

Route to Zero Action Plan - Call to Action

December 2020

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Chapter 1 - Executive Summary

The table below summarises the key priority actions that are outlined in this call to action document:

Sector	Action	Timescale
New build housing	7,000 units of social housing to be delivered by 2031 which will be constructed to an agreed environmentally sustainable standard based on an analysis of the deliverable and affordable elements of Passivhaus Standard (or as close to certified standard as possible), the technological demonstration project on Gressel Lane and changes required to the BMHT specification to meet new Building Regulations	2031, changes to spec in 2022
	BMHT to ensure that appropriate training on new technologies is included as part of the tendering process and staff from maintenance teams are included within this process.	Implementation in 2023
	Review the BDP and include policies to deliver zero carbon or Passivhaus homes.	Timetable for BDP update to be confirmed. Update anticipated to commence in 2022.
Housing retrofit	Develop an impact analysis period monitoring the thermal efficiency improvements.	Ongoing
	Create a plan for city wide retrofitting of houses, incorporating High & low level residential blocks	2021/2023
	Bid for Green Homes scheme 1b and match fund the existing and planned developments.	Dec 2020
	Phase 2 Green Homes LAD's funding – opportunity to consider larger bid - subject to identifying match funding of around £5million. This could lever in additional 50/70%.	Jan / March 2021
	Where feasible consider quick wins by converting garages under flats to new energy efficient accommodation units.	2020 / 2021
	Ensure boilers have a minimum Sedbuk rating efficiency of not less than "C" and are "hydrogen" ready, thus allowing them to take a natural gas/hydrogen blend from the grid.	10-year program
	Explore opportunities to include Ground Source Heating for planned Landlord and Property services blocks.	Ongoing

	Promote/educate all key stake holders about benefits of retrofitting and decarbonisation	Will require holistic approach
	East Birmingham Heat Taskforce to produce an Outline Business Case.	Early/mid 2021
Transport	Deliver the long term actions set out in the Birmingham Transport Plan.	2031
	Consult and Adopt the Birmingham Transport Plan.	2021
	Implement City Centre Segments scheme.	Ongoing to 2022
	Develop 2-3 additional pop up cycle lanes as part of tranche 2 of the active travel fund, funding permitting.	March 2022
	Deliver Places for People projects.	Ongoing to 2031
	Implement Space for Pedestrians in the local centres.	Ongoing to 2031
	Establish training and project partners for e-cargo bikes.	Complete November 2020
	Produce an Outline Business case for bus franchising.	Summer 2021
	Secure funding to deliver projects identified in the Birmingham Walking and Cycling Strategy.	Ongoing to 2031
EV charging	Provide 394 fast (22kw) and rapid (50kw) EV charging points.	Dec 2022
	Work collaboratively with relevant partners to stimulate the market and begin to tackle the issues around the provision of EV in problematic areas such as terraced housing.	Ongoing to 2030
	Produce an EV strategy document.	April 2021
	Launch the communication campaign of 'switch to electric'.	February 2021
	Install 9000 chargers citywide, of which 600 will be rapid.	2030
Waste	Commission a joint study with WMCA to look at waste movements in the conurbation	Phase 1 (municipal waste) completed in 2021, Phase 2 for all waste streams 2022

	Ensure waste depots have charging capability designed in them	Delivery in 2022
	Sign off of the draft Municipal Waste Strategy	2021
	Ongoing hydrogen/EV fleet demo	Underway
Energy	Maximise the potential of the Tyseley Environmental district, including energy from the Tyseley energy from waste plant during its operational lifetime.	2034
	Investigate how the district heat network's energy centres can be converted to a carbon neutral energy source.	Ongoing
	Complete the BEIS heat decarbonisation study.	December 2021
Natural environment	Complete the Future Parks Accelerator Project, embed Environmental Justice policy and governance recommendations where appropriate and maximise joint working	March 2022
	Produce Trees supplementary planning document.	Draft by March 2021. Adoption date dependent on progression of DM DPD.
	Produce Biodiversity supplementary planning document.	Follow on from the BDP review
	Production of an Urban forest masterplan	2021
	Begin targeting the wards with the lowest % canopy cover	2022
	Work collaboratively with WMCA on the WM National Park concept	Ongoing
	Deliver the Ward End and Cole Valley Green Skills Hub project.	December 2023

Chapter 2 - Introduction and Policy Context

2.1 Background to Climate Change – Legislation

2.1.1 Climate Change Act 2008- The Climate Change Act sets out emission reduction targets that the UK must comply with legally. It represents the first global legally binding climate change mitigation target set by a country. The Act committed the UK to reducing its greenhouse gas emissions by 80 per cent by 2050, compared to 1990 levels. However, this target was made more ambitious in 2019 when the UK became the first major economy to commit to a 'net zero' target. The new target requires the UK to bring all greenhouse gas emissions to net zero by 2050.

2.1.2 The Energy Act 2008- The Act contains the legislative provisions required to implement UK energy policy following the publication of the Energy Review 2006 and the Energy White Paper 2007. This policy is driven by the two long-term energy challenges faced by the UK: tackling climate change by reducing carbon dioxide emissions, and ensuring secure, clean and affordable energy.

2.1.3 The Energy Act 2011-The 2011 Energy Act has three principal objectives: tackling barriers to investment in energy efficiency (including via the Green Deal that provides up-front finance for investments in energy efficiency in the home; enhancing energy security; and enabling investment in low carbon energy.

2.1.4 Planning and Energy Act 2008- The Bill allows local councils to set targets in their areas for on-site renewable energy, on-site low carbon electricity and energy efficiency standards in addition to national requirements.

2.1.5 In addition to this, there are the European Directives that include:

2.1.6 The 2001 Strategic Environmental Assessment (SEA) Directive- SEA is a legally enforced assessment procedure required by Directive 2001/42/EC (known as the SEA Directive). The SEA Directive requires systematic assessment of the environmental effects of strategic land use related plans, policies and programs.

2.1.7 The 2009 Renewable Energy Directive- This Directive establishes a common framework for the production and promotion of energy from renewable sources. This Directive 2009/28/EC establishes a common framework for the use of energy from renewable sources in order to limit greenhouse gas emissions and to promote cleaner transport.

2.1.8 The 2010 Energy Performance of Buildings Directive- The principle underlying the Energy Performance of Buildings Directive is to make the energy efficiency of buildings transparent by requiring an energy performance certificate showing the energy rating of buildings, accompanied by recommendations on how to improve its efficiency.

2.1.9 The 2015 Paris Agreement - The Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. The agreement is wide in scope and provides the international framework for UK legislation. The Agreement includes (Article 12) an obligation to communicate about climate change and (Article 11) sustainable development goals as well as the more familiar carbon emission targets to limit global heating.

2.1.10 Background to Climate Change – Policy

Some of the key national policies that underpin climate change are discussed below.

The National Planning Policy Framework (NPPF) identifies various means by which Local Planning Authorities should respond to climate change. These include:

- The promotion of energy efficiency in new and existing buildings;
- The encouragement of energy generation from renewable and low carbon resources;
- The identification of opportunities for carbon emission reductions more generally;
- The adaptation of the local environment in response to the effects of climate change, including flooding and restricted water supply.

2.1.11 National Planning Practice Guidance (PPG) on climate change identifies the task of addressing climate change as a core land use principles. It sets out the means by which local plans can shape development to promote reductions in the emission of greenhouse gasses and increase the resilience of communities in the face of future flood risk, coastal change, threats to water supply and quality, and other effects of climatic change. In addition to this, the 25 Year Environment Plan sets out government action to help the natural world regain and retain good health. It aims to deliver cleaner air and water in our cities and rural landscapes, protect threatened species and provide richer wildlife habitats. It calls for an approach to agriculture, forestry, land use and fishing that puts the environment first.

2.1.12 The Plan identifies six areas which directly and indirectly will help combat climate change. The six areas include: Using and managing land sustainably, recovering nature and enhancing the beauty of landscapes, connecting people with the environment to improve health and wellbeing, increasing resource efficiency, reducing pollution and waste, securing clean, productive and biologically diverse seas and oceans and protecting and improving the global environment.

2.2 Background to Climate Emergency Declaration

2.2.1 Birmingham City Council declared climate emergency on the 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' (R20). On 25 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 R20 journey.

2.3 Our Current Council and City Wide Carbon Footprint

2.3.1 Consultants Anthesis were commissioned in January 2020 to undertake a study setting out the current emissions baseline for the city and to make recommendations which could be implemented to reduce carbon emissions. The Anthesis report broke down the emissions into two elements, the Council's own emissions and City wide emissions.

2.3.2 Council's own emissions: The report highlighted that the council's own emissions amounted to 417,772 tCO₂e. The analysis of Birmingham City Council's own emissions focused on six key emissions sources, including: Buildings & Other Assets, Vehicle Fleet, Business Travel, Employee Commute and Procurement Spend. The emissions were further split into three categories as:

- Scope 1 (Direct emissions): All direct GHG emissions from the activities of an organisation or under their control. For BCC, this primarily relates to natural gas for heating and fuel used by owned or controlled vehicles.
- Scope 2 (Indirect emissions): GHG emissions occurring as a consequence of 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 GHG 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.

The report also highlighted that only 2% of emissions fell into the Scope 1 category, 6% in the Scope 2 category and the remaining 92% in the Scope 3 category.

2.3.3 City wide emissions: The city wide emissions amount to a total of 4,578 ktCO₂e. These have been broken down as follows:

- Residential buildings (34%)
- Commercial buildings & facilities (6%)
- Institutional buildings & facilities (17%)
- Industrial buildings & facilities (11%)
- On-road (27%)
- Rail (1%)
- Solid waste disposal (<1%)
- Wastewater (2%)
- Industrial process (2%)
- Industrial product use (<1%)
- CHP generation (<1%)

- Local renewable generation (<1%)

2.3.4 The report further states that the carbon budget for the Birmingham City region between 2020-2100 is 27.5 MtCO₂. A consistent annual emissions reduction rate of -12.8% is needed to adhere to this budget. If Birmingham's emissions were to remain at today's levels, the finite carbon budget would run out in 7 years.

2.3 Emerging Policy

Rapid decarbonisation requires coordinated action across all levels of government. Ahead of the postponed COP26 in November 2021, the government is expected to publish a number of strategies and policies. These will set the national tone and affect local authorities by dictating wider decarbonisation goals and providing funding opportunities. These strategies include the final Transport Decarbonisation Plan, the UK Hydrogen Strategy, and the Environment Bill 2019-21 (next steps to be confirmed). Wider decisions, such as whether the UK will use a carbon tax or a domestic emissions trading system once it leaves the European Union's Emissions Trading System at the end of 2020 (which had not been decided at the time of writing this report) will also shape the national direction and therefore affect local authorities. It also important to consider the impacts of Brexit, which will be enacted on the 31st of January 2021. Most of the UK's environmental laws are derived from European law. From water and air quality, to nature conservation and climate change. Post January 2021, the UK government will have the power to set its own environmental targets, marking a period of change, we will continue to monitor national developments to understand their implications at the local level and provide feedback when there are consultation and engagement opportunities.

Chapter 3 - The Need for Rapid Systems Change

3.1 Decarbonisation efforts over the past 30 years have been slow and insufficient. Every year where progress was slow, the rates of emissions reduction needed for future years became even higher in order to compensate for past failures. Today we are facing a crisis that requires urgent action everywhere. Past failures also mean that current levels of warming are already causing environmental damage and the efforts to cut emissions are to limit the scale of future impacts rather than avoid them completely.

3.2 It is recognised that transition to a low carbon economy requires major and rapid systems changes but the transition must be just and deliver the jobs that are needed to sustain our economy. Birmingham and the West Midlands, as the birthplace of the Industrial Revolution and a global player in the development of green technology, is ideally placed - and has a moral responsibility to lead a new Green Industrial Revolution that delivers clean and inclusive growth. In order to achieve meaningful carbon reduction, system level change is required, both on a citywide level, but also within the council itself.

3.3 To date, internal operations have largely continued to favour a 'business as usual' approach. The 'business as usual' status quo needs to be overturned, to achieve organisational wide buy-in for drastic, council wide systems change. The scale of the changes needed to achieve decarbonisation is unprecedented and they cannot be achieved through incremental changes to existing policy packages and through nudging people to make slightly different choices. To achieve change, we need to consider new ways of working, particularly incorporating more partnership working and collaborative approaches to projects. In order to achieve net zero carbon, both as an organisation and across the City, the City Council will need to direct significant additional resources to the programme. These resources will need to be targeted to ensure that they provide the capacity for all areas of the Council to engage fully with the programme, and to reduce their carbon emissions. Consultants Inner Circle have been commissioned to undertake work to inform the Council's mid-term financial plan. The outputs of their work will include an ask for resources to establish a Route to Zero Team in order to establish a senior lead officer for the programme and support to embed Route to Zero across the City Council as a whole.

3.4 In June 2019 the UK became the first major economy in the world to pass laws to end its contribution to global warming by 2050. Beyond this, individual local authorities have declared their own climate emergencies. As the authorities in the West Midlands become unified by the shared ambition to reach net zero, a new opportunity is presented to take advantage of our collective goal by working collaboratively to prevent duplication and maximise resources.

3.5 Zero emissions would mean no production of any greenhouse gas emissions at all. There are some sectors (e.g. farming and aviation) where it is anticipated this will not be possible. Net zero therefore allows for a small amount of residual emissions to be produced but requires the UK to find so called 'negative emissions technologies' which can take carbon out of the atmosphere to compensate. These measures can include planting trees, rewilding and bioenergy with carbon capture and storage. It is important to note that the vast majority of city-level emissions will not be in the 'too difficult to cut' bucket which will be netted off. Achieving net zero carbon is a significant challenge. Much of what is required lies outside the direct control of the City Council and therefore

working with partners and driving change through influence and by being an example of best practice will be as important as the City Council making changes to reduce its own carbon emissions. Identifying and working with businesses within the City who have already taken steps to reduce their carbon emissions will be important in embedding net zero carbon both within the City Council and across the city as a whole.

3.6 Actions have already been undertaken to kickstart system change in the council. A cross party R20 working group committee has been set up, which will meet once per month. The group has been established to fulfil a cross party motion, which was agreed at City Council on 15th September 2020, for the creation of an Advisory Committee which will inform Cabinet on the Route to Zero (R20) Carbon agenda. The R20 Advisory Committee is chaired by Councillor Waseem Zaffar, Cabinet Member for Transport & Environment who has overall responsibility for leadership and direction of the R20 agenda. The committee sits in parallel with the taskforce and will have sight of any decisions before they go to Cabinet or Full Council. They will also support the work of the taskforce by ensuring that all decisions and papers align with R20 agenda and scrutinising and challenging any decisions that conflict with the R20 agenda. The committee is comprised of 3 Cabinet Members, 3 Labour Councillors and 3 Opposition Members. A council internal working group has also been created, including representatives from all service areas, which is already helping to improve cohesion on climate issues across the council. In addition to kickstarting system change in the council, it will be necessary to build a broad collaborative network across the City, including anchor institutions, environmental and campaigning groups, faith communities and others to help achieve the wider changes needed, take communities on the net zero journey and avoid impoverishing deprived communities.

3.7 Delivering the changes that are needed will have a significant financial cost. However, the cost of acting now needs to be weighed up against the cost of retrofitting at a later date and the additional cost of adapting to the unavoidable impacts of climate change in the future. Despite this, there is a need to attract significant funding to deliver net zero carbon across the City Council and the City, this cannot be delivered within existing resources. This call to action will focus on actions that deliver the most benefit in terms of reducing carbon emissions and will identify where lobbying for additional funding will be essential to delivery. To achieve major and rapid system change, finance from a wide range of sources will need to be attracted into Birmingham. Large global 'impact' investors increasingly take environmental, sustainability and governance (ESG) criteria into account. Existing and new intermediaries need to mobilise and channel into Birmingham projects, in addition to governmental sources.

Chapter 4 - Climate Justice and Social Justice

4.1 Birmingham City Council's initial climate change declaration included a commitment to a 'just transition', essentially fusing together climate justice and social justice. There are a number of key issues and challenges in relation to achieving this:

- The most disadvantaged and poorly paid citizens contribute the least to the causes of climate change but are impacted the most by it. As a proportion of their income, they pay the most towards implementing solutions but benefit the least from them.
- There needs to be a long term, systemic change in order to address climate change and move towards a net-zero carbon society. It is important that everyone's voices are heard in these decisions.
- There is a need for cross-sector responses which assess localised vulnerability to both climate change and to the policies which are put in place to mitigate and adapt to it.
- Climate change can compound poverty and disadvantage and, conversely, poverty increases vulnerability to climate impacts. These compounding effects and interactions make a strong case for policy solutions that integrate social justice considerations into climate change policy and vice versa.
- However, action to address climate change can help address social justice. For example, retrofitting homes to make them more energy efficient can reduce carbon emissions whilst also reducing fuel bills and creating, warmer healthier homes and delivering positive benefits for residents. Similarly, improving walking and cycling routes and public transport provision can make travel more accessible to those without access to their own car.

4.2 The Birmingham Business Charter for Social Responsibility is a set of guiding themes to which Birmingham City Council (BCC) will adhere and invites its contracted suppliers, the wider business community, other public sector bodies (including schools) and third sector organisations (including grant recipients) to adopt. In some cases, adopting the Charter is a requirement of specific contracts or grants. In all cases, adopting the Charter is a visible and recognisable sign of your organisation's commitment to the local economy and its communities. The Charter's Green and Sustainable theme is very pertinent to this policy aim as it asks signatories to commit to protect the environment, minimise waste and energy consumption, use resources efficiently and contribute towards Birmingham's Clean Air Zone. These commitments will also apply to their supply chain. Specific actions include:

- Reduce Carbon footprint – be aware of main impacts on carbon emissions including the indirect carbon used in manufacturing processes and the direct impact of operations and logistics.
- Measure carbon emissions and ensure a plan to reduce emissions, where possible, is being implemented using carbon measurement tools. Specific targets to be included in major contracts
- Eliminate unnecessary waste by adopting the "reduce, reuse, recycle" philosophy.
- Be a good neighbour, minimise negative local impacts (noise, air quality), and improve green areas (e.g. biodiversity, visual attractiveness).

- Protect the environment and minimise adverse impacts and instil this approach throughout the supply chain.

4.3 Decarbonising our economy and society involves making difficult choices across many sectors. We need to transition to a society where people have universal access to jobs, healthcare and housing, ensuring that no one is left behind. In March 2020 the UK was put into lockdown following the COVID-19 outbreak which continues to produce unprecedented health and economic impacts. Many parallels can be drawn between the covid health crisis and the climate crisis, namely:

1. Both crises are characterised by an increasing risk of negative impacts. With covid, this is due to contagion – one infected person can spread covid to more than one other person, causing infection rates to accelerate. With the climate crisis, non-action can trigger feedback loops, which in turn amplify the warming trend, edging us close to crucial temperature rise tipping points.
2. Tackling both issues requires dramatic disruption to our daily lives and norms.
3. Both crises require ‘mass’ change: the efforts of individuals do little to mitigate the risk unless accompanied by efforts from the majority.
4. In both cases, authorities have acknowledged the urgency of acting. A climate emergency was declared on the 11th of June 2019 and on the 11th of March 2020 covid-19 was characterised as a pandemic.

