



BRILLIANT BUILDINGS

DECARBONISATION

Destination zero

Willmott Dixon's holistic service is preparing customers for a zero-carbon future – and creating better workplaces in the process

1. INTRODUCTION

By bringing everything under one umbrella, Willmott Dixon's decarbonisation service helps customers to reduce their reliance on fossil fuels, lower their energy costs and meet their zero-carbon ambitions.

Many local authorities have declared a climate change emergency, and organisations across all sectors are developing ambitious action plans to reduce their carbon emissions to net zero. But the clock is ticking, as last year's COP26 climate change summit demonstrated.

The built environment contributes up to 25 percent of the UK's carbon footprint, making efficient management and decarbonisation of property portfolios essential in the transition to net zero by 2050. It is estimated that 80 percent of buildings in 2050 have already been built, so decarbonising existing assets needs to happen quickly. As the reports of the independent Climate Change Committee have made clear, this is about taking carbon out of the power supply and becoming more energy efficient.

This complex area requires specialist skill-sets, and Willmott Dixon is harnessing its experience and track record to help customers to navigate a whole-building approach covering fabric, heating and cooling systems in addition to renewable energy. This in turn will lead to higher asset values and lower energy costs at a time when, to take one example, it is estimated that bills across the NHS estate could pass £1 billion in 2022.

Richard Sterling, national head of land & development, Willmott Dixon

The UK's net zero obligations

- The Climate Change Act commits the UK to cut all greenhouse gas emissions to net zero by 2050.

- The UK has also vowed to achieve a 68 percent reduction in carbon emissions by 2030, compared to 1990 levels, under the Paris Agreement.

- In 2020, the Sixth Carbon Budget enshrined in law a target to cut emissions by 78 percent by 2035 compared to 1990.

- The 2021 Net Zero and Heat and Buildings Strategies include a commitment to reduce emissions from public sector buildings by 75 percent by 2037.



SOMERSET RETROFITS TO DECARBONISE

A scheme to upgrade a 1970s council headquarters in Somerset is one example of steps being taken to address energy inefficiency in ageing stock.

The work to decarbonise Block B for Somerset County Council in Taunton will complete in September. It is a key part of Somerset County Council's aim to be carbon neutral by 2030, following a similar upgrade to the council's 1930s-built Block A next door.

It will deliver energy savings of 532,000kWh per year, representing a reduction in regulated energy demand of approximately 25 percent, says Callum Barnes, Willmott Dixon's technical decarbonisation manager.

Taking the energy hierarchy into account, the 10-month project prioritises energy efficiency by combining fabric upgrades with new building services. Additionally, renewable generation will further reduce energy requirements and operational carbon emissions.

The building upgrade involves replacing metal-frame windows with thermally broken double-glazed units, and fixing insulated render to the existing concrete frame to replace concrete panels. The roof and parapet have been overlaid to improve thermal efficiency.

For the renewables, a photovoltaic (PV) array was installed on the roof while the heating was upgraded to use air-source heat pumps with mechanical ventilation and heat recovery.

"Using the Public Sector Decarbonisation Scheme [see page 10], the focus is on energy improvement, cutting carbon and running costs, while producing a great work environment for staff," says Barnes. "We've done this while the building remained open."

Left: Willmott Dixon has upgraded Block A at Somerset County Council's headquarters in Taunton. It is now undertaking a similar decarbonisation project at the neighbouring Block B

2. THE CHALLENGE

So, what is the best approach to decarbonise estates, and where is the funding to do so?

Willmott Dixon uses its knowledge and experience to unlock these challenges and help customers to navigate the options. Its end-to-end service ranges from early strategic advice to accelerate the process, to drawing up a holistic decarbonisation strategy, through to design, construction and post-occupancy monitoring – all based around preferred OJEU-compliant procurement frameworks.

The service is headed by Jo Mills, previously director of programmes at Salix Finance, a body funded by the Department for Business, Energy and Industrial Strategy to deliver grants under the Public Sector Decarbonisation Scheme.

“Our holistic service aims to meet the individual requirements of each customer,” says Mills. “We review the status of their estates to make best use of their assets, develop a plan with priorities for investment, design capital programmes, write business cases and identify funding models. Our post-completion monitoring service will gauge the use and impact of the new measures.”

