



Carbon Neutral Nottingham

2020 – 2028 Action Plan

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Foreword

Nottingham City Council has responded to the climate and environmental crisis by setting an ambition to become the first carbon neutral city in the UK by 2028. In keeping with Nottingham's proud tradition of climate leadership, our carbon neutral charter sets out a vision for sustainable carbon neutrality on behalf of the Council and the city's Green Partnership.

At the heart of this shared vision is an approach that not only positively addresses wider environmental challenges, but improves quality of life and builds a new form of clean growth for our economy through a green industrial revolution.

The science is clear; we need to act urgently to reduce our carbon emissions to limit global temperature rise to below 1.5°C, and so prevent devastating impacts around the world and closer to home. It also shows we need to prepare for a changing climate.

Climate Change is a long-lasting and universal problem that will affect everyone, particularly our most vulnerable citizens. It is also one that significantly affects the young of today and for generations to come. We are the stewards for the world they will inherit, and it is an essential role of local authorities to protect the security and welfare of those citizens who depend upon us.

We are continuing our work to create a prosperous, fair and resilient city for this and future generations.

We have been at the forefront of what local authorities can achieve. The Nottingham Climate Change Declarations and our current

strategies for energy and climate change have driven forward our progress and inspired others to do so.

The actions we have taken have made a real difference to people's homes, businesses, transport and to the way the Council operates. We've met our 2020 energy strategy emissions target early of reducing carbon dioxide (CO₂) emissions by 26% from 2005 levels. The most recent figures from 2017 show a reduction of 41% for the city and 49% per person.

We believe the approach we are taking will bring multiple benefits to the citizens, businesses and organisations of Nottingham. Our carbon neutral charter sets out the principles, priorities and definitions of this approach, building on our previous successes and state-of-the-art knowledge.

This is one of the most important and complex challenges any society has faced, which is why the Council has taken it to the core of how it operates, and why it is so pleased to be working with Green Partnership members to provide a genuine citywide response that can engage and support everyone in the city to take action.

We all have a role to play in this, but we all have something to gain by finding more sustainable ways to live and work. Together with city partners, we will be creating new Climate Change and Energy plans for the next decade, to help set in motion this ambitious work and turn words into actions.

Foreword

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Whilst we rightly celebrate the success that Nottingham has had, we know this is only the beginning. Together this Council, our partners and citizens of this city can take forward the ambitions of a locally responsible global city. There is a way forward on this vital issue, and we believe that this plan is something Nottingham can be proud of in ensuring we are on the right track.

Councillor Sally Longford

**Deputy Leader of the Council and Portfolio Holder for Energy,
Environment and Democratic Services**



Carbon Neutral

The Challenge of Climate Change

Why carbon neutral?

Over the past 50 years, the average global temperature has increased at the fastest rate in recorded history and the trend is accelerating. 2019 was the second warmest year on record, according to the World Meteorological Organization.

When sunlight reaches the Earth, some of the energy is absorbed on the surface and re-radiated as infrared energy that we call heat. This goes back into the atmosphere where greenhouse gases, such as Carbon Dioxide (CO₂) trap this heat and send it back out in all directions. This natural process stops our planet being cold and is called the 'Greenhouse Effect'.

Human activities, in particular, the burning of fossil fuels for electricity, heating and transport, are changing the balance of the Greenhouse Effect. This is because we are emitting more greenhouse gases, especially Carbon Dioxide. The increase in these gases, which can last from years to centuries in the atmosphere, means we are trapping even more heat and causing the planet to get hotter. There are also pollutants like certain aerosols that can absorb incoming sunlight, further warming the atmosphere.

These rising temperatures are now altering the global climate resulting in longer and hotter heat waves, more frequent droughts,

