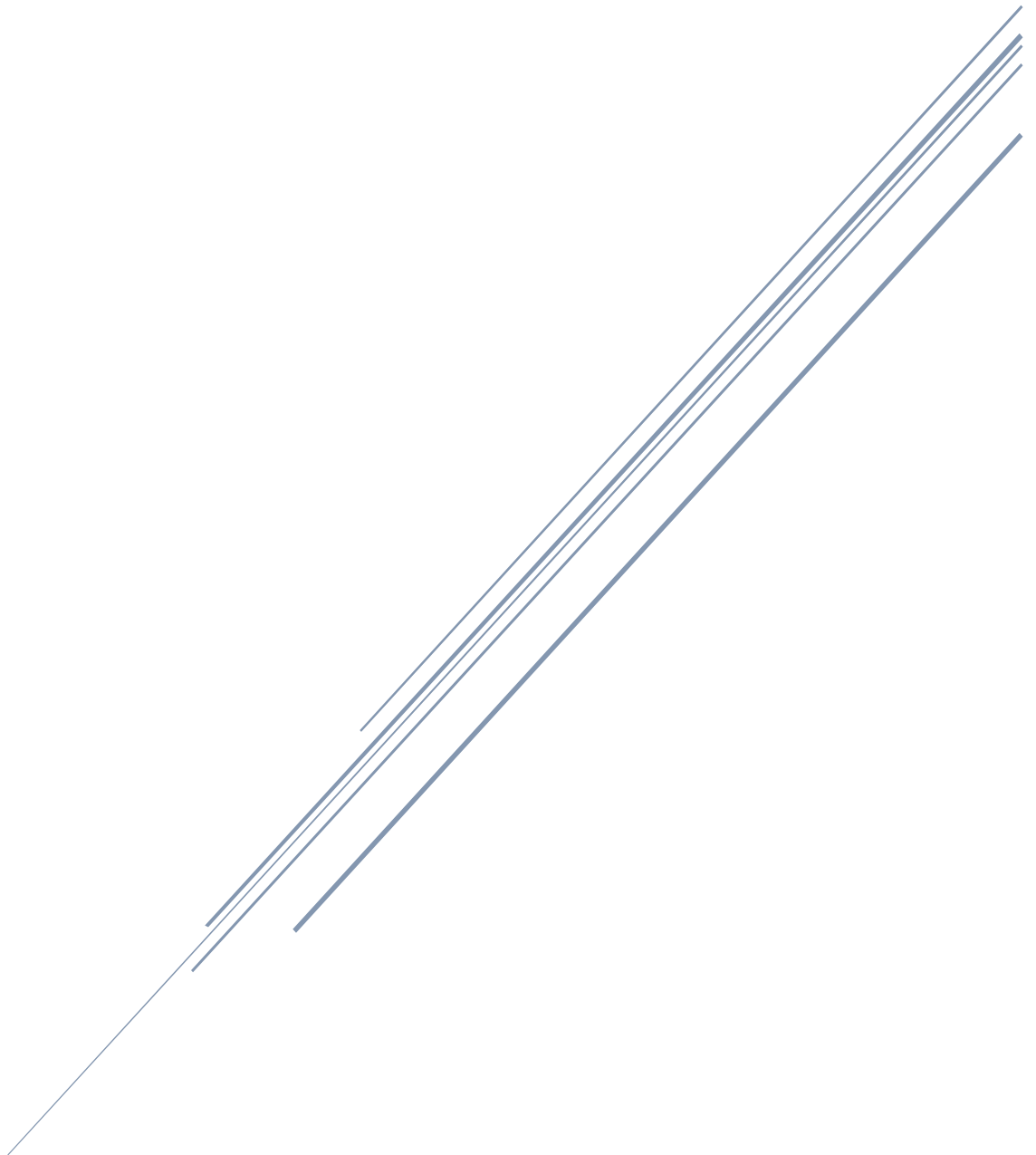


ROUTE TO NET ZERO ANNUAL REPORT

FEBRUARY 2023



Route to Zero Carbon Team
Place, Prosperity and Sustainability

Contents

| | |
|---|----|
| Executive Summary..... | 3 |
| Chapter 1 - Introduction | 6 |
| Birmingham Context | 6 |
| What is Net Zero and how does it support climate change?..... | 6 |
| Greenhouse Gas Emissions of the City of Birmingham..... | 7 |
| Progress on Birmingham’s Route to Net Zero | 8 |
| Chapter 2 - Project Updates by Theme | 11 |
| Buildings..... | 11 |
| Buildings: Summary | 11 |
| Buildings: Wave 1 Project Updates..... | 11 |
| Buildings: New Projects..... | 15 |
| Transport..... | 21 |
| Transport: Summary | 21 |
| Transport: Wave 1 Project Updates..... | 22 |
| Transport: New Projects | 26 |
| Energy | 28 |
| Energy: Summary | 28 |
| Energy: New Projects | 28 |
| Waste & Circular Economy | 31 |
| Waste & Circular Economy: Summary..... | 31 |
| Waste & Circular Economy: Wave 1 Project Updates | 31 |
| Waste & Circular Economy: New Projects | 32 |
| Nature and the Environment | 34 |
| Nature and the Environment: Summary..... | 34 |
| Nature and the Environment: Wave 1 Project Updates | 34 |
| Nature and the Environment: New Projects..... | 35 |
| Procurement | 39 |
| Procurement: Summary | 39 |
| Procurement: New Projects..... | 39 |
| Behaviour Change & Engagement | 41 |
| Behaviour Change & Engagement: Summary..... | 41 |
| Behaviour Change & Engagement: Wave 1 Project Updates | 41 |
| Behaviour Change & Engagement: New Projects..... | 42 |
| Communications | 47 |

| | |
|--|----|
| Communications: Summary..... | 47 |
| Communications: New Projects..... | 47 |
| Digital & Data | 51 |
| Digital & Data: Summary..... | 51 |
| Digital & Data: New Projects..... | 51 |
| Chapter 4 - Project Level Carbon Emissions Reductions..... | 55 |
| Chapter 4 - Next Steps | 56 |
| Appendix 1: Wave 1 Projects | 57 |
| Appendix 2: UK and International Climate Change Context..... | 59 |
| The UK Context | 59 |
| International Context..... | 60 |

Executive Summary

Birmingham responded to the increasing public concern and extensive scientific evidence on climate change by unanimously passing a climate emergency declaration at a meeting of the Full Council 11th June 2019 and made the commitment to take action to reduce the city's carbon emissions and limit the climate crisis. The ambition was set for the Council and city to become net zero carbon by 2030, or as soon as possible thereafter as a 'just transition' allows – ensuring we reduce inequalities in the city and bring our communities with us. This is the city's 'route to zero'. An action plan was published in 2020 and commitment made to report on the progress of the route to net zero programme on an annual basis. This report summarises progress made in 2022.

Buildings account for around two thirds of greenhouse gas emissions across the City of Birmingham, with the majority of emissions resulting from the burning of gas for space and water heating. The economic consequences of the pandemic, alongside the recent cost of living crisis means that it has also never been more important to support our citizens to live in more efficient homes that are cheaper to run. The World Health Organisation recognises fuel poverty as one of the most significant causes of poor health. Fuel Poverty is generally defined via the 10% rule, whereby a household needs to spend more than 10% of their income on heating their homes. 2020 estimates show that 21.8% of households in Birmingham are living in fuel poverty, compared to 13.2% for England¹. Birmingham City Council owns 60,000 properties. As the largest local authority housing stockholder in the country, we are harnessing our level of retrofit commitment to drive scaled delivery and supply chain capacity in partnership with Coventry and Wolverhampton Council's as part of the 3 Cities Retrofit. The Council's Cost of Living programme also includes a key workstream on energy efficiency. Alongside access to energy advice and support, we are working with communities and other partners to maximum access to grants to support energy and carbon emissions reductions in the domestic and non-domestic sectors and exploring funding and delivery approaches for large scale energy efficiency and renewable energy investment.

Data from 2020 shows that transport makes up just over a third of the City's carbon dioxide emissions at 34%. We cannot tackle the climate emergency without fundamental changes to the way people and goods move around our city. Companies in the West Midlands are helping to lead the way in global development of new types of vehicles, including self-driving and electric vehicles, offering significant improvements in efficiency and emission levels. But regardless of advancements in technology, private cars will never be able to match the capacity of mass public transport for getting people to where they want to go. The Birmingham Transport Plan, now adopted and in the delivery phase, outlines how the city's transport system needs to be transformed to meet the challenges of the next decade. Action on a robust set of measures to assist with modal shift – increasing the amount of sustainable transport we use – will be integral to our net zero journey.

Energy is a key theme in our route to net zero journey. The Council are currently working on developing a pathway for decarbonising and expanding the existing city centre district energy network. Working in partnership with other large network customers, the network's operator EQUANS and consultants Sustainable Energy Limited, a range of existing and new low carbon heat supply options have been identified. The capacity of the electricity network is a key concern particularly as buildings and transport decarbonisation accelerates and demand for electricity increases. We are reviewing opportunities for expanding renewable and low carbon energy sources in the city as well as demand management through heat and electricity storage and building working

¹ Department for Business, Energy & Industrial Strategy, Sub-regional fuel poverty data 2022

relations with utility providers and key local stakeholders such as Tyseley Energy Park to bring forward new infrastructure projects.

With a city net zero goal, reducing waste, reuse and recycling, and solutions to manage and reduce the impact of waste management processes across the city plays a critical role. A large proportion of an organisation's own operational carbon dioxide emissions impact is directly related to the materials and products it consumes and therefore resource efficiency and a circular economy has a key role to play in reducing city and organisational emissions. Planning policy is a significant lever for driving resource efficiency and the Council has existing policy within the local plan that requires sustainable construction practices to be adopted on all new developments. An existing circular economy project in Birmingham uses wood waste from urban parks and roadsides to capture carbon in a biochar suitable for reuse in tree planting. This project is run by Aston University in partnership with the Council. Alongside initial work on a net zero-aligned strategy for waste management in the city, the Council is exploring a wide range of opportunities including the reduction of operational emissions in the waste vehicle fleet and providing facilities to support reuse and repurposing of materials and products. New technologies to support the carbon emissions reduction of waste management process will also be further explored in 2023.

In tackling climate change, it is important to recognise the dual importance of climate change mitigation and adaptation and nature resilience. Adaptation and nature resilience are important for a number of reasons, including reducing the risk of flooding, moderating local temperature, reducing pollution and improving soil quality. From 2023, the Council's climate emergency response will bring together key teams working on both climate change mitigation and adaptation and nature resilience to jointly tackle the City's climate challenges.

A large proportion of the Council's own organisational impact is from the indirect emissions resulting from Council procurement – meaning procurement provides a key opportunity to reduce carbon emissions. To tackle this challenge, procurement has been created as a new defined theme in the Council programme of work. Over the last year, mechanisms have been incorporated into procurement arrangements to enable service areas to set out how contracts to be tendered will support carbon emissions reductions. The programme of work to reduce supply chain impact and support procurement partners will grow in 2023.

Birmingham's net zero ambition can only be realised through collective change by the council and by the city as a whole. Moreover, it is evident that much of this systemic change will need to come from behaviour change of our citizens, our staff, and our businesses. In addition to making net zero a priority at the strategic level, progress is being made to raise the awareness of climate change and the need to act among all our staff. Engagement activity includes staff carbon literacy training. By empowering council officers to put net zero at the forefront of their professional work, we also benefit from their roles as individuals and members of their communities. An exciting programme of engagement is being developed, recognising the need to work hand in hand with businesses and citizens. By engaging with a diverse range of voices we can ensure that Birmingham's progress towards net zero is just and equitable.

Over the last year, a new Strategy, Equality & Partnerships lead has been recruited, alongside a new team working on Partnerships Insight and Prevention. Good work is already underway internally, as well as in coordination with the City's universities. Communications on climate change and our route

to net zero journey are central to achieving our goals. Climate change communication is about simultaneously educating, inspiring and motivating residents to take their own actions to tackle climate change. Events that have taken place this year, including the Commonwealth Games, which had sustainability at its heart, and the PoliNations festival have helped to spread the messages of the climate change, nature and net zero programme.

Chapter 1 - Introduction

Birmingham Context

Birmingham responded to the increasing public concern and extensive scientific evidence on climate change by unanimously passing a climate emergency declaration at a meeting of the Full Council 11th June 2019 and made the commitment to take action to reduce the city's carbon emissions and limit the climate crisis. The ambition was set for the Council and city to become net zero carbon by 2030, or as soon as possible thereafter as a 'just transition' allows – ensuring we reduce inequalities in the city and bring our communities with us. This is the city's 'route to zero'.

On 25th June 2019 the Council's Cabinet agreed to add a new priority to the Council Plan which states that Birmingham will be "a city that takes a leading role in tackling climate change". This commitment will embed climate action in the Council's decision-making process to make sure that all service areas contribute to the Route to Net Zero journey. Following this, the councils corporate plan 2022-2026 was published, which replaces the replaces the Council Plan and sets a vision for 'A Bold Green Birmingham' which includes aims to improve street cleanliness, improve air quality, continue on the Route to Net Zero and be a City of Nature. Acknowledging the Council's role as a leader, major local employer and partner with the local community we wanted to ensure that we are doing all we could to change this path.

[What is Net Zero and how does it support climate change?](#)

Net Zero is about achieving a balance between the greenhouse gas emissions (particularly carbon dioxide) emitted into the Earth's atmosphere and those removed from it. It is about reduction down to the lowest possible levels, and then the active removal of the remaining greenhouse gas emissions from the atmosphere. Achieving Net Zero emissions is important as it's the point at which the greenhouse gas emissions impact of global warming is stopped to well below 2 degrees centigrade; the goal world leaders committed to in a legally binding treaty at United Nations Climate Change Conference in Paris in 2015 (the Paris Agreement).

Net Zero is about reducing and removing greenhouse gas (particularly carbon dioxide emissions, the most prevalent greenhouse gas) to mitigate against increasing climate risk. However, even with significant greenhouse gas emissions reduction, the climate is already changing, and we need to plan and prepare for the future climate in the projects and policies we create today, building resilience in the built and natural environment. The Climate Change Committee advocate that we plan for a 2 degree centigrade average annual temperature rise and assess for 4-degrees. Average global annual temperatures have already increased by 1.1 degrees centigrade since the Industrial Revolution and [a study by the UK Met Office](#) predicts that there is a near 50% chance one year in the next five may exceed an increase of 1.5 degrees centigrade.

Commissioned by the West Midlands Combined Authority, and working with the Environment Agency, Sustainability West Midlands have used current UK climate change trends to identify the main climate risks for the region, including Birmingham as a major urban conurbation. The report *Summary of Climate Change Impacts in the West Midlands Combined Authority area*, published in 2022, highlights several direct risks to Birmingham based on UK Climate Projections to 2100:

- Heatwaves could cause an increase in health-related fatalities due to extreme temperatures.
- Hotter, dryer summers could cause water shortages which would affect energy production, industrial activity, and public access to water.
- Wildfires in the area around Birmingham could become more common, particularly as there are a number of moorlands prone to wildfires.

- Flooding could become more common and would carry an additional pollution risk as there are several industrial sites in Birmingham where harmful industrial material and waste could mix with flood water.
- Average temperature increases pose threats to Birmingham’s local natural environment such as biodiversity loss, decreasing soil quality, and threats to freshwater species.
- Extreme weather events could cause cascading failure of infrastructure networks and supply chains.

The report also highlights several indirect risks, including:

- Coastal flooding causing a potential influx of residents moving to the region as well as disruption to estuaries and tributaries in the Midlands.
- There could be global food scarcity as crop yields fall internationally.
- There may be increased international violent conflict as a result resource scarcity.

The Climate Change Committee’s Independent Assessment of UK Climate Risk published in June 2021 highlighted the importance of plans to both achieve Net Zero and climate change resilience building. *‘Reducing climate impacts requires both emissions reduction and adaptation. The UK will face significant further changes in climate to 2050 and beyond, even if the world is on a Paris-aligned emissions trajectory. By 2050 the heatwave summer of 2018 will be a typical summer, summer rainfall could fall by as much as 24% and winter rainfall increase by as much as 16%, changes that will impact our well-being, the natural environment and the economy.’*

Recognising the dual importance of climate change mitigation and adaptation and nature resilience, the Council’s own climate emergency response will from 2023 bring together key teams working on these climate challenges and future Annual Reports will present progress across these key areas.

More detail on the UK and International context in which Birmingham is operating is available in Appendix 2.

[Greenhouse Gas Emissions of the City of Birmingham](#)

Each year, the Department for Business, Energy and Industrial Strategy (BEIS) publishes local authority and regional level greenhouse gas emissions statistics based on national data. These emissions statistics show annual reductions since 2005; the 2022 publication provides emissions reductions for 2020. This is the most up to date city-wide source of carbon dioxide emissions data.

The 2022 BEIS publication indicates that the City of Birmingham emitted a total estimated 3,714 kilotonnes of carbon dioxide in 2020. The publication also presents emissions by sector (domestic, transport etc) and fuel type including gas and electricity. The Birmingham sector breakdown for 2020 presented in Figure 1 shows that the City’s greatest sources of carbon dioxide emissions are domestic housing at 36% and transport at 34%.