Material improvements

Alasdair Donn, head of building performance, group sustainability at Willmott Dixon, leads the company’s Energy Synergy™ service. He stresses the importance of post-occupancy monitoring: “If we don’t make improvements that materially reduce carbon emissions, we haven’t met the customer’s needs. Our bespoke process to measure performance ‘in use’ is critical to this, a benchmark to evaluate success.

“Decarbonisation is not new,” he adds. “Every refurbishment we’ve done is a decarbonisation project, transforming the building from a less valuable asset to one that operates efficiently. We understand the complexities of the process and manage the risks.”

Richard Sterling, national head of land & development at Willmott Dixon, highlights the need for simplicity: “Offering a ‘one stop shop’ service means saving money for customers who normally have to pay out fees to a number of different consultants and their teams.”

Sterling says the industry should not be deterred by fears that decarbonisation is too expensive or complex. “It’s an opportunity to be creative about how estates can realise value. Some local authorities, for example, have been looking at creating their own solar farms, which moves their supply to renewable sources and gives them more control.”



“DECARBONISATION MEANS WE HELP ESTATE OWNERS CREATE THEIR OWN SOLAR FARMS, WHICH MOVES THEIR SUPPLY TO RENEWABLE SOURCES.”

RICHARD STERLING, NATIONAL HEAD OF LAND & DEVELOPMENT, WILLMOTT DIXON

Right: The refurbishment of the London Screen Academy, completed in 2019, included low-carbon technologies such as LED lighting in all areas, a solar PV array and passive heat recovery.



Five rules for cutting carbon

Know your estate. Know the age of the buildings, their energy use and where big carbon emissions are coming from, and your priorities. Establish from surveys the energy performance of each building to inform an action plan with clear outcomes.

Take a holistic approach. Look at the estate as a whole and think about how the process can be used to drive value – including generating electricity and working with partners on innovative funding models.

Develop an adaptable plan. It is best to develop a 5-10 year plan, to be reviewed in the light of emerging technologies and affordability. This means that, when funding is announced, you have a proposal ready.

Future-proof first. It may not be possible to put in place all decarbonisation measures in one go, but you can ensure that you don’t have to go back to the drawing board in 20-30 years. For example, upgrades to the building fabric involve considerable disruption but are a long-term investment that should only need to be undertaken once, whereas renewable generation is a measure that can be bolted on afterwards. Upgrades to building services, such as new boilers or more efficient plant, can sometimes be more straightforward than fabric changes.

Celebrate reductions in carbon emissions. A low-carbon community centre or leisure centre generates a lot of local positivity, and boosts the reputation of an organisation.

A journey to decarbonisation



3. TO BUILD OR RETROFIT? CARBON'S ROLE IN ASSET MANAGEMENT

Making decarbonisation stack up financially is a key part of any strategy. From ageing 1960s stock to 1980s energy guzzlers, it can be difficult to know where to start. It becomes even more complicated when embodied carbon is added into the equation.

In the case of real estate investment firm FORE Partnership, it decided to retrofit rather than replace an out-of-date 1990s office building next to Tower Bridge, preserving the embodied carbon in the frame (see page 8).

Embodied carbon refers to all of the greenhouse gas emissions associated with construction, including extracting, transporting, manufacturing and installing building materials on site, as well as the operational and end-of-life emissions associated with those materials. Calculating embodied carbon helps customers to weigh up whether it is more sustainable to retrofit a building or demolish and rebuild to zero-carbon standards.

"Retrofitting means less embodied carbon used in the process, but operational carbon emissions might be larger because it might not be as efficient as a new building," explains Alasdair Donn, head of building performance, group sustainability at Willmott Dixon. "And in the new-build case, it could be the converse — you might have a bigger chunk of carbon at the beginning, but less during its lifetime."

"We can give that kind of analysis to customers as part of an estate rationalisation."

Such assessments are becoming increasingly prominent in development decisions. The Greater London Authority, for example, requires whole-life carbon assessments for major planning applications. And in spring 2022, the issue made the front pages when the then secretary of state for the Department of Levelling Up, Housing and Communities, Michael Gove, called in plans to demolish Marks and Spencer's landmark art deco building on London's Oxford Street and replace it with a retail and office complex.