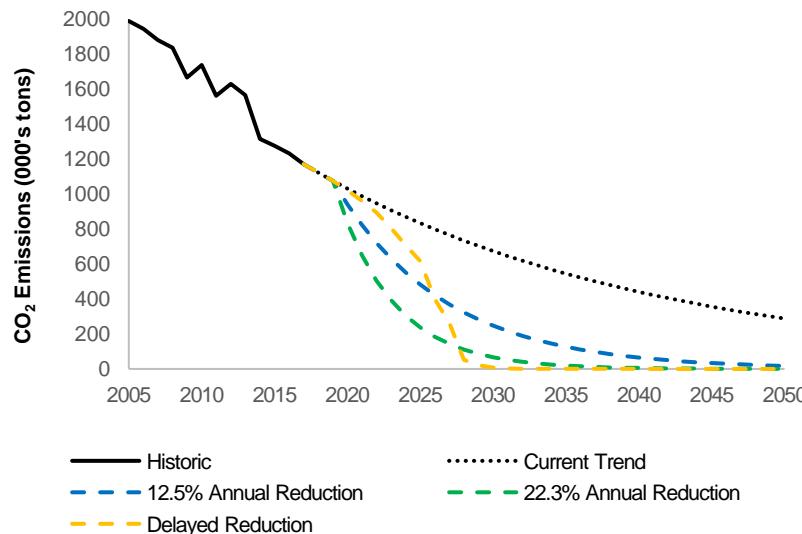
heavier rainfall, rising sea levels and more powerful storms and hurricanes. This is seen in the retreat of glaciers, rising sea levels, loss of habitats, floods, droughts and fires around the world.

As the frequency and scale of impacts increases with the changes in the climate that are forecast, the threat becomes critical. The recent UN (IPCC) report from 2018 set out that an average global rise in temperature of 1.5°C above pre-industrial times would be an unacceptable risk. There is though in truth, no safe level of global warming, and we have already seen a rise of 1°C, with each decade adding more than 0.2°C to that figure at the moment. This tells us that global action is needed sooner and efforts must be made to go faster and further in reducing emissions to keep us safe.

There is an increasing threat to nature and the ecosystems we rely upon. The continuing, unprecedented loss of biodiversity around the world is putting a vast number of species at risk from extinction. This poses an immense threat to our livelihoods with substantial risks to the economy, social well-being and the natural environment.

The risks from these issues are very high, and the time to act is short. Not acting upon them is inconceivable. This means that our response has to be to put these issues at the forefront of what we do, and to embed it everywhere and in everything.

On the 13th January 2020, Nottingham City Council acknowledged the scale of this challenge by declaring a Climate and Ecological Emergency at Full Council, recognising the immediate action required to achieve sustainable carbon neutrality.



It is a global issue where every person, every place and every organisation has a role to play. For the last 19 years, Nottingham City has shown a proactive approach and commitment to tackling this climate emergency, developing key strategies for Climate Change, Energy, Transport and Fuel Poverty. These have been vital drivers of Nottingham's success in reducing harmful emissions and enhancing the city's resilience.

Nottingham has already reduced official citywide CO₂ emissions by 41% (49% reduction in per person emissions) from 2005. This

considerable reduction was achieved through actions across industrial/commercial, transport and domestic sectors. The city is also on track to meet the target of generating 20% of the City's energy demand through low and zero carbon sources by 2020.

The city's success stems from the successful implementation of key strategies and through our partnerships with local businesses, universities and other local authorities, enabling many forward-thinking carbon reduction actions to take place.

However, the city still emitted 1.17 million tonnes of CO₂ in 2017, enough to drive the average car 6 billion miles!

Now, Nottingham must go further to reduce emissions and lower its carbon footprint to play its part in preventing a dangerously warmer world. The scale of the change in our citywide efforts required is shown in the graph opposite, with the green line showing where we want to be, and the blue line the absolute minimum to keep us in line with what science says is required. Nottingham must keep its emissions between now and the end of the century below a scientifically determined amount, known as its 'carbon budget', otherwise risking contributing to a dangerously warmer world. Aiming for the minimum reduction though, brings a real risk of failing to make the changes in time and would also mean Nottingham missing out on the benefits of being a leader.

The Carbon Neutral Charter (www.nottinghamcity.gov.uk/CN2028) recognised that tackling climate change needs to be done in a way that is fair and sustainable—improving and protecting our environment, economy and society. This sits at the heart of the city's approach. Nottingham City Council will play a leading role in enabling, empowering and coordinating the city to tackle the challenge, but it cannot achieve this alone. This plan will only succeed with everyone's involvement and support.

Framework

This plan builds on Nottingham 2028 Carbon Neutral Charter by setting out high-level objectives in order to achieve a resilient and carbon neutral Nottingham by 2028. These are broken down into four main sections:

- Carbon Reduction Measures
- Carbon Removal
- Resilience and Adaption
- Ecology and Biodiversity

Waiting to take action is not an option. This plan sets out where we in Nottingham need to go, and focusses on the actions we can start to take now. This provides an approach and platform to build on.