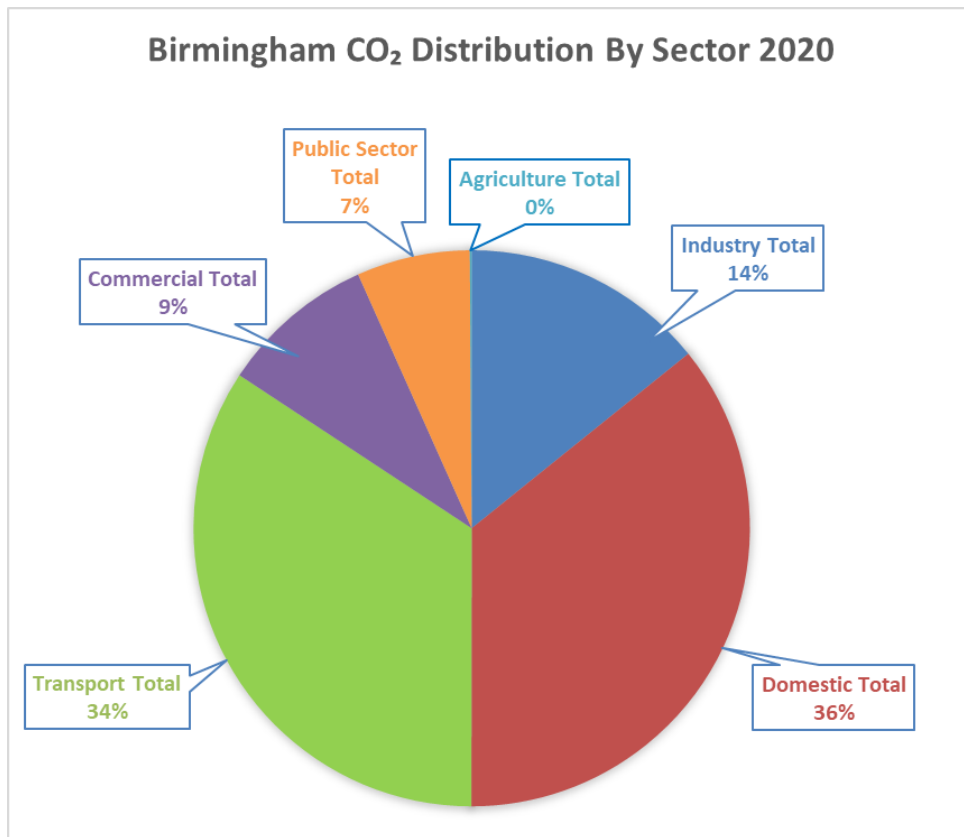


Figure 1 City of Birmingham carbon dioxide emissions by sector, 2020

Birmingham City Council as an organisation directly controls around 8% of City-wide greenhouse gas emissions. This distribution can be calculated by splitting emissions by scope and adding scope 1 and 2 together. The emissions scopes are defined as follows:

- Scope 1 (Direct emissions): All direct greenhouse gas emissions from the activities of BCC or under our control. For BCC, this primarily relates to natural gas for heating and fuel used by owned or controlled vehicles.
- Scope 2 (Indirect emissions): Greenhouse gas emissions from the use of grid-supplied electricity, heat, steam and/or cooling within the city boundary. For BCC, this relates to purchased electricity.
- Scope 3: All other greenhouse emissions that occur outside the Birmingham City boundary as a result of activities taking place within the boundary. For BCC, Scope 3 emissions include schools, housing, procurement activities and employee commuting.

Scope 3 emissions therefore make up the other 92% of City-wide greenhouse gas emissions. Although the direct emissions that the Council controls or has strong influence over is a relatively small proportion of the City of Birmingham emissions, it has an important role in stimulating and influencing action across the city.

[Progress on Birmingham's Route to Net Zero](#)

Since 2005, the BEIS statistics show that greenhouse gas emissions (specifically carbon dioxide) have reduced by 46.6% with year-on-year emissions reductions averaging 3% over this period. The carbon emissions reduction from 2019 to 2020 was 6.5%. Figure 2 below shows reductions from 2005 to 2020, based on the BEIS statistics.

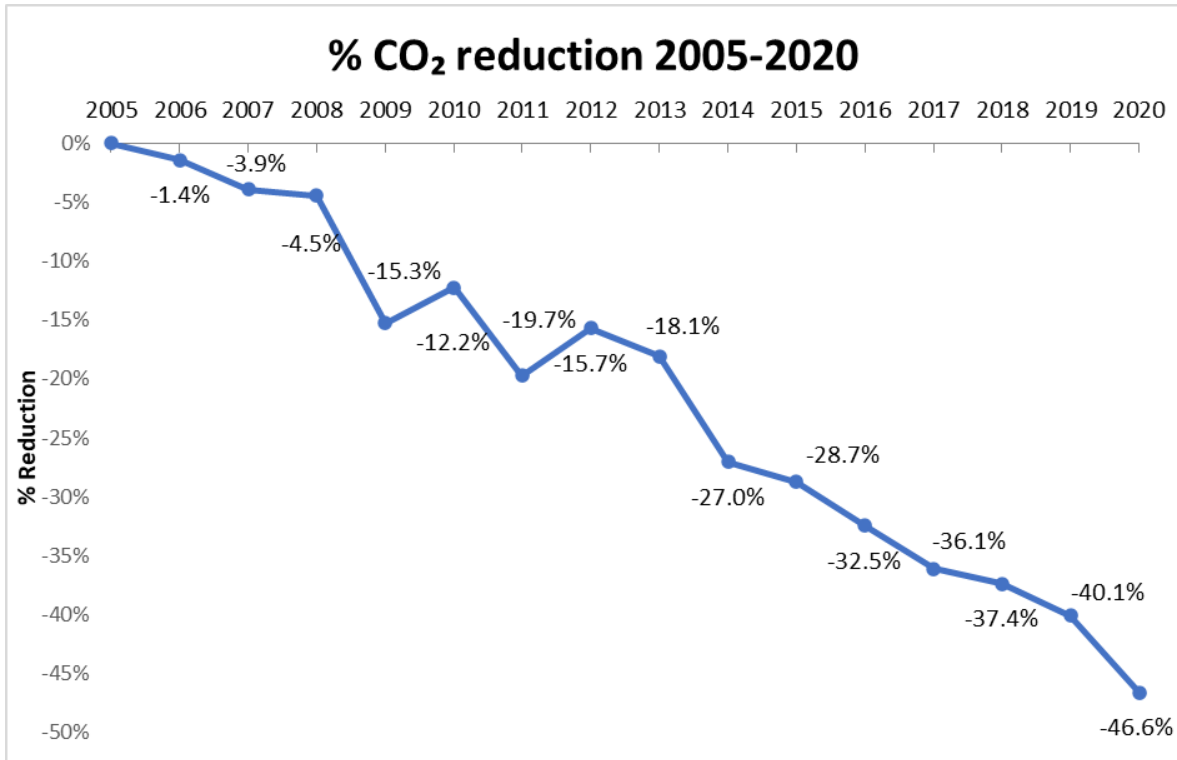


Figure 2 City of Birmingham carbon dioxide emissions reductions, 2005-2020

Figure 3 below shows the ‘actual’ year-on-year reduction between 2005 and 2020, followed by the projected average annual reduction required to achieve a 100% reduction by 2030 and 2050. Net Zero allows for carbon capture and storage of emissions that cannot be eliminated without significant technological or economic cost. There is no local level allowance for carbon capture and storage and therefore this is not included in this projection.

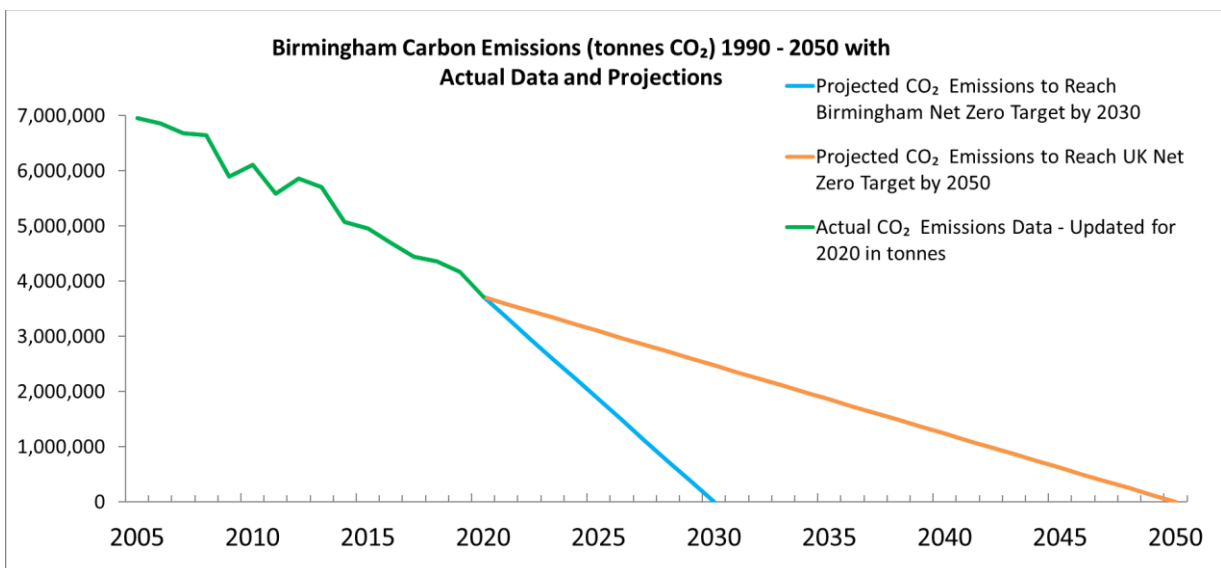


Figure 3 Carbon dioxide emissions reduction between 2005-2020 accompanied by a trend line illustrating the speed of reduction required to meet 100% carbon dioxide emissions reduction by 2030 (City ambition) and 2050 (UK target). Emissions shown in tonnes of carbon dioxide.

Whilst the decrease in emissions is encouraging, a far greater pace of reductions will be required to achieve the City's net zero ambition. Not accounting for any carbon capture and storage, an annual average annual carbon dioxide emissions reduction of 530 kilotonnes (530,000 tonnes) of CO₂ is required to meet our 2030 ambition. The reduction from 2019 to 2020 was 452 kilotonnes (452,000 tonnes) of CO₂, an acceleration from the previous year likely in part due to the coronavirus pandemic.

Scaling up delivery of carbon dioxide emissions at scale takes time and over 2022, the Council has been building its understanding and capability to deliver at an increased scale and pace in future years along with implementing projects that lead to real emission reductions. The creation of a dedicated team is proving to be a key enabler: the team is commissioning key technical pieces of work to inform viable and cost-effective decarbonisation of key assets such as the Birmingham District Energy Company, facilitating delivery of large scale energy efficiency programmes and securing funding to expand investment across the city, and ensuring policy is aligned with our Net Zero ambitions.

A breakdown of known project level carbon dioxide emissions reductions is presented in chapter 4, project level carbon emissions reductions. A key priority for 2023 is to improve visibility and reporting on project level carbon dioxide emissions at both an organisational and City level alongside a wider set of indicators of progress.

Chapter 2 - Project Updates by Theme

Buildings

[Buildings: Summary](#)

Buildings account for around two thirds of greenhouse gas emissions across the City of Birmingham, with the majority of emissions resulting from the burning of gas for space and water heating. Heat decarbonisation is a city priority, and the Council has been working over the past year with the Department for Business, Energy and Industrial Strategy to refine an approach to heat decarbonisation at an area and building sector level (see Energy theme – New Projects). The economic consequences of the pandemic, alongside the recent cost of living crisis means that it has also never been more important to support our citizens to live in more efficient homes that are cheaper to run.

Birmingham City Council owns 60,000 properties. As the largest local authority housing stockholder in the country, we are harnessing our level of commitment to drive scaled delivery and supply chain capacity in partnership with Coventry and Wolverhampton Council's as part of the 3 Cities Retrofit. This collaboration is developing an integrated programme reflecting the diversity of needs and housing portfolios of each city and includes major projects including a 300-home Whole House Retrofit programme in East Birmingham and a £24.8 million application to the Social Housing Decarbonisation Fund.

The cost of energy is a pressing concerns for households and businesses alike and the Council's Cost of Living programme includes a key workstream on energy efficiency. Alongside access to energy advice and support, we are working with communities and other partners to maximum access to grants to support energy and carbon emissions reductions in the domestic and non-domestic sectors and exploring funding and delivery approaches for large scale energy efficiency and renewable energy investment.

Alongside a range of existing building projects, the Council seeks to ensure that development is as energy efficiency and low carbon as possible, including working with major developers as part of the planning pre-application process to maximise the energy performance of new buildings, undertaking a major review of its planning policy alongside new home pilot projects.

Further details on individual Building themed projects and initiatives are presented below.

[Buildings: Wave 1 Project Updates](#)

Birmingham Development Plan Review

- Actions and achievements this year: The [Issue and Options consultation](#) – the first stage of public consultation on the new plan, took place between 24th October and 5th December 2022. The consultation gathered thoughts from a wide range of stakeholders on a number of issues and the options for addressing them. The Centre for Sustainable Energy also completed a critical friend review of the local plan, which identifies potential policy directions the new local plan could take around sustainability.
- Challenges/Barriers: Resources to progress the plan to timetable- recruitment to two posts within the team is now underway. Uncertainty over Government planning reform and associated impact on the plan format and timetable.
- Next steps: The next step will be to gather the evidence required to work towards a Preferred Options consultation in October 2023.

- If possible, any identified carbon emission savings: Cannot be attributed. Policy will enable emissions reductions but will not be adopted until 2026.

New Build – BMHT Energy Saving Technologies Pilot (Gressel Lane)

- Actions and achievements this year: Being completed by Birmingham Municipal Housing Trust. The Gressel Lane Scheme also known as the Home Energy Housing project is being part funded by European Regional Development Fund. (ERDF). The appointment and contract signing for Jessup the contractor who will undertake the building of the 36 Council houses has been appointed. 30 of these houses are part funded by ERDF. Work has started on the ground with drainage systems going in on the site and property foundations. It has been agreed that the system for the Ground Source Heat Pumps will be an Array System and the boreholes system has been started. Technical designs and discussion meetings about the renewable technology for the scheme is continuing, this includes the solar panels, car charging points, air source heat pumps and mechanical ventilation systems. Pre-planning conditions are being actioned and highways design work is continuing for the new roads that will be installed.
- Challenges/Barriers: Minor delays due to bad weather which may also continue during winter months. Some challenges with underground services which are being addressed with the statutory service provider.
- Next steps: The build programme is continuing, together with the discussions about the technology. All technologies to be confirmed and purchased. When the properties are at an appropriate construction stage the renewable technologies will be installed. The completion of 30 properties is scheduled for the end of June 23 and 6 further properties to be completed end of July 23. Once tenants have moved in some monitoring and evaluation will be undertaken regarding living with and using the new technologies and overall savings. Monitoring and evaluation of this project will help to inform future schemes.
- If possible, any identified carbon emission savings: To date, carbon savings for scheme have been calculated for a typical home (House type: 3 bed Harborne Semi Detached). BMHT typical specification: 1.30 tonnes CO₂/yr, the addition of an air source heat pump saves an additional 0.24 tonnes CO₂ /yr.



New Build - BMHT Passivhaus Pilot - Dawberry Fields

- Actions and achievements this year: Being delivered by Birmingham Municipal Housing Trust, the scheme is made up of 55 units for Social Rent. The scheme is a mix of 2, 3, and 4, bedroom houses and 2-bedroom apartments. A pre-application has been submitted and the design of the scheme has undergone a positive Planning review . The scheme will have a mix of technologies including, Mechanical Ventilation with Heat Recovery, Air Source Heat Pumps, solar Photovoltaic Panels, Electric Vehicle Charging points, etc.
- Challenges/Barriers: The site has a number of constraints to deal with, including, level issues, nature conservation issues – there are protected species on the site – flood risk, relationship to adjoining area. The scheme cost will be greater than a traditional housing approach.
- Next steps: Submission of Detailed Planning Application. Cabinet approval for the Procurement Strategy and Full Business Case. Commencement of procurement process and selection of preferred bidder.
- If possible, any identified carbon emission savings: Not yet known but data will be collected.



Retrofit - Thermal Impact / Energy Efficiency Survey & Delivery Plan

- Actions and achievements this year: An Energy Performance Certificate (EPC) assessment via Acivico has been requested on 1,000 Council properties to assess the accuracy of existing, older, Council energy performance data due to changes in the assessment methodology since EPCs were originally carried out. Stock Condition Surveys of the Council Stock is an ongoing requirement, and it is the intention of the draft Asset Management Strategy for a rolling stock condition survey programme to be implemented. It is anticipated that the EPC assessment will be carried out as a compliment to these Surveys. Data gained as a result of funding Bids such as SHDF (Social Housing Decarbonisation Fund) and delivered projects such as LADS2 is being focused for use on internal systems to build a better picture of the EPC levels of our stock and compare with existing data and inaccuracies of national held data.
- Challenges/Barriers: The cost of retrofitting the entirety of BCC's 60,000 homes has been estimated to be as much as £3.6bn over 30 years. Sourcing the funds and planning to address this is a significant challenge for BCC, which is being addressed currently via the development of Asset Management Strategy, Housing Revenue account Business Plan and taking advantage of Government funding initiatives. Energy performance data is crucial to the planning and prioritisation of retrofit investment.
- Next steps: Identify additional funding. Recruit inhouse team.
- If possible, any identified carbon emission savings: The energy performance surveys will not in themselves delivery emissions reductions, but the results will support effective targeting of investment to improve energy performance.