4.4 Given the number of similarities that can be drawn between the two crises, it is reasonable to assume that both should evoke similar responses. However, the response to the coronavirus crisis to date has arguably been far greater than the response to the climate crisis. The rapid response to the covid crisis has demonstrated the level of action that can be achieved when a matter is truly considered an ‘emergency’ and gives us an indication of the level of rapid change that is possible with direct government guidance. Successful change will require listening to and communicating with Birmingham’s citizens as well as working through existing, and developing new community networks, organisations and structures. The covid recovery strategy provides the opportunity to link it in with climate recovery as a complimentary process to help deliver a socially just transition.

Chapter 5 - Working with Partners

Birmingham City Council cannot achieve Route to Zero alone. It is essential that the City Council works with partners to deliver and support the changes needed to achieve net zero carbon. The West Midlands combined Authority and the GBSLEP are two of the main partners in delivering this.

5.1. West Midlands Combined Authority (WMCA)

5.1.1 The WMCA published a green paper in early 2020 to start the conversation around their response to climate change. They are now working with consultants to produce 5 year action plans. The first of these 5 year action plans is in the early stages of preparation and will be published in 2021. Birmingham City Council is engaging with this activity and working with the CA to identify those areas where the CA is best placed to lead and where the City Council is best placed to lead.

5.1.2 Birmingham City Council are also working with the CA through the Low Carbon Officers' Group which brings together climate change leads from across the CA to share experiences and best practice and engage in delivery. Collective lobbying across the CA region will be important in seeking the national changes required to deliver Route to Zero.

5.1.3 Birmingham City Council has also begun working with the CA to set up a Jobs taskforce. The Council recognises that the transition away from a high-carbon economy towards a green economy is interwoven with two other transitions in the coming period: to a post-Covid economy and a post-Brexit economy. In this context tens of thousands of people in Birmingham, including school-leavers, workers in high-carbon sectors and migrant workers, face an uncertain future, while new opportunities open up. The jobs taskforce has the potential to ensure that sustainable building skills and retrofitting skills are being developed. If we can see a way to develop a viable local industry, then that has the potential to become a 'procurement framework' for private and public retrofitting, and may be able to form a revenue stream for the council of some of these roles are kept in house.

5.2. Greater Birmingham Local Enterprise Partnership (GBLEP)

5.2.1 The Council is engaging with LEP as they are the part of the Task Force and involved in some of the key meetings and decisions which are to be taken forward by the City Council. The Local Industrial Strategy (LIS) for the West Midlands recognises the low carbon sector as one of the region's key areas of strength that can enable clean growth and prosperity in the coming years.

5.2.2 The GBSLEP has been assigned the Low Carbon and Environmental Sector as one of its key sectors to deliver on under the region's Local Industrial Strategy. The Low Carbon Sector Action Plan defines low carbon technology sector as 'businesses and organisations who are currently located wholly or in part in the West Midlands or are planning to relocate to the region, and who provide or intend to provide solutions and services necessary to support the transition towards a low carbon economy'. It incorporates a large proportion of the energy system, which is leading the low carbon transition, and increasing proportions of the transport/automotive and construction/housing sectors.

Local Industrial Strategy for the WM - Low Carbon & Environmental Technology Sector Action Plan

5.2.3 This Action Plan outlines the strengths, barriers to growth and opportunities for the Low Carbon and Environmental Technologies (LCET) sector in the West Midlands. It proposes a set of interventions that can build on these strengths, overcome the barriers and take advantage of the opportunities, in order to put the West Midlands at the forefront of clean growth economy. The Low Carbon Sector Action Plan is primarily concerned with the ‘scale-up’ of the low carbon sector in terms of jobs, GVA and GDP. The Action Plan is part of the West Midlands Industrial strategy. It is based on consultations with over 80 local LCET businesses and stakeholders and its proposed interventions cover the three Local Enterprise Partnerships of West Midlands Combined Authority (WMCA): Greater Birmingham and Solihull LEP, Coventry and Warwickshire LEP and Black Country Consortium. BCC have been inputting into the GBSLEP’s wider position on the ‘Green Recovery’. If GBSLEP is to form a bigger proponent of Green Recovery, this will only be achievable in collaboration with BCC. Moving forward, it may be possible for GBSLEP to take on a more ambitious role and mobilise awareness and wider support and investment into their regional low carbon projects. Part of this wider responsibility of GBSLEP could be to build on the points outlined in sections 6.2 and 6.3 – by helping to influence and control over what we choose to fund.

5.3. Centre for Sustainable Energy

5.3.1 In September 2020, the Centre for Sustainable Energy (CSE) was awarded €345,285 from the ICLEI Action Fund, which is led by ICLEI Europe, in collaboration with Google.org. CSE will establish an open-source, city-wide energy dataset for Birmingham, bringing together available address-level and local-area energy data for the city’s housing, non-domestic buildings, existing and planned energy infrastructure, over-laid with socio-economic and demographic household data, and Google’s transportation emissions data. The project will include some initial data analysis (e.g. modelling decarbonisation options for buildings in the city, overlaying and integrating public datasets, aggregating address-level data, mapping results to small area level). However, working in partnership with Birmingham City Council and the city’s Route to Zero Task Force, the focus will be on using the data to deliver a range of community-scale carbon reduction initiatives alongside underpinning ‘full-city-scale’ applications of the data which align with Birmingham’s existing decarbonisation policies and programmes. These may include building energy data will inform low-carbon policies in the Local Development Plan; housing energy datasets combined with housing tenure and socio- demographics will be used to target home energy efficiency programmes; solar resource data will help the city council, community groups and businesses prioritise investment in new solar PV schemes; socio-demographic data will help identify neighbourhoods for delivery of local active and sustainable travel projects and to inform wider city-wide climate communications and public engagement campaigns.

5.4 Birmingham Universities

5.4.1 Aston University

Aston University have a number of research programmes and studies that can help with the city’s R20, including:

Energy and Bioproducts Research Institute (EBRI) at Aston University

The Energy and Bioproducts Research Institute (EBRI) at Aston University in central Birmingham is a unique hub of bioenergy research and technology development. EBRI is home to both academic and industry facing teams that aim to accelerate the commercial development of emerging renewable energy, bioenergy, bioproducts and supporting technologies. EBRI's research and technology capabilities extend to cover the breadth of advanced thermal technologies and biological conversion processes. This includes gasification, pyrolysis, catalysis, and thermochemical refining of biomass, wastes and plastics to high quality products and fuels. Allied with this is expertise in energy systems, supply chains, techno-economic analysis, transport logistics, analytics, engines and energy systems. Unique industry scale demonstrator in thermal processes and energy systems. EBRI is the result of a £20 million investment to support the development of a regional bioenergy supply chain and to promote the adoption of innovative new bioenergy technologies across the West Midlands region. This includes its demonstration plant that can provide the heat, electricity and cooling needs of the EBRI building and other parts of the university campus. This innovative technology is the first of its kind in the UK incorporating interoperable distributed energy technologies which can support the traditional energy system through demand side grid management. This unique development offers a number of uses from powering electric vehicles to a low carbon network for cities.

SuperGen national bioenergy hub

The Supergen Bioenergy Hub works with academia, industry, government and societal stakeholders to develop sustainable bioenergy systems that support the UK's transition to an affordable, resilient, low-carbon energy future. The Hub delivers and funds a diverse range of bioenergy research projects from fundamental science to engineering challenges, social responses to technologies, economic context and policy development. Key features and benefits of EBRI to the city of Birmingham include:

- Recognised as a major science and technical asset to the city;
- Attracts inward investment from around the world;
- Generates economic advantage in the local manufacturing and service sectors;
- Supports the development of a regional supply chain;
- Facilitates new high growth sectors in the Smart Cities field including "demand side management" and "the internet of energy";
- Helps reduce the carbon footprint of the city and increase its energy efficiency.

Knowledge transfer and economic impact

Independent feedback on the impact of EBRI on the local West Midlands business community indicates that 100% of businesses felt that the support received from EBRI had had a positive impact on their company:

- 47% said EBRI improved their competitiveness;
- 76.5% said EBRI increased their awareness of bioenergy;
- 26% had invested in bioenergy;
- 28% had placed more orders with suppliers;
- 28% of businesses had increased their spend on Research, Development and Innovation.
- According to HM Treasury "Green Book" methodologies the economic impact of the EBRI business support was:
 - 234 jobs created in the West Midlands, including businesses supported and the wider supply chain;
 - An increase of over £28.9 million in Gross Value Added (GVA) through business support;

- An increase in RD&I spend of over £1.97 million businesses got involved with EBRI.
- EBRI Interim Evaluation Reports published June 2015 and April 2019
- EBRI has supported 387 small and medium sized enterprises in the West Midlands (Oct 2020);
- 211 companies have attended EBRI's highly acclaimed 'Value from Waste' Master Class and Challenge Based Consultations – devised to help SMEs develop new products and services;
- 97% of EBRI Master Class business attendees have rated the two-day course as 'Excellent' or 'Very Good'.

Opportunities

Moving forwards, Aston University welcomes collaboration opportunities with academia, government bodies and industry from the local region, and from around the globe. The University is actively bidding for new research and industrial engagement projects to bring further benefits to the city's economy.

5.4.2 BCU

5.4.2.1 Birmingham City University (BCU) is developing a number of research areas, studies and initiatives that support the city's zero carbon target. STEAMhouse, a Birmingham maker and innovation space run in partnership with Eastside Projects, has been supporting the agenda through the delivery of STEAM labs on topics such as air quality and green business recovery, facilitating key stakeholders to find potential solutions to challenges. One of the University's Professors formulated the West Midlands National Park initiative, further detail of which can be found in 14.2.4.

5.4.2.2 Academics researching zero-carbon retrofitting have secured funding to develop the EcRoFit tool for assessing energy efficiency and renewable energy use in domestic and non-domestic buildings. This will enable businesses to identify the most effective retrofit and renewable energy solutions for their buildings.

5.4.2.3 BCU is in early conversations with West Midlands Combined Universities about setting up a retrofit training programme, initially as part of (or overlapping with) their BA Design for Future Living course but also as a stand-alone training course or summer school. This would be for higher level skills training for PAS 2035 retrofit designers and coordinators. They have started to develop how this might work with a mix of new and existing modules and how they might accredit the courses. They also have an ambition to carry out an exemplar project either as part of this course or as a consultancy/research project.

5.4.2.4 The Birmingham School of Architecture and Design has been developing an exemplar self-build low/zero carbon housing project suited to small infill sites with Cherwell District Council in Oxfordshire and are hoping to build a prototype development in the next year. The project aims to explore how to build to zero carbon at an achievable cost and is transferrable to Local Authorities across the UK.

5.5 Greener Birmingham Coalition

As a result of the previous Birmingham Council Green Commission, a range of local environmental and sustainability environmental groups and organisations have formed a partnership to drive action to improve our shared environment. They include network organisations such as Birmingham Open

Space Forum, Climate Action Network West Midlands, Sustainability West Midlands, Greener Games network, and Friends of the Earth Birmingham, to local environmental asset managers, such as the Birmingham and Black Country Wildlife Trust, and the Canal Rivers Trust, and local organisations such as EcoBirmingham. Various members of the coalition have contributed to the council Route to zero taskforce. In 2019 the coalition carried out the 'Greener Birmingham' conversation across a range of communities to identify what residents wanted for a greener city, their role and that of the council. As a result, the coalition is developing a programme to broaden the partnership, raising unheard voices, and building the capacity of local community organisations, councillors and leaders across the city to support activity for environmental and health outcomes, and wider economic benefits. This work will be piloted in the first half of 2021 to inform a wider 3 year support programme.

5.6 Wider Partnership Working

Birmingham City Council acknowledges that it cannot achieve Route to Zero alone. It is essential that the City Council works with partners to deliver and support the changes needed to achieve net zero carbon. In addition to working together with WMCA, GBLEP and other public sector partners, it will be necessary to build a broad collaborative network across the City, including anchor institutions, environmental and campaigning groups, faith communities and others to help achieve the wider changes needed, take communities on the net zero journey and avoid impoverishing deprived communities. BCC will link up with the CA and the LEP to maximise our lobbying power.

5.7 Public Consultation

The City Council has undertaken some early engagement work on Route to Zero including an online survey and a series of focus groups. This is seen as a starting point and a full programme of community engagement will need to sit alongside the delivery of Route to Zero, the Communications and Engagement sub-group of Route to Zero Task Force will play an important role in shaping and delivering this. Through the Future Parks Accelerator project (chapter 14) there are discussions around the formation of consultation/stakeholder type groups. The formation of an independent "Parks Foundation" is also underway as a charitable organisation either as a main fundraising partner or commissioning type body) that would oversee and scrutinise the management of Parks and green spaces. This approach can provide lessons for other areas of Council activity, including Route to Zero.

5.8 Education

The council acknowledges that education has a vital role to play in raising climate awareness. However, the council cannot directly alter the curriculum for Birmingham, as this is set at a national level. We will need to lobby for curriculum changes at a national level to include climate change in order to deliver consistency across schools. However, there is also an opportunity to explore what could be done locally, for example providing or signposting material to enable schools to teach elements of climate change through the existing curriculum as well as looking at how we can work with schools to engage children with specific activities related to climate change and sustainable lifestyles.

Chapter 6 - What can we control and influence?

6.1 Figure 1 illustrates that BCC's influence is varied and complex across the different activities that occur within their own operations and also across the city.

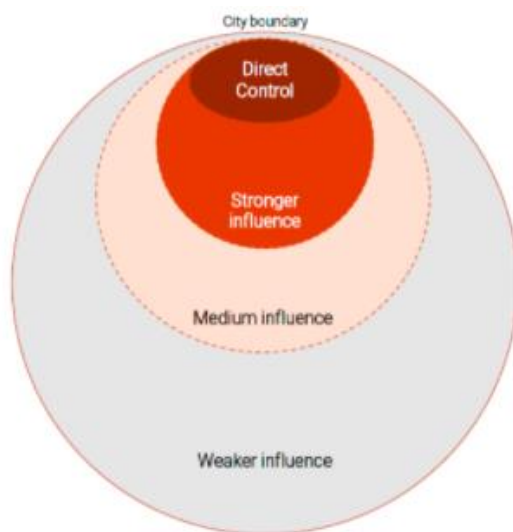


Figure 1: The sphere of influence of the council

6.2 Influence bandings were based on Anthesis' judgment following discussion with officers. The council has direct control over Emissions sources which are directly owned or operationally controlled by the Council, such as council buildings or council fleet. Procurement spend is within the Council's direct control and is the largest emissions source, accounting for 80% of the council's total emissions. It and relates to services that the council procures support services across the city, such as road or building maintenance. Following procurement, the operation of council buildings: electricity, gas and water account for another 17% of the Council's Scope 1, 2 and 3 emissions.

6.3 The council has a strong influence over owners and operators of emissions sources, and these are clearly defined but are not directly operated by the Council. For example, emissions related to commercially leased buildings that the council owns but does not operate. As a council we then have medium influence over emissions sources that do not relate to council owned or operated assets, procurement or council led activities, however some convening power may exist with specific actors in the city, such as major businesses within city boundaries. Finally, we have a weak influence over owners and operators of emissions sources that are not clearly defined, influence limited to lobbying central government or trade associations. For example, national planning policy limits the extent of improvement to new build energy efficiency.

Chapter 7 – Identifying Our Priority Actions

7.1 In January 2020 consultants Anthesis were commissioned to undertake a study setting out the current emissions baseline for the city and to make recommendations which could be implemented to reduce carbon emissions. The report helped provide the city council with a strong baseline study and gain a better understanding of which sectors emit the bulk of the cities carbon emissions (which amount to 4,578 ktCO₂). Figures 2 and 3 below summarise the production of emissions relating to area administered by Birmingham City Council, using Anthesis' SCATTER Greenhouse Gas Inventory tool:

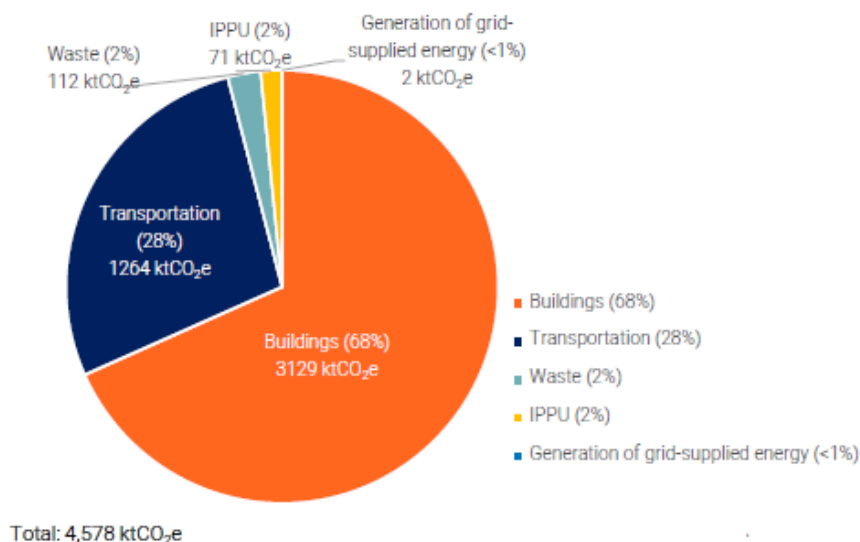


Figure 2: SCATTER sector inventory for direct and indirect emissions within Birmingham, 2017 (taken from Anthesis report, 2020)

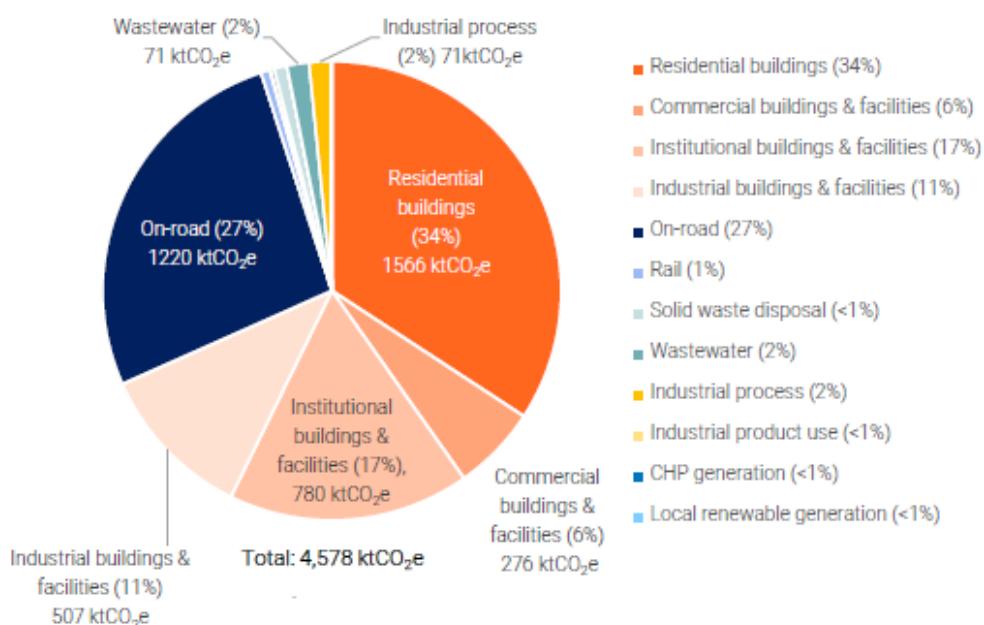


Figure 3: SCATTER sub-sector inventory for direct and indirect emissions within Birmingham, 2017 (taken from Anthesis report, 2020)

7.2 Figures 2 and 3 clearly illustrate that buildings are by the far the largest emitter of CO₂, accounting for 68% of Birmingham's total emissions. This is followed by transport, which accounts for another 28%. Through reviewing Anthesis' work, we have selected a number of priority areas and actions which we have identified as being key to making the biggest contributions to reducing carbon emissions. The key areas we will be targeting, accompanied by our rationale for their selection is outlined below:

Targeting buildings: New build housing and housing retrofit priority actions

7.3 The Anthesis report identified that the total estimated savings potential of buildings by 2050 is 48 million tCO₂e, with 75% of these savings deliverable in the domestic sector. As previously identified, buildings are the largest single emitter of carbon emissions in the city, making it paramount that adequate consideration is given to tackling this sector. To ensure that we hit buildings hard, separate priority actions have been set to include new build housing and the retrofit of existing housing.

