries is not feasible, alternative approaches are needed. One suggestion is to spread the cost through general taxation, reflecting the idea that society as a whole benefits from healthier, more resilient communities. Another is to rely on regulation: stricter standards on air quality or building performance, for example, can shift costs onto those responsible for generating negative impacts, such as polluters or developers, rather than the communities affected.

In practice, funding for non-monetisable outcomes often comes from a combination of these approaches, blending public finance, regulation, and shared responsibility. This ensures that valuable but hard-to-price outcomes are not overlooked but supported as integral to achieving wider climate and social objectives.

Case study: monetisation through regulation

London's Ultra Low Emission Zone charges polluting vehicles for entering designated zones, directly funding air quality improvements. While residents on low incomes benefit from cleaner air but cannot afford to pay, the regulation ensures that costs are borne by polluters instead.

This illustrates how regulation can shift responsibility from vulnerable beneficiaries to those creating the negative externality.

About the authors

BwB is a not-for-profit investment banking, asset management and advisory firm focused on delivering value to clients while benefiting the environment and society. It serves the financial needs of governments, institutional clients, corporates, high net worth individuals, cities and foundations worldwide. It is focused on enabling the public sector to leverage private capital necessary for decarbonisation at scale. It applies creativity and innovation to achieve result to meet the most pressing social and environmental challenges we face. It is experienced in supporting more than 100 cities and multiple local authorities.

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City Science was founded out of the need to support local authorities to decarbonise their regions, and works with UK local authorities on a wide range of decarbonisation projects across energy, transport & carbon accounting. Having supported government departments and over 60 local authorities with net zero programmes at every stage of their development, it provides practical and expert advice on how to identify, develop, finance and deliver net zero programmes. Expertise covers internal public sector considerations such as business cases, finance and risk and commercial models. City Science has specific expertise in models for renewable energy, district heat, electric vehicle charging, retrofit, offsets/insets and carbon accounting for supply chains.

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About Net Zero Living

A new wave of place-based innovation is transforming UK towns, cities and communities, today. Innovate UK's £60 million Net Zero Living programme is helping local authorities and businesses work together to deliver new solutions that improve local services and open markets for economic growth.

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