Council Stock - Boiler Replacement Programme

- Actions and achievements this year: Allocated budget is being used to provide for the replacement of 1,200 properties with 'A' rated boilers where low energy efficient boilers currently are in operation. Concentrating on funding to provide such replacements is ongoing. In addition to this, Birmingham City Council (BCC) undertook a programme of hot water system replacement in residential tower blocks across the City of Birmingham. This project set out primarily to lower legionella risk from poorly heated and insulated direct electric hot water tanks, however the outcomes of this project soon expanded to improve running costs and lower carbon by deploying Mixergy's direct electric smart hot water cylinders. Mixergy's direct electric smart hot water cylinders allow residents to heat smaller volumes of water, heating only what they need as cost optimally as possible. This is in contrast to their legacy hot water tanks (copper lagged vented tanks) that heat everything twice per day and suffer from high heat losses due to poor quality insulation. When deployed alongside a solar PV system, the Mixergy tank unlocks additional SAP points helping landlords meet the challenge of improving their housing stock to EPC C by 2030.
- Challenges/Barriers: Life cycle of the existing boilers and the need to address the deficit in terms of funding for properties which currently have E, F, and G rated boilers.
- Next steps: Continuation of the scheme in line with funding availability.
- If possible, any identified carbon emission savings: For the boiler replacements, it is estimated that the Carbon Saving is 1.4 tonnes of CO₂ per boiler, per year. For the 1,200 boilers completed this year, this equates to 1,729 tonnes CO₂ in 2022. For the water tanks, each apartment was heated with conventional direct electric hot water tanks on a timer control that heated the tank twice per day, using on average 12 kWh electricity per day. After the installation of the Mixergy smart direct electric tanks, the average daily energy consumption for hot water has reduced to 6 kWh per day. This is saving of 6 kWh per day equates to 0.4 tonnes of CO₂ per annum per apartment. When applied to the 126 properties included in the first phase, this project will save 53 tonnes of CO₂ per year.

Energy Companies Obligation (ECO4)

- Actions and achievements this year: Engagement with energy suppliers to identify priority areas and options to maximise the allocation of funding to Birmingham households over a 4-year period from 2022-2026. Priority is to build continuity and opportunity for long term engagement with communities. Collaboration across the 3 Cities (Birmingham, Coventry and Wolverhampton) to establish a co-ordinated and collaborative approach to deliver greater benefits across the region.
- Challenges/Barriers: A strategic, co-ordinated approach is likely to deliver greatest outcomes, however, will require greater input from the Council. Seeking to balance scale of delivery and resource capacity.
- Next steps: In talks with 3 Cities about joint approach to attract greater funding and deliver more outcomes including longer term local skills. Aim to agree the approach early in the new year and commence delivery soon after.
- If possible, any identified carbon emission savings: Savings will be captured once ECO4 works are in delivery.

East Birmingham Low Carbon Heating Innovation Zone

- Actions and achievements this year:
 - **Commencement of 300-Home Whole-House Retrofit Pilot:** The pilot directly supports Birmingham’s bold ambition to deliver best in class housing services, placing the Council front and centre in addressing fuel poverty by developing and implementing innovative solutions and funding models to scale up whole house retrofit.
 - **Development of Castle Vale Net Zero Neighbourhood Proposition:** A proposal has been created for a “net zero neighbourhood” at Castle Vale where net energy needs are reduced through demand reduction measures such that remaining energy requirement for vehicles, thermal, and electrical energy within the community is met by renewable energy generation, while also investing in other aspects to create community buy-in and a more sustainable place to live. Funding is currently being sought to implement the proposal
 - **Submission of Levelling Up Fund application for National Centre for Decarbonised Heat:** A bid was submitted by University of Birmingham with the support of the City Council to Government for £20m to create a National Centre for Decarbonised Heat at Tyseley. The bid was unsuccessful; however the Council will work alongside partners to assess how the centre’s vision to support growth of the local retrofit economy can still be realised.
 - **Wider funding bids:** In addition to Net Zero Neighbourhood Demonstrator Programme investment, the Council and its partners are targeting funding through: Innovate UK’s Pioneer Places; Strategic Innovation Fund, Social Housing Decarbonisation Fund; Sustainable Warmth competition; Green Homes Grant LAD schemes; ECO4.
- Challenges/Barriers: The supply chains need support to increase their capacity to deliver retrofit at scale but using a place based approach does provide economies of scale. Grant funding has tight deadlines for delivery and specific criteria which can make effective delivery difficult.
- Next steps: The East Birmingham Low Carbon Innovation Zone will continue to be a key area of activity around the retrofit and decarbonisation agenda. Priorities will be to secure funding for the Net Zero Neighbourhood proposition and to develop enhanced partnership working with key stakeholders including around Tyseley Environmental Enterprise District.
- If possible, any identified carbon emission savings: Potential for 397 tonnes CO₂ savings from Whole House Retrofit and 33 tonnes CO₂ for NZN Castle Vale if 25 houses are retrofitted.

Buildings: New Projects

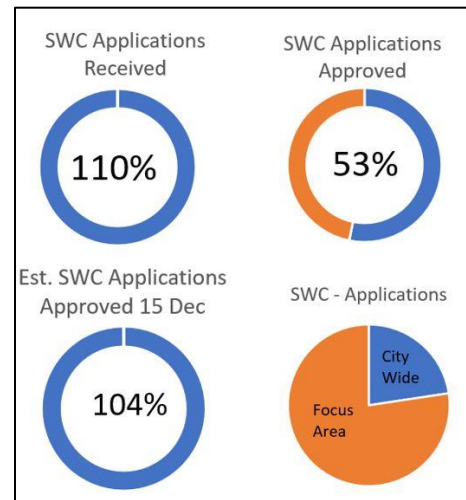
Social Housing Decarbonisation Fund

- Actions and achievements this year: Social Housing Decarbonisation Fund (SHDF) – bid submitted to BEIS for a £24.8m grant to carry out decarbonisation work on 2,076 homes has been submitted. The Housing Directorate have led bid strategy and submission with the Route to Net Zero coordinating bid preparation and coordination between 3 Cities Retrofit and WMCA.
- Challenges/Barriers: Funding requires match from Housing Revenue Account. BCC owns 60,000 homes and so the decarbonisation task and funding required to deliver retrofit works to all homes will be considerable. Innovative sources of funding are being explored with partners
- Next steps: Develop a decarbonisation strategy for all BCC housing stock and identify additional sources of funding or delivery models.

- If possible, any identified carbon emission savings: If successful, the estimated carbon reduction across all homes is 5,172 tonnes CO₂.

Sustainable Warmth Competition

- Actions and achievements this year: The Local Authority Delivery Scheme 2, LADS2 (part of the BEIS Sustainable Warmth Competition) was completed in 2022, with 102 properties benefiting from a package of retrofit measures; 15% owner occupier and 85% social housing (Council stock). 56% of homes were EPC D rated properties. A total of 171 measures were installed including ventilation.
- The LADS 3 programme is now in delivery. The target is to support 700 properties by March 2023 and the programme is well on track to deliver due to adoption of a community led engagement approach in the Balsall Heath, Acocks Green and Tyseley areas. The council, working with Acivico as project managers, appointed local community groups MECC Trust and Acocks Greener to work with communities within Balsall Heath and Acocks Green. These local community organisations then engaged with the community through retrofit cafes, events, briefing sessions and street by street door knocking to promote the benefits of retrofit for residents and households. Councillor engagement and support at events has also helped to build trust. By working collaboratively with local community groups, we have been able to really engage residents, overcome language barriers - with 4 languages spoken across the target areas - and build trust leading to a far greater volume of applications than seen in many other areas of the West Midlands.
- The Home Upgrade Grant (HUG) 1 off-gas programme is also running in parallel with a target of 114 properties. The uptake has been low to date due to the significant volume of gas connected homes in the city. A targeted, city-wide campaign is underway to help maximise use of these funds.
- Challenges/Barriers: Risk of inclement weather hinders progress in delivering the 814 retrofits by March 2023. Off gas grid properties are proving very difficult to attract to scheme (this is a challenge in urban areas across the country). Due to success of engagement, likelihood that the LADs campaign will result in more properties than funds available. The intention is that ECO4 will be secured as a follow up funding route to maximise household benefit.
- Next steps: Broaden range of areas. Continue to build community links to improve take up of schemes.
- If possible, any identified carbon emission savings: LADS2 delivered an estimated 930 tonnes CO₂ savings. LADS3 is expected to deliver significantly greater savings – exact figure to be confirmed once the scheme is completed in 2023.



Corporate Landlord Net Zero Plan (Buildings and Land)

- Actions and achievements this year: Centre for Sustainable Energy survey of solar potential on Council owned buildings completed and analysis undertaken of buildings most likely to benefit from solar due to high electricity demand. Commissioned use of tool to support corporate landlord portfolio level review of energy use and carbon emissions and have

commissioned delivery and funding model options appraisal to inform potential approach to scaled investment.

- Challenges/Barriers: Lack of consistent data, particularly energy consumption.
- Next steps: Identify priority buildings for solar and implement. Support Corporate Landlord team in developing a decarbonisation plan and source funding.
- If possible, any identified carbon emission savings: Capital works on Council non-domestic property has not yet commenced – no savings yet attributable.

Place Based Initiatives - Net Zero Neighbourhoods, Net Zero Living and Healthy Living Zones

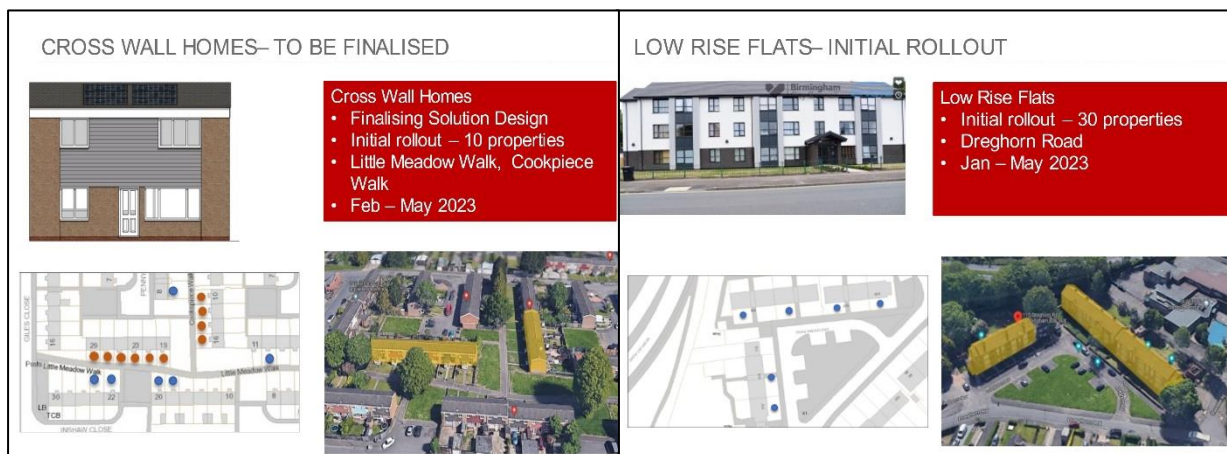
- Actions and achievements this year: Funding is available from Innovate UK for Net Zero Living areas. This funding has two phases: phase 1 provides up to £75,000 to support work on identifying the non-technical barriers to net zero system change and phase 2 up to £8 million to implement changes to overcome these barriers. Bid submitted for the Tyseley area, led by local business Webster and Horsfall and supported by a range of public and private sector organisations including University of Birmingham and Siemens. The Council is committed to 5 Healthy Living Zones which will ensure that the need for car travel is reduced within the area. These 15-minute neighbourhoods will reduce carbon emissions from private transport and Bordesley Green has been chosen as the pilot area. The City Council's bid for Castle Vale was unsuccessful in the initial round of Net Zero Neighbourhood funding via WMCA and so other sources of funding are being sought to implement the plans. This net zero neighbourhood will include retrofit of housing and increased cycle and walking routes.
- Challenges/Barriers: Funding applications may be unsuccessful.
- Next steps: Await funding decision for Net Zero Living bid and if successful, support phase 1 delivery and preparation of phase 2 bid. Work with the WMCA on the Castle Vale NZN and continue with the Bordesley Green HLZ pilot.
- If possible, any identified carbon emission savings: Funding application – no savings directly attributable although potential to realise significant savings if successful.

Bromford Housing Retrofit

- Actions and achievements this year: The £28.2m 3 Cities Whole House Retrofit (WHR) Pilot was approved by Cabinet in July 2022. The pilot aims to test two different approaches to improve thermal efficiency, reduce carbon emissions and improve tenants' energy demand usage and with a view to scaling up the delivery of whole house retrofit across the Council's wider HRA stock. The scope of the pilot is to deliver WHR to 300 units of BCC social housing stock in Bromford, East Birmingham: 174 low rise flat properties and 126 cross wall properties. A core principle for the pilot is to apply an incremental learning approach to retrofit works to progress works on Council HRA stock without committing the Council to unaffordable levels of borrowing
- Barriers and Challenges: Property mapping and asset data review - property information was incomplete and included inaccuracies which impacted solution design and also grant funding applications. Significant effort was required to review, validate and undertake additional surveys. Inaccuracies in asset data can lead to material amendments to scheme design and costing. Planning – engagement and discussion with Planning is required from the outset and particularly at 'concept' stage. Cross Wall Homes Solution – the planning and design phase of the project has identified particular challenges with the Cross Wall Homes. The target properties comprise 6 different archetypes which require 'bespoke' solutions. Distribution of Properties & Owner Occupiers - the distribution of 'pepper-potted' properties and adjacent owner-occupiers has a significant impact on design and performance standards due to

additional and complex details around the party wall(s). Owner occupiers (not included within the scheme) are likely to significantly impact on the performance outputs of the adjoining properties. Investing time to understand and map assets early in the scheme development will assist here.

- Next steps: The programme is entering the Initial Solution Rollout phase and it is proposed that the programme proceeds as follows:
 - Low Rise Flats –The solution fabric measures have been adjusted to meet BCC Planning requirements. An alternative Mixergy[1] heating solution will be deployed alongside the solar PV solution to support energy efficiency performance to address fuel poverty, decarbonisation and increased EPC ratings of B+ / A. The initial solution rollout is planned for Dec 2022/Jan 2023 – May 2023 and wider solution rollout: June 2023 – April 2024.
 - Cross Wall Homes – The Solution Design process has identified a number of challenges which have an impact on programme scope, costs and timescales. The pilot programme is currently working through a managed process to determine the preferred solution design and cost plan. It is anticipated that this will be agreed end Jan / early Feb 2023.



- If possible, any identified carbon emission savings: Not yet known. The project is targeting improved EPC levels from an average EPC D to EPC B / A ; 50-60 kWh/m2/year.

Public Sector Decarbonisation Scheme

- Actions and achievements this year: Public Sector Decarbonisation Scheme (PSDS) funding application being prepared for Small Heath Well Being Centre alongside a number of other council-owned buildings. PSDS provides grant funding for public sector non-domestic building decarbonisation.

- Challenges/Barriers: The complexity of the Well Being Centre site means a wider programme of capitals work will be required alongside funding to support energy efficiency and decarbonisation works.
- Next steps: Support funding application submission once wider plans for building works have been agreed.
- If possible, any identified carbon emission savings: Potential saving of 65.39 tonnes CO₂ if identified works undertaken.

Sustainability in Planning Policy

- Actions and achievements this year: The Route to Net Zero team engage with the planning policy team by providing comments relating to carbon reductions and sustainability on planning applications. In the last year, comments have been provided on 44 planning applications. This includes in larger pre-apps and large strategic applications including Smithfield and Curzon Wharf.
- Challenges/Barriers: Staff resource/time. Whilst sustainability requirements apply to all applications, the policy team is only consulted on major applications – it is not possible or sustainable to comment on all applications.
- Next steps: Continue to engage on applications – ensure planning policy flag all significant development to the route to zero team.
- If possible, any identified carbon emission savings: Not known.

East Birmingham Programme

- Actions and achievements this year: The East Birmingham Programme has delivered multiple projects during the last twelve months, including a number which are relevant to the route to zero programme:
 - **Dolphin Centre:** a £2 million package of improvements to the Dolphin Centre in Ward End Park to include the creation of an inclusive Youth Hub. The project will include the extension and retrofitting of the building with green energy and carbon reducing technologies.
 - **Bordesley Green Spatial Pilot:** This is a place-based pilot which seeks to establish a framework for improving the quality of local places as Healthy Living Zones in terms of utility and amenity in line with the theory of the “15-minute city”. Active Travel to reduce the need to travel by private vehicle, and Green Infrastructure are key elements of this work.
 - **Tyseley Clean Energy Masterplan for Growth:** A joint vision has been agreed with key stakeholders including around Tyseley Environmental Enterprise District. A Masterplan will be developed to deliver this vision; addressing both spatial and infrastructure planning and also the proactive development of low and zero carbon assets to maximise the potential of Tyseley at the forefront of the city’s response to climate change.
 - **Green Infrastructure projects:** multiple projects have been progressed including the Bordesley Green City of Nature pilot, the collaborative Tyseley Community Commons project with University of Birmingham, and design studies for parts of the Cole Valley.
 - **Castle Vale Net Zero Neighbourhood Proposition:** A proposal has been created for a “net zero neighbourhood” at Castle Vale where net energy needs are reduced through demand reduction measures such that remaining energy requirement for vehicles, thermal, and electrical energy within the community is met by renewable energy

generation, while also investing in other aspects to create community buy-in and a more sustainable place to live. Funding is currently being sought to implement the proposal

The Council, West Midlands Combined Authority and Solihull MBC are jointly promoting East Birmingham and North Solihull (EBNS) to Government as a Levelling Up Zone where transformational change will be delivered, including the accelerated delivery of decarbonisation and the “just transition”. In addition, through the partnership development workstream, the programme is developing working relationships and increased collaboration with key stakeholders including at Tyseley as described above, with Severn Trent, which recently launched a major social initiative focussed on East Birmingham, and the National Trust.