7.4 Improving the standard of new build and existing housing to address our net zero ambitions will also produce a number of co benefits. The first of these are the health benefits, improving the energy efficiency of homes can reduce ill-health, nearly half of households living in the most energy inefficient homes are in fuel poverty. 10% of excess winter deaths are directly attributable to fuel poverty. Improving the standard of Birmingham's housing stock will also produce financial savings, by reducing energy bills. Improving housing standards also in turn increases resilience, making households better protected against future energy price rises as well as being more physically resilient during heatwaves. Finally, identifying buildings as a key area to tackle within our net zero agenda will lead to job creation and the upskilling of local people. Two-thirds of jobs in the low carbon and renewable energy economy are in energy efficiency products, the demand for which will only grow as the agenda accelerates.

Targeting transportation: Transport and EV charging priority actions

7.5 As previously identified, transport is the second largest emitter of carbon emissions, so is a key area to target. Lots of good work is already underway in the transport arena in Birmingham, a trend we intend to continue to help accelerate a reduction in carbon emissions. The use of sustainable transport has multiple health benefits, both through reducing air pollution and increasing physical activity. Air pollution has been linked to 900 excess deaths per year in Birmingham. Promoting modal shift will also lead to reduced congestion, improved transport flow and reduced air pollution in turn. The transition to electric vehicles will provide further decarbonisation benefits as well as financial gains for the individual owner and that of business, given the lower 'Total Cost of Ownership' costs over the life time of the vehicle, particularly on fuel costs where there is more of a significant difference. The transition to EV take-up at an individual level can enable citizens to further their own role in contributing to decarbonisation through:

1. Time-of-use charging: currently available via home charging tariffs with specific energy providers aligned with the current level of product innovation/technology readiness levels of EV vehicles. Given technology advancements, further vehicle sectors/vehicle models will enable take up of time-of-use tariffs developments.

2. Vehicle-to-Grid (V2G): V2G is still in its infancy as a technology, with only a small number of available vehicles supporting V2G. The options for public rapid (50kW) V2G charging are very limited. The likely opportunity for V2G to progress is within the residential charging sector, as part of integrated smart metering and home renewable deployment (PV and / or battery storage). The ISO 15118 standard has been developed to accommodate V2G technology alongside Innovate UK funding a significant number of V2G trials and research projects. So, although not yet commercial, V2G is a future opportunity for citizens to contribute to decarbonisation.

In the meantime, the Council are working closely with their procured EV charging infrastructure partner, ESB Ltd, to ensure that the currently under-way public charging network upgrades will represent a meaningful step-change for EV drivers in Birmingham. They will continue to monitor technology advancements in areas such as time-of-use tariffs, V2G and other such developments, to help evolve the publicly accessible Birmingham network to improve the customer experience while progressing transport decarbonisation objectives.

Targeting waste: Waste priority action

7.6 Waste is a key area to target, whilst it does not result in the emission of carbon to the degree of other sectors, waste management has wider environmental implications. Through attempting to reduce the amount of waste we produce; we also help to protect eco-systems and wildlife through the reduced need for raw material extraction and minimised pollution. Reducing the amount of waste produced in the city and identifying the most efficient way to deal with the waste we do produce will be of financial benefit to Birmingham City Council. This may be through lower costs associated with waste collection across the city and the subsequent disposal of this waste. There is also the potential to generate further income, for example through composting. Changing the way that we deal with our waste also has the potential to lead to job creation. Friends of the Earth estimate that if a target of 70% recycling rate was reached it could create 50,000 new UK jobs.

Low and Zero Carbon Energy priority action

7.7 There are two steps in reducing the volume of carbon emitted by energy use: reducing of demand for energy, as well as the adoption of technologies which are powered by electricity as opposed to fossil fuels (e.g. natural gas). Local projects such as community energy schemes help to generate income for local people. This also has benefits such as increased autonomy, empowerment and resilience by providing a long term income and local control over finances. More widely, smarter energy use has the potential to reduce utility bills and generate a long-term source of income. This in turn will help to reduce fuel poverty through improving access to low cost energy in council housing stock, a key outcome for Birmingham where 14.2% of residents live in fuel poverty compared to the UK mean of 10.2%. Divergence from fossil fuel sources also increases economic resilience, providing protection against future fossil fuel price increases. Birmingham is already innovating in this area through the Tyseley Energy Park, which already houses an energy from waste plant and is also exploring the use of hydrogen. Stimulating the energy industry may also lead to job creation and the subsequent upskilling of local people. In the UK, low carbon and renewable energy activities generated £44.5 billion turnover in 2017, directly employing 209,500 people (full-time equivalents).

Targeting the natural environment, biodiversity emergency and environmental justice: Natural environment priority action

7.8 Birmingham is one of Britain's greenest cities –over 1/5th of area consists of green space (parks, nature reserves, allotments, golf courses and playing fields). There are around 1,000,000 trees in the city. Of this, 750,000 trees are in city ownership including highways. Parks have 132,000 individually plotted trees and 1400 Ha of woodland, 75,000 are street trees, and the remainder are in woodlands. Our green space is a valuable asset, and it is paramount that we maintain and expand this network, to encourage sustainable transport use. Projects such as increasing canopy cover in the city will produce financial benefits, house prices typically increase between 5% and 18% when a property is associated with mature trees. Maintaining Birmingham's greenspaces will benefit biodiversity, trees and green spaces can create habitats, support species and increase biodiversity. A green city is also more liveable, trees and other vegetation can reduce noise pollution (up to 6-8 decibels) and act as a visual barrier. It can also improve comfort in urban areas by reducing wind speed and air turbulence. Green space can provide a space for communities to engage, which can improve community cohesion, walkability of neighbourhoods, reduce crime levels and develop a connection to local place. These benefits in turn link back to the transport priority action, by making sustainable transport more attractive. Access to green space can also help to improve mental and physical health by encouraging physical activity: the cost of physical inactivity to the local economy has been estimated at £21.9 million. Maintaining Birmingham's natural environment is key to securing the cities future resilience, trees and vegetation can help to reduce surface run-off and reduce flood risk. They can also help to reduce temperature and the urban heat island effect. Certain trees and other vegetation can improve air quality by intercepting harmful pollutants.

7.9 Procurement – Whilst procurement has not been included as a priority action at this stage, it has an important role to play when making sourcing decisions and it is well placed to influence supply chains to reduce the carbon footprint in the supply of their products and activities and the effect they have on the environment. Whilst the Council already has provision within the Birmingham Business Charter for Social Responsibility to address this under the Green and Sustainable theme there is still more that can be achieved. Work is now underway within the Council's Corporate Procurement service to determine what additional measures can be put in place to support the Council's drive towards zero carbon by 2030 although, procurement legislation will have to be carefully examined to ensure that the Council remains compliant in any changes it proposes to make.

7.10 Costings have been included in this report where possible. However, this call to action is the first step in moving towards the implementation stage of many of these priority actions and therefore, where projects are not underway and already costed it is not possible to provide accurate estimates at this time. Accurate costs will be established as delivery and implementation of the Action Plan progresses and each element is subject to further project planning work and business case development. Making the shift to a net zero Birmingham economy will need to be part of the UK's financial system to managing climate risks effectively and efficiently by channelling capital towards sustainable activities. A decarbonised, net-zero economy could involve extra investments of 1–2% of UK's GDP per year until 2050, but it would also create thousands of new jobs, with an

associated economic boost. Financial innovation – in the form of alternative sources of funds and varying criteria for investment - is needed to accelerate the Just Transition.

7.11 An annual update report will be presented to Council in January of each year, from January 2022, setting out updates on each of the projects and continuing to roll forward the next steps. As schemes within this call to action develop, their individual delivery plans will become more detailed, independent of this report. The actions within this report cover January 2021-2022, meaning this report is not due for revision until January 2022 at the earliest.

Chapter 8 - Priority Actions - New Build Housing

8.1 What have we done to date?

8.1.1 Birmingham Municipal Housing Trust (BMHT) Specifications and Passivhaus Pilot

Since 2009, BMHT has strived for high quality and energy efficient properties, already building to a minimum EPC B standard. Our detailed specification of the build and standard house types will continually be amended to reflect improvements in materials and technologies and ultimately support carbon reduction goals. BMHT has always considered the space around homes, and it is important that we continue to improve the natural environment with planting, orientation of the buildings and natural shading. All these elements support long-term carbon reduction goals. Over the course of 2020 officers have commenced a programme of on-going work to:

- **Gather and share information with other Councils and partners**, learning lessons from other schemes, and viewing demonstrations to learn about technologies that reduce energy use or generate renewable energy.
- **Work closely with other BCC departments** such as Housing (maintenance) and Planning to consider materials used in construction and make appropriate improvements. Discussions held regarding technologies to be used and the best approach for long term maintenance approaches.
- **Implement Building Regulations 2020** - in the Spring Statement 2019, there included a commitment that by 2025 government would introduce a Future Homes Standard for new build homes with low carbon heating and high levels of energy efficiency. The consultation document included 2 uplift options on the current standards. An uplift of 20%, which could be delivered by very high fabric standards, or an uplift of 31% which could be delivered based on the installation of carbon-saving technology. Officers are currently working with architects and Employers Agents to reflect both these options in the current BMHT specification. Both options are being costed and the results will assist with recommendations for both the short term and longer term BMHT specification requirements. The results of these will be available by the spring of 2021 after which decisions will be made about BMHT specification changes and timescales.
- **Submit a European Regional Development Fund (ERDF) bid** to fund a trial of technologies for reducing energy demand, such as heat pumps, photovoltaics and storage batteries. A site in East Birmingham has been identified, Gressel Lane, to build 36 new properties that will include energy saving technologies. A plan has been developed and submitted for planning permission and a decision is due in December 20. The ERDF bid has been successful with the expression of interest (first stage) and the second main bid round will be completed by the 8 January 20, the outcome of this bid will be made 3 months after this date. If successful the finances will need to be spent by June 2023, however the scheme will complete in 2024.

- **Passivhaus trial** - This includes working with architects and Employers Agents to establish an understanding of the best approach. A site has been identified and is known as Dawberry Fields in Kings Heath. A design team has been set up and draft plans are currently being designed for the scheme. The aim is to obtain planning permission and go out to tender for a contractor in 2021 with an aim to be on site in 2022.
- **Inform and support tenants** on the way their new homes work, through production of guidance and a show home to demonstrate the technology and construction and maximise the effectiveness of their design.
- **Contribute to research** with organisations such as University of Birmingham and the Sustainable Housing Action Partnership (SHAP) to share information and learning.
- **Supporting ongoing maintenance of the technologies.** As part of the tendering process for the development the suppliers of the new technologies will include maintenance training for internal staff to ensure that the ongoing maintenance is appropriately carried out.

8.1.2 A review of the current BMHT build programme has seen a site at Dawberry Fields selected to pilot Passivhaus development. A review of Passivhaus delivery in other Local Authorities is underway, and identification of appropriate consultancy expertise to guide the development is in hand. A new build Passivhaus pilot will test the cost, effectiveness and appeal of this form of housebuilding for Birmingham Council tenants. Passivhaus works on the principle of increased insulation, and air tightness combined with mechanical ventilation and heat recovery. Homes built to this standard typically use 80% less energy than traditionally built homes, which delivers a major cost saving to residents. They are also reported to improve resident health outcomes by providing warmer and better ventilated homes. We will apply the learning from the Passivhaus pilot across all BMHT developments immediately as the benefits become clear.

8.1.3 After new sites have been built and tenants have moved in, the performance of the build form and technology will be monitored and evaluated, using both hard and soft measurements including actual energy used and resident interviews. These findings will provide guidance for future developments.

8.2 What are the next steps?

8.2.1 Improving the Quality of the Council's New Build

8.2.1.1 On future schemes BMHT will look at design to ensure that energy efficiency forms part of the design process before taking schemes through for planning. This will inevitably create a cost increase for new homes. The purpose of the current phase of pilot schemes is to establish the most cost-effective way to reduce energy use in homes, whilst minimising negative impacts on residents.

8.2.1.2 A higher cost of build will result in fewer homes being developed in total. It is important to recognise and monitor the challenges of the twin goals of sustaining and increasing affordable housing levels and improving the energy performance of these homes. If successful, the pilot schemes will be rolled out city- wide, with the intention to achieve the highest energy efficiency

possible within the current cost envelope of development. To meet the net zero carbon target, a significant proportion of future energy demand must be in the form of electricity rather than gas, oil or other fossil fuels. From 2025 new gas fired boilers cannot be installed in new build properties. Electricity is currently more expensive than gas and heating must be kept affordable to our tenants to avoid fuel poverty. There are new technologies that will help address this, such as ground source heat pumps, air source heat pumps, improved photovoltaic systems and batteries to store energy.

8.2.1.3 While all of these are currently on the market, there are different views as to which are the most appropriate to use and where. Early installations of air source heat pumps in new build Council stock some years ago were unsuccessful, due to a lack of understanding as to the most appropriate specification for the homes in question, along with resident expectations not being met. Technology and appreciation of how they are best used has improved since then. BMHT will be responsible in ensuring that appropriate training for the new technologies is included as part of the tendering process and staff from maintenance teams are included within this process. The ERDF funded pilot will test the latest generation of this technology and establish the most appropriate and cost-effective approaches. We are carrying out further research before setting out proposals.

8.2.1.4 With regard to the Passivhaus pilot, a design team has been set up and draft plans are currently being designed for the scheme, with completion expected by end of the financial year 2024/25. The aim is to obtain planning permission and go out to tender for a contractor in 2021 with an aim to be on site in 2022. Monitoring and evaluation of the trial schemes will also be important to learn lessons and to ensure that appropriate education is provided for both staff and future tenants. However, waiting for final outcomes of the Passivhaus trial to become evident in 2024/25 will not result in a fast enough pace of change in line with BCC's net zero aspirations. Any learning from the Passivhaus pilot should therefore be analysed and implemented as soon as is practicable, or by 2022 at the latest (the end of the council term). We need to apply learning as soon as possible, as we have 7,000 units of social housing to deliver through BMHT, InReach and other Registered Providers by 2031. This is a significant volume of housing and it is in the council's interest to construct these to the highest possible standard, achieving the highest carbon savings possible.

8.2.1.5 We need to observe other local authorities' council housing schemes to enhance our own learning. Exeter council's house building operations can be examined as an example of best practice. Over the last decade Exeter Council have developed 103 certified Passivhaus homes, including the UK's first multi-residential Passivhaus development in 2010. Exeter's council housing is designed to be climate ready and to be climate resilient to at least 2080 and are integrated within a sustainable landscape – buildings are set within a permaculture integrated landscape. By building to Passivhaus standard the buildings are healthy for occupants, comfortable regardless of the weather and extremely cost effective to run (thereby helping to eradicate fuel poverty). Over 60% of residents have not needed to switch on their heating since the homes were occupied. From a Council perspective the new building specs have reduced operating and lifecycle building costs, led to happier and healthier tenants, with reduced rent arrears and anti-social behaviour and exemplar buildings that are performing way beyond comparable building regulation compliant assets.

8.2.2. Standards of Private New Construction

8.2.2.1 Raising the standard of all new homes within the City will be an important part of achieving net zero carbon. The Council can facilitate and support this change, every home that is completed to a standard lower than net zero carbon is a future retrofit requirement. However, the City Council does not currently have a planning policy to require net zero carbon in all new build and therefore the planning department can only encourage developers to go further than the current requirements.

8.2.2.2 Two key policies are currently included in the Birmingham Development Plan (BDP) that relate to the sustainability of new developments. These are TP3 (Sustainable construction) and TP4 (Low and zero carbon energy generation). Policy TP3 requires development to maximise energy efficiency, minimise waste and consider the type and source of materials used, as well as BREEAM Excellent for non-residential buildings of a certain threshold. Policy TP4 states that: *“New developments will be expected to incorporate the provision of low and zero carbon forms of energy generation or to connect into low and zero carbon energy generation networks where they exist, wherever practicable and unless it can be demonstrated that the cost of achieving this would make the proposed development unviable.”* When the local plan, and the policies that comprise it, were written and subsequently examined, they were as ambitious as possible given legislation and policy in place at the time, as well as the evidence from viability assessments and interested parties. As understanding of climate change and its intrinsic links to sustainable construction and low/zero carbon energy has increased it is now evident that policies that were composed years ago can create a barrier when attempting to push developers to achieve notable carbon reductions. With little change in policy at a UK level, many developers present the issue of viability – as developers are already required to deliver affordable housing (or submit a financial viability assessment for why they cannot fulfil all policy requirements) they are able to conclude that they are unable to incorporate low or zero carbon energy generation on financial grounds. Moreover, developers are also able to meet the requirements of policy TP4 with minimal low/zero carbon energy generation (such as one PV panel) because at the time of writing the policy it was not possible to request a higher uplift. The BDP will be 5 years old in January 2022 and by this point the City Council must publish a review of the plan setting out which elements need to be updated. Policy to deliver zero carbon development will be developed through the BDP update which will commence in January 2022.

8.2.2.3 In addition to the BDP review the City Council are working on ‘Our Future City Plan - Central Birmingham 2040’. The plan sets the vision for the City Centre for the next 20 years. The City Councils R20 initiative is at the heart of the plan that includes a zero-carbon approach to development, green solutions for climate change adaptation and mitigation, supporting positive public health outcomes, the promotion of green infrastructure corridors including extending the tree canopy cover in the City Centre and utilising technology to better adapt our City for the future. The vision ‘Shaping Our City Together’ will be launched by the Leader in mid-January 2021.

8.3 What do we need to get us there?

8.3.1 In order to be able to require developers to achieve larger % reductions in carbon emissions, a revision to policy is required. Currently we are restricted by the existing policies in the local plan (the Birmingham Development Plan) and the fact that very few developers chose to go above and beyond these. There will be an opportunity to develop new policies as part of the update which will commence in 2022. However, the Government has consulted on a Future Homes Standard and one of the options presented would prevent Local Authorities setting their own energy requirements through Local Plans, instead the issue would be addressed through Building Regulations, therefore, until the outcome of this consultation is known it is not clear how ambitious a review of the BDP could be.