There may be many ways to achieve the outcomes we need. The plan is not intended to plot a fixed and definitive course to carbon neutrality. There will be further developments which cannot be accurately predicted. It is essential that there is continuing involvement in the development and implementation of actions from citizens, businesses, and other organisations in the city and further afield.

To ensure the action plan remains valid for the entirety of the next 9 years, it will be reviewed on an annual basis. This will allow the latest research, technologies and regulations to be incorporated over time, as well as for learning from previous actions.

This flexible approach will allow new partners, collaborators and stakeholders to continually contribute to the plan and its actions.

Nottingham's approach to sustainable carbon neutrality will integrate carbon reduction with sustainability and an ambition to identify and realise multiple benefits, termed co-benefits.

Co-benefits are deliberate or incidental positive outcomes across a range of other areas in addition to the central aim of an intervention. An example of a co-benefit is moving towards more active travel to tackle air-quality also has benefits for health from exercise and mental wellbeing, and reducing carbon emissions.

Sustainability, economic growth, alleviating poverty and tackling climate change are all complementary and interlinked. Carbon neutrality and clean growth have been part of the City's and region's plans for some time, and will be at the heart of future plans for the economy.

Nottingham must find new ways of doing things that can consider all these elements. This offers an opportunity to tackle key issues facing the city while simultaneously reducing the problems of inequality and maximising a range of benefits that improve people's quality of life. This would make Nottingham a fairer city and society for all.

Section 1 – Carbon Reduction

This plan prioritises carbon reduction measures to increase the chance of staying within our carbon budget and meeting the 2028 carbon neutral ambition. To do this, emission reduction rates would have to be in excess of 22.3% per year.

This section is further broken down into five chapters for activity:

- Transport
- The Built Environment
- Energy Generation
- Waste & Water
- Consumption.

Within each chapter, the plan identifies key objectives for achieving carbon neutrality and the steps we can take towards it. These are summarised in the action tables, which provide timescales for implementation as follows:

- Short term: Actions that can start now and aim to complete within the first three years of the plan (2020 – 2022)
- Medium term: Actions which require further development to be implementable within years three to six of the plan (2023 – 2025)
- Long term: Actions that have dependencies or require substantial development to be implementable within the final three years of the plan (2026 – 2028)

Section 2 – Carbon Removal

The second section of this plan focusses on capturing carbon and offsetting residual greenhouse gas emissions that cannot be removed entirely. Negative emissions technologies and offsetting could be used to neutralise remaining emissions. These are broken down into three groups:

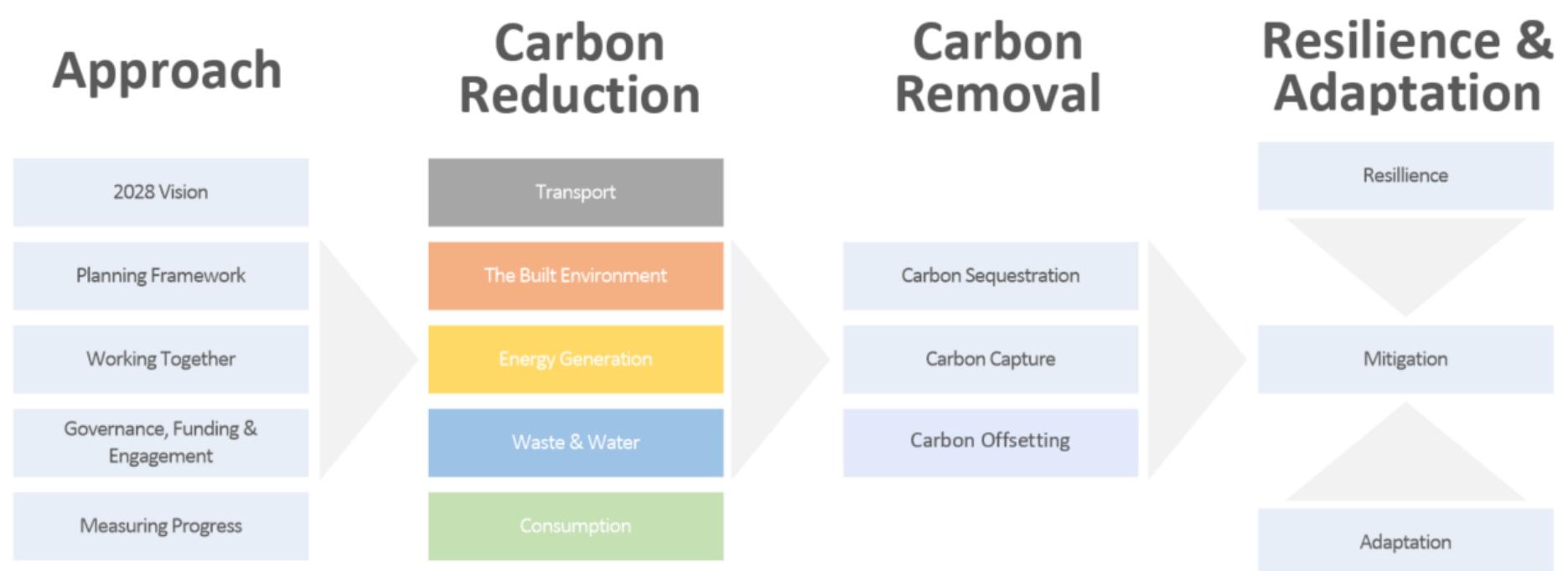
- **1. Local carbon sequestration**– Using nature or geology around the city to take carbon from the atmosphere and store it. This could be stored in plants, trees and soil, or in underground spaces between rocks.
- **2. Carbon capture** – use of negative emissions technologies to capture carbon from the atmosphere and at point of source
- **3. Large scale carbon offsetting** – activities outside the City that can offset the emissions we generate locally through other credible and transparent mechanisms.

Section 3 – Resilience and Adaption

The third section addresses the actions Nottingham must take to protect against unavoidable harmful impacts of climate change. Whilst the global goal remains avoiding dangerous levels of climate change by keeping temperature rises below 1.5°C, impacts such as flooding and extreme temperatures are already experienced locally.

Section 4 – Ecology & Biodiversity

This section explains the importance of green and open spaces, and biodiversity, for climate change mitigation and adaptation - unlocking other positive outcomes such as improvements in our physical and mental wellbeing and enhancing the local landscape.



Nottingham in 2028



A Safer City

By becoming the UK's first carbon neutral city, Nottingham will be helping safeguard the future of our children and future generations. Through adaptation and resilience measures we will ensure the City and its residents are protected from the worst impacts of unavoidable climate change.

A Healthy City

Nottingham will be one of the healthiest places to live with clean air, green open spaces and locally produced healthy food. New networks of safe cycling routes and high quality vehicle free public spaces will make it easier for people to get regular exercise.

A City of Opportunities

The Nottingham economy will be built on new sustainable technologies creating high quality employment for our citizens and a worldwide reputation for innovation and excellence. New infrastructure developments will not only create jobs directly, but make Nottingham one of the best places for businesses to thrive.

An Inclusive City

Nottingham will become one of the most equitable cities with new training opportunities to help Nottingham people benefit from the low carbon economy. We will continue to ensure the benefits from economic growth are felt by our citizens and lift people out of poverty.

A City that takes care of its residents

Nottingham will become one of the cheapest places to live and work in with low household fuel bills, affordable low carbon public transport, and high quality public services.

A City where everyone is able to reach their full potential

Nottingham will be one of the happiest places to live. Good quality homes, high employment, attractive public spaces and biodiverse ecosystems will improve the overall wellbeing of citizens and communities.

Governance, Funding & Engagement

Governance

Achieving our target to be carbon neutral by 2028 won't work through business-as-usual approaches. It will require us to work in different and new ways to ensure we remain agile and joined-up to effectively solve and tackle the issues we face. We will all need to focus on how to generate and capture more ideas, actions and resources across the Council, its partners and the city.