- Challenges/Barriers: The previous twelve months have been the mobilisation phase of the East Birmingham Programme and as a result resources and capacity have been limited due to the need for recruitment and the development of partnerships and governance. The Programme Team is now taking shape and collaborations are developing well, and the pace of delivery is expected to significantly increase during the next year.
- Next steps: Key priorities for the Programme are: to build strategic alliances including with Tyseley partners and the National Trust; to progress the EBNS Levelling Up Zone to secure the capacity to scale up the programme; to expand project activity and delivery.
- If possible, any identified carbon emission savings: There are no savings directly attributable to the above projects during 2022 but the programme is supporting significant funding and investment to support emissions reduction ambitions.

CASE STUDY: 3 Cities Whole House Retrofit



The first project in East Birmingham is piloting two different approaches to Whole House Retrofit:

174 low-rise flats to an EPC B+ rating.

Energiesprong approach for 126 cross wall properties which brings properties to EPC A – zero carbon. Under the Energiesprong approach tenants will have a guaranteed level of hot water and energy for a fixed level of consumption. It incorporates a high level of digital monitoring of temperatures, energy consumption, air flow and ventilation.

CASE STUDY: Low Carbon Homes Retrofit Summit

Commissioned by the Route to Net Zero team, Low Carbon Homes alongside a range of internal and external stakeholders from across the City worked to organise and deliver the Birmingham Retrofit summit from 6th to the 8th of December in 2022. The event brought together a wide range of speakers to discuss the challenges around retrofit and the opportunities to alleviate fuel poverty and support carbon emissions reduction.



Over 150 retrofit professionals signed up to attend, and cabinet members Councillor Mahmood and Deputy Leader Councillor Bridget Jones introduced the second and third days, while Council Leader, Councillor Ian Ward, opened the whole event. By bringing together Council officers, housing providers, community groups and local businesses to explore how we can better work together, the event helps demonstrate the Council's commitment and leadership on retrofit.

Transport

Transport: Summary

Data from 2020 shows that transport makes up just over a third of the City's carbon dioxide emissions at 34%. We cannot tackle the climate emergency without fundamental changes to the way people and goods move around our city. Transport is so much more than a means of getting from A to B. Transport can be an enabler of transformational changes. The climate emergency is setting the pace of change for our transport network. The latest evidence shows that a rapid shift is needed away from single occupancy private car use. Companies in the West Midlands are helping to lead the way in global development of new types of vehicles, including self-driving and electric vehicles, offering significant improvements in efficiency and emission levels. But regardless of advancements in technology, private cars will never be able to match the capacity of mass public transport for getting people to where they want to go. The Birmingham Transport Plan, now adopted and in the delivery phase, outlines how the city's transport system needs to be transformed to meet the challenges of the next decade. Action on a robust set of measures to assist with modal shift – increasing the amount of sustainable transport we use – will be integral to our net zero journey.

Transport: Wave 1 Project Updates

Electric Vehicle Charging Points and EV Strategy

- Actions and achievements this year: To date 686 charge points have been installed across the city, of which 143 are rapid (50kw-250kws) charge points (enabling a full charge in less than 30 mins) , which is a 51% achievement towards the 2025 target of 280. The Cabinet approved EV Charge Point Strategy is a joint collaboration of the Public and Private Sector, where around 3,600 -5,000 (3.5kw-250kw) publicly accessible charge points are estimated to be installed by 2030.
- Challenges/Barriers: The number of charge points required will depend on the extent of change in travel behaviour away from private cars towards sustainable modes such as walking, cycling and public transport, in line with the Birmingham Connected Transport Policy aim of achieving at least 40% modal shift in Birmingham. Key challenges also include the available grid capacity across the City, which provides a particular challenge in residential areas. Alongside this there are challenges associated with the continued effects of the energy crisis and the war in Ukraine, Brexit, and COVID which have all impacted on the cost of individual EV electric car charging, as well as impacting global supply chains for EV car and charge point unit production and availability. More locally the availability of skilled workers and engineers involved in installation and grid infrastructure connections is a barrier.
- Next steps: From 2023 there will be a focus on deploying ultra-rapid hubs, alongside local community on-street charge point solutions where there is little or no off-street parking. Where 70% of Birmingham households already have access to off street parking, the next step is to focus on low power level 'over-night' charge point solutions that align with planning consent, Highway regulatory approvals and the Council's Private finance initiative arrangements.
- If possible, any identified carbon emission savings: This cannot be calculated as we only have usage data from our charge points - which represents 168 out of 682 charge points within the city. There is no data to compare to milage vehicles have undertaken, only how much energy has been drawn from our charge points (and every EV/hybrid vehicle model is different). There is no comparative data of petrol/diesel vehicles, if indeed these have been replaced by EVs, which we do not know. Also, whilst our charge points are 100% renewable energy, most others from other providers, including household electric for charging is from the grid which is only around 26% renewable power - (not due to be 100% until 2050).



Hydrogen Bus Pilot

- Actions and achievements this year: UK's first 20 double deck hydrogen buses delivered to Birmingham and commenced the 'Clean Air Hydrogen Bus' pilot programme: Bus depot has been retrofitted for hydrogen bus maintenance. 200 drivers have undertaken technical staff training and development has commenced in 'drive train' and fuel cell maintenance and operational requirements. The buses were co-developed with procured bus operator, National Express, and hydrogen fuel provider, ITM/Motive. Hydrogen bus route assessments have been completed.



- Challenges/Barriers: Developing the training, knowledge and skills at the same time as trialling the buses, as the first double deck hydrogen buses- where the weight of fuel tanks and fuel cell on the daily operation of use, has been challenging. Also, the price of hydrogen (made from a process involving electricity & water) within the current energy crisis, means that the hydrogen buses are not as commercially viable as diesel buses.
- Next steps: Working with a range of 'green' & 'blue' energy solutions to negotiate energy supply agreements ahead of the Government ceasing the business energy cap March 2023. Also, working with strategic partners Transport for West Midlands, Bus Operators and hydrogen fuel providers, in regard to outcomes of the Clean Air Hydrogen Bus pilot, to support their latest ZEBRA funding sourced for the next 124 hydrogen buses, to be operational by 2024/25.
- If possible, any identified carbon emission savings: Not yet known. The 20 hydrogen buses are still under the Clean Air Hydrogen Bus pilot, and while out trialling on the road, the existing Euro 6 diesel fleet of 20 X51 route buses remain on the road delivering the bus service. When these are withdrawn, and the hydrogen buses fully replace them, then carbon savings based on mileage will be possible to calculate.

Birmingham Transport Plan Delivery Plan

- Actions and achievements this year:
 - **Birmingham transport delivery plan:** The work on the Birmingham Transport Plan Delivery Plan (DP) commenced in March 2022 and is expected to be completed in early April 2023. We have already produced some key outputs, which relate to understanding the scale and pace of change required to deliver transport decarbonisation in the city. Whilst the pace of change is set by the urgency of the need for action on climate change, the BTP aims to respond to a range of social, economic and environmental imperatives to create a transport system fit for purpose for a growing, diverse, inclusive and sustainable

city of the future. Our initial assessment shows that a dramatic decrease in vehicle kilometres travelled is required to deliver Paris agreement compliant transport decarbonisation in Birmingham. This will be achieved through extending our commitment to deliver measures that align with the principles of the BTP and through lobbying our partners and other government organisation to align their level of ambition to ours.

- **Delivery of the active travel measures** - The City Council's Highways and Transportation Capital Programme is an annual rolling programme that incorporates a significant package of schemes aimed at promoting cycling and walking as the preferred mode of travel with a budget of over £70m identified for the implementation of schemes until the 2027/28 financial year. Over the last year, a number of schemes have been successfully delivered on the ground, both as part of the residual Birmingham Cycle Revolution (BCR) Programme and also in support of the strategy of making the 2022 Commonwealth Games the first truly sustainable international multi-sport competition. Schemes delivered in the last year include an extension of the



A34 Birchfield Road 'Main Corridor Blue Route' into the centre of Perry Barr, cycle safety improvements around the junction of Pershore Road/Priory Road which connect the A34 Bristol Road 'Main Corridor Blue Route' with NCN Route 5 at Cannon Hill Park, as well as a number of public realm schemes which provided improved pedestrian connectivity from the city centre to key Commonwealth Games venues, all of which have legacy benefits. The Council is also implementing a series of cycle, local centre and neighbourhood infrastructure improvements around the city, plus the City Centre Segments project and a tranche of Big Birmingham Bikes through the central government Active Travel Fund (ATF) administered by Transport for West Midlands. This £5m package of improvements, which is currently being implemented, builds on the schemes previously introduced through an earlier tranche of ATF monies as part of the Emergency Birmingham Transport Plan which set out a wide range of measures to support walking, cycling and public transport throughout the city, in light of the impact of the COVID-19 pandemic. The introduction of active travel measures is essential in providing alternative options to travelling by private car and aligns with the priorities of the Birmingham Transport Plan.

- **Places for People** - Over the last year, the work on three Places for People scheme has progressed towards implementation. Progress so far includes extensive consultation with local residents, which resulted in amendments and tailoring of the proposed schemes based on the feedback gathered. The three areas are Lozells, King's Heath and Bournville, where the measures are expected to be introduced within 2023 subject to approvals. The introduction of Places for People schemes plays a key role in the Council's efforts to implement the Birmingham Transport Plan, as it demonstrates our commitment to prioritising active travel and reallocating road space away from private cars.
- **Challenges/Barriers:** There are no specific challenges identified in relation to the project itself. However, the delivering the DP is big challenge as it reflects the scale and pace of a just transition. The BTP DP is expected to be completed by April 2023, with the next stages involving the production of a detailed delivery plan and calculation of the financial resources needed to deliver it.

- Next steps: The next stage of the DP is looking at developing a preferred option of schemes and policies that will comprise the DP and engaging with partners and members of the public to discuss the challenges and needs of delivering transport decarbonisation in Birmingham.
- If possible, any identified carbon emission savings: There are no associated savings associated with the plan itself, however it will set out what needs to be done to deliver net zero by 2030 in Birmingham and identify the policy gaps in achieving our target. Whilst the delivery plan is still in development, it will certainly include continuations and extensions of many existing projects and programmes relating to transport. Therefore, progress in delivering the existing Transport & Highways Capital Programme and other key infrastructure projects with partners such as TfWM is as relevant to the decarbonisation agenda as the Delivery Plan itself. This is supported by an ongoing programme of travel demand management, school and workplace travel planning, and cycling activities.

Clean Air Zone

- Actions and achievements this year: The purpose of the Clean Air Zone is to address the issue of poor air quality which is directly and indirectly negatively impacting the lives of the people who live and work in our city. By addressing this issue, we remove a barrier that may be preventing people from achieving their full potential. Since the Clean Air Zone began operating, the percentage of the most polluting vehicles entering the city centre every day has reduced from just over 15% in June 2021 to 7.5% in September 2022. This change has helped reduce the levels of the pollutant, nitrogen dioxide. The purpose of the Clean Air Zone is to reduce the levels of nitrogen dioxide within the zone in order to reduce the impact of this pollutant on people's health. The zone achieves this by applying a daily fee to journeys through the zone in the most polluting vehicles as a way of encouraging the owners of these vehicles to upgrade their vehicle, use public transport and/or adopt more active forms of travel. The Council is also helping to accelerate change by providing financial grants to key groups such as low income workers in the zone, SMEs in the West Midlands who operate HGVs, coaches or vans and, critically, Birmingham-licensed private hire and hackney carriage drivers. The change in the private hire and hackney carriage fleet has been significant. In September 2018 (the month the Council's Cabinet approved the submission of the Clean Air Zone Full Business Case to Government) the rate of compliance in the private hire fleet was 36%. By August 2022 the rate had grown to 95%. Similarly, 12% of the hackney carriage fleet met the emission standards of the zone in September 2018 but by August 2022 this had increased to 54%.
- Challenges/Barriers: The Council has always recognised that some people and organisations might require additional time or support to adjust to the Clean Air Zone. To help make the transition to a clean air city easier the Council introduced a range of temporary exemptions from the daily fee and financial incentives to upgrade or replace 'non-compliant' vehicles. In the first year of the scheme just over 9,000 people who work or live in the Clean Air Zone benefited from an exemption. And to date just under £5m of grants have been approved. The



other key challenge with the scheme is awareness. There are already over 300 signs in place to alert drivers that the scheme is in operation and the Council has invested in significant multi-media advertising campaigns over the summer and Christmas to help get the message to more people. These campaigns have included a range of tactics, including digital billboards, posters with QR codes in car parks, advertising through navigation applications in an effort to ensure that drivers are aware that the scheme is in operation.

- Next steps: The primary objective of the Clean Air Zone is to improve air quality in the city, but it is also an enabler of change within the Transport Strategy and the reduction of carbon emissions, which contributes to progress on the Council ambition to create a net zero city by 2030. To support the Council's ambitions all surplus revenues generated by Clean Air Zone re-invested in local and regional transport-related strategies and policies. To date just over £40m of revenues from the scheme have been allocated to a number of schemes, which include the purchase of 20 hydrogen buses, further pedestrianisation of the city centre, upgrades to the University train station and stations on the Camp Hill line, a number of cross city bus projects and an expansion of the Big Birmingham Bikes programme.
- If possible, any identified carbon emission savings: This is not something that is directly measured through the scheme, but we are exploring ways of trying to quantify any carbon reductions associated with the scheme or through the projects it supports.

Transport: New Projects

Civic Cars, Taxis and Alternative Transport Provisions Review

- Actions and achievements this year: The Chief Executive's Delivery Unit (CXDU) were commissioned to conduct a review to answer the question: What is the most appropriate, cost effective / efficient way of transporting civic leaders, cabinet members and BCC officers? The fieldwork included analysis of data (e.g., policies, processes, spend data, benchmarking data etc), stakeholder meetings, delivery chain mapping to understand the current process and identifying best practice. The work also extended to include a review of all Council fleet vehicles and opportunities to align operational and future decisions
- Challenges/Barriers: Behaviour change away from private use vehicles. Capital cost differential to move fleet vehicles to electric and or hydrogen.
- Next steps: Recommendations to inform transport theme programme and to be led by new programme structure for climate change and net zero.
- If possible, any identified carbon emission savings: Recommendations not yet implement. Emissions reductions will follow as recommendations are implemented.

CASE STUDY: Safer, Greener, Healthier School Travel

One of the best ways to tackle air pollution at the school gates, along with alleviating issues around traffic congestion and parking which so many schools face, is to encourage people to leave the car at home where they can and to walk, cycle and take public transport to school instead.

All schools in Birmingham can access support and resources through the national [Modeshift STARS](#) scheme, which rewards schools for taking steps to promote safer, greener, healthier travel. As part of this, schools produce a travel plan outlining what they will do to encourage more sustainable and active travel for the school journey. They are also able to access support and guidance to deliver various [initiatives and campaigns](#), such as Bikeability cycle training (delivered by The Active Wellbeing Society) and Living Streets' Walk to School outreach programme. Schools with an approved (Green) travel plan in place can apply for grants of up to £1,000 through the [Young Active Travel Trust](#), as well as being considered for infrastructure improvements funded by the Safer School Streets capital programme. Lea Forest Primary Academy (pictured below) has achieved Platinum on Modeshift STARS, making it the first school in the West Midlands to gain this prestigious accreditation



Since September 2019, roads outside selected schools in Birmingham have been closed to traffic at the start and end of the school day as part of our [Car Free School Streets](#) initiative. This has been delivered at 17 schools to date in three phases, with another phase of a further 5 schools planned for April 2023. We are also currently undertaking an audit of all schools across the city to identify and prioritise suitable locations for expansion and further roll-out of this initiative.

Energy

Energy: Summary

The Energy theme primarily relates to the use of gas and electricity in buildings and therefore there is some cross over on the Building theme, particularly on projects relating to heat decarbonisation. The burning of gas for space and water heating, and the demand for electricity to power buildings is directly responsible for two thirds of city carbon dioxide emissions².

The Council is working on a range of projects in addition to those specifically referenced in the Buildings section, which are focused on supporting large scale energy infrastructure development and renewable heat and power generation roll out.

For example, the Council are working on developing a pathway for decarbonising and expanding the existing city centre district energy network. Working in partnership with other large network customers, the network's operator EQUANS and consultants Sustainable Energy Limited, a range of existing and new low carbon heat supply options have been identified.