8.3.2 Birmingham City Council can also act as an influencer. By increasing the standards of BMHT properties the City Council can start to kickstart the supply chains and skills development required, as well as demonstrate how higher standards can be met and the true costs of delivering this. This can start to encourage the development industry to increase standards.

8.3.3 Some investigation into the viability of modular housing has already taken place under the title of the 'modpod' project. However, only one trial unit has been completed to date. High density modular housing, which can be produced and constructed rapidly and designed to have favourable sustainability credentials could provide a relatively 'quick win' way to roll out new build housing with considerably smaller carbon footprints.

8.4 Lobbying

8.4.1 We need to continue to lobby whilst we wait for the outcome of the future homes consultation. We either need the government to raise the sustainability standards or allow local authorities to set their own standards. One of the fundamental issues is central government's 2050 net zero target, which conflicts with local authorities' more ambitious targets. The planning white paper creates uncertainty about the role of planning in tackling climate change and fails to provide any detailed explanation of how carbon reductions will be secured. We need to lobby central government for better sustainability requirements at a national level.

8.4.2 We also need to lobby partners, such as the combined authority and UK Green Building Council (UKGBC). It is possible that the UKGBC may be able to provide some much needed funding for the retrofit agenda. There are some good examples of work being undertaken, the Combined Authority has a Low Carbon Homes Group which is starting to bring together best practice across the region. Birmingham will need to access an equity release scheme to facilitate meaningful retrofit.

8.5 Costings

8.5.1 The Passivhaus certification board have carried out studies to establish the additional cost % associated with targeting Passivhaus standard. The overall summary of this trend is shown in figure 4 below and demonstrates the current best practice is at 9% extra cost. However, Exeter City Council, with nearly 9 years' experience, are now building Passivhaus at a premium of just 8% over baseline and that the steady-state projection of Passivhaus adoption at scale is around 4%. BMHT expect the Passivhaus cost to be 10-20% higher than the traditional BMHT build, producing carbon savings of up to 75% on the Passivhaus and up to 60% with the energy saving technologies. These are estimates only and the schemes will be monitored to establish what the actual figures will be.

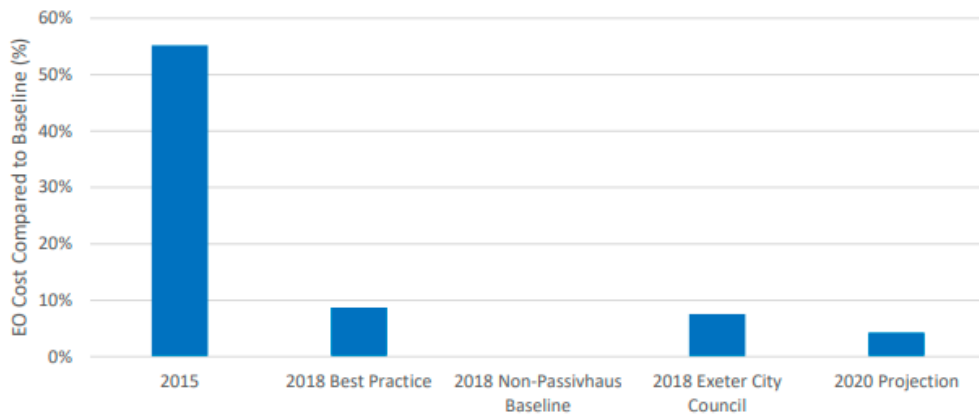


Figure 4: % uplift in cost associated with targeting Passivhaus standard (Passivhaus Trust)

Chapter 9 - Priority Actions – Retrofit of Existing Housing Stock

9.1 What have we done to date?

9.1.1 BCC Capital Investment

9.1.1.1 The BCC capital investment budget has diverged from the programmed replacement of internal fittings and replacement of high efficiency gas boilers over the last few years and will continue to be as such over the foreseeable years due to upgrading External Wall installation (EWI) on High Rise Residential Blocks in response to Grenfell incident. Work is ongoing on high rise residential block's External Wall installation as a total heating solution, roof replacement, internalising external balconies, replacement windows, replacement of external panelling and as such where possible, other internal refurbishment is included with these works which in some instances have increased the thermal properties within the block.

9.1.1.2 Due to budgets being diverted to HRRB the programme of works has drastically reduced since 2017 and for the next few years. There are some good examples in the recent years of preprogrammed works on low rise blocks, and their total refurbishment, working jointly with energy companies to achieve energy efficient outcomes. It must however be emphasised this is a drop in the ocean, given the total amount of low-rise blocks is in the region of around 3,000. There are some examples of retrofitting of BCC housing properties, however it would be unlikely even those improvements, would match or meet current or future deep retrofit decarbonisation standards. We are also exploring ways to tap into the various guises of the Government's Green Homes grants. Although they provide an excellent opportunity to lever in money to revamp BCC housing, the issue of specific match funding continues to pose as a major obstacle, lacking strategic input.

9.1.2 Retrofit Conference

9.1.2.1 Between the 21st and 23rd of July 2020 Birmingham supported Low Carbon Homes UK in delivering a retrofit virtual conference. A working group was set up internally within the council to assist LCH in tailoring and shaping the event. The acting assistant director, Jane Trethewey, also gave a presentation on retrofit in Birmingham. The event was successful, with 167 delegates registering, 130 logging on and very encouraging feedback received.

9.1.3 East Birmingham Community Heat Taskforce

9.1.3.1 An East Birmingham Community Heat Taskforce has been set up, having its first meeting on the 22nd October 2020. The aim of the taskforce is to make the East Birmingham Corridor a pioneer/epicentre for retrofit and heat decarbonisation as part of the Route to Zero transition recognising that we need to decarbonise at the same time as creating good jobs for a just transition. East Birmingham is a national exemplar of what can be done in this space and developing models locally that can be scaled up across the city and then nationally. The initial objectives of the taskforce are to:

- Identify the research and engagement we need to do.
- Create a body of expertise that be used to bid into significant national funding pots.
- Identify areas of priority for projects and model interventions and investment to put together a portfolio/pipeline of projects for bidding

- Support the city's R20 Task Force ambition
- Explore how Tyseley Energy Park and other assets can provide solutions and low carbon energy services out into the community.

9.2 What are the next steps?

9.2.1 We need to develop an impact analysis for a 6- and 12-month period monitoring the thermal efficiency improvements made and thus be able to demonstrate the efficiencies and the installations/improvements likewise and thus its part of their works. Just to remove the "E, F and G" rated boilers from the city the financial outlay would be circa £3.8 million. The area of heating has seen underfunded for some time and where we have circa 12,000 homes with boilers that have past their end-of-life cycle and would need replacing (end of life is based on 15 years usage). This will require additional funding.

9.2.2 We need to give due consideration to the size of the undertaking in retrofitting all of Birmingham's properties, it will need a large strategic commitment. The retrofit of 60,000 homes over 30 years equates to 2,000 properties per year every year (40 homes every week). Our key next step will be to create a plan for citywide retrofit in to include a trial 2021, with a view to scale up towards 2030.

9.2.3 The council have participated in a consortium bid with WMCA with a small project, (subject to securing match funding), with a view of retrofitting flats over garage properties and separately but linked the potential of converting the garages to accommodation. The project is focussed on SHDF whole house retro fit in Cottsmeadow Drive - Hodge Hill 16 flats above garages, match funding contribution from BCC of around £1million will be required. The project will provide insight to whole house retrofit, opportunity to explore economies of scale, and ultimately provide the residents with energy efficient accommodation, the additional conversation would provide vitally needed and energy efficient social housing. Separate to the SHDF but complementary, we are requesting an additional budget of £1.3 million to convert the garages into 16 residential units. We are exploring potential bid to Green Homes 1b, with existing or committed projects which may be easier to match fund. We have our sight on Green Homes LAD's phase 2 as a potential to pursue a larger grant, again this will be subject to match funding that can be secured, although a notional figure of £5 million could lever in a further 50 to 70% providing an excellent platform to conduct deep energy efficiency works on various archetype and which would support our forward planning. We are also in early discussions with our contractors / supply-chain including energy providers, investors, where we are exploring Ground Source Heating for planned structural works on LPS blocks, with a view of getting either fully/partially funded projects on the back of RHI.

9.2.4 The EB taskforce has identified that a blended approach is needed that considers the retrofit and technology solutions but as part of a model that considers the functionality of the neighbourhood and the lived experience of communities. We need workable options that can be fundable and deliverable in the next 6 months. The taskforce has begun to identify potential funding and forums to progress the retrofit agenda. The EB programme provides an opportunity to prepare a business case to support a bid for funding (from the WMCA or elsewhere) which could focus on a

pilot retrofit project, focussing on the most inefficient housing stock. Planned next steps for the EB TF will be:

- Strategic Outline Case and initial East Birmingham Board meeting November 2020
- Development of OBC and early wins (some of which won't require funding)
- Outline Business Case early/mid-2021
- Delivery mid-2021 onward

However, this is yet to be confirmed as the EB taskforce has only had one meeting to date.

9.2.2 Private Sector Homes

The retrofit of private sector homes will also be essential to achieving net zero carbon. The Council cannot require the retrofit of privately rented or owned homes but can use its own retrofit programme to demonstrate what can be achieved and to start the process of upskilling workers and kickstarting supply chains in order to encourage others to follow. The Council will also investigate the potential to bring in higher standards across Birmingham's private rented sector through licensing. The Council can also act as a source of advice – learning from retrofitting its own stock and sharing this with owner occupiers and private landlords through information leaflets and demonstrator homes. Additionally, it is anticipated that central Government will put measures in place to encourage and eventually force the change, particularly in the private rented sector where regulations can be used to achieve minimum standards of energy efficiency in homes. Central Government have also made available grant funding to encourage homeowners to invest in retrofitting their own properties.

9.3 What do we need to get us there?

9.3.1 The key barrier to wide scale retrofit is the lack of funding. We will need to lobby central government and relevant stakeholders to secure further funds. Many current funding opportunities from BEIS are subject to match funding: for example, for retrofit it is a 60% contribution and Green Homes a 33% contribution, this can be difficult to meet. As previously identified, we have an internal shortfall of funding, grant aid and specialists, which coupled with the Government short notice periods are hampering progress. At present we are currently going through a phase in getting some schemes ready in anticipation of further funding rounds.

9.3.2 We will need to dramatically increase the thermal efficiency of our stock's building fabric, by implementing a range of improvements, such as external/internal insulation and electric heat pumps, eliminating draughts and replacing windows and doors. Introducing ventilation where appropriate, incorporating all the things that need to happen to homes to reduce energy bills and get carbon emissions down to zero. We should be endeavouring to provide and give the "best" experience that is possible to achieve. I.e. strive to achieve the energy saving target of 50 kWh per square metre per annum. By having this as an aim, properties would be within the EPC rating of "B" and to set a minimum standard for each property of an EPC rating of "C"

9.3.3 A city-wide programme to upgrade housing stock will be essential to meeting the climate commitments. We will also need:

- To be innovative and experimental and understand that some projects may not deliver the required outcomes but we should learn from these and adjust works accordingly. By not achieving set outcomes should not be the reason to stop work but one that pushes us to strive for excellence and to do better for our residents.
- An approach that is designed to ensure that thermal efficiency works carried out do not block further improvements that may be required later down the line.
- To promote/educate all key stakeholders about benefits of retrofitting and decarbonisation, through a city-wide programme, bringing about a concept of value, ethical thinking and future proofing of homes as a normal approach.
- Building that are “smart” and thus adapted to ensure they have the ability to use all new technologies that present themselves.
- Normalise the concept of retrofitting which will be key for the building industry contractors. This will require utilising added value through our procured contractors to have a leading role within the retrofit industry at large, with possible training and showcasing good practice ‘know how’ upping skills and knowledge. This should be a minimum requirement in all new tenders and that they should hold certain certification i.e. MCS certified and trust mark registered, set a minimum PAS standard that they will work to
- Develop strategies that promote West Midlands as a safe space for companies to innovate.
- Where properties need to remain on electric for their heating and hot water then a property should be “Lot 20” compliant as a minimum requirement and have access to at least one other new technology i.e. solar PV, battery storage, or mechanism to reduce their costs i.e. external wall insulation and improve their thermal comfort.
- Where properties remain on fossil fuel i.e. gas, they should have a boiler with a minimum SEDBUK rating efficiency of not less than “C”. Gas boiler purchased should be “hydrogen” ready, thus applicable to take a natural gas / hydrogen blend from the grid.
- If windows are replaced independently of a whole approach, then these should be triple glazed.
- More staff resource to enable us to rollout a large scale retrofit programme.
- We will also need additional staff resource to utilise additional funding pots provided by central government, such as the green homes grant which was announced in 2020. A lack of staff resource has proved a barrier to maximising the potential of this opportunity.

9.4 Lobbying

9.4.1 We need to have an Energy Performance Certificate (EPC) on every property, to fully understand the scale of issue. This would include software, hardware and resources. If we were to try and carry out this exercise on all of our stock it would take 5 years and it would likely require 12

additional surveyors permanently employed within the business and would cost £585k per year for these posts. We will need additional funding to begin the process of boiler conversion/removal.

9.4.2 With the current cost in the region of £40k for whole house retrofit, there is a significant funding gap of £2.4 billion, this though is conservative and could be as high as £60K per property. Although it is envisaged the overall cost of whole house retrofit may reduce over the coming years based on economies of scale and the advancement industry capabilities, there is no doubt the financial contribution required to bring BCC housing stock anywhere near the 2050 compliance is a colossal amount of investment. Of course, these model projected costs do not take into consideration structural changes or repairs or products that have naturally reached the end of their lifecycle and require changing. We will need to lobby central government for new legislation and funding pots to enable wide scale retrofit, starting with the simpler task of moving away from inefficient gas fired boilers. We need to lobby government to bring forward regulations to improve the energy efficiency of private rented homes as well as making further funding available to support the retrofit of private homes.

9.5 - Costings

9.5.1 Anticipated cost: It is important to recognise that currently there is an anticipated cost of £2.4 to £3.5bn shortfall for retrofitting all our stock beyond the departments existing budget. The current cost is in the region of £40k for whole house retrofit, there is a significant funding gap of £2.4 billion, this though is conservative and could be as high as £60K per property.

Chapter 10 - Priority Actions - Transport

10.1 What have we done to date?

10.1.1 The COVID-19 outbreak has affected people's lives and the way they move in unprecedented ways. The measures that were taken to address the challenges presented by the pandemic were also unique in the way they were put forward. Due to social distancing, public transport capacity was significantly reduced, and people were encouraged to use trains and buses only for essential journeys. The long-term impact of the pandemic on public transport patronage levels is yet to be seen but we expect it to be a challenge at least in the short to medium term following the containment of the COVID-19 outbreak.

On the other hand, we put forward measures to support walking and cycling at a speed that would have been nearly impossible during normal times. The government allocation of the Emergency Active Travel Fund allowed us to dedicate more space to walking and cycling, and as a result accelerate the delivery of some of our existing ambitions as these were stated in the Birmingham Transport Plan. The new Birmingham Parking Supplementary Planning Document (SPD) sets out standards for car club parking spaces and for electric charging points in new developments or those undergoing major renovation. The new parking standards will also have greater expectations on developers (particularly for residential, although some non-res wording is included) to include car club provision and liaise with either Co-Wheels or another accredited provider to put these in place. Where a bay(s) for a specific development is not appropriate then S106 contributions will be sought to enable on-street provision within the local area.

10.1.1 Birmingham Transport Plan (BTP)

10.1.1.1 The Birmingham Transport Plan sets out 4 'big moves' to deliver Birmingham's vision for a sustainable, green, inclusive, go-anywhere network:

1. Reallocating road space

The allocation of road space will change away from single occupancy private cars to support the delivery of a public transport system fit for a global city, fundamentally changing the way that people and goods move around the city.

2. Transforming the city centre

The city centre of Birmingham will be transformed through the creation of a network of pedestrian streets and public spaces integrated with public transport services and cycling infrastructure. Access to the city centre for private cars will be limited with no through trips. This includes looking at different options for the central section of the A38 including re-routing it to an upgraded ring road.

3. Prioritising active travel in local neighbourhoods

Active travel – walking and cycling – will become how most people get around their locality most of the time. Cars will no longer dominate street life around homes and schools. A limit of 20mph will be standard on all local roads. Residential neighbourhoods and local centres will be places where people are put first.

4. Managing demand through parking measures

Parking will be used as a means to manage demand for travel by car through availability, pricing and restrictions. Where development potential exists, land currently occupied by car parking will be put to more productive use.

10.1.1.2 The draft Birmingham transport plan was consulted on early in 2020 with intention to adopt by end of 2020, however this is now unlikely due to the formation of the BETP, necessitated due to the Covid-19 outbreak.

10.1.2 Birmingham Emergency Transport Plan (BETP)

10.1.2.1 The Birmingham Emergency Transport Plan sets out plans for a wide range of emergency measures to support walking, cycling and public transport throughout the city, in light of the impact of COVID-19. As part of the Emergency Birmingham Transport Plan, the council has already begun making a number of changes to make walking and cycling safer and enable people to maintain social distance. Cycling and walking can also help improve physical and mental health and wellbeing.

Pop up cycle lanes

10.1.2.2 The first of these measures are pop up cycle lanes. These temporary 'pop-up' cycle routes on roads are intended to create safer spaces for cycling. In many cases, these will have 'light segregation' from other traffic, meaning that the cycle lane is on the road, but motorised vehicles may not enter the lane, and are stopped from doing so by physical barriers such as poles bolted into the road surface. Seven routes have been chosen for pop-up cycling infrastructure. They are all sections of route that have already been identified as priorities within the [Birmingham Walking and Cycling Strategy and Infrastructure Plan](#) and form part of the proposed [West Midlands regional cycle network](#). To date the following five of the seven routes have been delivered:

- City centre to Small Heath (A45 corridor) - provision of light segregation and links along quiet streets and traffic-free paths to provide a safer parallel route to the A45 between the city centre (Bordesley Circus) and Small Heath.
- Selly Oak to Northfield (A38 corridor) - reallocation of road space in Selly Oak local centre to create a two-way light segregated cycle route between Selly Oak Triangle and the Birmingham Cycle Revolution A38 'blue' route. Light segregation and/or shared bus and cycle lanes along the A38 between Selly Oak and Northfield town centre.
- City centre to Fort Dunlop (A47 corridor) - reallocation of road space, direction signs and other access improvements to connect the city centre and its Learning Quarter (including Aston and Birmingham City Universities) to Nechells and Saltley. This will also link, via the existing cycle route on the A47, with key employment sites at Fort Dunlop and Jaguar Land Rover at Castle Bromwich.

- City centre to City Hospital via Jewellery Quarter - reallocation of road space, direction signs and other access improvements to support travel by active modes to City Hospital, Jewellery Quarter and city centre.
- Bradford Street (city centre cycle access) - reallocation of road space to create a two-way, light segregated cycle route, aligned with the city centre traffic cells initiative (also being brought forward as part of the Emergency Active Travel Fund).
- A34 New Town Row/High Street and A38 Bristol Road/Bristol Street corridors.