Willmott Dixon follows industry best practice in these calculations, such as guidance from LETI, a London-based network of built environment professionals focusing on the zero-carbon agenda. LETI has recently published a best practice guide, The Embodied Carbon Primer, which Donn helped to compile.

Right: Bristol's world-famous entertainment venue, the Bristol Beacon, will become the UK's first carbon-neutral concert hall when its refurbishment is completed.



Realising your ambitions

Understanding the different routes to decarbonisation is key to delivering the most suitable solution for any business. Below are three headline ambitions, which can help to define a company strategy and establish the optimal rate of transition.

Gold - net zero carbon. Taking all reasonable steps to reduce greenhouse gas emissions (expressed as kg/CO₂e) prior to any offsetting taking place.

Silver - carbon neutral. Building efficiency targets are lower as on-site reductions can be balanced with offsets.

Bronze. A 40 percent reduction in regulated greenhouse gas emissions.



Energy generation and funding

Alongside reducing the energy consumed, another way of decarbonising is to generate renewable energy on the building rather than buying it from the grid. As part of this, there are a number of innovative funding models that can offset capital costs, says Willmott Dixon's Alasdair Donn. "We have a set of not-for-profit community partners who will invest in renewable energy generation. So rather than the customer investing the capital cost, it would pay for that renewable energy as if it was buying it from the grid, if you like, but effectively at quite competitive costs. All operating and maintenance responsibilities and costs for the PV system would remain the responsibility of the community energy group."

Willmott Dixon is refurbishing the famous Bristol Beacon, which aims to be the UK's first carbon-neutral concert hall. The company is negotiating a community solar installation with Bristol Energy Cooperative (BEC), which is investing in the solar PV system. The customer will pay for the energy the PV generates, which will support the ambitions of the city council to make Bristol a greener place.

"Bristol is a very egalitarian place with a lot of interest in green issues," says Rosa Corbishley, development director at Bristol Beacon. "Bristol Energy Cooperative invests in making a positive change and I love the thought that people will walk past the Beacon and see us as a piece in that wonderful puzzle that's hoping to make a difference."

"I LOVE THE THOUGHT THAT PEOPLE WILL WALK PAST THE BEACON AND SEE US AS A PIECE IN THAT WONDERFUL PUZZLE THAT'S HOPING TO MAKE A DIFFERENCE."



ROSA CORBISHLEY,
DEVELOPMENT
DIRECTOR,
BRISTOL BEACON

4. ACTION NOW FOR A LOW-CARBON FUTURE

Oxford City Council wants to be a net-zero-carbon city by 2040 or earlier – 10 years ahead of the government’s national legal target. Even more ambitious is the council’s goal to reach zero-carbon across its own estate and operations by 2030.

With leisure facilities making up around 40 percent of the council’s building carbon emissions, Willmott Dixon was chosen in 2021 to decarbonise four of the city’s leisure centres. This will cut carbon emissions from the council’s operations by around a fifth.

The scheme involves replacing gas boilers with heat pumps that transfer heat from the air or water at the Ferry Leisure Centre, Leys Pool and Leisure Centre, Barton Leisure Centre and Hinksey Outdoor Pool. At the latter, heat extracted from a nearby lake will be used to heat the pool, resulting in an annual reduction in gas consumption of approximately 80 percent.

Helping with enquiries

Willmott Dixon is providing strategic advice to Gloucestershire Constabulary, which is reviewing its estate, looking at occupancy levels and floor space utilisation to reduce carbon emissions. Gloucestershire police force has pledged to be carbon neutral by 2035.



“WILLMOTT DIXON HAS THE SAME OPERATING ETHOS AS OURSELVES, SETTING HIGH STANDARDS”

VICKI HESELTON, HEAD OF ESTATES AND SUPPORT SERVICES, GLOUCESTERSHIRE CONSTABULARY

The estate comprises 27 buildings, which are a mixture of ages and functions, ranging from a listed police station to a brand new operations centre.