The following are a number of propositions that need to be explored in order to maximise our potential for success:

- For the City Council to establish a flexible and dedicated internal project team to work across and with all appropriate Council services led by its Energy Services. Members of this team to be seconded from within the Council to work exclusively on the project
- Develop a network of Climate Champions across the Council
- Change the style and venue of meetings to be more engaging for partnerships and community/business to creatively address key challenges
- Develop new forms of democratic involvement
- Develop a 'carbon neutral by design' ethos where everything that is proposed or implemented across the organisation considers how it can be carbon neutral or contribute to

reducing carbon as a matter of course. This will include being considered from the outset in the City Council's major projects assurance process to inform decision making

- Place a value on carbon emissions within financial and business planning that result from operational activities

Funding

Key to implementing many of the actions to achieve the target will be the funding. Building a carbon neutral economy will create new opportunities for private and public sector investment. In addition to ensuring every pound of our capital is working towards carbon neutrality, we must also create a platform to attract investment to the city. Nottingham City Council will take the following actions:

- Consider how internal budgets are used effectively to value and support work on carbon reduction
- Review current asset portfolio and work with partners towards divestment from any fossil fuel related investments and campaign for divestment of the Nottinghamshire Local Government Pension Scheme
- Identify appropriate ways to support and incentivise internal carbon reduction or offsetting projects
- Explore the opportunities for providing a climate change budget, through a variety of appropriate income sources

Engagement

Effective engagement of organisations' workforces, partner agencies, sectors and all people who live and work in, or visit, the city is essential to achieving the ambition of being carbon neutral by 2028. Innovative and effective ways of doing this will form part of a communications plan and include the following considerations:

- Undertake in-depth stakeholder mapping
- Develop a competition to encourage and support new community carbon reduction ideas
- Have a more open and inclusive process on carbon reduction plans, working with key partners and experts across the city
- Harness the city's ideas, knowledge and collective intelligence
- Carry out community energy/sustainability mapping
- Develop community carbon reduction champions
- Engage and involve schools and colleges across the city.

2028 Action Plan Consultation

The 2028 Carbon Neutral Action Plan is a platform to build upon for the work ahead to sustainable carbon neutrality. The Plan is a document that will evolve in conjunction with Nottingham's stakeholders, through ongoing engagement and co-creation. The first step of this process was an eight-week citywide consultation, from January to March 2020, which gathered feedback on the draft Action Plan. The approach was to listen, inform and learn from citizens and partners.

Nottingham City Council asked residents, workers, visitors, businesses and other organisations for their views on Nottingham's ambition of sustainable carbon neutrality, and the actions to deliver this. The engagement work created conversations across the city around everyday topics related to sustainability and climate change.

The online survey attracted 580 responses and over 300 people were consulted in person at many events across the city. A full summary of the feedback received is published separately, covering the actions people, and organisations, are already taking and want to take to meet the Action Plan's aims. The consultation found a high level of support (9 out of 10 respondents) for the Council's 2028 ambition, as well as the objectives and suggested actions to get there. This valuable feedback has been used to strengthen citywide action and ensure that this 2028 Carbon Neutral Action Plan is one that puts citizens at its heart.

Engagement is at the heart of the Action Plan and is fundamental to its success. Feedback from the consultation and ongoing engagement will feed into communications, actions and how we work. Engagement is also critical to delivering actions, so many of which are in partnership. This engagement work continues, both within the Council and across the city, helping make Nottingham a city of Climate Leaders. It is together that we can make Nottingham the UK's first carbon-neutral city, bringing benefits to the whole city for this, and future generations.



Monitoring Progress

The UK Government department BEIS (Department for Business, Energy & Industrial Strategy) annually release each summer local authority carbon emissions.

Each year, Nottingham city's emissions will be assessed against the pathways outlined in the Carbon Neutral Charter to measure progress towards achieving carbon neutrality in 2028.

At the end of each financial year, the review of the action plan will inform an understanding of the anticipated carbon saved. The related year's carbon emissions will not be published by BEIS until

two years later due to the data lag (e.g. short term actions in 2020/21 will not be in the released reported emissions until 2022).

When the reports of these emissions are released, these will be reviewed to assess whether this is in line with the local actions undertaken and the anticipated impact.

The BEIS data reports what are known as Scope 1 and 2 carbon dioxide emissions at local authority level. These local energy related emissions are what our target is focussed on.

Nottingham City will report annually through the CDP climate and environmental reporting platform for cities. This internationally recognised questionnaire will help identify major risks, opportunities and sources of emissions that need to be accounted for. Annual submissions to CDP will allow tracking of Nottingham's progress, including identifying actions with the greatest impact, and benchmarking of Nottingham's performance against other cities. This may also allow us to identify areas of opportunity for Nottingham in the future.