Park, roll and stroll

10.1.2.3 Secondly, as part of working towards a [low carbon, clean air recovery after COVID-19](#); the BETP has led to the launch of two Park, Roll and Stroll sites. These are two car parks where you can park up and cycle the remainder of your journey. The two sites are Selly Oak Station Car Park and St Andrews BCFC Car Park. The car parks are already in use and will only be available for use on a temporary basis during recovery from the COVID-19 pandemic.

Places for People

10.1.2.4 Another initiative within the BETP is the 'Places for People' scheme. Places for People is about reducing the amount of traffic in residential neighbourhoods so that it is nicer to be outside and safer for people to walk and cycle, children to play, neighbours to chat. To date, the council is delivering low traffic neighbourhood pilots in Kings Heath, on the western side of Kings Heath High Street, as well as some early demonstration measures with three modal filters between Moseley and Kings Heath on the eastern side of Kings Heath High Street. We are delivering low traffic neighbourhood pilots in Lozells, to the north and south of Lozells Road, including some no entry points and one-way streets. This will include school street measures with Anglesey Primary School and Heathfield Primary School.

Space for Pedestrians

10.1.2.5 The final initiative within the BETP is space for pedestrians in local centres. This involves widening and marking footways (pavements) in a number of local centres to make social distancing and queuing easier. To date, the following measures have already been implemented:

- City Centre - social distancing signs and pavement markings to assist pedestrian movement and queuing have been installed in a number of pedestrian areas of the city centre including New Street, Corporation Street and High Street.
- Erdington - parking bays on sections of High Street from the north east end (near John Taylor hospice shop) to the south west end (near Poundland/Six Ways Island) are suspended to extend the width of the footway.
- Harborne – parking bays on the High Street are suspended to extend the width of the footway. Extra disabled parking bays have been created on Station Road. A pedestrian one-way system is in operation on the footway from York Street to Home Bargains (74 High Street).
- Kings Heath - parking bays on sections of High Street between Asda and Silver Street are suspended to extend the width of the footway.

- Ladypool Road - parking bays on sections of the high street between Ladypool Road congregational church in the north, and Taunton Road to the south are suspended to extend the width of the footway.
- Sutton Coldfield - markings outside shops on The Parade and Maney Corner indicate spaces for socially distanced queuing outside shops. A section of parking bay is suspended on Birmingham Road outside Scrivens and Halifax to extend the width of the footway.

10.1.2.6 To support the BETP, Birmingham City Council has produced the Birmingham Bus Statement which reinforces our commitment to bus travel as a major strand of our transport policy and describes how we are supporting this mode of travel.

10.1.3 E-cargo Bikes

10.1.3.1 Engagement has been undertaken with targeted organisations with the aim of developing an e-cargo bike pilot that would remove car and van trips from the central Birmingham transport network. The following groups were approached: Business Improvement Districts (BIDs), hospitals, universities and local couriers. All organisations within these groups were invited to submit an expression of interest in the project, along with the Active Wellbeing Society (TAWS), a partner working with the Council to deliver active travel projects. As a result of these expressions of interest we successfully bid for 20 e-cargo bikes. Of these, 4 will be used by the Council for our own needs and the rest will be allocated to the following local organisations via a three-year lease.

- Jewellery Quarter BID (2 bikes): for their own use and to lease to businesses
- Westside BID (2 bikes): for their own use and to lease to businesses
- University of Birmingham (3 bikes): managed by the fleet team and trialled on different services on campus
- Aston University (1 bike): for their own use
- WEGO couriers (3 bikes): to carry out low carbon deliveries across Birmingham
- West Midlands Fire Service (1 bike): for their own use
- The Active Wellbeing Society (4 bikes): to be deployed for various uses with different communities in Birmingham.

10.1.3.2 Following a procurement process Raleigh have been selected as the supplier of the e-cargo bikes and e-cargo trikes. The bikes will be set up and maintained by the Active Wellbeing Society.

10.1.3.3 In addition to the e-cargo bikes, an e-scooter trial is currently underway within Birmingham city centre. Many of the docks will be located close to public transport interchanges. Both of these schemes are the first steps in our wider effort to decarbonise last mile freight trips in the city.

10.1.4 Hydrogen Buses

10.1.4.1 Birmingham City Council has purchased 20 new hydrogen double decker buses as part of their Clean Air Hydrogen Bus Pilot. The Clean Air Hydrogen Bus Pilot looks to 'kick-start' the hydrogen market as a viable zero-emission fuel with the procurement and deployment of 20 hydrogen buses in Birmingham. The buses, which are made by Wrightbus and are the world's first

zero-emission hydrogen fuel-cell double deckers, will be introduced with National Express West Midlands from April 2021.

10.1.4.2 It's intended that pilot will be the catalyst for the next generation of hydrogen buses, hydrogen production and re-fuelling infrastructure development. The council have also collaborated with ITM, who will be producing and dispensing the hydrogen fuel from the new re-fuelling hub at Tyseley Energy Park. Hydrogen buses consume four times less fuel in comparison to standard diesel buses, covering 300 miles on a single tank and with the ability to refuel within 7-10 minutes. They emit water vapour, meaning no carbon dioxide or other harmful gases are being pumped into the air. Hailed as another solution to tackling the city's poor air quality and a key step towards achieving the council's net zero carbon target, each bus is expected to save up to 79.3 tonnes of carbon dioxide emissions per annum.

10.1.4.3 Fuel cell buses offer a practical solution for cities to decarbonise public transport and immediately improve air quality. This pilot is a significant step towards our net zero carbon target and will provide Birmingham with a leading role in informing debate on supportive policies for zero emission public transport at a local and national level. The buses are being manufactured by Wrightbus, who are also supplying vehicles to Aberdeen and London as a first in the deployment of hydrogen fuel cell double decker buses in the UK and within Europe. The buses will be operated in Birmingham by National Express, with an ambition to run them on the new Sprint route when it opens. The development will see the start of fuel cell technology supply chains within the region and will help to support a brand-new service and maintenance apprenticeship programme. It has been funded through OLEV (Office for Low Emission Vehicles), GBSLEP (Greater Birmingham & Solihull Local Enterprise Partnership), Birmingham City Council and JIVE project funding from the FCH JU (European Funding from the Fuel Cell Hydrogen Joint Undertaking) under grant agreement No 735582. The FCH JU receives support from the European Union's Horizon 2020 research and innovation programme, Hydrogen Europe and Hydrogen Europe Research.

10.1.5 Clean Air Zone

10.1.5.1 The Birmingham Clean Air Zone (CAZ) is to be introduced by 1 June 2021, at the earliest. It aims to reduce levels of NO₂ in the air to a maximum average of 40µg/m³, as soon as possible. The CAZ received government approval in 2019 and follows London's Ultra Low Emission Zone (ULEZ), introduced in the same year. Birmingham's Clean Air Zone will cover all the roads within the A4540 Middleway Ring Road, but not the Middleway itself.

10.1.5.2 Implementation of £10m Heavy Duty Vehicle (HDV) Fund was approved by Cabinet on 11th of February 2020. The fund is designed to support SMEs to purchase and/or lease new compliant vehicles/retrofit non-compliant vehicles to achieve compliance and improve air quality and was due to be launched during 2020. The scheme for Birmingham-licensed hackney carriage and private vehicles which aims to encourage an upgrade to this fleet through retrofits, purchase of hybrids or EVs (total value c. £15m) is also due to open for applications at the same time as the HDV scheme. A scheme to develop rental of EV taxis is being developed. A scrappage and/or mobility credit scheme for workers in the CAZ earning less than £30k p.a. will be launched in late 2020 and will encourage people to scrap a 'non-compliant' vehicle for one that is compliant or use the money for 'mobility' credits.

10.1.6 Cole Valley as a Key Route for Walking and Cycling

10.1.6.1 At present the following actions are underway to establish the Cole Valley as a key green route for walking and cycling:

- Cole Valley cycle route waymarking – following investment in upgraded surfaces along the Cole Valley route through the Birmingham Cycle Revolution programme, direction signs will be provided along the route and at all highway access points (including signs to indicate which sections of the Cole Valley form part of National Cycle Network Route 53).
- Wildlife Ways project – improvements along Cole Valley in north Solihull
- A45 corridor cycle route – development funding from WMCA will support design work for a high-quality cycle route between Birmingham City Centre and Sheldon, crossing Cole Valley at Small Heath, and building on the temporary pop-up cycle lane introduced in 2020 between Birmingham City Centre and Small Heath.
- Tyseley Energy Park and community partners are working up proposals for the green space between A45 and Ackers Adventure and identifying funding to progress these.
- Iron Lane Local Growth Fund project in Stechford – major highway improvements including new bridge across River Cole and new pedestrian and cycle crossings

10.2 What are the next steps?

10.2.1 As previously discussed, Birmingham City Council published a draft Birmingham Transport Plan (January 2020) setting out what the city needs to do differently to meet the demands of the future. The BTP sets out the short, medium and longer-term actions Birmingham can take to enable a low carbon, clean air recovery from COVID-19. The actions were categorised into the following timescales: short term (over the next few weeks), medium term (over the next few months) and longer term (beyond 2020). Programs and plans were to be brought forward in line with the four big moves which have been previously discussed.

10.2.2 Towards the conclusion of the period of public consultation on the BTP, the country was placed in lockdown to reduce the spread of the coronavirus COVID-19. As a result, travel patterns were transformed overnight with traffic down to a third of usual levels and public transport services focused only on getting key workers to their workplaces while maintaining social distancing. This led to an increased incidence in walking and cycling, as residents began to explore their local area during their daily permitted exercise. On the 9th of May 2020, the Secretary of State for Transport announced a £2 billion package to support active travel to help the country emerge from the coronavirus crisis, of which £250 million is for swift, emergency interventions to make cycling and walking safer. In response to this the Birmingham Emergency Transport Plan was created, which sets out plans for a wide range of emergency measures to support walking, cycling and public transport throughout the city, in light of the impact of COVID-19. The draft Birmingham Transport Plan (BTP) was consulted on early in 2020, and this was followed by the adoption of the Emergency Birmingham Transport Plan (EBTP) in response to the Covid-19 pandemic. The intention is now to adopt the full BTP by summer 2021.

10.2.3 Decarbonising transport includes parts of the network that are beyond the remit of Birmingham City Council. As a key player in the city, the council has a role to play in bringing different actors together to identify synergies for the city. The City Council will start to regularly review the decarbonisation plans of transport stakeholders (such as Network Rail, Transport for West Midlands, bus operators, Midlands Connect) and keep an up-to-date record of their commitments and decarbonisation initiatives. In addition, we will identify the best way to maintain an open and regular dialogue with them either through existing channels (such as the WMCA Low Carbon Officers Group) or through our own initiatives (such as expanding upon the Transport Sandpit that we carried out in May).

City Centre Segments

10.2.4 Transforming the city centre was one of four Big Moves outlined in the draft Birmingham Transport Plan (launched in January 2020). To achieve this, fundamental changes to how the city centre is accessed was proposed as part of a city centre ‘traffic cells initiative’. Through this, the city centre will be divided into a number of segments. Each area will only be able to be accessed from the A4540 Middleway (ring road), and to move from one segment to another in a private vehicle you would have to go back out onto the A4540 Middleway. Movement between the segments would be unrestricted, and indeed enhanced, for public transport, pedestrians and cyclists. This commitment to transforming the city centre through the creation of walking and cycling routes alongside public transport services and limited access for private vehicles was reinforced in the [Emergency Birmingham Transport Plan](#) (approved in June 2020).

10.2.5 Through the Emergency Active Travel Fund, we are now able to begin to implement these city centre segments, creating more space for people by reducing the volume of through traffic and the dominance of vehicles on minor roads in the city centre. The area within the A4540 Middleway will eventually be divided into six city centre segments, as shown below. The first phase of measures are being introduced alongside new pop-up cycle lanes in the city centre. The first phase of will be delivered using temporary traffic management including barriers, cones, signs and road markings. It will include the following changes:

- Prohibiting access to Cecil Street, Lower Tower Street and Brearley Street from New Town Row (access to New Town Row will be maintained)
- Restrictions to north–south movements along Camden Street, Sand Pits and Parade
- Restrictions to east–west movements along Bristol Street
- Restrictions to westbound movements through A4400 St Chads Queensway

10.2.6 This scheme is being delivered on a trial basis for the next few months, with the potential for the measures to be modified

Pop up cycle lanes

10.2.7 Cycle lanes will continue to be delivered. Cycle lane proposals are set out in the Birmingham Walking and Cycling Strategy and Local Cycling and Walking Infrastructure Plan, 2020. Tranche 2 of the Active Travel Fund provides an opportunity to enhance existing routes, and if funding permits, develop 2-3 additional schemes.

Places for People

10.2.8 Places for People aims to reduce traffic in residential neighbourhoods so that it is safer for people to walk and cycle, and more rewarding to be outside. Early demonstration projects to address traffic problems on identified streets in Bournville, Castle Vale and Moseley are in the early stages ahead of further engagement to develop low traffic neighbourhoods in these areas. These trial areas will be as follows:

Bourneville Places for People trial measures will be located:

- On Oak Tree Lane, to the south of the junction with Woodbrooke Road.
- On Franklin Road, to the west of the junction with Linden Road/Watford Road.

Castle Vale Places for People trial measures will be located:

- On Yatesbury Avenue, to the south-west of Biggin Close.
- On Cosford Crescent, to the north of the junction with Tangmere Drive.

Moseley Places for People trial measures will be located:

- On School Road, to the north of the junction with Greenhill Road and Greenend Road.
- On Cambridge Road, at the end by the roundabout and Cambridge Road Methodist Church.
- On Poplar Road, to the west of Woodville Road, beyond the school keep clear markings.

Space for Pedestrians in Local Centres

10.2.9 As previously mentioned, we have already been widening and marking footways in a number of local centres (previously listed) to make social distancing and queuing easier. In many cases, we are doing this by suspending some on street parking and opening that space up to pedestrians. There is the aspiration to extend this scheme and measures are proposed for other centres, details on these will be added when these have been assessed and schemes designed.

The following existing schemes as of 13/05/2020 have been identified to be delivered either later this year or next year:

- Dudley Road Major Scheme
- Alcester Road Bus Priority Scheme
- Selly Oak Local Centre Proposals
- Cross City Bus
- City Centre and Snow Hill Public Realm Schemes
- SPRINT Bus Rapid Transit

The Road Space Reallocation & Cycle Schemes to be delivered include:

- A38 extension Selly Oak to Longbridge
- A47/A38/B4148 Fort Parkway to Langley/Walmley
- A456 Hagley Road corridor
- Bristol Street to Five Ways/Edgbaston
- Pershore Road/ Priory Road connection to A38 from NCN5
- Ward End Park and Washwood Heath

The city wide active travel measures include:

- Green route upgrades
- Cole Valley Green Route upgrades
- Canal route upgrades and access
- Lighting (off road routes) where appropriate

The city centre wide schemes include:

- Westside Area Streetspace Rationalisation Pilot
- Southside Area Streetspace Rationalisation Pilot
- Eastside Area Streetspace Rationalisation Pilot
- Spill out areas/Parklets

E-cargo bikes

10.2.10 With regard to the e-cargo bikes, the next steps will be:

- To develop e-cargo bike branding based on the Brum Breathes logo in recognition of the CAZ funding that is being used to support the revenue aspect of the pilot.
- To ensure project partners are in a position to receive the vehicles, this will include training and the establishment of partnership agreements in early 2021.
- To begin staggered approach to distribution and set up of e-cargo vehicles.
- The Active Wellbeing Society will utilise the first tranche of the e-cargo bikes for community food deliveries over Christmas 2020.

Hydrogen Buses

10.2.11 Once launched, the Clean Air Hydrogen Bus Pilot will be monitored and reviewed to analyse and ensure the ongoing commercial and operational viability of hydrogen buses, to enable a continued roll out of hydrogen fuel cell technology within bus fleets, as part of the city's commitment to the environment and cleaner air.

Cole Valley Route

10.2.12 The Birmingham Walking and Cycling Strategy and Local Cycling and Walking Infrastructure Plan was adopted in January 2020 and includes several projects (which are currently unfunded) along the Cole Valley including:

- Local network: **Stechford** - Area-wide walking and cycling improvements including elements delivered through Iron Lane Local Growth Fund project and Urban Centres Framework
- Local links: **Cole Hall Lane** - Cycle track along Cole Hall Lane. Cole Valley footbridge and green route spur to Glebe Farm Recreation Ground
- Local links: **Heartlands Hospital, Bordesley Green East** - Cycle track along Bordesley Green East. Cole Valley footbridge improvements and green route spur between Morden Road, Stechford, Cole Valley and Bordesley Green East
- Local links: **Heartlands - Small Heath** - Signed advisory route

- Regional priority route: **A45 Birmingham to Solihull** - Mixed route: cycle track and signed advisory route on side roads
- Green route: **Ackers and Cole Valley Canal access** - New ramp or bridge for Cole Valley, potential opportunities for 'Lost World' project with Tyseley Energy Park and community partners
- Local links: **Shardway - Packington Avenue - Lea Village** - Mixed route
- Local links: **Hall Green Station** - Mixed route
- Local links: **Kings Heath** – Shirley -Mixed route
- Local links: **Yardley Wood** - Mixed route

10.3 What do we need to get us there?

10.3.1 First and foremost, we need to utilise our existing resources to embed decarbonisation principles in every aspect of transport. There is an annual Transportation and Highways Capital programme report, which goes to Cabinet every Spring and will be used to deliver funding for the BTP alongside the Infrastructure Delivery Plan (as well as the West Midlands Movement for Growth 10 year delivery plan). The Transportation and Highways Capital Programme (THCP) has been approved for the period 2020/21 to 2025/26 at a total estimated cost of £256.211m.

10.3.2 However, there is always a funding gap between BCC's aspirations and our current programme – to deliver more ambitious projects as well as delivering Route to Zero. As such, we need dedicated resources (funding as well as staff) focusing on the complex task of decarbonising Birmingham and understanding the role each sector needs to play and the synergies as well as clashes between different sectors. Decarbonising transport alone is not possible as it is linked to multiple other sectors including but not limited to land-use planning, housing, energy, education. The scale and urgency of this crisis call for dedicated experts who investigate this challenge holistically.

10.3.3 We require at least one full-time lead role that will focus on research, action development, and coordination of the transport decarbonisation work with the R20 programme, securing financial resources (government grants etc.) and evaluation of progress against the council's decarbonisation targets. In addition, these experts will also be researching best practice elsewhere, identifying collaboration and funding opportunities that will further accelerate action, and engaging with the public to prepare them for the massive changes needed to achieve local decarbonisation targets while understanding their needs so that this transition is just. This role could either sit in transport or be a transport specialist that is part of a dedicated decarbonisation team. As the R20 programme develops further, there will be the need for additional resources to support the lead role with the delivery of actions, research and monitoring. This will help BCC respond expediently to funding opportunities and grants for sustainable transport schemes.

10.4 Lobbying

Zero Emission Public Transport Network

10.4.1 Going forward, we need to lobby for a zero emissions public transport network. The introduction of 20 hydrogen buses as outlined above can start to provide the catalyst for decarbonising the bus network, demonstrating the feasibility and viability of hydrogen.