The capacity of the electricity network is a key concern particularly as buildings and transport decarbonisation accelerates and demand for electricity increases. We are reviewing opportunities for expand renewable and low carbon energy sources in the city as well as demand management through heat and electricity storage and building working relations with utility providers and key local stakeholders such as Tyseley Energy Park to bring forward new infrastructure projects.

Whilst still in development, these projects have the potential to support significant emissions reductions, build greater self-sufficiency and energy price resilience.

Energy: New Projects

Decarbonisation of Birmingham District Energy Scheme (BDEC)

- Actions and achievements this year: BDEC is a strategic asset with the potential to support city centre heat decarbonisation. The network currently supplies 40,000 megawatt hours of heat across a 12 kilometre network route. The Council has secured funding from the Department for Business, Energy & Industrial Strategy Heat Networks Delivery Unit to identify a technical, commercial and funding route for decarbonisation of the network and inform scale of city centre expansion potential.
- Challenges/Barriers: Capital cost and technical constraints associated with moving from gas fired centralised heat plant to lower temperature renewable technologies and heat recovery. Level of energy efficiency improvements required to existing buildings to make them low carbon heat ready.
- Next steps: Identify technical and economically viable options and approach to delivery and funding.
- If possible, any identified carbon emission savings: The emissions savings associated with network decarbonisation will be calculated as part of the study.

City Decarbonisation Delivery Programme 3: Delivery Model for Non-Domestic Net Zero Retrofit

- Actions and achievements this year: This project included two work packages: identification of potential heat network zones and potential delivery models and delivery and funding model options appraisal for Council non-domestic property portfolio to inform potential approach to scaled investment (reported above).

² UK Local Authority and Regional Greenhouse Gas Emissions National Statistics 2005-2020

- Challenges/Barriers: Heat network zoning will require significant local authority involvement in stakeholder engagement, communications, planning, coordination and enforcement. Zoning legislation is due to be introduced in 2025.
- Next steps: Work with BEIS on next phase of heat network zoning preparation and ensure engagement across Council teams most likely to play a role in their implementation or management.
- If possible, any identified carbon emission savings: Heat network zones aim to support rapid decarbonisation in locations where heat networks provide most cost-effective option. Once introduced, zoning will facilitate significant emissions reduction from heat.

East Birmingham Energy Infrastructure

- Actions and achievements this year: Work underway through the East Birmingham Heat Taskforce to develop low and zero carbon community heating plans for East Birmingham. The Taskforce has mapped the energy system, housing types, Energy Performance Certificate and ownership of housing in communities of this area. A study has been completed into the possibility of using waste heat from the final effluent wastewater from Minworth sewage treatment works alongside other existing sources of heat. A workshop has been held with a range of industry stakeholders to explore the potential of the scheme and to begin to understand the barriers to delivery. The Tyseley Environmental Enterprise District Vision due to be launched in January 2023 highlights a number of existing and potential opportunities to support net zero. A strategic alliance with University of Birmingham and Tyseley Energy Park is now being formed to bring these opportunities forward.
- Challenges/Barriers: Scale of infrastructure investment and complexities associated with delivery. Engagement of a wide range of potential stakeholders.
- Next steps: Advance project to more detailed feasibility and continue to engage industry partners to identify potential solutions and route to market.
- If possible, any identified carbon emission savings: If implemented, significant emissions savings will be delivered through the decarbonisation of heat.

Solar Photovoltaics

- Actions and achievements this year: Commissioned study on potential scale of domestic and Council non-domestic opportunity around solar photovoltaics (PV). Findings equally apply to rooftop potential for solar thermal (hot water) panels. The study details the energy performance certificate, tenure and solar PV potential for homes in East Birmingham and locates existing solar PV installations. There is sufficient roof space potential for solar PV installations which would supply half of the existing domestic electricity demand in the area. For Birmingham City Council owned non-domestic buildings, the building usage and solar PV potential has been identified and estimates made of current electricity demand and the cost of the installation. The internal rate of return has been calculated for each building and ranked to give an order of priority for delivery.
- Challenges/Barriers: Solar photovoltaics (generating electricity) can reduce household electricity emissions at a faster pace than the electricity grid is currently decarbonising, however in isolation may not deliver significant energy savings to residents who are currently using gas for space and hot water heating. Solar photovoltaics need to be considered



alongside other energy efficiency and heat decarbonisation solutions as well as demand management and electricity storage. Grid capacity for new solar photovoltaic installations.

- Next steps: Prepare a strategy for solar investment across a range of different building types and investment options. Consider opportunities for packages of work.
- If possible, any identified carbon emission savings: Potential for significant emissions savings, particularly when also paired with other energy efficiency and decarbonisation measures.

Waste & Circular Economy

Waste & Circular Economy: Summary

With a city net zero goal, reducing waste, reuse and recycling, and solutions to manage and reduce the impact of waste management processes across the city plays a critical role. Resource efficiency is about using limited resources in a sustainable way and minimising the impact of resource use. A circular economy uses resources for as long as possible, extracts maximum value from them (through reuse or repurposing), minimises waste and promotes resource efficiency. A large proportion of an organisation's own operational carbon dioxide emissions impact is directly related to the materials and products it consumes and therefore resource efficiency and a circular economy has a key role to play in reducing city and organisational emissions.

The ten-year 'transitional' contract at the Tyseley Energy Recovery Facility (ERF) will form part of the climate solution by preventing Birmingham resident's non-recyclable waste being sent to landfill. The Tyseley ERF generates power from non-recyclable waste, that generated 184,157 MWh of electricity in 2021 equivalent to powering approximately 63,000 Birmingham households for 12 months, or 15% of the homes in Birmingham. Through the competitive dialogue, net zero and climate change were high on the agenda and with the scope for dialogue being deliberately wide to ensure that all potential options could be explored using industry knowledge from bidders. Through dialogue, options to increase recycling and re-use, mitigate carbon emissions through the avoided emissions from generating electricity for Birmingham households and near zero unavoidable landfill were discussed. Nationally, the move away from landfill to energy recovery resulted in a 63% reduction in the waste sector's carbon emissions since 1990, since on average every tonne of waste treated at Tyseley energy recovery facility saves 0.2 tonnes of carbon dioxide compared with landfill. This transitional contract has been procured for a minimum term of ten-years to focus on the post 2034 solution procurement strategy, to consider tried and tested innovative technologies when they become available in the market.

Planning policy is a significant lever for driving resource efficiency and the Council has existing policy within the local plan that requires sustainable construction practices to be adopted on all new developments. New circular economies to harness e.g. heat, carbon dioxide emissions or repurposing waste arisings can also present economic opportunities. An existing circular economy project in Birmingham uses wood waste from urban parks and roadsides to capture carbon in a biochar suitable for reuse in tree planting. This project is run by Aston University in partnership with the Council.

Alongside initial work on a net zero-aligned strategy for waste management in the city, the Council is exploring a wide range of opportunities including the reduction of operational emissions in the waste vehicle fleet and providing facilities to support reuse and repurposing of materials and products. New technologies to support the carbon emissions reduction of waste management process will also be further explored in 2023.

Waste & Circular Economy: Wave 1 Project Updates

Waste Fleet – Hydrogen/EV Fleet Demonstrator

- Actions and achievements this year: The service has been in contact with Officers in St Helens to learn about their first Hydrogen Refuse Truck whilst we wait for a trial. The service has had a successful trail with EV collector and are working with Finance colleagues to find an option to renew the remaining refuse vehicles. Discussions are ongoing to move to hydrotreated

vegetable oil, (HVO) fuel instead of diesel. A new fuel contract has been let and the option of HVO is available.

- Challenges/Barriers: The challenge with changing the fleet is electric vehicles are double the price of diesel and hydrogen powered vehicles are double the price of electric vehicles. HVO is also more expensive than plain diesel.
- Next steps: To be confirmed.
- If possible, any identified carbon emission savings: Not known.

Total Waste Strategy

- Actions and achievements this year: Commissioned by Route to Net Zero team to support BDP review, identify operational opportunities and priorities for waste reduction and circular economy. Now being taken forward as a joint strategy with waste management team. Potential to be first strategy to align resource efficiency and circular economy with carbon emissions reductions. The Environment Act 2021 includes implications for waste including:
 - Introduction of deposit schemes
 - Charges for single use items
 - Food waste collected once a week and other recyclables separated out
 - Electronic waste tagging
 - Waste licencing and charging.



These emerging changes to legislation will need to be considered as part of the strategy. The Strategy aims to consider short, medium and long term priorities.

- Challenges/Barriers: Large and complex piece of work, rapid development in new technical solutions, long lead in times for significant changes.
- Next steps: Develop total waste strategy aligned with emissions reduction ambitions and circular economy opportunities.
- If possible, any identified carbon emission savings: Will be identified as part of strategy development.

[Waste & Circular Economy: New Projects](#)

Recycling and the Alternative Treatments of Waste to Reduce Carbon Emissions

- Actions and achievements this year: The service introduced a mobile household recycling centre scheme to make it easy for residents to recycle and dispose of unwanted items. This has visited each Ward in the City and will continue to do so over the next 12 months. The HWRCs have introduced a scheme to help residents sort their materials once they visit the site. This has ensured everything that can be recycled is before the



remaining items go to the ERF plant. We have been working closely with our Disposal partner, which has led to a number of new recycling options being introduced including mattresses, paint and hard plastics. The new reuse shop at Tyseley recycling centre is going from strength to strength. All items too good to be fully recycled are being sent to the reuse shop to be sold on at a very reduce rate. Containers are now at all HWRCs to capture any items that are in a good condition and take them to the Tyseley reuse shop.

- Challenges/Barriers: The Environment Act is being monitored and preparation work has been undertaken to look at what are the implications for the introduction of food waste collections. However, unfortunately within existing budgets we are unable to implement this scheme without financial support from central Government.
- Next steps: This exploration of new recycling markets will continue to be implemented. We will continue to develop the reuse shop and are in the process of offering free start up packages for new housing tenants. The use of mobile recycling centres will continue and will be promoted through leaflets and open days
- If possible, any identified carbon emission savings: Not known.

Nature and the Environment

[Nature and the Environment: Summary](#)

In tackling climate change, it is important to recognise the dual importance of climate change mitigation and adaptation and nature resilience. Adaptation and nature resilience are important for a number of reasons, including reducing the risk of flooding, moderating local temperature, reducing pollution and improving soil quality. Trees and other foliage are also a natural form of carbon sequestration.

Nature and the Environment is an area of particular strength in the city. Birmingham is recognised by the United Nations Farming and Agriculture Organisation as a Tree City of the World. During 2022, Birmingham was awarded the Queens Green Canopy Champion City for the work undertaken in partnership with Birmingham Trees for Life in engaging local residents in tree planting. The City's Urban Forest Masterplan is the first of its kind in the UK and follows a model widely used in the US and Canada. In creating the plan, Birmingham took a strategic approach to its urban forest by engaging experts and key stakeholders to help it prepare an Urban Forest Master Plan. Now complete, the Plan will help Birmingham work towards a vision for its trees that is sustainable into the future. In partnership with Birmingham Tree People, the City has launched a digital platform for identifying where tree planting is most needed to deliver climate change regulation services. This will be key in plotting future tree planting.

From 2023, the Council's climate emergency response will bring together key teams working on both climate change mitigation and adaptation and nature resilience to jointly tackle the City's climate challenges.

[Nature and the Environment: Wave 1 Project Updates](#)

Urban Forest Masterplan

- Actions and achievements this year: The Urban Forest Master Plan continues to draw interest from around the UK Local Authorities, and Government Departments alike. Birmingham has presented on the plan and Urban Forestry at a number of online national seminars and training sessions over the course of 2022, most recently presenting for the Forestry Commission on the topic of Woods for Nature – an urban case study and for the Town and Country Planning Association/ Green Infrastructure Partnership on Urban Forestry as part of their seminar series "A new era for green infrastructure". In partnership with the National Trust, Woodland Trust and Community Forest Trust a successful bid was submitted to the Trees Call for Action Fund. This programme will be delivered between now and September 2024
- Challenges/Barriers: The changes required to implement the plan require systemic changes in the way we as a City Council work plus a need to increase both internal and external capacity around strategic planning, delivery, community engagement and sustainable funding.
- Next steps: The Trees Call for Action Fund grant will deliver an Urban Forest Accelerator national pilot in Birmingham. This pilot will work on how to deliver some of the trickier areas of the adopted Urban Forest Master Plan such as sustainable finance and working with hard-to-reach communities. In addition, it will seek to devise a 5-year strategic tree planting plan building on the prioritisation mapping for tree equity and climate adaptation delivered in partnership with Birmingham Tree People. Learning outcomes from the pilot will be shared nationally as part of a tool kit.
- If possible, any identified carbon emission savings: Sustaining and increasing urban canopy cover improves the delivery of essential ecosystem services providing increased benefits in

terms of climate adaptation to local communities. Trees do sequester carbon, decrease flood risk and cool air around thereby providing indirect carbon savings.

[Nature and the Environment: New Projects](#)

City of Nature

- Actions and achievements this year: In February 2022 the City of Nature 25 Year Plan was approved for adoption. This City of Nature Plan will change the way in which the city treats its natural environment and how it thinks about the future of its parks and green spaces. Opening more equitable access by ensuring all its green spaces achieve the Birmingham Future Parks Standardise a way of assessing green spaces that is a direct response to the issue of environmental justice. Funding has been secured to deliver the next phase of project work to deliver the City of Nature Plan under a banner of the Urban Nature Development Programme. City of Nature Plan has earned a prestigious regional award. The Council-backed Birmingham City of Nature Plan won the Judges' Award at this year's West Midlands National Park (WMNP) Awards.
- Challenges/Barriers: The changes required to implement the plan require systemic changes in the way we as a City Council work plus a need to increase both internal and external capacity around strategic planning, delivery, community engagement and sustainable funding.
- Next steps: We continue to work with the City of Nature Alliance and build on the work already underway in the Bordesley and Highgate Ward in considering parks in that Ward against the Birmingham Future Parks Standard and implementing required actions to bring them up to that standard. Castle Vale, Nechells and Balsall Heath West are the next priority wards for roll out of the Future Parks Standard. This is comprised of three projects; one will work on devising our Local Nature Recovery Network to deliver a schedule of sites for delivery of Biodiversity Net Gain ahead of the full mandate contained in the Environment Act 2021, a second will draw up a green infrastructure masterplan for the East Birmingham Inclusive Growth Area. The final project will be Nature on your Doorstep, this will engage communities with their green space through the Future Parks Standard Process and help identify local Green Champions.
- If possible, any identified carbon emission savings: Not known, however improving local green spaces through changes in management or creation of new habitats improves the delivery of essential ecosystem services providing increased benefits in terms of climate adaptation to local communities. Natural habitats sequester carbon, decrease flood risk and cool air around thereby providing indirect carbon savings.

Biochar Trial

- Actions and achievements this year: Working in partnership with the Energy from Bioproducts Research Institute (EBRI) we have installed a demonstration and test facility at Birmingham's plant production nursery at Cofon Park. Biochar as a product when produced from timber (derived from our cyclical urban forest management) can have many applications including use in tree planting. When used in such a way it can improve water retention in soils and increase plant growth and resilience to a number of climate related impacts. This facility also has a range of by-products that can be used in industry while surplus heat is used to warm the polytunnel used for growing on seedling plants.
- Challenges/Barriers: This technology and applications are still in relative infancy but show great potential for delivering low carbon products along with carbon sequestration through

use of the biochar itself. Exploring and developing the technology and breaking into new markets is a key theme of EBRI's work.

- Next steps: We will continue to support the Biochar trial and are looking to utilise the char product in our tree planting programmes. Teaming up with EBRI and Cranfield University trials will be undertaken to look at the effectiveness of biochar in several plant growth situations such as our tree planting programme but also when incorporated into soil mediums as a means of phasing out the use of Peat in plant production.
- If possible, any identified carbon emission savings: Biochar and its production has great potential to reduce carbon emissions through the sustainable use of natural materials and application of by-products. Biochar production plants are being trialled in Sweden as part of a decentralised district heat network thereby reducing the direct consumption of power generated from fossil fuel resources.

National Trust Collaboration

- Actions and achievements this year: Building on the previous Future Parks Accelerator project, discussions are underway with the National Trust regarding the Council's aspiration to become a City of Nature by prioritising the value of green and blue infrastructure to address the global climate, biodiversity and health crises. The collaboration will focus on the East Birmingham geography to create a route map for delivery of green infrastructure and nature-based solutions to the challenges the area faces. This in turn will inform the wider approach to improving the quality of and access to nature at the city, regional, national and European levels. The partners will work with the community and stakeholders in the city to develop transformational improvement to Birmingham's green infrastructure, address inequitable access and maximise the benefits to local people. The partnership will also work together to identify and develop new and emerging funding and finance opportunities that support the creation, improvement and ongoing maintenance of green infrastructure. In support of this emerging collaboration, a Green Infrastructure Vision has been prepared for the East Birmingham Board. The Vision identifies the need to bring together various elements to deliver a comprehensive approach to Green Infrastructure. Based on this shared vision, a Green Infrastructure Action Plan will be prepared over the next twelve months setting out this approach, addressing the following key areas:
 - Greening the Grey – enhancing the ecology and amenity value of places where there is little or no Green Infrastructure
 - Improving Parks and Green Spaces – improving parks in East Birmingham to at least the Fair Parks Standard
 - Transport – maximising the potential of Green Infrastructure as part of the active travel network
- Challenges/Barriers: Delivering large-scale improvements to Green Infrastructure with strong community involvement and empowerment will require a very significant resource and capacity commitment from the Council and its partners. This will be addressed through the partnership development and funding and finance activities which are currently underway.
- Next steps: The next step will be to work with the National Trust to develop proposals for further and greater collaboration with the City Council, focussed on the East Birmingham area.
- If possible, any identified carbon emission savings: Not known.