Vicki Heselton, head of estates and support services at Gloucestershire Constabulary, says the decarbonisation work is in the feasibility stage. “We’ve had a couple of briefings and workshops with Willmott Dixon and identified various desired outcomes we would like to achieve, starting with the Gold standard which may be challenging due to affordability, to setting a target to deliver a 40 percent reduction in carbon. We’re about to embark on a number of condition surveys, which will define the baseline of what we do next.”

The constabulary has applied to the Public Sector Low Carbon Skills Fund (see overleaf) to help with the feasibility study, she adds.

Willmott Dixon was appointed to do this work through a construction procurement framework. It is continuing a strong track record with the constabulary, having built its operational hub, currently nearing completion, and refurbished its Sabrina Centre, Learning Conference Facility, completed in 2020.

For Heselton, it is a natural step for Willmott Dixon to support this new phase in the estate’s development: “We really enjoy working

with them; they have the same operating ethos as ourselves, setting high standards.”

Tackling NHS carbon

Over 4 percent of England’s carbon emissions arise from the NHS, making healthcare a key focus for cutting carbon. Delivering a ‘Net Zero’ National Health Service, published by NHS England in October 2020, says there are significant opportunities for reductions in the secondary and primary care estates through energy use in buildings, waste and water, and new sources of heating and power generation.

Willmott Dixon is currently working with a number of NHS trusts to help take decarbonisation plans forward. The work is often carried out while the hospital is operational, which is a crucial factor in planning, according to Anastasia Chrysafi, Willmott Dixon’s national account manager for health. “Much of the current estate will need modifying to deliver these carbon savings; we have to show our talent for project-planning the work so they can continue treating patients.”

Willmott Dixon is working with Mace on the P23Procure framework, an alliance that brings together two of the UK’s largest privately owned contractors to collaborate on how best to serve NHS trusts.

London landmark’s retrofit to transform carbon profile and workplace experience

A high-profile building next to Tower Bridge in central London is to undergo a £50m upgrade to become one of the UK’s most sustainable and healthy offices.

Rather than demolish an existing 1990s-era office, real estate investment firm FORE Partnership chose Willmott Dixon to transform the current building (seen here left of Tower Bridge), preserving the embodied carbon in the frame.

The move reflects FORE’s commitment to retrofit first rather than rebuild. When complete in 2024, TBC.London, as it will be known, will be net zero carbon in operation, with no fossil fuels used in running the property.

It is targeting BREEAM Outstanding and WELL Platinum, the highest rating under the WELL Building Institute’s certification programme, a global rating system, which serves as a marker of healthy building design.



Jo Mills: expert knowledge on funding

Jo Mills moved to Willmott Dixon from Salix Finance, where she was director of programmes. This involved leading the delivery of the government’s multibillion-pound decarbonisation grants programmes, including the Public Sector Decarbonisation Scheme (PSDS) and the Public Sector Low Carbon Skills Fund (LCSF).

Phase 1 of the PSDS awarded capital grants with a total value of £1bn to a wide range of public sector organisations including local authorities, central government departments and government agencies, NHS trusts, universities, colleges, and schools.

Further funding was made available

through PSDS Phases 2 and 3 which were launched in 2021 and 2022, with values of £75m and £475m respectively.

Mills left Salix in February 2022 after completing the award of Phase 3 grants. Her previous roles include director of planning and new communities at South Cambridgeshire District Council, where she led the development of a Local Plan and secured planning consent for the new 10,000-home town of Northstowe and other major developments. Before joining South Cambridgeshire District Council, Mills was director of housing and care services for a housing association.



“WE HAVE TO SHOW OUR TALENT FOR PROJECT-PLANNING THE WORK SO THEY CAN CONTINUE TREATING PATIENTS.”

ANASTASIA CHRYSAFI, NATIONAL ACCOUNT MANAGER FOR HEALTH, WILLMOTT DIXON

“OUR HOLISTIC SERVICE AIMS TO MEET THE INDIVIDUAL REQUIREMENTS OF EACH CUSTOMER. WE REVIEW THE STATUS OF THEIR ESTATES TO MAKE BEST USE OF THEIR ASSETS.”