10.4.2 If the e-cargo bike pilot scheme is successful we would hope to extend the pilot and offer vehicles to other partners across the city. Funding would be required to facilitate this (approximately £5000 for each vehicle and we would need to identify appropriate lobbying opportunities (either regional or through central government) to secure this.

Lobbying for a bus service franchise

10.4.3 In light of the new powers available through the Bus Services Act (2017), in 2019 it was agreed that TfWM would undertake an assessment of whether pursuing a Franchising scheme the delivery options within the Act with a view to delivering the West Midlands Vision for Bus. One such delivery option is franchising along with new formal partnership arrangements which could be applied to all or part of the West Midlands bus network. Franchising powers would enable the LTA to specify routes, timetables, fares and other aspects of service delivery and award contracts to operators to deliver services in line with agreed contractual conditions. This is the mechanism that is in place in London, where the bus industry was not deregulated, and has widely been considered a success, although prohibitively expensive.

10.4.4 TfWM are preparing an Outline Business Case (OBC) for the options within the Act including Franchising to assess which would better meet the objectives within the region's adopted Vision for Bus. The first stage of this requires bus operators to submit data pertaining to the operations of their services, including costs, revenues and other liabilities. This data collection is now underway. This will be used to model the costs and risks associated with implementation of a franchising scheme. This modelling will support the wider OBC, which needs to follow the Government's five case model, assessing the strategic case, economic case, commercial case, financial case and management case. The OBC case is expected to be complete by summer 2021, after which a decision will be taken by TfWM in discussion with partners including the City Council, as to whether to proceed with a Full Business Case (FBC) and a new approach to delivering bus services in the region. Franchising the bus network would allow the WMCA and the council to have greater influence on the day-to-day operation of the network and the vehicles that are being used in the city. Subject to the business case being met, it would also hold the potential to specify zero emission buses for the delivery of any contracts. It should also be considered that the new partnership powers in the Act also have the potential for delivering this outcome.

10.4.5 Climate Action Network West Midlands have put forward the suggestion of commissioning a feasibility study for the introduction of a Fare Free Public Transport system. Whilst BCC does not have the capacity to take the lead on this, it fully supports the commencement of the study. The City's universities may be best placed to take the lead on this.

10.5 Costings

Long-term funding

10.5.1 Long-term funding for multimodal solutions that specifically focuses on decarbonisation will allow councils to plan ahead and deliver their ambitions better. At the moment councils are trying to deliver very ambitious decarbonisation plans without dedicated resources, which makes the scale of the challenge even greater. The central government has recognised the importance of long-term funding cycles in other parts of the transport network, such as investment in the Strategic Road Network when Highways England was established in 2015 with the ability to develop 5-year Road Investment Strategies.

Dedicated funding focusing on decarbonisation

10.5.2 At present, there is no dedicated funding to develop local decarbonisation plans and multiple other sources of DfT funding that support sustainable transport measures are offered on a competitive basis. The climate emergency cannot be addressed through councils bidding for parts of pots of money that are ringfenced for specific solutions. Councils need dedicated resources to answer questions such as: who pollutes the most?, which social groups cannot access low-carbon alternatives to their current carbon intensive choices?, which solutions will help us decarbonise fast?, what can we do about decarbonising leisure and other trips that have never been the main focus of transport policies?

Multimodal funding

10.5.3 There is an urgent need for multimodal investment. Funding options that support individual modes often contradict each other, for example, road space reallocation for cycling may have adverse effects on public transport schemes. There is a clear need to develop strong strategic cases for multimodal investment.

10.5.4 Birmingham City Council is able to support schools with advice on sustainable travel initiatives and funding from the Young Active Travel Trust.

Chapter 11 - Priority Actions - EV Charging Points

11.1 What have we done to date?

11.1.1 OLEV funding was sourced in 2018 towards the installation of 197 chargers, which prioritise taxi vehicles, but with publicly accessible charge points, giving time to further develop the network for a wider publicly accessible charge point network which will be developed from year 3 to year 12, as part of the emerging charge point strategy. The procurement of an EV Development Partner has been completed and the contract is now finalised, leading a concentrated two-year EV charge point deployment of 197 OLEV funded chargers (up to 394 charge points) across the city, in addition to the upgrade and replacement of existing 14 legacy public accessible chargers (28 charge points).

11.1.2 Planning and development for the first tranche of sites is underway, alongside feasibility work and approvals from Western Power Distribution regarding grid capacity and capability. The design plans and surveys are also underway to enable a TRO process to cover each charge point installation, setting up internal processes for section 50 application process – aligning Planning, Transportation, Highways and Birmingham and Property Services requirements to meet regulatory obligations and public realm requirements. The Fast (22kw) & Rapid (50kw) charge point strategy is being developed and will be available for consultation by the end of November- contributing to the development of the wider city EV charging Strategy by March 2021, reflecting EV take-up projections; EV Charger requirement; comparison of the projected charge point requirement with the planned deployment of the 2-year fast & rapid initial phase aligned with trajectory of deployment to put Birmingham on track in contributing to ‘net zero’ target .

11.2 What are the next steps?

11.2.1 The next steps will be:

- Efficient regulation framework (TROs, section 50, permits) in place to enable the scale of change of the public charge point numbers (re highway and public sites) from 28 charge points to 394 fast (22kw) & rapid (50kw) charge points (which will be more than any other UK city), followed by continued growth in charge point installation to meet anticipated market growth by 2030.
- Through joint working with the contracted EV Charge Point Network development partner, stimulate the market, working in wider collaborations for innovation development in charge point technology to support more challenging areas such as terraced housing, blocks of flats etc. in response to continued growth to match the market take up to achieve net zero target- however, this needs to be matched with BCC and strategic stakeholder engagement to support behaviour change and enable the significant modal shift to public transport, walking and cycling that is also required to enable net zero target.
- Communication of ‘switch to electric’ – the Fast & Rapid EV charge point strategy will have a communication campaign kick-started when the first tranche of fast & rapid charge points are deployed.
- Carbon savings are uncertain, due to unpredictable factors including behaviour change; modal shift; take-up of EVs and vehicle availability on the market- however;

on-going monitoring of EV take up & charge point utilisation in Birmingham will be in place and reviewed as part of the wider city EV strategy planned actions.

- We need to address the challenge of how home EV charging can be supplied for homeowners who live in terraced properties, which are particularly common in Birmingham.

11.2.2 Our targets for EV rollout citywide are to rollout 394 Fast & rapid charge points by 2022 and 9000 chargers by 2030, of which 600 will be rapid.

11.2.3 Regarding the transition to council fleet to EV, whilst not all vehicles on the fleet have an electric alternative on the market e.g. tipper trucks, electric charge points have been deployed in 5 key locations to align with service delivery for the Postal service, Adult Night Care Team, Parks & Nurseries and Housing Directorate Estate Services. Waste Management Services are trialling electric bin wagons with a view to transition the fleet towards electric. They are currently investigating the charge point infrastructure deployment requirements for an electric fleet across the West Management depots, with a view that transition will have started to commence by the end of 2022.

11.2.4 The Council work in collaboration with Transport for West Midlands (TFWM) low and zero emission bus strategy development. The West Midlands Low Emission Bus Delivery Plan was launched in 2016 as a collaborative development with regional Local Authorities, with subsequent work on electric bus route mapping with BCC, and current alignment with the EV 'Fast & Rapid' charge point deployment grid capacity assessment to evaluate bus opportunity charging in line with the TFWM 'Zero Emission Bus Charging Infrastructure Needs' strategy. Zero emission Bus market growth is estimated at 70% electric and 30% hydrogen. In addition to the initial tranche of hydrogen buses, 19 electric buses have now been introduced to the Birmingham fleet as the first step towards transitioning to zero emission. The electric buses currently operate on the Route 6 between Birmingham and Solihull via Hall Green and Shirley. In order to move all buses to net zero carbon, it will require a mixture of electric and hydrogen vehicles, with electric vehicles more suited to shorter routes and hydrogen more suited to longer routes. The first phase of transition will clarify the operational and infrastructure arrangements that need to be in place to support the wider transition towards 100% zero emission bus fleet.

11.3 What do we need to get us there?

11.3.1 To enable further expansion Birmingham's EV network, a wider city EV charge point network strategy will be produced by March 2021. This strategy will be key in allowing Birmingham's EV network to be scaled to meet market growth in regard to EV take up for cars, taxis, vans and heavy goods vehicles. In line with the strategy, there is a need for the market to step forward to support with the delivery of EV charging points. We need to continue our collaboration with Western Power Distribution, to ensure grid capacity and capability for EV expansion. We need to align EV infrastructure and highway and public realm major development projects including bus opportunity charging (TFWM), metro development (WMCA/TFWM), as well as developments including e-scooters/bikes. To ensure EV infrastructure is as accessible as possible, we will need to simplify the EV framework in the city – at present an EV user may need to use up to 8 apps across Birmingham to identify charging points – this will be simplified under the public accessible EV charge point contract

arrangements, that specify 'universal accessibility', which includes contactless credit/debit card payments.

11.4 Lobbying

11.4.1 Transport for West Midlands (TFWM) have set up a ULEV working group, that Birmingham City Council are represented on, to collaborate on the regional actions approved through the WMCA ULEV paper. With the key action approved regarding the development of regional rapid charge point hubs prioritising freight and commuter EV transport charge point needs, Birmingham City Council will promote this EV agenda to ensure a 'joined up' regional approach.

11.4.2 The Council will lobby developers to maximise the inclusive of EV charge point provision, as well as the use of zero emission vehicles within the development and construction through Planning policy requirements for Developers to provide EV charge point provision and use of section 101 requirements, for example, stage 2 of the Peddimore development provides an ideal opportunity to promote sustainability through deployment of EV vehicles and installation of charge point infrastructure due to the large development size (70ha site), high level of public and media interest and council ownership. It is anticipated that Government will amend building regulations to require EV charging points in new development, however, the details of this are currently uncertain.

11.4.3 The Government has consistently supported ZE cars and buses – this should continue. However, the same level of support and a strategy for vans and freight vehicles is needed, especially for long-haul freight vehicles as they operate nationally and are the most challenging to transition away from diesel. The Government should account for the need to reduce car demand in the road network planning – official projections from the Department for Transport show an ever-growing growing vehicle km travelled. This is inconsistent with net-zero targets and encourages more road network construction. Given the role of modal shift in reaching net zero targets, the Government should support public transport services through more urgent review of the Bus Service Operators Grant and its impact on the bus industry, enabling take up of zero emission buses to be more commercially viable. We will need to continue to lobby central government on these matters.

11.5 Costings

11.5.1 Funding has already been secured for the 394 chargers to be delivered by 2022. Moving forward, we anticipate that EV sales will grow from <5% in 2020 up to 100% in 2030 – this leads to EVs comprising ca. 45% of total car stock by 2030. However, there is uncertainty in the scale of public charging required, due to uncertainty in how the EV and EV charging markets will develop. By 2030, Birmingham is expected to need in the region of ca. 600 public rapid EVCPs¹ (50kW+) and ca. 9,000 slow-fast EVCPs (7-22kW) – this represents a baseline case, and depending on how the 150kW+ EVCP market and EV capabilities develop, the volume of rapid EVCPs required in 2030 may in fact be lower than those shown below. It is estimated that roughly half of these will be on-street chargers, providing a home charging alternative to those without private parking. Funding of chargers will be predominately private sector led and will be highly dependent upon how the EV market develops.

Chapter 12 - Priority Actions – Waste

12.1 What have we done to date?

12.1.1 The City Council published a Municipal Waste Strategy consultation (2016) and is developing a Municipal Waste Strategy. The draft Municipal Waste Strategy identifies a waste hierarchy to firstly reduce the amount of waste that is collected in the City Council, but also that any waste that is collected should, in order of preference, be re-used, recycled or recovered for the generation of energy.

12.1.2 Birmingham City Council's Waste Management service is undertaking significant change and investment in order to improve the Council's recycling performance and green credentials. The Council has entered into a procurement process for the new waste disposal contract. This procurement seeks to find a new partner who will:

- Operate and maintain the Tyseley Energy Recovery Facility (ERF) for the treatment of the Council's residual waste and the continuous improvement of the Tyseley ERF to ensure it meets any future legislation. This shall include management of all residues, materials and products from the Tyseley ERF
- Operate and maintain five Household Waste and Recycling Centre (HWRC) sites at Kings Norton, Tyseley, Sutton Coldfield, Castle Bromwich and Perry Barr, and the continuous improvement of all the HWRCs.
- Operate and maintain the three Waste Transfer Stations (WTS) at Kings Norton, Tyseley and Perry Barr, and the continuous improvement of all the WTSs
- Manage the Council's clinical waste disposal service

This Contract will be for a term of ten years with the opportunity to extend for a further term of up to five years.

12.1.3 The Council currently collects around 500,000 tonnes of municipal waste from residents and businesses each year. The city is expected to grow by a further 51,000 households by 2031, adding at least a further 60,000 tonnes. The Council delivers a number of waste and recycling services. These include:

- Domestic kerbside collections service – including residual, recycling and garden waste
- Bulky waste collections
- Clinical waste collections
- Commercial waste collections

The Council owns the following waste and recycling infrastructure:

- WTS (Kings Norton, Perry Barr, and Tyseley)
- Tyseley ERF
- HWRC (Castle Bromwich, Kings Norton, Perry Barr, Sutton Coldfield and Tyseley)

12.1.4 The Authority Monitoring Report 2019 identifies that since 2011, the City Council has approved the development of 11 new privately operated waste facilities which together have the capacity to process over 1 million tonnes of waste per year, and that six new privately operated waste facilities have been completed with a combined capacity of over 600,000 tonnes per year.

12.1.5 To support the achievement of these objectives, the City Council has committed to a £44.2m investment in the Energy from Waste Facility at Tyseley Energy Park (TEP), the potential building of a new Materials Recycling Facility and modernisation of Household Recycling Centres and Waste Transfer Stations. TEP is located next to the Birmingham City Council Energy Recovery Facility (ERF) operated by Veolia, which takes 350,000 tonnes of Birmingham's rubbish each year and converts it into electricity which is exported to the grid. Currently, waste heat from the incinerator is not utilised but future plans for Tyseley involved developing Energy from Waste and waste processing technologies that utilise waste heat, capture CO₂ and turn waste into products and fuels. The Authority Monitoring Report 2019 identifies that since 2011, the City Council has approved the development of 11 new waste facilities which together have the capacity to process over 1 million tonnes of waste per year, and that six new waste facilities have been completed with a combined capacity of over 600,000 tonnes per year.

12.2 What are the next steps?

12.2.1 At present, there is an over fixation on household waste, with too little attention being paid to industrial and commercial waste. Moving forward, we need to change the way that we deal with our waste. Our vision is for Birmingham to be a city where:

- Waste is reduced wherever possible by reducing the amount of waste that is created, pushing waste up the waste hierarchy
- Recycling and re-use is maximised, and the value of waste is realised by significantly increasing recycling of all our waste through circular economy principles
- Materials which cannot be reused or recycled shall be used for energy recovery through generating electricity locally
- No avoidable waste is sent to landfill
- We manage our waste in a sustainable way to make a positive contribution to climate change and help reduce carbon emissions
- Our citizens have access to modernised waste and recycling infrastructure
- Citizens who live and work here play their part in sharing the environmental, economic and social benefits of viewing waste as a resource

12.2.2 The draft Municipal Waste Strategy will outline the Council's approach to household waste for the next ten years. A group is also to be established to look at the Council's approach to household waste, post 2034, including what disposal / treatment paths should be utilised for the City's household waste and recycling.

12.2.3 The Council is also considering the future impact of the Resources and Waste Strategy. Part of the consultation for the Waste and Resources Strategy explored the introduction of food waste collections. If food waste collections did become legislation, then this could see a reduction in tonnage from residual waste collections. This waste would require alternative means of processing. The next step will be to approach the Combined Authority, to request they act as the facilitator between county councils to commission a joint study looking at waste movements across the conurbation. The aim of this study would be to observe the ways that all types of waste is moving across the wider West Midlands area and identify the most energy efficient way of managing waste at sub regional level. Ideally, this study will be commissioned through the Combined Authority, but could also be facilitated through the housing market area group, which would enable districts to take it back to the county councils. This work will need to feed into the post 2034 Municipal Waste Strategy.

12.2.4 The current tranche of the City Council's fleet of waste vehicles are all Euro VI compliant, meaning they meet the Clean Air Zone standards. However, the Council is currently trialling alternative fuel vehicles within its waste collection fleet and will move towards alternative fuels in the next generation of vehicles. The two new planned City Council waste depots will have charging capability designed in.

12.2.5 The council is currently rewriting the Council's Waste Prevention Plan and are in discussions with Keep Britain Tidy to co-ordinate a campaign to address the Circular Economy with actions prioritised on the top end of the waste hierarchy (prevention, minimisation and reuse).

12.3 What do we need to get us there?

12.3.1 The next steps are for sign off of the draft Municipal Waste Strategy and to establish the group to look at the Municipal Waste Strategy, post 2034. The City Council will work with government on the outcomes of the Waste and Resources strategy, once these are announced to minimise waste creation and maximise the benefits of a circular economy.

12.3.2 The Council will continue the trials of alternative fuel vehicles and following these trials a procurement exercise will be carried out for the next generation of the waste collection fleet.

12.3.3 The Combined Authority is already in the process of commissioning a piece of work around the circular economy. The outputs from this work will be valuable to Birmingham City Council in helping to develop an understanding of how waste works, which can then feed into a more detailed understanding of our own waste movement. As previously mentioned, a separate study will be commissioned around this. To kick-start the waste movement project, the first step will be to approach the combined authority so that we can commission a study to look at waste movements within the region.

12.3.4 1 Meeting the goal of Zero Carbon will also require the enthusiastic participation of Birmingham households in the huge change towards collecting their waste, separating what be composted, digested, reused and recycled.

12.4 Lobbying

12.4.1 We need to change the way that we deal with our waste and formulate a new way that waste can be managed at a sub-regional level. Continued partnership working with the Combined Authority, local authorities, waste management and disposal companies, and other relevant organisations such as the Environment Agency will be key to this. To help reduce this, we work with the Chamber of Commerce to lobby central government to encourage large commercial operations to reduce the amount of waste they produce.

12.4.2 The move to collection and disposal of food waste in Birmingham will be as a result of the Government response to the Waste and Resources Strategy. The change to collection of food waste will require significant investment (containers, vehicles, increase in staffing etc.) which BCC does not currently have funding for as a non-statutory requirement. It is prudent to understand the request from Government when finalising plans for Birmingham to ensure that any investment in infrastructure is correct and meets requirements for the future of Birmingham and the longer term plan by central Government.

12.5 Costings

12.5.1 We will need funding to commission the waste movements study. All other actions in this chapter sit within the council's current budget and do not require additional funding.