The Scale of Funding Secured for Nature & Environment

During 2022 there are number of projects related to the natural environment that have been either in delivery or commenced during this period. These include:

- Natural Rivers and Green Corridors
- Naturally Birmingham – Future Parks Accelerator
- Urban Forest Accelerator
- Urban Nature Development Programme

Several of these have been or are multi-year delivery. These projects have generally been led or co delivered by BCC with staff from Place, Prosperity and Sustainability, Public Health and City Operations. These projects either directly or as a co- benefit have supported the climate change agenda through delivery of climate adaptation and resilience benefits as well as biodiversity.

Funding for these projects has been (mainly) though external grants. **Total funding secured is £8,331,357.**

The above cumulative figure does not account for the tangible direct and indirect savings delivered through reduced impacts of climate change (reduced incidents of flooding for example) or the intangible in-kind value of volunteering enabled through the engagement and delivery of these projects and the mental health and well-being benefits derived for them and the wider communities.

CASE STUDY: Riparian projects

Several projects have and are being delivered which will both improve the natural environment and provide improved flood resilience. The final stages of the 3 year long Natural Rivers and Green corridors project are being delivered this year and up to the end of March 2023. This project has delivered habitat enhancement and in channel river morphology improvements through the River Rea upper catchment in conjunction with a major Environment Agency flood defence project on the River Tame in Sandwell Valley. This work when combined will decrease the flood risk for 1000's of properties in Birmingham.



The Hatchford Brook in Sheldon was also subject to some re-naturalisation work to decrease localised flood risk and improve the aquatic habitat for invertebrates. The River Rea through Stirchley and on to Cannon Hill Park has been subject to several weir removals and reprofiling of the channel including removal of engineered embankments again improving localised flood resilience and increased opportunities for isolated fish populations to repopulate previously

BCC is working with partners such as the Environment Agency to identify a range of opportunities for funding future works. An initial business case has been submitted by the EA to their internal funding programme to secure a further £500k to deliver a second phase of the Natural Rivers and Green Corridors project over the period 2023 – 2025. This work will contribute to the overall citywide Flood Risk Plan.

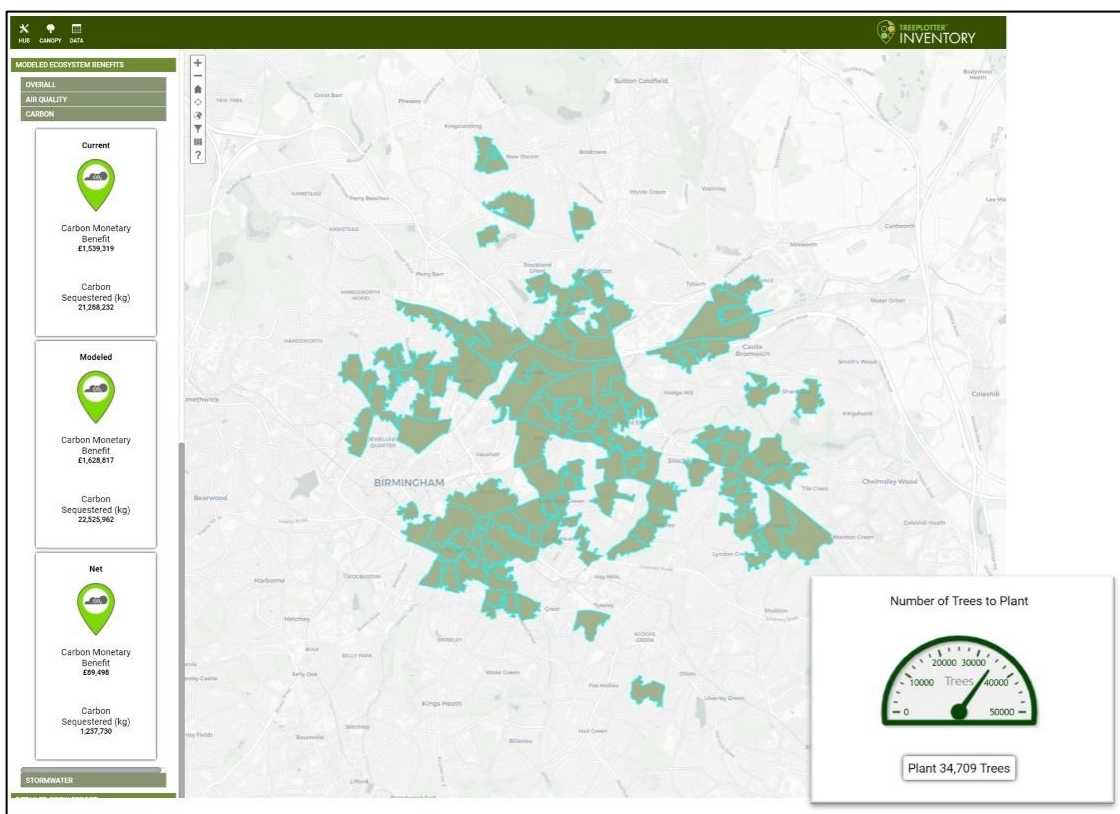
CASE STUDY: Tree Planting

Birmingham is recognised by the United Nations Farming and Agriculture Organisation as a Tree City of the World.

This award is given to cities that demonstrate they have robust plans and process in place for the sustainable management of trees within their area. In addition, it recognises the value that trees play in climate change regulation, carbon sequestration and promotion of mental health and well-being for residents of the city. In November 2021 Birmingham launched the UK's first comprehensive Urban Forest Master Plan which sets out the ambition for management and growth to 2051.

To support the aims and objectives of the Urban Forest Master Plan the city has in 2021/22:

- Supported the planting of 500 fruit and flowering trees as part of the National Trust's Blossom Together programme (these are a mix of private properties, community centres, parks, businesses etc.)
- Supported the planting of 12 acres of new woodland (17,000 trees) as part of the Commonwealth Games Legacy Woodland scheme.
- Supported the delivery of 8 Tiny Forests within Birmingham Schools
- Dedicated new tree plantings to the Queens Green Canopy project as part of the Platinum Jubilee celebrations
- Been recognised as a Queens Green Canopy Champion City for the work undertaken in partnership with Birmingham Trees for Life in engaging local residents in tree planting.
- Continued our Highway tree replacement planting scheme
- Supported the delivery of trees and urban greening through a number of public realm improvement schemes
- In partnership with Birmingham Tree People launched a digital platform for identifying where tree planting is most needed to deliver climate change regulation services.



Procurement

Procurement: Summary

A large proportion of the Council's own organisational impact is from the indirect emissions resulting from Council procurement – meaning procurement provides a key opportunity to reduce carbon emissions. To tackle this challenge, procurement has been created as a new defined theme in the Council programme of work. Over the last year, mechanisms have been incorporated into procurement arrangements to enable service areas to set out how contracts to be tendered will support carbon emissions reductions. The programme of work to reduce supply chain impact and support procurement partners will grow in 2023.

Procurement: New Projects

EQUANS Housing Repairs Contract

- Actions and achievements this year: Discussed areas of delivery for reporting emissions, how to capture and in what format the report should take. Main areas of reporting for Responsive Repairs will include Employee commute, Fleet and Business Mileage, Waste Created, electric fleet charging, transport of materials for main supply chain. Similar for Planned maintenance but will also include onsite electricity and gas usage.
- Challenges/Barriers: Identified areas of work which are difficult to report on e.g., supply chain very small companies do not record their emissions. EQUANS needs to work with all of their supply chain providing advice and guidance on how to measure their emissions.
- Next steps: To agree reporting template and frequency of reporting
- If possible, any identified carbon emission savings: Not yet known, but will be collected.

Route to Net Zero Procurement & Investment Policy

- Actions and achievements this year: Mechanisms have been incorporated into the procurement governance arrangements to enable service areas to set out how contracts to be tendered will support carbon emissions reductions. Major programme of work planned to engage with supply chain on net zero and sustainability priorities, prepare businesses for net zero aligned procurement policy and develop the policy and performance framework to manage and capture progress.
- Challenges/Barriers: Need for specialist support to develop policy and performance framework and support supply chain engagement; need to ensure consistent standard for performance which emphasises need to work in partnership with wider public sector; large proportion of small and medium businesses supplying services to the Council who may not have considered environmental sustainability as part of business activity to date.
- Next steps: Understand pipeline of new contracts and renewals to prioritise support, access expertise and capacity to support policy development and supply chain engagement. Reducing CO₂ within the supply chain will lead to a number of benefits including:
 - Identification and adoption of innovation and technology to support CP sustainability management and reporting.
 - Greater engagement with local SMEs including signposting to organisations supporting businesses with net zero readiness and emissions performance monitoring.
 - Smarter KPI's and reporting on the decarbonisation of the supply chain.
 - Budget holders, contract managers and corporate procurement are trained on category management sustainability ask for BCC vendors and how to engage with vendors to establish contract level CO₂ reporting and plans to deliver decarbonisation of the Council's supply chain.

- BCC CP is recognised for work in promoting and embedding sustainability best practice within and across the Council
- Improved partnership working with strategic vendors
- Increased granularity of understanding on procurement carbon emissions impact
- Addressing high CO₂ generating spend categories identified in the Anthesis Report, accelerating progress towards BCC's CO₂ reduction target
- Transparency and measurable outputs on how BCC is reducing its scope 3 emissions impact.
- Supply chain readiness for net zero including investment readiness for business expansion given the increased focus on the Environmental, Social and Governance credentials of investments.
- If possible, any identified carbon emission savings: Cannot be attributed. Performance reporting from existing Council contract underway.

Procurement of Green Electricity

- Actions and achievements this year: BCC have procured green electricity (REGOs) through an energy framework for Council non-domestic consumption.
- Challenges/Barriers: Purchasing green electricity represents a carbon offset and not a true carbon emissions saving – the priority is to support real emissions reduction through demand reduction and renewable energy investment.
- Next steps: Supporting identification of, and investment in, action to reduce electricity demand and renewable electricity generation.
- If possible, any identified carbon emission savings: Annual carbon offset of 28,597 tonnes CO₂.



Behaviour Change & Engagement

Behaviour Change & Engagement: Summary

Birmingham's net zero ambition can only be realised through collective change by the council and by the city as a whole. Moreover, it is evident that much of this systemic change will need to come from behaviour change of our citizens, our staff, and our businesses.

As a large organisation, tackling our own emissions requires the council to consider net zero in all new projects. We have taken steps to achieve this through new mandatory environmental sustainability assessments on our cabinet reports. In addition to making net zero a priority at the strategic level, progress is being made to raise the awareness of climate change and the need to act among all our staff. By empowering council officers to put net zero at the forefront of their professional work we also benefit from their roles as individuals and members of their communities.

An exciting programme of engagement is being developed, recognising the need to work hand in hand with businesses and citizens. By engaging with a diverse range of voices we can ensure that Birmingham's progress towards net zero is just and equitable.

Behaviour Change & Engagement: Wave 1 Project Updates

Council Wide Route to Net Zero Comms Strategy

- Actions and achievements this year: A communications strategy will be required to support regular and transparent communication about Council and city-wide route to zero activity. Due to lack of capacity in year, priority has been given to website refresh and building relationships and communicating with stakeholders in the public, private and community sectors. The team is now working with communications officers to develop a clear communication forward plan.
- Challenges/Barriers: Net zero is a complex area which requires engagement across all stakeholders across the city.
- Next steps: Development of a more detailed communications strategy.
- If possible, any identified carbon emission savings: Does not produce savings within itself. Strategy is about communicating activities that do produce savings.

Environmental Sustainability Assessment

- Actions and achievements this year: An Environment and Sustainability Assessment (ESA) is an appraisal process which assesses the environmental impacts of projects and programmes. Sign off is required from the Route to Net Zero team on all ESA's. The ESA process was approved at Cabinet following two trials, ESA now a requirement of all Cabinet reports.
- Challenges/Barriers: Knowledge required to identify carbon emissions reduction and environmental sustainability priorities as part of projects or policies. Awareness of ESA requirement.
- Next steps: Continue to assess ESA's and deliver training to ensure staff familiarisation with purpose and requirements. Strengthen responses by seeking engagement at early stage of project or policy development.
- If possible, any identified carbon emission savings: ESA does not currently calculate potential carbon emissions savings. This will be considered as part of strengthened methodology.

Behaviour Change & Engagement: New Projects

Carbon Literacy Training

- Actions and achievements this year: A pilot training session was delivered to 12 staff in November. Feedback has been gathered to gauge whether the training was effective in growing knowledge and understanding and is therefore beneficial to staff. Additional training has also been delivered to Councillors around retrofit.
- Challenges/Barriers: Funding – the training is affordable at a cost of £10 per person, however the long-term costs associated with delivering the training are significant.
- Next steps: To review feedback and identify potential improvements to the training, and subject to agreement, write a business case to fund carbon literacy training long term.
- If possible, any identified carbon emission savings: The Carbon Literacy Project estimates that those who complete the course make action pledges which on average results in a reduction of 3.6 tonnes of CO₂ per person.

Route to Net Zero Website Update

- Actions and achievements this year: The team has drastically updated the Climate Change section of the BCC website to rationalise content and deliver 3 purposes: 1) Inform residents about what climate change is. 2) Provide accountability over what action the Council is taking. 3) Signpost residents, community groups, and businesses towards useful resources to help them take action.
- Challenges/Barriers: The lengthy process to get website updated was not anticipated.
- Next steps: Maintain and update with any new developments. There is the possibility to expand the signposting and advice section of the website to provide more information.
- If possible, any identified carbon emission savings: Not possible to quantify.

Schools Air Quality Monitoring

- Actions and achievements this year: Birmingham's Clean Air Strategy includes a pledge to improve air quality monitoring at schools across the city. The first phase of the project is currently underway that aims to install an air quality sensor at a rate of one sensor in every council ward in Birmingham (a total of 69 sensors). The sensors are supplied by Airly and monitor for a range of pollutants including Nitrogen Dioxide and Particulate, the results are in real-time and can be viewed at [Air Quality Map - Check air pollution in your area - MyAirly](#). The project aims to increase the understanding of the air quality around schools and to engage students, teachers and the wider public how positive behaviour change can help improve air quality.
- Challenges/Barriers: The main challenge encountered has been the installation of sensors. In some wards it has been a challenge to encourage schools to have a sensor installed and has required a significant amount of proactive engagement. A survey is due to be undertaken to better understand these barriers.
- Next steps: The next phase of the project is due to commence later this year in which an air quality sensor will be offered to every school in Birmingham.
- If possible, any identified carbon emission savings: Not possible to quantify.



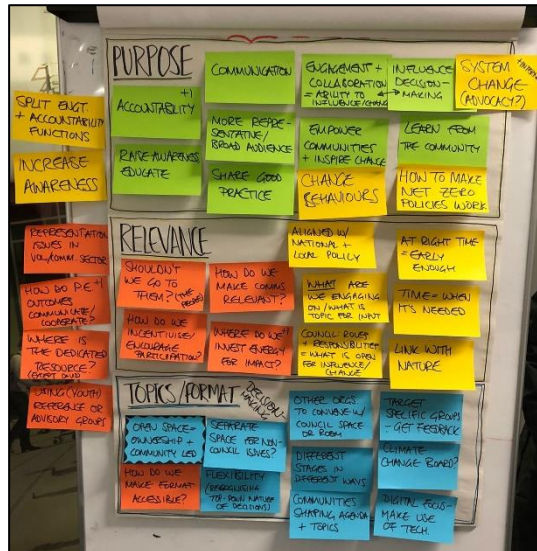
3 Cities Retrofit Collaboration

- Actions and achievements this year: The 3 Cities is a unique collaboration between the cities of Birmingham, Coventry and Wolverhampton, working together to make our cities great places to live, work and play. By working together, we aim to bring additionality, driving pace and scale in addressing complex retrofit issues and opportunities together. 3 Cities Retrofit aims to develop an integrated programme reflecting the diversity of needs and housing portfolios of each city. The 3 Cities submitted three individual bids to BEIS' SHDF Wave 2.1, towards a capital programme totalling over £190m and representing a significant proportion of the total funding available. These included joint 3 Cities commitments across key enablers including skills and training development, sharing of best practice and lessons learnt, procurement and supply chain development. These bids were also aligned with the West Midlands Combined Authority's consortium bid. We expect to hear back in quarter 1 2023. Have held discussions with private finance to explore the options to address the UK's funding gap for retrofit. We are now progressing an investible retrofit funding model for social housing ahead of further engagement with potential partners.
- Challenges/Barriers: SHDF application is unsuccessful.
- Next steps: Pilot will establish basis for future retrofit of similar homes.
- If possible, any identified carbon emission savings: Collaborative work intended to scale up delivery of significant carbon emissions savings but none directly attributable to collaboration itself.