JO MILLS, HEAD OF DECARBONISATION, WILLMOTT DIXON

5. FUNDING NET ZERO

As the former head of programme delivery at Salix Finance, **Jo Mills** uses her expertise on decarbonisation funding to explain the different schemes available, and what makes a successful bid.

Many funding schemes are available, so depending on where an organisation is, Willmott Dixon can support their plans, work to design their capital programmes and investment in particular projects, and then deliver them.

Public Sector Decarbonisation Scheme
The PSDS provides grant support with the aim of reducing emissions from public sector buildings, through capital investment. Some £2.5bn has been committed to date through three phases, with Phase 4 reopening for further bids later in 2022 – with a committed value of £479m.

Phase 1 provided 100 percent grant funding, but the later phases required applicants to fund the like-for-like replacement costs of existing heating systems. Grant is then available on additional costs to achieve a decarbonised system. The focus of the grant has been around

heat decarbonisation in order to deliver greater carbon emission reductions. It has supported the public sector in taking a whole-building approach when decarbonising their estates. The PSDS has a requirement for three years of monitoring.

Public Sector Low Carbon Skills Fund
The Public Sector Low Carbon Skills Fund provides revenue grants for public sector bodies to put in place heat decarbonisation plans and engage the specialist skills they need. The application portal for Phase 3 opened in mid-June 2022.

Applications for previous rounds of funding have ranged from village primary schools to large hospital sites, and may involve devising a plan from scratch or enhancing an existing plan or programme of works. There is no cap on the amount of money that can be requested, but the

value for money of each application will be assessed. Bids must be completed and submitted by 31 March 2023.

Social Housing Decarbonisation Fund

The SHDF provides grants to social housing providers to improve the energy performance of social housing stock. To date, £179m has been awarded to cover 20,000 homes. A further £800m has been committed over the next three years, with bidding rounds later in 2022.

Green Heat Network

The £288m Green Heat Network Fund, launched in March 2022, supports low-carbon technologies, such as heat pumps, solar and geothermal energy as a central heating source. Schemes that deliver clean heating to homes, offices, commercial and public buildings can apply for grants over the next three years.



Delivery options

Decarbonisation is a journey, and our holistic approach provides a plan that we can deliver either wholly or through phasing. Below are some of the differing delivery mechanisms that Willmott Dixon has provided for its customers.

Option 1: Deliver it all

We will undertake everything proposed in the decarbonisation plan, illustrating the indicative programme and cost for these works.

Option 2: Prioritise where need is greatest

We will set out a phased approach, addressing the priorities with environmental benefits as the key factor. A risk assessment for each item outlines the benefits and risks of doing or not doing the works, alongside the costs.

Option 3: Focus on affordability

We will set out a phased approach addressing the priorities with cost as the key factor – starting with the most costly works and working downwards. A risk assessment for each item outlines the benefits and risks of doing or not doing the works, from the quick wins to the more expensive interventions.

Top tips for a winning bid

Get it in quickly

The schemes are over-subscribed. You will increase your chances of success if you get in early with a good quality bid that hits the criteria. It's better to concentrate on getting a good scheme ready and know what you're doing than trying to put in 10 in the hope that one of them will come off.