The Council will have its own internal Carbon Management Plan, which will include all key greenhouse gases, not just CO₂ and report on the City Council's scope 3 emissions, which are from wider services, procurement and functions. This will be measured and progress reported against the carbon management plan, annually.

Nottingham City Council's Plan 2019-2023 includes the pledge '*Become the first carbon neutral city in the country, reaching this target by 2028*'. Progress towards this pledge, including annual milestones and the carbon neutral pathway targets, will be reported quarterly as part of the Council's corporate reporting.

Working Together

Partner Organisations

Key to becoming carbon neutral by 2028 will be all people, businesses and organisations in the city working effectively and in harmony with each other. Each business or organisation can succeed with certain things alone but the greatest impact will come from working together across all sectors.

We have identified some of the key partners to help shape and deliver activities in Nottingham, including, but not limited to the One Nottingham Green Partnership and following organisations:

- Local authorities, including Police and Fire services
- National Health Service
- Private businesses including utility providers, Small & Medium-sized Enterprises (SMEs) and multi-nationals
- Voluntary and charity sector
- Civil Service e.g. Her Majesty's Revenues & Customs (HMRC)
- Central Government.
- Research partnerships with both Nottingham universities and wider national and international research organisations

What businesses and other organisations can do

Businesses, charities and other ventures in the centre have a critical role in transforming Nottingham into a sustainable city. How they operate, how staff get to work, what they buy, what they provide or make. Many organisations are taking great steps forward to support sustainable carbon reduction. There are many benefits to taking action, such as reducing costs, accessing or attracting new customers and increasing productivity. The consultation responses show some of the main ways local organisations are acting already:

- Energy conservation initiatives (75%)
- Corporate/board commitment to sustainability (75%)
- Company travel plan encourage public transport, walking, cycling (71.4%)

Some of the other ways organisations take action are:

- Signing-up to the forthcoming Council Business Charter
- Allowing more flexible working and online meetings for staff where possible to reduce travel
- Making buildings energy efficient to cut costs and carbon, and to provide a more productive space for staff
- Reducing water usage through behaviour change and simple interventions
- Creating wildlife friendly green space wherever possible
- Monitoring and measuring energy usage and carbon emissions
- Supporting local and sustainable procurement and production

Investors

Many of the projects and schemes to create a resilient and carbon neutral Nottingham will be low or no-cost, such as a behavioural change. Most will create a range of social, environmental and economic benefits. The city will embrace new business models and ways of working to ensure everyone can benefit from the opportunities.

However, many will require significant investment and funding, particularly in new or improved infrastructure to achieve their aims. There is strong evidence that investment in infrastructure and the development of new products and services creates significant local value and good returns for investors.

A carbon neutral Nottingham will present many exciting opportunities for equity investors in sustainable solutions and so attracting and involving suitable investors in the projects will be key.

Working with Communities

Working effectively with, and in, Nottingham's local communities and neighbourhoods will be vital. Communities will be engaged in projects' design and implementation throughout in order to create genuinely sustainable solutions. Improving a community's green space, for example, can only be sustainable if local citizens feel a sense of ownership, empowerment and are able to realise its benefits long into the future.

What citizens can do

Becoming a sustainable carbon neutral city is something that requires everyone to take action and already citizens across Nottingham are taking positive steps in their lives. Each step forward is one worth taking, no matter how small it may seem. Everyone is in different circumstances, but we can all do something, not just as individuals but as neighbours, friends and communities. Many of the steps help save money and improve our wellbeing. Citizens who responded to the 2028 consultation have are contributing towards tackling the climate and ecological emergency by:

- Recycling (98.4%)
- Saving energy (88.2%)
- Growing Plants at home (77.3%)

This is a great start and there are many other ways we can all reduce our own emissions, including:

- Walk or cycle more than once a week, instead of using the car
- Take shorter showers
- Fix, reuse and share goods
- Use a renewable energy tariff
- Buy more local and sustainable food and drink
- Lease, share or own an electric car or bike
- Use home or community composting

Section One – Carbon Reduction Chapters

In order to effectively group the activities needed to become carbon neutral by 2028, five key groups or chapters have been identified and created over the following pages.

Each chapter contains an introduction on the key associated issues and current activities, a series of key objectives with a range of actions which will deliver the objective and thus the necessary change by 2028.