Community Assembly Review

- Context: The Community Assembly was born out of the Route to Net Zero Taskforce and met 3 times from June 2021 to February 2022. Sessions and talks were delivered on the clean air zone, transport plans, and the natural environment. Questions have been raised about how to improve the assembly and make it more useful to attendees and the Council, therefore the team are reviewing options.
- Actions and achievements this year: Attended Local Climate Engagement Training delivered by Involve UK and applied learning to the Community Assembly. Discussed options to take the assembly forward with the Cabinet Member for Environment, organised internal workshop on public engagement for Transport, Planning, and Housing to share public engagement knowledge and discuss how to improve the Community Assembly. Conducted a survey with existing members of the Community Assembly, to gather their opinions on progress to date.
- Challenges/Barriers: Creating a platform for meaningful engagement, ensuring inclusive participation and representation.

- Next steps: Agree next steps for the Community Assembly and commence engagement activity to review this with existing members. To ensure we maintain a good frequency of communications whilst developing a behaviour change and engagement plan that will ensure wider engagement. Including more direct involvement with greener together former and greater frequency of communication on city council activities.
- If possible, any identified carbon emission savings: Not applicable.



Climate Justice Staff Network

- Actions and achievements this year: A proposal has been submitted to establish a Climate Action Network at Birmingham City Council for staff members. This aims to help empower staff to make climate conscious actions in their work and personal lives.
- Challenges/Barriers: Encouraging sign up of staff, making the outputs of the network genuinely useful.
- Next steps: Presenting the proposal to the Diversity Alliance Network.
- If possible, any identified carbon emission savings: Not applicable.

Centre for Sustainable Energy Training

- Actions and achievements this year: The Centre for Sustainable Energy delivered 4 2-hour general carbon literacy training to Council staff. Approximately 70 staff were trained. 2 tailored planning training sessions, each lasting 3 hours, were also delivered by members of the Route to Net Zero team and were received well.
- Challenges/Barriers: The lack of engagement when attending training online rather than in person, time commitment to training.
- Next steps: The successes of this training created the appetite for the team to further explore and implement a wider Council wide training programme (see carbon literacy training).
- If possible, any identified carbon emission savings: Not applicable.



Community and Business Stakeholder Engagement

- Actions and achievements this year: Helped join up efforts to engage businesses on climate change by various stakeholders. Signposted on our website and participated in the West Midlands Net Zero Business Pledge scheme. Presented at and participated in the Chamber of Commerce's sustainability series. Proposed introduction of a business mentoring scheme to encourage knowledge sharing across organisations – now being trialled by Greater Birmingham Chamber of Commerce. Supply chain workshops have been run with major contractors to build reporting framework on net zero and sustainability and inform new policy development. The council have worked with local community groups MECC Trust and Acocks Greener to work with communities within Balsall Heath and Acocks Green around LADs 3. These local community organisations then engaged with the community through retrofit cafes, events, briefing sessions and street by street door knocking to promote the benefits of retrofit for residents and households.
- Challenges/Barriers: Due to Birmingham's large geographic area and population, being at all relevant events and meetings can be a challenge with limited resources. Next steps: Continue to build partnership working with business support organisations and networks.
- If possible, any identified carbon emission savings: Not applicable.

Cost of Living Programme

- Actions and achievements this year: Route to zero team have been engaged with the Cost-of-Living Emergency Working Group to lead on the energy efficiency workstream and identify and establish support mechanisms and access to energy efficiency measures. Alongside signposting advice and referrals to grant funding schemes, a range of other sources of support are being established.
- Challenges/Barriers: Limited capacity in energy advice services, speed of mobilisation.
- Next steps: Continue to implement existing mechanisms and support services and ways to build continuity and capacity.
- If possible, any identified carbon emission savings: Energy efficiency advice and grants to support retrofit measures may lead to savings.

CASE STUDY: Retrofit reimagined case study – Birmingham Settlement, Edgbaston Reservoir

“What if the climate transition and retrofit of our homes and streets were designed, owned and governed by the people who live there?”

The participants at the Retrofit Re-imagined festival in July 22 sought some answers to this question through four days of events and talks. Some of the solutions were for residents to be part of the retrofit solution by doing some of the work themselves, forming district heat networks, supporting each other to use less energy and by raising awareness of the climate crisis and how to adapt to increasing temperatures. The event was organised by John Christophers from the Zero Carbon House, Dark Matter Labs, Civic Square, Architects Climate Action Network and New Economics Foundation.



CASE STUDY: Place, Prosperity and Sustainability Away Day



After volunteering to work on the organising committee of the Place Prosperity and Sustainability directorate away day (held on the 7th of September at the Rep Theatre) the team used the event as an opportunity to promote awareness of climate change issues and the built environment which the directorate works on. Having previously seen Immy Kaur and Indy Johar speak at another Birmingham event, the team booked the pair to present a powerful talk followed by an on-stage Q&A with Route to Net Zero Assistant Director.

The talk was well received by staff and directors alike, with the Strategic Director extending the allotted time of the talk. The event led to some very serious and frank discussions around the work required by the directorate in this area and Indy also offered to return to speak to specific departments about climate change and the built environment. Overall, we were able to use the away day to raise the profile and awareness of the net zero work and commitment of the Council, helping embed it within departments across the Council.

Communications

Communications: Summary

Communications on climate change and our route to net zero journey are central to achieving our goals. Climate change communication is about simultaneously educating, inspiring and motivating residents to take their own actions to tackle climate change. Events that have taken place this year, including the Commonwealth Games, which had sustainability at its heart, and the PoliNations festival have helped to spread the messages of the climate change, nature and net zero programme. BCC is also a member of a number of groups who the City communicates with and who in turn communicate with local residents. Moving forward, a strong communications plan will be crucial to ensuring the residents of Birmingham are informed on and engaged with the actions the Council is taking on climate change.

Communications: New Projects

Sustainability in the Commonwealth Games Major Events

- Actions and achievements this year: Birmingham hosted the Commonwealth Games (CWG) which aimed to be the most sustainable Games yet and will have a carbon neutral legacy. Following extensive engagement with key stakeholders, businesses, business networks and citizens, and effective planning by TfWM and BCC, the efforts to promote the use of active travel and public transport during Commonwealth Games were considered a resounding success. During the Games, 650,000 spectator journeys were carried out on spectator shuttle buses, while Metro patronage doubled compared to its pre-pandemic level. In addition, there were 28,000 cycle hires during the Games and a record 255,000 passengers travelled through Birmingham New Street station on August 6th. The success of travel planning during the Commonwealth Games demonstrates that large-scale travel behaviour change is possible and provides a hopeful basis for future interventions.
- Challenges/Barriers: Achieving net zero for international events requires the use of offsetting which is a challenge.
- Next steps: The World Trampoline Championships will be held in Birmingham in 2023 and Birmingham will also be welcoming the European Athletics Championships in 2026. Learning from the CWG approach, each event has a Sustainability plan and should commit to be net zero. Next step is to support events' organisers with carbon emission monitoring and offsetting (if needed).
- If possible, any identified carbon emission savings: Not yet known

Sustainable Tourism Hub

- Actions and achievements this year: The Council are working with Sustainability West Midlands to develop online training modules and guides to support Birmingham's Visitor Economy businesses in their journeys to become more environmentally sustainable. Access to the support will be free and topics including business benefits, utilities, food and drink, waste and recycling and marketing their sustainability will be illustrated with videos, toolkits and local case studies. It is a challenging time for the sector during the current economic climate, however the hub aims to make a compelling case for businesses to become more adaptable and resilient to rising energy prices and other shocks.
- Challenges/Barriers: None identified to date.

- Next steps: Training content is currently being finalised and reviewed before being uploaded to visitbirmingham.com. The Sustainable Tourism Hub is due to launch in late January/ early February 2023.
- If possible, any identified carbon emission savings: Engagement will indirectly lead to carbon savings.

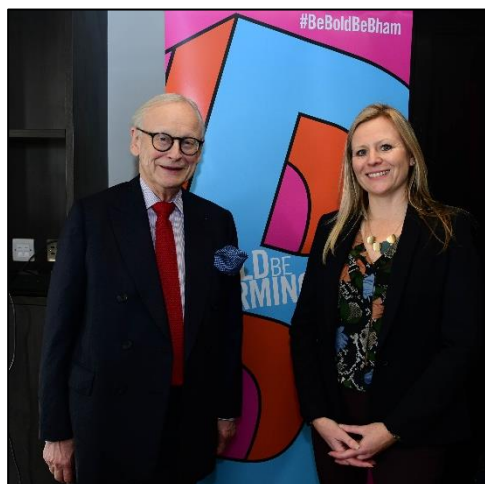
Group memberships

In addition to the above, BCC is also a member of a number of groups:

- Birmingham and Solihull NHS Green Board – collaboration group of all NHS Trusts. Board member represents BCC.
- Net Zero Directors – run by West Midlands Combined Authority - group of senior officers leading on net zero across the region
- Net Zero Officers Group – run by West Midlands Combined Authority – network for net zero Council officers in the region
- Core Cities Low Carbon Energy and Resilience Hub
- Sustainable Housing Action Partnership – BCC are members and AD of Route to Net Zero is both a member and chair of the group.
- Birmingham Voluntary Service Council - Energy & Environment Group
- WMCA Net Zero Business Pledge Network

CASE STUDY – Birmingham first UK city to host the UK’s Climate Change Committee (CCC)

Birmingham was selected as the first city in the UK to host the Climate Change Committee (CCC) to mark the start of the CCC’s “climate conversation” initiative. The CCC, chaired by Lord Deben, is an independent, statutory body, which advises the UK and devolved governments on emissions targets. The visit took place in February 2022, during which time the Committee meet with a range of groups, including college students, faith and business leaders as well as members of the City Council’s cabinet and leadership team. The CCC also visited Tyseley Energy Park (TEP) to see a demonstration of Birmingham City Council’s Hydrogen Bus fleet. The demonstration took place at TEP’s low and zero carbon refuelling station, home to the UK’s largest green hydrogen refuelling facility.



CASE STUDY: The Route to Net Zero Team



As of April 2022, a substantive route to zero carbon team has been in place. Having the resource of a dedicated team has enabled team members to attend meetings and present to other directorates to spread the route to zero message. Presentations have been given to various other Council departments. We have also delivered talks at: Forum for the Built Environment, Tomorrow's Net Zero Conference, Housing 2022 Annual Conference, Planning Portal and Royal Town Planning Institute National Conference and Birmingham Retrofit Summit.

CASE STUDY: Project 80 - Midland Heart



Midland Heart have worked with partners from Birmingham City University to develop Project 80. Project 80 is an initial development of 12 homes in Birmingham that meets the Future Homes Standard three years ahead of schedule. These developments are believed to be the first of their kind in the country and the average home will have 80% less carbon emissions than one built now. The first 12 homes are being delivered on Eco Drive in Handsworth. The homes have been designed to provide superior insulation, as well as incorporating low and zero carbon technologies such as air-source heat pumps, hot water heat pumps and wastewater heat recovery. Midland Heart have also started work on 12 Future Homes maisonettes on Elvetham Road in Edgbaston, where they will explore different methods of achieving the FHS.

CASE STUDY – PoliNations



The PoliNations events transformed Victoria Square in the City Centre into a vibrant living oasis filled with thousands of plants and brought to life through free garden tours, audio baths, live music and light shows, costume design workshops, sensory experiences, poetry and performance. Created by Trigger Collective, the event was held between 2nd - 18th September 2022 and was a resounding success with many thousands of visitors.

The event was inspired by the fact that 80% of plants found in UK city-gardens originate from overseas. Audiences discovered a super garden in Birmingham's City Centre, with giant architectural trees and thousands of colourful living plants beautifully arranged in zones ranging from meadows to forest. Across two long weekends, a community planting weekend, and a daily programme of inspiring activity, PoliNations presented artist commissions, talks, workshops, garden tours, and performances spanning live music, spoken word, dance, and drag. All events were free and open to everyone. As part of a partnership with Birmingham City Council, plants from the PoliNations garden will be reused to re-green the city.

Digital & Data

Digital & Data: Summary

Over the last year, a new Strategy, Equality & Partnerships lead has been recruited, alongside a new team working on Partnerships Insight and Prevention. Expertise sits within this new team around data and digital, and as a result a decision was made to create a new theme around digital and data. Good work is already underway internally, as well as in coordination with the City's universities. The use of digital GIS systems for the creation of the emerging Climate Risk and Vulnerability Assessment makes Birmingham the second city in the UK to have a fully compliant Climate Risk & Vulnerability Assessment. Moving forward, the use of digital and data solutions will be central to how the council gathers, analyses and presents future climate change data.

Digital & Data: New Projects

Digital Twin for Tyseley (TEED)

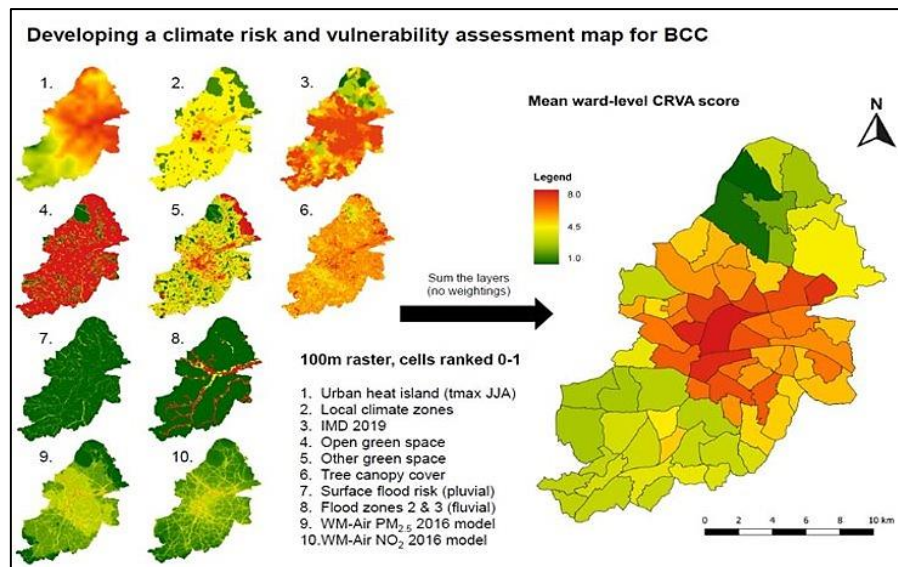
- Actions and achievements this year: The Digital Twin working group has been established. The work associated with mapping out the physical grid connections is well underway. The scanning of TEED will be early next year. The work is funded (£240k) by UoB and funding agreements are now in place and this phase of the project needs to be complete by end of March 2023.
- Challenges/Barriers: Contracts and agreements
- Next steps: This activity links into a Strategic Investment Fund bid led by National Grid to develop the energy infrastructure across TEED. The Digital Twin will be used in this project if it is funded.
- If possible, any identified carbon emission savings: None as yet.

Driving Urban Transitions Call

- Actions and achievements this year: BCC are working with Aston Uni/BCU on a bid which offers opportunities for transnational cooperation and transdisciplinary cooperation along three transition pathways, and in particular for the purposes of the 15-minute transition pathway. The purpose of the pathway is to facilitate analysis, elaboration, experimenting and testing of innovations to develop 15-minute cities in co-creative settings, and bring this together in a portfolio of 50+ experiences and practices, recognising different urban contexts and focusing on transferability. Birmingham City Council is currently carrying out a pilot of the 15-minute concept in the area of Bordesley Green, East Birmingham which is known locally as the Healthy Living Zone initiative. The work of the pilot will lead to a project prospectus of possible interventions to deliver on the concept within the pilot area.
- Challenges/Barriers: Co-ordination of policies from different directorates within BCC and responding to the views and needs of local people and businesses.
- Next steps: Undertake research with Aston University and implement some pilot changes in Bordesley Green.
- If possible, any identified carbon emission savings: Not yet known.

Climate Risk and Vulnerability Assessment

- Actions and achievements this year: In February 2022 Birmingham City Council adopted an Environmental Justice Map for Birmingham, which added 4 new GIS layers on top of the Index of Multiple Deprivation, which we believe to be a UK first. BCC's central GIS team have agreed to work with the University research team, to re-work the existing Environmental Justice Map for Birmingham, by introducing these missing GIS layers. This would make Birmingham the second city in the UK to have a fully compliant Climate Risk & Vulnerability Assessment. A summary of outputs can be seen below.



- Challenges/Barriers: The major challenges have been to locate the missing data layers and apply for a formal working ticket for the precious time of the BCC central GIS team's time. Both of these challenges have now been met. Additionally, is ensuring that the mathematical assessments required to generate the final CRVA Map do not double count any element, on top of the existing baseline IMD data layers.
- Next steps: The WM-Air University research team and the BCC central GIS team are making the data available as a GIS tool. The intention of the CRVA is that this will inform all Council policy, including the revised Birmingham Development Plan by making visible to contrasting zones of impact of both climate change and nature deficit, across the city. This new map would then form part of, to help inform future development decisions in the city. The map will be available in early 2023.
- If possible, any identified carbon emission savings: The Climate Risk and Vulnerability Assessment Map is a policy driver for change, so will not in itself represent a carbon saving. However, its adoption is a key driver for accelerated change for Birmingham City Council and all its stakeholders and partners. It will lead to immediate changes to development and service requirements, each of which will result in their own discreet carbon and nature enhancements for the city. By creating such a visual impactful map this will also help lead to the accelerated delivery of a 'Just Transition'; in so far as making very visible to distinct inequalities of current quality of life experienced by different citizens of the city; just as a result of their geographic location.