Have delivery plans in place

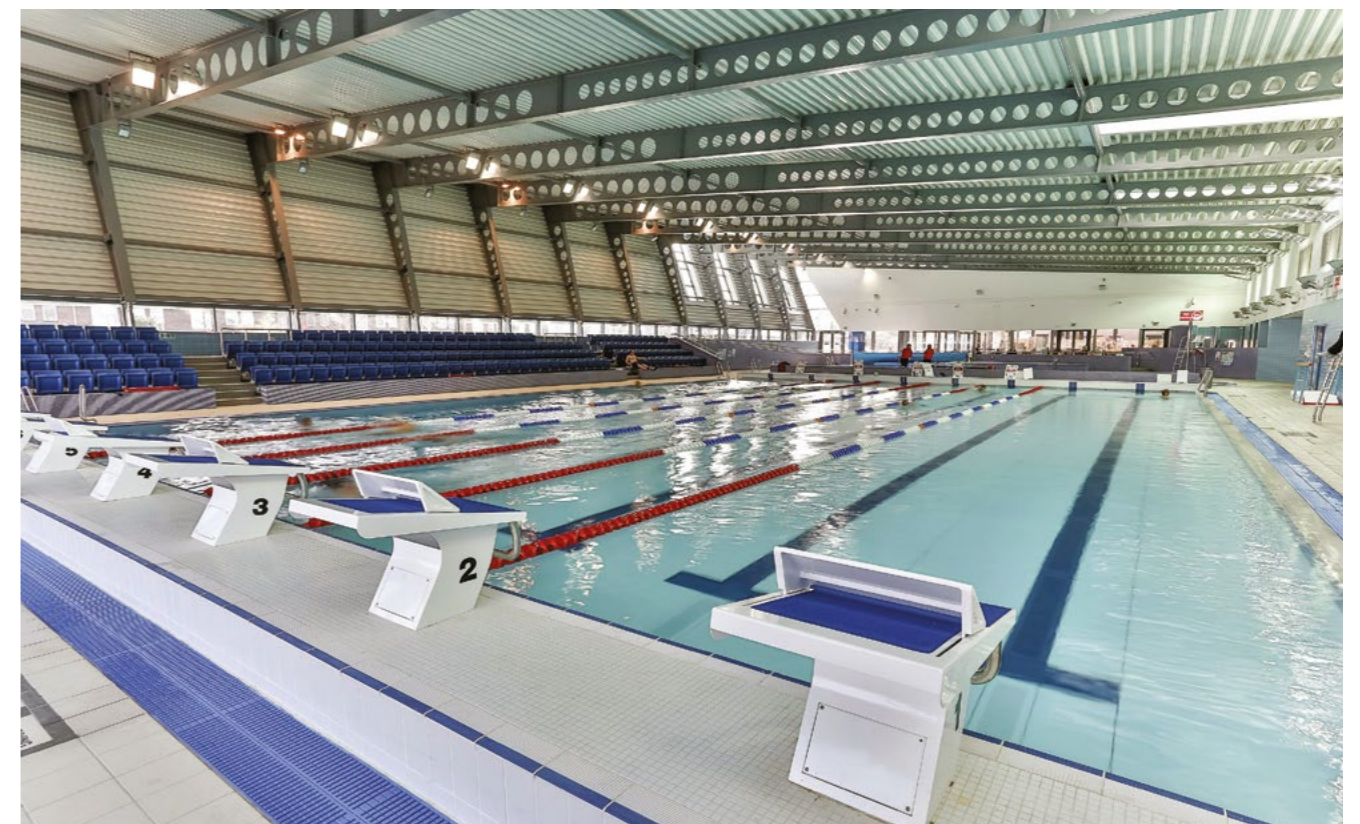
Another important tip is to make sure you're confident you can deliver the plan, because this will come under a lot of scrutiny when the application is assessed. Projects must be delivered within the funding window. If you have a partially completed project, you need to fund the rest yourself – which because of Covid happened quite a lot within the first two funding rounds.

Make sure the sums add up

It is essential to know exactly what your project is, because it will be assessed on whether the costings are robust and whether the cost is good value for money in terms of the carbon savings it will deliver. The assessors will need to be confident that you've got a supply chain in place too – from designers to construction teams. So having a single point of responsibility through Willmott Dixon helps with that.

Far right: Leys Pool and Leisure Centre in Oxford. Plans to decarbonise five leisure centres in the city will reduce emissions from council operations by about 20 percent.

Right: Following the building of five schools for Powys Council, our Energy Synergy™ post-occupancy process identified further areas of operational carbon savings.





WILLMOTT DIXON

SINCE 1852

**BRILLIANT
BUILDINGS**

Willmott Dixon is a privately-owned contracting and interior fit-out group. Founded in 1852, we are family-run and dedicated to leaving a positive legacy in our communities and environment. Being a large company means we can create a huge and lasting positive impact on our society. This is not only done through what we build and maintain; it's achieved through the fantastic efforts of our people who make a major contribution to enhancing their local communities.

www.willmottdixon.co.uk
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For advice on how to make your estate more efficient and reduce energy costs, contact:
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