Chapter 13 - Priority Actions – Energy

13.1 What have we done to date?

13.1.1 There has been a focus on renewable electricity generation (including waste and biomass combustion plants and PV studies) and more recently the decarbonisation of heat:

- Initial 2018 Anthesis (SCATTER) report provided the understanding and helped to demonstrate the scale of change that was needed. Although at the time it was a high-level assessment which considered GHG emissions across the city and not just heat, to understand decarbonisation scenarios to 2050.
- Birmingham Solar PV Study (December 2016) - This is an initial city-wide resource assessment for Birmingham with regards to Solar PV, and still relevant for the deployment of Solar Thermal.
- With respect to other heat networks, BCC has undertaken several HNDU-funded studies (2015-2018). Whilst these identified a number of heat network development opportunities, these have not been progressed due a number of factors principally related to lack of external funding (appetite for investment and buy in for projects) and complex commercial relationships and the management of risk. However, further work is to be progressed via HNDU.
- District Heating Network Canal Opportunities Study (2016) - DHN opportunities are presented, detailing heat pump systems that extract heat energy from the flowing water in the canals.
- Various Heat Network Feasibility and Masterplanning Studies - Several feasibility and Masterplanning studies potential heat networks in the Birmingham area.
- Birmingham Energy Baseline Mapping Study (2019) – mapping energy demand and supply of renewable energy within Birmingham.
- Birmingham City Outline strategy for achieving net-zero (Jan 2020) – Precursor to BEIS study. This study commissioned by BCC outlines what the net zero target meant in regard to the Council 's role, key actions and asks from Government.
- HECA Report 2017 (May 2017) - An update report setting out the energy conservation measures that the local authority has undertaken.
- SCATTER initial Birmingham Specific carbon reduction City analysis (July 2018) - This study comprises World Resource Institute compliant goal setting using BAU scenarios to 2050.
- Birmingham City Council Planners Guidance (October 2018, updated May 2020) - This document advises how Birmingham's current planning policies relating to sustainable design will be applied to different types of development.
- A Regional Energy Strategy for West Midlands (2018) – This document has been produced by Energy Capital and the West Midlands Combined Authority, of which BCC is a Board Member and contributed to the Strategy development for how Birmingham fits within the region from an energy and low carbon perspective. Work is currently underway to develop the delivery of Energy Innovation Zones within Tyseley and Central Birmingham, with one of the main focuses being to integrate proven low-carbon technologies across energy systems. BCC is working with regional academic experts, businesses and industry through Energy Capital

to understand how the transition to a decarbonised system can work for the West Midlands. The WMCA has set a target of achieving net zero by 2041 (WM2041).

- Hydrogen – launch of the 20 bus hydrogen project and associated 3MW Hydrogen re-fuelling hub at Tyseley Energy Park. The council's work to date has led to interest in procuring additional hydrogen buses and further studies on the benefit of industrial hydrogen in the city.
- Emissions reduction from heat generation has been limited to small scale energy efficiency works (some BCC led such as the HNDU CHP network, others led by the energy suppliers via ECO2).

13.2.1 BEIS Decarbonisation of Heat Programme

13.2.1.1 Work on the BEIS Decarbonisation project commenced in January 2020. Output from BEIS work stage 1 shows that 16 scalable and 'fit for purpose' heat decarbonisation interventions have been shortlisted, that if from 2020-2050 they were implemented across building types and sectors, the modelling shows that they would potentially achieve around 80% reduction in carbon from heating of buildings from homes, council buildings, industrial, university, health to retail. BEIS work shows that Air source heat pumps will significantly provide the biggest impact because they are an easier (smaller) solution for most residential areas and don't require planning permission (the issue here will be the market availability within this timeline). However, the scale of what is required would mean the cost would be around £6.8billion, with no investment rate of return until after 2050.

13.2.1.2 Phase 2 is about to begin and will include business case development including the funding sources, legal requirements and procurement routes aligned with the heat decarbonisation building typology models- drawing together the outcomes of stage 1 across Birmingham and the 5 other cities involved in the development- whereby BEIS consultants will develop a business case approach for social housing and the rented sector; local Authority estate buildings; schools under Local Authority control; and public sector buildings including hospital or university buildings. Phase 2 will also ascertain what the cost levels of interventions will be, and what potential carbon savings would be. The whole project will achieve 4 major full business case developments for heat decarbonisation interventions that are funding-ready. However, there will still be Local Authority governance processes and for funding applications and private sector intervention.

13.2.1.3 Work on the BEIS Decarbonisation project commenced in January 2020. The initial stage (which ran from January to August 2020) involved data collation, stakeholder engagement and initial modelling. This first phase will identify opportunities for heat decarbonisation with specific interventions defined by BEIS for Phase 2 further development, potentially including the low/zero carbon interventions for the City Council's new housing development, retrofit of existing stock, and feasibility of use of ground, air and water source heat pump deployment; city-wide energy from waste opportunities for deploying future district heating; the role of Hydrogen as a source of heating; and planning policy interventions. To date, the project has not produced any carbon reductions calculations, but will do in the latter stages of the work plan.

13.1.3 Birmingham District Energy Company (BDEC)

13.1.3.1 Birmingham District Energy Scheme is the largest low carbon heating network in Birmingham. It is owned, operated under the name of Birmingham District Energy Company (BDEC). BDEC supplies low carbon, low cost energy to major energy consumers across the city centre. Overall, the BDEC network comprises of three schemes: The Broad Street Scheme, Aston University Scheme, and Birmingham Children’s Hospital, with interconnecting pipework linking the three schemes to enable future growth and densification of the scheme. There is also an energy centre at Birmingham New Street Station. The Broad Street scheme is a tri generation of heat, power and cooling to connected buildings including International Convention Centre, Birmingham Arena, Hyatt Hotel, Library of Birmingham, Birmingham Council buildings and Birmingham New Street Station. Broad Street has delivered £2.4m of energy savings and a total of 45,000te of carbon savings from 2007 to 2018. The Aston University scheme supplies heat and power to the University Estate and third-party neighbouring buildings, the scheme has delivered £3.0m of energy savings since 2009, and realised 43,166te carbon savings from 2009 to 2018. Birmingham Children’s Hospital supplies heat to the estate, realising £1m energy savings and a carbon saving of 23,591te since 2009.

13.1.3.2 The scheme makes use of highly efficient large-scale combined heat and power (CHP) technologies across 6 energy centres, and uses conventional boilers for ‘top up’, standby and increased resilience. At present, the network is still running on natural gas. By taking heat from the district heating system there are carbon and cost savings when compared to heating individual buildings. The network currently provides 60,000MWh of heat, 47,000MWh of electricity and 8,000MWh of chilled water per annum, with a 12km network infrastructure. A strategy to introduce lower cost and lower carbon technologies for future generation and growth may also incorporate technologies such as heat pumps, fuel cells and waste heat sources.

13.1.3.3 To date there has been £17m worth of investment, a total of £6.4m of energy savings and 120,000+te carbon saved. Due to the exponential development growth and climate change commitments to achieve net zero across the city by 2030, an impact study which assesses growth verses energy demands forecasts 500Gwh of additional heat demand and 100Gwh of electrical demand equating to a carbon savings 90,000te per year.

13.1.4 Tyseley Energy Park

13.1.4.1 Tyseley Energy Park (TEP) is an Energy Innovation Zone situated in East Birmingham on the A45 Coventry Road that connects the airport to Birmingham City Centre. TEP was established by Webster & Horsfall, a 300-year-old steel wire manufacturing company, to diversify their site operations but in keeping with their long history as industry innovators benefiting/supporting the surrounding community. The Tyseley area, has through local area planning been identified as an Environmental Enterprise District (EED), and has potential to cluster complementary waste and sustainable energy uses. The City Council actively encourage energy generation and air quality improvement schemes in this location. The University of Birmingham is a strategic partner of TEP and has invested in the development of the site and related research activity. The mission of Tyseley Energy Park (TEP) is to deliver a green technologies hub for the City of Birmingham as part of a wider intention by Birmingham City Council and Energy Capital to create one or more large scale Energy

Innovation Zones in the city. TEP seeks to deliver new jobs and growth through the deployment of innovative energy supplies. To date the following has been achieved on the Tyseley Energy Park site:

- Birmingham Biopower Plant
- The UK's first Low and Zero Carbon Refuelling Station including Hydrogen, biodiesel, Biomethane and EV charging
- UoB Birmingham Energy Innovation Centre (BEIC) due for completion March 2021
- Rent E – fleet of 30 electric taxis + pay by the hour EV car fleet
- Private wire across site helping Webster and Horsfall and all tenants across TEP meet their sustainability goals
- Supporting and providing space for green tech start-up companies (for example Lontra) who want to be within a cluster of likeminded businesses

13.1.4.2 The University of Birmingham has also:

- Supported business growth through Birmingham Energy Incubation Hub (an integrated package of support to drive growth amongst low-carbon energy businesses) and the ATETA ERDF funded SME support programme).
- Research and innovation projects and partnerships through the TEP Co-Creation Group
- Developed a community engagement and outreach programme including RA-Eng Ingenious Grant Award project
- Promoted TEP and Birmingham in events across the country, most recently the Commercial fleet roadshow and Rail industry associated annual events in October 2020

13.1.5 Exploration of Council Utility Companies

13.1.5.1 In 2018/19 the Council looked at the feasibility of setting up an energy company and a water company. The development of the Outline Business Case/Full Business Case was a Service led project which, as part of the Council's decision making process and due diligence, progressed through the constitutional governance stages having input from the various disciplines and external consultants (energy and finance) to arrive at a final decision. However, the Cabinet Member decision to not take forward came as a result of the Council's prevailing risk appetite, where it was deemed too uncertain and too high a risk. In reviewing the decision in the light of the issues experienced with Nottingham City Council's Robin Hood Energy Company and that of Bristol City Council energy company that are no longer running as Local Authority Energy Companies, the decision was perhaps justified, but clear, that there are lessons to be learned.

13.1.5.2 In regard to the setting up of a Council Water Company, as a Labour Group Manifesto pledge, this was based on addressing fuel poverty and enabling costs to households to be reduced. However, the change in regulations that enabled Local Authorities to become licenced to operate as a water company, only applied to offering water services to commercial premises. The regulations will be reviewed in 2025, where it is understood that further change to regulations will apply to households, and therefore the pledge to address fuel poverty at household level potentially can be realised. The decision will need to be reviewed, based on a revised feasibility and business case, where learning from other Local Authority experiences will also be sought.

13.2 What are the next steps?

13.2.1 The core objectives of TEP moving forward are:

- Developing advanced technologies to deliver optimal value from waste and resources.
- To deliver investment into renewable heat and power infrastructure.
- Developing low and zero carbon transportation infrastructure.
- Gathering data and creating the platform for testing and validating new innovative technology that develops new business models and employment opportunities.
- Creating a blueprint for systems thinking that is capable of being applied at a city scale, supporting Birmingham City's transition to a lower carbon future.
- Developing skills and training in a commercial environment.
- Attracting inward investment to support the regeneration of Tyseley and surrounding areas.
- Working with regulators to overcome barriers to investment.
- Make TEP the home of a National Centre for Decarbonisation of Heat (NCDH).
- Scale-up research through the BEIC on energy storage, hydrogen and fuel cells, critical materials and reprocessing and fuels from waste.
- Develop collaborative projects with industry on hydrogen and heat decarbonisation
- Submit proposal for ERDF funding to create a community commons, green and blue infrastructure asset along the River Cole by Tyseley Energy.
- TEP purchased an additional 15,000sqft of industrial space in October 2020 and have submit funding bid to the GBLEP for the refurbishment of 11,000sqft of space to provide business support 20 SME within the green technologies sector from April 2021 onwards.
- Support establishment of East Birmingham Community Heat task Force and a Community Learning Platform, and programme of activity to make East Birmingham a pioneer for retrofit and heat decarbonisation solutions.

13.2.2 With regard to district energy scheme, the next step will be to investigate how the concession can be extended and the network's energy centres can be converted to a carbon neutral energy sources (or as close to neutral as is feasible) as soon as possible. Any future extension of the concession will be dependent on a shift to green energy. The BEIS study phase 2 is set to produce 4 business case developments (identifying funding sources & funding models, legal, financial and procurement modelling) of 'early pathfinder' developments across:

- Domestic Social Rented
- Non-Domestic Public Sector EE/Retrofit/LZC Heat – LA Whole Estates (excl. schools but including commercial estate)
- Non-Domestic Public Sector EE/Retrofit/LZC Heat – Non-Academy Schools
- Non-Domestic Public Sector EE/Retrofit/LZC – including Health Estates/University Campuses.

13.2.3 Next steps towards additional hydrogen re-fuelling infrastructure for next tranche of hydrogen buses, alongside joint collaboration in the research of a Hydrogen Hub concept of producing hydrogen through steam reformation of gas. Lead through Cadent with public & private sector organisations, BCC are contributing insights & knowledge of infrastructure development,

commercial and operational viability. Some of these decisions around electrical infrastructure and hydrogen networks are out of the control and competence of a local authority and require national government or corporate decisions. Implementation of the hydrogen bus deployment and hydrogen re-fuelling facility, alongside the development of the next tranche of hydrogen buses and re-fuelling infrastructure. Moving forward, we need to scale up blue hydrogen production and grid connection. Working with public and private sector partnerships in preparing the gas, and hydrogen production, systems to help support heat decarbonisation.

13.2.4 Commencing BEIS Phase 2 (from Nov 2020) will involve business case development re: funding sources, legal requirements and procurement routes aligned with the heat decarbonisation building typology models- drawing together the outcomes of stage 1. BEIS consultants will develop the business case approach for social housing & rented sector; Local Authority estate buildings; School under Local Authority control; and public sector buildings including hospital or university buildings. Aligned with the business case development will be cross programme development for behaviour change insights, zoning of heat decarbonisation interventions and assessing 'heat/energy as a service'.

13.3 What do we need to get us there?

13.3.1 To deliver our ambitions at Tyseley Energy park we will need to:

- Submit proposal for ERDF and other funding to acquire additional space for business incubation.
- Success on funding proposals – including regional asks to government for NCDH.
- Improved access and infrastructure across Tyseley and Hay Mills to enable to expansion of the power ring main and to connect energy/waste/ transport and heat assets in the area.
- More generally, the council needs to maximise the potential of working with partners such as UoB.
- With central government support, enable carbon literacy and financial literacy - shared understanding and support. We need to support behaviour change and enabling shared understanding across BCC staff, public sector stakeholders, residents and businesses. There needs to be a more structured input from central government, such as in the form of recognised training and funded programmes or public information campaigns. Financial literacy would particularly cover the cost per KW of implementing different schemes, capital programmes, individual actions such as roof/wall insulation, re level of investment vs impact of carbon level reduced.
- Local government public/private partnerships – we need a clear / streamlined process for financial assessments and sign off. Where central/local government approvals/governance processes are required or where national/local funding is being used- the funding and approval processes need to be more streamlined from approval to implementation to allow for more rapid and meaningful change. For example, when attempting to fund large capital projects, projects are subject to Green Book Assessment which assesses their value for money. Typically, the solutions required are expensive by their very nature- and do not necessarily pass the ROI test.

- Local government bulk purchase scheme – allowing for economies of scale. Upon agreement with Government around the city scale priorities, there needs to be an understanding of how scope and scale are built to enable economies of scale (whether locally, regionally or nationally). There is a need to work nationally or regionally with other cities in procuring decarbonisation intervention solutions, as this can produce significant savings re economies of scale. Equally, we need open systems that enable local developers or private households to benefit from the scales of economy, and also joining up the roll out of decarbonisation intervention solutions.

13.3.2 The scale of intervention means the Council will have to obtain substantial amounts of funding and manage a wide range of programmes. Delivering these programmes with the scale and urgency required is likely to require a large and dedicated team to be assembled within BCC. City wide, we need to upskill the local workforce to meet future needs. We also need to work with communities to engage in new energy/heat systems and programmes like Electric cooking – reducing barriers to electrification.

13.4 Lobbying

13.4.1 The transition to Net Zero will require an unprecedented level of change across all sectors and will impact every home and business. The current market share of Net Zero-compatible technologies such as renewable heating systems, energy efficiency retrofits and zero emission vehicles, and the supporting infrastructure needed, are far below that required. Urgent lobbying action must be;

- For ambitious regulatory and incentive-based policies at national and at local level.
- To address where even if all new sales of vehicles and heating systems today were Net Zero-compatible, some of the fossil-fuelled stock already in use will remain in operation and emit carbon beyond 2030 – need to influence National and local schemes to ensure that these assets are retired early.

Lobbying is required regarding;

- Local Authority and developers for all new builds to use high efficiency electric heating or be served by low carbon district heating; tight restrictions on carbon emissions (80% plus reduction on current requirements) are required ahead of the 2025 planned introduction date for the *Future Homes Standard*.
- Government continuing to support low carbon district heating through policy, funding and regulatory changes beyond 2021, when the current Heat Network Investment Project is due to close.
- Focus required on the regulator Ofgem, to clarify how it will use price controls to encourage strategic clean investments, solve "tomorrow's problems" and avoid further network upgrades until 2050. Regulator should reward outcomes of increased decarbonisation of heat and transport. A key challenge for the regulator is the uncertainty about making these

strategic investments. BCC should commit to and communicate to government its Clean, Smart and Flexible growth plan for net-zero.

- New build standards – In order to avoid duplication of costs, work and planned obsolescence, it is vital that new developments incorporate zero carbon heating from the outset. Consultation is currently ongoing about energy efficiency standards, but by 2025 at least all new developments must have zero carbon heating.
- Clarifying Responsibility Structure – Clarifying of structure of how to tackle the decarbonisation of heat needs to be considered including the role of government and policy to aid transition. The role of local authorities and their local delivery plans would then be better defined.
- Funding and contractual structures – These need to be agreed at a central level before being funnelled down for use by cities. Schemes need to be of a sufficient magnitude and ambition of the ‘Green Deal’ or better to establish working relationships, qualifications, standards, proformas etc to enable quick deployment by cities.

13.4.2 We will need to lobby central government for the National Centre for Decarbonisation of Heat to be based in West Midlands at TEP. We will also need to lobby the service provider for the district heat network to decarbonise the heat source.

13.5 Costings

13.5.1 The BEIS study is already being directly funded by central government. There is a large policy gap at national level with regards to providing funding to incentivize private conversions to zero carbon heating systems; a successor scheme to the Renewable Heat Incentive capable of driving orders of magnitude greater uptake is required.

13.5.2 The Public Sector Decarbonisation Scheme can help toward the cost of connections to low carbon heat networks. It also offers financial support to deliver a package of in-house projects to reduce energy consumptions, improve monitoring and management of consumptions. Some energy projects in schools can be also supported with the Salix Public Sector Decarbonisation Fund.

Chapter 14 - Priority Actions – The Natural Environment

14.1 What have we done to date?

14.1.1 Trees - Birmingham is one of Britain's greenest cities –over 1/5th of area consists of green space (parks, nature reserves, allotments, golf courses and playing fields). There are around 1,000,000 trees in the city. Of this, 750,000 trees are in city ownership including highways. Parks have 132,000 individually plotted trees and 1400 Ha of woodland,75,000 are street trees, and the remainder are in woodlands. To date the following has been achieved:

- Tree policy review undertaken in conjunction with elected members 2018
- Implementation of policy change recommendations is being delivered, changes to internal policies and practices for highways in relation to transportation projects.
- Design guide (out for consultation Nov 20 – Jan 21) includes more detailed information on trees, tree protection in development, tree species selection and planting requirements. Also included is reference to CAVAT (capital asset valuation of amenity trees) as a way of assessing tree values, replacement values and compensation payments to fund additional planting.
- Birmingham Urban Forest Masterplan is being commissioned as the overarching high level vision and direction setting document.
- Development Management in Birmingham policy document (currently at examination stage) requires tree replacement provision to be based on CAVAT (Capital Asset Value for Amenity Trees) methodology. A Trees SPD will be produced to support application of the policy.