Digitalisation in Housing Retrofit

- Actions and achievements this year: Increasing digitalisation of services and products in the city. Head of Digital City and Innovation is leading on a 'data lake' to aggregate anonymised live data. Successful bid enables sensors to be installed in the 3 Cities whole house retrofit houses and at least 9 from other archetypes to provide comparison data.
- Challenges/Barriers: Unsuccessful bid prevents roll out.
- Next steps: Successful bid enables sensors to be installed in the 3 Cities whole house retrofit houses and at least 9 from other archetypes to provide comparison data.
- If possible, any identified carbon emission savings: Data will start to be captured on building completion.

Decarbonomics – Energy and Carbon Asset Management Tool

- Actions and achievements this year: Faithful and Gould have been commissioned to assess the BCC owned buildings using their Decarbonomics tool. Detailed data on BCC buildings energy use and models for how this can be decreased will be developed.
- Challenges/Barriers: None
- Next steps: Support Corporate Landlord with a decarbonisation strategy for BCC owned properties
- If possible, any identified carbon emission savings: No direct savings.

Centre for Sustainable Energy 3D Project

- Actions and achievements this year: Project 3D, run jointly between CSE and BCC was a 2 year long initiative to help decarbonise Birmingham within a decade. CSE worked alongside Birmingham City Council and local community partners to:
 - Establish an energy data hub.
 - Engage with a wide range of stakeholders, including through training and demonstrations.
 - Support city wide applications of the data as well as local community projects using data to help reduce carbon emissions.
 - Evaluate the project and share our learning.

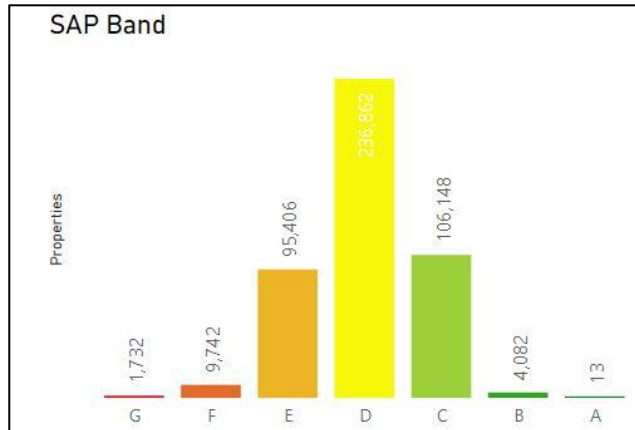


The project selected 7 projects that use the 3D data in an innovative way. These projects were: Birmingham County Football Association, Community Energy Birmingham - solar node, EcoBirmingham 69 wards bikes, Ecobirmingham One Planet Living, Footsteps, Faith for a low carbon future, Birmingham Tree People and Community Energy Birmingham – energy efficiency. BCC have also been a part of CSE's Solar Calculator Advisory Group. The project concluded in September 2022.

- Challenges/Barriers: Increasing interest in solar pv requires an easy to access tool to calculate savings made from solar photovoltaics per building. Price of tool may be prohibitive.
- Next steps: Solar PV tool could be used to assess BCC buildings and housing stock. We are exploring the possibility of uploading the data from the 3D data hub to the BCC produced city observatory data platform.
- If possible, any identified carbon emission savings: No direct savings.

CASE STUDY: Housing Stock Tool – Parity Projects

As part of a funding package secured by the WMCA, Parity produced a housing stock analysis tool for the West Midlands. The tool allows a variety of data to be interrogated either by lower super output area, postcode, ward or simply city wide. Data spans all housing data held for the city, from glazing type to main heating source. The tool produces graphs and tables that can be quickly and easily exported. The tool has proved extremely useful when formulating the evidence base for reports or bids.



Chapter 4 - Project Level Carbon Emissions Reductions

As a Council, we still struggle to quantify the carbon emissions reductions from the wide range of activities that happen across the city, or that indirectly contribute to the city's Route to Zero. Access to quality data is the largest barrier and it is for this reason that a key theme of the programme moving forward is Data and Insights. We are exploring a range of options for data capture and assessment to ensure emissions reductions at an organisational and City-wide level can be measured and tracked as part of all emerging policies, plans and projects. We are also working with supply chain partners on reporting of key environmental metrics as part of contract delivery.

A huge number of the projects outlined above have the potential to realise significant carbon emissions reductions over the coming years. Council-led projects actively in delivery during 2022 are estimated to lead to the following carbon reductions:

- Boiler replacement programme – 1,782 tonnes CO₂ (per year).
- Sustainable Warmth (LADS 3) – 930 tonnes CO₂ (whole project)

The following significant projects have been developed during 2022 and will commence in 2023:

- Whole House Retrofit - 397 tonnes CO₂ savings (whole project)
- SHDF (subject to application success) – potential saving of 5,172 tonnes CO₂ (whole project)

The following projects and programmes will directly or indirectly lead to carbon emissions reductions, however, the quantum of carbon dioxide emissions contribution is yet to be quantified.

- Energy Companies Obligation 4
- Corporate Landlord Net Zero Plan
- Hydrogen buses
- Birmingham Transport Plan Delivery Plan
- Clean Air Zone
- Civic Car and Alternative Transport Provisions Review
- Birmingham District Energy Scheme Decarbonisation
- East Birmingham Energy Infrastructure
- Solar Photovoltaics Rollout
- Alternative Treatments of Waste
- Waste Fleet Vehicles
- Urban Forest Masterplan
- Biochar Trial
- EQUANS Housing Repair Contract
- Route to Net Zero Procurement Policy
- Commonwealth Games

A key priority for the data & digital theme of the programme will be to seek to quantify and report accurate carbon emissions data to all policies, plans and programmes.

Chapter 4 - Next Steps

This final chapter will discuss the direction of the Route to Net Zero team over the next year, as well as any further support that will be required to facilitate this.

A new Climate Change, Nature and Net Zero Programme Board made up of senior representatives from across the Council has been established that will report directly into Council Leadership Team on a quarterly basis. The group will oversee strategic and delivery progress in each theme area. The sessions will include deep dive presentations on specific topics. The first Board will meet in early January 2023 and will ensure there is appropriate pace and scale of action across net zero and climate resilience and adaptation activities. In addition to this a cross party group, the Climate Change, Nature and Net Zero advisory committee made up of cabinet and cross-political party representatives which will provide political oversight.

In 2023 Birmingham's Our Future City Plan (OFCP) will be launched, presenting a 20-year vision for Central Birmingham which includes the city centre and surrounding key growth areas. OFCP will provide a solid foundation from which to develop policies and projects that will deliver high-quality housing, employment, education, sustainable and active transport and green space, aligned with the Council's objectives around Inclusive Growth and Route to Net Zero. Following the initial launch of the "Shaping our City Together" consultation document in 2021, the Route to Net Zero team have been providing strategic direction into the emerging framework. The plan will in turn inform the key projects and shape the future direction and priorities of the Route to Net Zero agenda.

Through the review of the Birmingham Development Plan, we need to produce new policies that require all new development, including change of use and retrofit, to be as close to net zero as possible to ensure they do not add to the carbon emissions of the city and are not adding to the future retrofit burden. Policies will need to deal with all carbon associated with new buildings including the energy needed to power them (operational energy) and that needed to construct and decommission them (embodied energy). This is known as whole life carbon.

Central Government recognises that local authorities play an essential role in driving local climate action, however there is no statutory obligation for Local Authorities to act on climate change, nor fixed framework to do so. However, as the largest Council in England, Birmingham City Council are keen to ensure the Council accelerates the Route to Net Zero agenda, providing leadership and working in collaboration with the wider city to realise the significant opportunities that our Net Zero transition presents. In tandem with this need for an accelerated activity on Net Zero, there is a severe biodiversity crisis; the natural world has already reached crisis point, with 28% of plants and animals threatened with extinction. In recognition of both the climate and ecological emergency, the Ecology Bill currently being heard in the House of Lords is supported by Birmingham City Council. Our own moves to ensure the dual importance of climate change mitigation, and adaptation and nature resilience is recognised in the Council's own climate emergency response is in recognition of the importance of nature and biodiversity. The introduction of a legally enforceable nature target to match the Net Zero is an important step forward and it is right that the UK plays its fair role in halting and reversing the destruction of the natural world. Birmingham's City of Nature 25-year green infrastructure plan presents our own commitments to Environmental Justice and Nature Recovery across the city by improving the quality, climate resilience and biodiversity value of our parks and green spaces.

Moving forward, we need to build upon the momentum of the past year and increase the City’s capacity for delivery. There are several major applications we are waiting to hear the outcomes of – including for housing energy efficiency investment via the Social Housing Decarbonisation Fund (SHDF). Should these be successful, a huge volume of activity and carbon dioxide emissions reduction will ensue. The relationships forged with public sector, private sector and community networks across Birmingham will provide invaluable support in ensuring the Route to Net Zero activities have people and place at their heart, help build continuity in areas such as housing retrofit and bring large scale funding into the city. Communicating activity more frequently and supporting wider engagement across the City is a key priority and we look forward to working closely with our citizens and partners.

Appendix 1: Wave 1 Projects

Appendix 1 provides an update on the wave 1 projects. Please note the old theme categories were: New Build, Retrofit, Transport, Waste, Energy, City of Nature and Council. The updated theme names are Buildings, Transport, Waste & circular Economy, Energy, Nature & Environment, , Behaviour change & Engagement, Communications, Digital & Data and Procurement. The old theme names have been used here for transparency

The following projects are live, and have been reported on in the main body of the report:

| Theme | Project |
|---|---|
| Buildings New Build | Energy Saving Technologies Pilot (Gressel Lane) |
| Buildings New Build | Passivhaus Pilot - Dawberry Fields |
| Buildings New Build | Review the Birmingham Development Plan |
| Buildings New Build | Our Future City Plan |
| Buildings: Retrofit | Thermal Impact / Energy Efficiency Survey and Delivery Plan |
| Buildings: Retrofit | Boiler Replacement Programme |
| Buildings: Retrofit | East Birmingham Heat Taskforce produce retrofit and decarbonisation OBC |
| Transport | EV Charging Points |
| Transport | Hydrogen Bus Pilot |
| Transport | City Centre Clear Air Zone |
| Waste | Waste Fleet – Hydrogen/EV Fleet Demonstrator |
| City of Nature | Urban Forest Masterplan |
| Council Engagement & Behaviour Change, Agile / Remote Working | Council - wide Route to Zero Behaviour Change Communications Strategy |

The following actions are complete:

| Theme | Project | Notes |
|---------------------|--|--|
| Buildings New Build | To agree an environmentally sustainable standard | Action complete. Standard updated in July 2021 and now used for all new schemes. |
| Buildings New Build | Zero Carbon Homes Route Map (WMCA | Routemap published in 2021 |

| | | |
|---|--|--|
| Buildings: Retrofit | Phase 2 Green Homes LADs funding | LADs 2 concluded in April 2022. This has now been replaced with a new action around LADs 3. |
| Buildings: Retrofit | Partnerships with Utilities | ECO3 has now concluded, new action added around ECO4. |
| Transport | Birmingham Transport Plan and Delivery Plan | Complete - this has now been replaced by an action around the delivery of the Birmingham Transport Plan. |
| Energy | BEIS – City Decarbonisation Delivery Plan programme 2- (CDDP), | Project completed – individual CDDP strands covered by new actions |
| Energy | Council House Electrical Rewire | Project complete. |
| City of Nature | Future Parks Accelerator Project | Adopted in 2022 – now City of Nature Delivery Plan. |
| City of Nature | Design Guide SPD | Design guide was adopted in winter of 2021. |
| Council Engagement & Behaviour Change, Agile / Remote Working | Agile / Remote Working, | Project complete. |

The following actions have been reprofiled or embedded into new actions or themes. Work also continues at a partnership level –and we are identifying a range of individual opportunities that are currently being defined.

| Theme | Project |
|---|---|
| Buildings: Retrofit | Large Panel Block (LPS) Retrofit and Ground Source Heating Pilot |
| Buildings: Retrofit | Implementation of city-wide retrofit plan |
| Transport | Bus Franchising |
| Transport | Delivery of Active Travel Fund |
| Waste | Commission a Joint Study with WMCA |
| Waste | Municipal Waste Strategy |
| Waste | Circular Economy |
| Waste | Waste to Recycling |
| Energy | District Heat Networks Energy Centres |
| Energy | Tyseley Energy Recovery Facility, Waste Transfer Stations and Household Waste |
| City of Nature | Biodiversity Supplementary Planning document |
| City of Nature | WM National Park Concept |
| City of Nature | Ward End and Cole Valley Green Skills Hub |
| Council Engagement & Behaviour Change, Agile / Remote Working | Working with Partners |
| Council Engagement & Behaviour Change, Agile / Remote Working | Embed carbon reduction in decision making |

| | |
|---|------------------------|
| Council Engagement & Behaviour Change, Agile / Remote Working | Training and Induction |
| Council Engagement & Behaviour Change, Agile / Remote Working | Council Procurement |
| Council Engagement & Behaviour Change, Agile / Remote Working | Council Procurement |

Appendix 2: UK and International Climate Change Context

The UK Context

The Net Zero Strategy: Build Back Greener published by the Department for Business, Energy and Industrial Strategy (BEIS) on 19th October 2021, sets out the UK government's overarching approach to meeting its 2050 net zero emissions commitment. Overall, the Strategy's ambitions align to the UK's Net Zero by 2050 target and the requirement to reduce carbon emissions by 78% by 2035 compared to 1990 levels (63% relative to 2019) as enshrined in the UK's sixth Carbon Budget.

The strategy sets out Government's plans for reducing emissions from each sector of our economy, while tackling any remaining emissions with greenhouse gas removals – either via the use of natural carbon sinks or technological means such as carbon capture and storage. The document sets out clear policies and proposals for keeping Britain on track to achieve its Carbon Budget commitments and sets out the Government's vision for a decarbonised economy in 2050. The document sets out policy proposals to hit the 2050 target across a range of economic areas including power, heat and buildings, and transport.

The Strategy sets out four key principles:

1. Working with the grain of consumer choice: no one will be required to rip out their existing boiler or scrap their current car.
2. Ensuring the biggest polluters pay the most for the transition: through fair carbon pricing.
3. Ensuring that the most vulnerable are protected through government support: including energy bill discounts and efficiency upgrades.
4. Working with business to continue developing deep cost reductions in low carbon tech: through support for the latest state of the art kit to bring down costs for consumers and deliver benefits for businesses.

The Net-Zero Strategy includes a breakdown of what will be required in the coming years from each area of the economy. It includes charts showing "indicative" pathways up to 2037, which government use as a guide to ensure that it is on track to achieve its targets, including upcoming carbon budgets and the UK's nationally determined contribution under the Paris Agreement.

The Net Zero Strategy has revealed that the government will seek to "embed transport decarbonisation principles in spatial planning" and reiterates that the National Planning Policy Framework (NPPF) will be reviewed to "make sure it contributes to climate change mitigation and adaptation as fully as possible". The Strategy also acknowledges the role of local leaders and communities in tackling climate change and states "we will empower local leaders to kickstart their own net zero initiatives, taking responsibility for improving their areas and shaping their own futures".

In September 2022 UK government launched a 'net zero review' – a review on how the UK can deliver net zero for the UK public, whilst maximising the economic opportunities of the transition. The review reaffirms that UK government is committed to reaching net zero greenhouse gas emissions by 2050 and is intended to ensure that delivering the net zero target does not place undue burdens on businesses or consumers. The review was commissioned amongst the changing political landscape of

the Russo-Ukrainian War. The review reaffirms that UK government is committed to reaching net zero greenhouse gas emissions by 2050 and is intended to ensure that delivering the net zero target does not place undue burdens on businesses or consumers. Birmingham City Council responded to this call for consultation.

In addition to this, in February 2022 the government made a pledge to open negotiations on trailblazer deals to deepen devolution with the West Midlands and Greater Manchester combined authorities. These would act as “the blueprint for other mayoral combined authorities to follow” according to the levelling up white paper. Birmingham City Council fed into the West Midlands Devo deal, which set out three key asks:

- We must go further and faster on those drivers of growth that have been devolved to us already.
- To solve the productivity challenge in the West Midlands and create more, higher paid local jobs, we need new powers to reboot economic growth.
- To level up we must address our communities’ concerns about public services and restore pride in place.

International Context

In 2022, the United Nations Intergovernmental Panel on Climate Change (IPCC) published their 6th report. The report includes a major change from previous IPCC reports by redefining the ability of scientists to attribute specific extreme weather events to climate change. The report also emphasises that drastic reductions in methane emissions will be necessary to keep the world under the 1.5°C tipping point. The report concludes that if the world does not begin to drastically cut emissions by the time of the next report of the IPCC, then it will no longer be possible to prevent 1.5°C of warming.

At the recent COP 27 summit in November 2022, it was agreed that a fund be created to compensate for loss and damage suffered by the countries most impacted by climate change. This was a positive step although funds still need to be committed. However, progress in other areas was limited as there was no consensus about other key climate change issues, such as reducing the use of fossil fuels. The war in Ukraine has significantly impacted the geo-political landscape. This has led to the Cost-of-Living crisis and the energy crisis. It has placed huge pressure on households and businesses through high energy prices and broader inflationary pressures. From a Council perspective, it has increased overall financial pressures and impacted the funding available for Net Zero related projects.