14.2.1 Future Parks Accelerator

14.1.2.1 New Governance Model - for Natural Environment - 'Naturally Birmingham', is Birmingham's Future Parks Accelerator initiative. It represents a corporate transformation programme that seeks to put nature at the centre of the city's decision-making for the next 25 years and delivery of Environmental Justice. It will achieve this through the adoption of a new governance model for the city's natural and green environment including all parks and green spaces. This will provide a new delivery and funding mechanism for the sustainable future of the city's green and natural environment. This action will deliver a major plank of the city's R20 Adaptation ambitions.

14.1.2.2 The FPA programme commenced in April 2019 and was due to complete end of May 2021 but has been extended to March 2022, allowing for the considerable impact on delivery due to Covid-19. The project is funded as part of the national Future Parks Accelerator initiative funded by MHCLG, National Trust and National Heritage Fund. Birmingham was selected as one of 8 test case towns and cities across the UK. The initial funding award was for £900,000; however, this has now been extended with an additional £204,000. There is one caveat; the programme is subject to a Mid-point Review by the funders; this must be passed successfully in order to continue; our review date is the end of March 2021.

14.1.2.3 Full Council Engagement- The FPA programme takes a systems-change approach that has mapped the integration between the city's strategic outcomes and the natural environment across the following areas of the council - Housing and the built environment; the Children's Trust and Education; the Health agenda; Employment & skills; new ideas and activities have been tested on the ground through 4 community pilots.

4.1.2.4 Embed Permanent Change - Looking forwards, phase 2 of the project will involve building the new governance model for green space in Birmingham supported by 4 under-pinning frameworks. The 4 frameworks are:

1. Environmental Justice Framework
2. Healthy City Framework
3. Sustainable Finance Framework
4. Citizen Involvement Framework

The FPA programme will proceed until its conclusion in March 2022.

14.1.3 Cole Valley Route

14.1.3.1 One of our big moves within the natural environment is how we will create enhance existing green corridors and create new routes and green infrastructure within Birmingham. A key focus within this agenda is the Cole valley route. We want to maximise the cities 'green lungs' and green routes that allow easy access into city, making it more enjoyable for walking and cycling. To date, the Cole Valley has become an area of focus for this agenda.

14.1.3.2 Birmingham City Council has submitted an expression of interest to the GBSLEP for part funding for the Ward End and Cole Valley Green Skills Hub project. The deliverables will be the creation of a skills hub at Ward End Park in Washwood Heath, consisting of training and community facilities at the Dolphin Women's Centre (run by Norton Hall Children & Family Centre) and Ward End Park House; expanding existing Access and Level 2 functional skills provision to encompass Level 2 and Level 3 sector specific pathways with the potential for digital and low carbon themes. There will be an associated package of connectivity, leisure and Green Infrastructure improvements focussing on Ward End Park, where there will be improvements including a cycle path link, a cycle proficiency training circuit; an outdoor fitness training hub and a MUGA, and links to the Cole Valley walking and cycling corridor including new and improved cycling and walking routes, a new bridge access across the river Cole at Glebe Farm and landscape, amenity and biodiversity enhancements. The project aims to contribute towards the regeneration of East Birmingham, and the economic recovery of the area in the aftermath of the COVID-19 pandemic.

14.1.3.3 Further to this existing work, additional funding is being sought through ERDF funding and a bid has been submitted. The project is seeking investment on the Priority 6 Axis for a programme of interlinked green and blue infrastructure improvement activities that will develop an underutilised

urban green corridor into an accessible and connected corridor and community commons with improved water, woodland and grassland habitats. Project activities will take place in the Tyseley area of East Birmingham, by Tyseley Energy Park, along the River Cole, where it connects with the Ground Union Canal and transport infrastructure, residential and business communities and other urban green spaces. Alongside the infrastructure improvement project activities there will be a programme of community engagement to inform the ongoing rehabilitation of this currently underused area to create a community common that is used by and accessible to the local community. Community engagement will focus on developing the area as a green, post-Covid recovery, connecting corridor to the wider city that benefits local citizens economically and socially as a site for green skills training and learning pathways and enterprise opportunities, as well as improved health and wellbeing.

14.1.3.4 The Wildlife Trust for Birmingham and the Black Country in conjunction with the EA and LLFA have undertaken a number of interventions on the River Cole. These interventions have mainly been in channel in the form of changing channel from straight to a more sinuous shape, bank re profiling, introduction of aggregates to form riffles and formation of back wash areas. These combined significantly improve biodiversity as well as improving water quality and providing an increase in flood capacity. While each intervention may only be relatively small the number of interventions provides a cumulative effect. To date interventions have occurred at the Burberry Brickworks site (off Warwick road), Bachelors Farm POS and Gumbleberrys POS at Stechford bridge.

14.1.3.4 The strategic CEF bid submitted by a partnership of TWBBC, Warks WT, EA, SMBC and BCC for the River Cole at Glebe Farm onwards was unsuccessful, however a subsequent bid has been submitted to the Green Recovery Fund based on the same intervention works but with a slant towards job retention and creation, An ERDF bid is being formulated by the UoB in partnership with TEP, Ackers and community and BCC for habitat restoration, in channel modifications and removal of the weir at Ackers – this will provide biodiversity and flood alleviation benefits. In addition, the works is seeking to gain greater involvement of the local community, increase participation in and access to local green space (environmental justice strand). Consideration is also being given to providing a section of cycleway to avoid the need for cyclists to cross the busy (and relatively dangerous) Tyseley incinerator access road.

14.2 What are the next steps?

A draft Trees SPD will be written by March 2021 to detail the CAVAT process for accounting for and mitigating tree loss and replanting levels through development including a financial compensation mechanism (through S106). The Birmingham Urban Forest Master Plan draft will be produced early 2021 – once completed Birmingham will be the first UK city to have such a plan. The Urban Forest Master Plan will identify priority areas for tree planting, based on a variety of factors, such as air quality and surface water flooding. A biodiversity information note will be drawn up to set out Biodiversity Net Gain principle and outline the Local Nature Recovery Network and strategy ahead of

this being mandated through the Environment Bill. A Biodiversity SPD will follow after the BDP review.

14.2.1 Future Parks Accelerator

14.1.2.1 A key work plan of this FPA is integrating with the R20. The new governance model and the 4 frameworks provides an ideal vehicle to deliver the city's R20 agenda. Bringing the R20 and FPA agendas across all council departments will be essential. The FPA is looking to embed Integration Champions across all departments and all partners.

14.2.2 Canopy cover

14.2.2.1 We have completed a project mapping tree canopy cover at ward level and converting this into a % coverage for each. This revealed an uneven % cover across the city, with some wards exceeding 40% canopy cover and others having a much lower coverage closer to 10%, such as Lozells (11.4%) and Bordesley and Highgate (9.6%). Minimum tree canopy cover for urban locations in the UK to realise co-benefits is 25%.

14.2.2.2 An ambitious target is to try and get all wards (or as many as practicably possible) up to 25% canopy coverage. To facilitate this, we need to identify plantable space. This will take place as part of the Urban Forest Master Plan work. Following the initial assessment, this will then be rationalised through ground surveys/clash detection for utilities, consideration of matrices for biodiverse habitat, amenity/ sports space/other soft landscape and canopy cover. The initial target is to achieve a city average of 25%, focusing on the wards with the lowest levels first and then moving on to try and bring all wards up to 25%, whilst not losing canopy from those wards already over the 25% threshold.

14.2.3 Rehabilitation of existing green space.

14.2.3.1 Environmental Justice totally embraces climate and ecological emergencies; and responds to the COVID-19 crisis. As part of the FPA consideration is being given to Environmental Justice – that is ensuring that all the population has equal access to quality green space and receives benefits from those ecosystem services provided by Green Infrastructure. An initial step was mapping of public open space, to tabulate data on Indices of Multiple Deprivation. Hectares of POS, Population data, SHLAA (2019) dwellings loss or gain and estimated population growth based on the SHLAA gains using the BDP average of 2.6 persons per dwelling. The BDP and Government ANGSt standards set clear thresholds for size of open space, and distance from the populous plus a threshold of a minimum of 2Ha of public open space per 1000 capita

14.2.3.2 Using these data sources it was possible to see which wards are already significantly suffering injustice and which would be even worse based on projected population growth if there was no intervention to protect and expand on the provision of POS and urban greening as a whole. Currently 40 of the city's 69 wards fall below the above thresholds. To illustrate this visually a basic "heat map" was produced to show the IMD, location of POS and with a 400m buffer (this being the smallest of the thresholds for distance).

14.2.4 WM National Park Concept

14.2.3.1 The West Midlands Combined Authority formally adopted the West Midlands National Park (WMNP) project on the 5th of July 2020 as a key component of a post-Covid green economic recovery. The WMNP project will result in a region-wide spatial vision to kick-start the post-Covid economy in the context of WM2041, the West Midlands zero-carbon strategy and accelerated brownfield-first house building. It will also provide an overarching context for a range of WMCA post-Covid recovery interventions, and a roadmap to increased and inclusive regional prosperity, spatial and environmental justice and growth where no one is left behind. The WMNP proposal was formulated by Kathryn Moore, Professor of landscape architecture at Birmingham City University, and would make the region home to the UK's 16th official National Park.

14.2.3.2 Landscape Architects working on the vision suggest once detailed case studies have been carried out, a West Midlands National Park could see the area categorised as 'a region of a thousand cycle and footpaths, a thousand parks and a thousand lakes' featuring extensive:

- Creative hubs;
- Fields;
- Orchards;
- New forests and woodlands;
- Hi-tech agriculture;
- Green Industries;
- Systems of rainwater gardens and sustainable urban drainage;
- Increased and better-connected areas of biodiversity;
- Engaged communities and networks working towards a new vision of what the West Midlands Combined Authority region could become in 20 years' time.

14.2.3.3 The idea uses the transformation of the region as a springboard, with the arrival of HS2, Birmingham's successful bid for the 2022 Commonwealth Games and Coventry's City of Culture win, reigniting the vibrancy and regeneration of the area.

14.2.5 Exploration of Heat Extraction from Parks

Moving forward, we will explore the heat potential for public parks and green spaces. Birmingham has been identified among the top-10 Local Authorities in England by magnitude of ground source heat resource (197MW heat supply potential from public parks and 82MW from paying fields for total potential 78,000 tCO₂e savings per year). There may be the potential to link this project up with others, such as with future Passivhaus schemes or other BMHT developments.

14.2.6 Biochar Project

The Energy and Bioproducts Research Institute (EBRI) at Aston University is experimenting the use of biochar as carbon sink in construction. Biochar is an inert high carbon product that locks away carbon and when incorporated into soils can be used for amelioration and has measurable benefits in terms of tree and plant growth, resilience and water retention. Early discussions have been held

with the Energy from Biomass Research Institute (EBRI), suppliers and operators in the biochar industry and with Bloomberg Philanthropies who facilitated discussions with the Stockholm operators and are possible funders of a trial operation. Biochar can be used for various applications and GBSLEP has been supporting Aston University with LGF funding for EBRI's Urban Carbon Balance using biochar. The project would be a partnership though with an external organisation providing and running the biochar plant itself, with BCC supplying some of the feed stock. The city would then be able to use the char in tree pits and landscaping. To advance this further, we will need to continue discussions with EBRI on potential grant applications for trials, alongside site visits to look at feed stock materials and allow assessment of viability for use.

14.3 What do we need to get us there?

14.3.1 Additional resource is required for the canopy cover project, to allow an officer to give dedicated time to producing a green space/ecology/tree strategy. Historically, an officer led on greenspace policy, but the post was deleted, being absorbed into the remit of multiple positions. There is a need to have a senior officer role with an overall strategic view of trees and green infrastructure. This should be a position with the time and authority to influence decisions, be the voice for green space, its management and delivery of Environmental justice through development and green infrastructure improvement projects.

This post would be responsible for, for example:

- Delivery of projects funded by S106 compensation payments for both trees and Biodiversity net gain.
- Delegated authority for Tree preservation Orders to sit with someone who has a thorough understanding of environmental issues
- Coordination of the Tree Board (tree board would identify tree related projects)
- Management of staff within an “environment team” (trees, ecology, landscape)
- Strategic Urban forest management and monitoring
- Strategic Nature Recovery Network management and monitoring
- Greenspace policy development and delivery

14.3.2 This will be key in identifying early opportunities and constraints within new developments for tree planting/green/blue infrastructure. This role could also act as an overarching manager for the green space team, which would also be able to assist in fulfilling the governments new net gain requirements. At present, officers typically only see applications at planning application stage, at which point developers may already have their design agreed in principle at pre-application stage and are often resistant to design alterations to incorporate GI/BI.

14.3.3 The Tree Protection Order and tree works approvals IT system is out of date. A new system is required to allow mapping of TPO's in the field and completion of tree work notes and approvals. A new system should allow for the majority of TPOs to be drawn up on-site. In addition, a new system would allow remote completing of tree work applications made under TPO regs or S211 while on site. The new TPO system could/ should interface with M3 system. Any new system should be used across the Council to avoid the need to interrogate multiple systems that do not integrate. A system such as Tree Plotter (Plan-IT – Geo) could integrate all tree management operations into one GIS

system - it would also enable greater transparency, as it is a web based system and can be set up to allow public viewing. The cost and feasibility of introducing such a system will be investigated and this will be linked to the Urban Forest Master Plan work.

14.3.4 A new governance model for the natural environment is essential to make the necessary step-change in being able to respond at scale and urgently to the climate, COVID & ecological emergencies. Business-as-usual has to move onto a new integrated approach. The Naturally Birmingham programme will deliver this for the city.

14.3.5 With regard to the WMNP, the WMCA has committed to tackle the Climate Crisis with inclusivity, prosperity and fairness, as described in the WM2041 policy document. There is a clear recognition that the zero carbon challenge needs to be attacked at speed, but in a way that yields scalable, replicable and sustainable solutions. The key to success will be the need to create better, more easily accessible places offering a high quality of life, wellbeing and environment. This project will explore and define approaches to planning, construction and connectivity that minimise environmental impact, carbon emissions and detrimental effects on air quality. It will strive to give a sense of hope to all of our communities, especially those hardest hit by the pandemic.

14.4 Lobbying

14.4.1 Some lobbying will be needed to deliver the canopy cover project; lobbying will be community based in the areas of low canopy cover. As previously mentioned, some internal lobbying may be required to secure some additional staff resource within the ecology/green infrastructure team.

14.4.2 Lobbying is ongoing with Naturally Birmingham (FPA) to the Government sponsor- MHCLG- to adopt the concept of Environmental Justice and build in the natural environment to its current IMD assessment criteria; this would help capture climate justice. Lobbying Defra over their Tools for assessing Biodiversity Net Gain or Green Infrastructure Standard need to reflect the environmental justice context.

14.4.3 Lobbying of MHCLG and CIPFA over sustainable finance methodologies to re-understand future investment and development; measured against planetary and social boundaries- not just simple book balancing approach. Again, financial business-as-usual has to urgently reflect the multiple emergencies.

14.4.4. Lobbying for the West Midlands National Park continues at regional and national Government level; particularly in reference to how green infrastructure should be part of the National Infrastructure programme to help deliver better 'levelling-up' projects going forward.

14.4.5 Currently, BCC uses the well-recognised TEMPO method for TPOs, as this is a standard that a lot of LA's use. At present, when assessing a TPO, .gov guidance states that nature conservation and climate change can be considered but can't be used as the sole factor. Moving forward, we feel this

should be amended to allow TPOs to be placed or given significantly more weight based on these. This will require lobbying of Government to change the regulations. Any lobbying would need to be as a LA or through MPs and industry bodies.

14.5 Costings

14.5.1 Some funding for the canopy cover project will be delivered through S106 following change in DM DPD policy DM4. There is also the potential for some additional funding through the CAZ. There will be a need to work with internal and external partners to identify funding opportunities this will be coordinated through the Birmingham Tree Board. Policy DM4 will also require developers to maximise canopy cover (or fund via first point). To support this, we will need to get highways to revise the commuted sums for adoption as this is a blocker to adding trees to the highway network. Funding will be required for the additional roles required as set out in section 14.3. The Birmingham Urban Forest Masterplan has £22k for commissioning in place from Neighbourhoods Directorate, however finance for publication will be required. The Trees and Biodiversity SPD's will require additional finance for design and publication.

14.5.2 Naturally Birmingham is a funded programme due to complete in March 2022, but its legacy is all about adopting a sustainable finance framework for the city; so that it can transition from business-as-usual to new greener finance. This could open up new investment potential for Birmingham.

Chapter 15 - Implementation and Monitoring

15.1 Route to Zero Supply Chain Programme

15.1.1 A Route to zero supply chain programme will be created worth £5 million, focussed on new and existing SMEs which:

- Operate within the green sector or SMEs who wish to diversify into this sector
- Can demonstrate viability and financial capability to deliver the project
- seek to implement an investment plan which helps to develop and grow the business
- Create sustainable new jobs and/or safeguarding existing jobs.

15.1.2 This programme will support of existing businesses, operating within the green sector of the economy or seeking to diversify or set up within key business clusters such as e.g. environment and energy technologies; automotive; building technologies, digital media; medical technologies; aerospace; advanced manufacturing and materials; ICT; food and drink and transport and logistics. Funding of £10k- £100k will be available to support the following areas:

- low carbon reduction, energy efficiency and waste management
- purchase of capital equipment
- relocation and expansion into new premises
- Development of new green markets
- development new green products
- improvements in systems or processes

We will develop a detailed programme in 2021 and if resource is available move into delivery in 2021/22.

15.2 Moving Forwards

15.2.3 Much of the work set out within the strategy is on-going. All of these projects will be taken forward over the next two years and each of them will make a significant and valuable contribution to achieving net zero carbon. There is a need to identify additional resources in order to successfully implement the work set out in this strategy.

15.2.4 The implementation of the strategy will need to be monitored. An annual update report will be presented to Council in January of each year, from January 2022, setting out updates on each of the projects and continuing to roll forward the next steps. As schemes within this call to action develop, their individual delivery plans will become more detailed, independent of this report. The actions within this report cover January 2021-2022, meaning this report is not due for revision until January 2022 at the earliest.

15.2.5 In terms of monitoring carbon emissions, Birmingham City Council completed a CDP return for the first time in 2020 and this process will be repeated annually. The CDP declaration process is transparent, and the report is publicly available. The annual update will include reporting progress towards achieving Birmingham's climate emergency declaration goal net zero emissions by 2030 or

as soon after as a just transition permits. In addition to this, the City Council recognise that there is a need for a more detailed carbon emissions monitoring system, a number of products are available to purchase which could help to monitor the City Council's own emissions as well as the City regions emissions in much greater detail. Further consideration will be given to procuring a tool to assist with monitoring during 2021.