3. Energy Generation

Nottingham has been active in helping to decarbonise electricity. For instance, by March 2019, over 6,200 solar photovoltaic (PV) installations had been deployed across the city.

We will need to take action to significantly expand local low carbon sources of energy with the capacity to store energy within the city and to be recognised as a test bed for new energy generating technologies.

1. Transport

In 2017, nearly a third of Nottingham's total CO₂ emissions came from transport of which, nearly all come as a result of road transport from cars, vans, lorries and buses.

Action is needed to reduce car journeys, increase cycling and walking, improve public transport and more low emission vehicles. Through this, we can achieve better air quality, mobility and health for citizens.

4. Waste & Water

In 2018-19, 113,000 tonnes of household waste was produced by Nottingham, of which 26.5% was reused, recycled or composted, 64.5% was sent for energy recovery; and 7.0% was sent for landfill.

Actions are needed to reduce the volume of all waste and eliminate it from landfill, increase the reuse and recycling of waste, and use the rest for energy. Water use must be managed effectively.

2. The Built Environment

In the coming decade, Nottingham will have to improve the efficiency of all buildings to reduce the demand for energy.

We will need to heat our buildings with low carbon and/or renewable heating, change our behaviours towards energy reduction and increase the adoption of energy efficiency technologies in both commercial and domestic buildings.

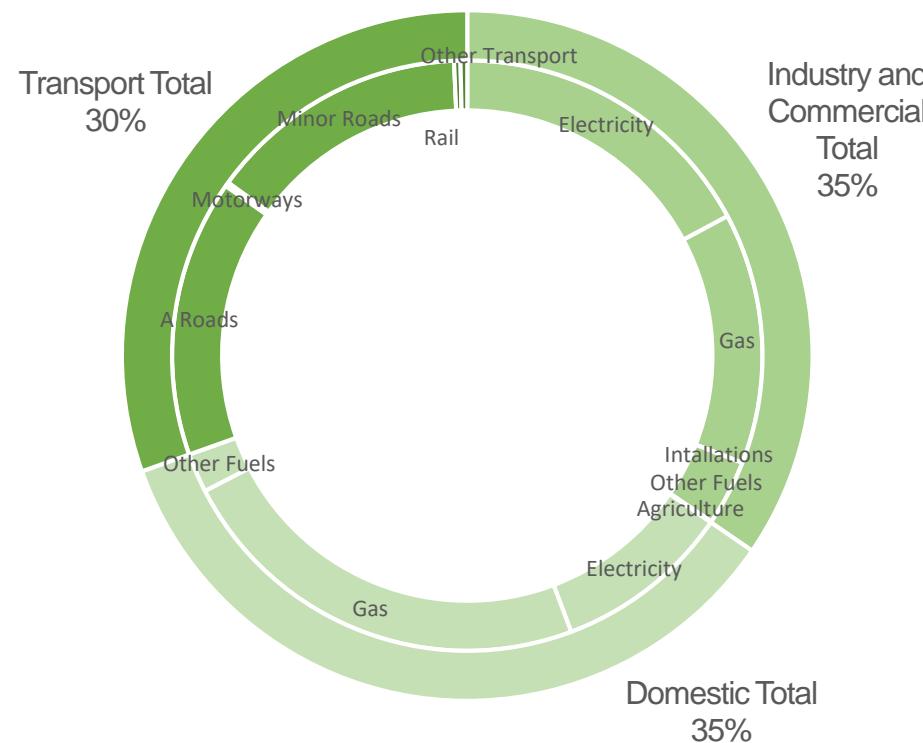
5. Consumption

The goods we buy have many emissions in their manufacturing and transport, often from around the world. Food and drink in particular has a big impact on wider and imported emissions, the wider environment and our use of finite resources.

Areas for reducing emissions include reducing meat and dairy, reducing transport miles, and sourcing from less energy intensive forms of production.

1. Transport	2. The Built Environment	3. Energy Generation	4. Waste & Water	5. Consumption
By reducing the need for travel and adopting more sustainable modes of transport the city can reduce the emissions from vehicle fuel consumption.	By improving the energy efficiency of the built environment the city can reduce electricity and gas consumption in domestic and commercial buildings.	Building on existing low carbon energy generation to support the transition through a new energy system which will reduce the carbon impact of the electricity consumed in our homes and businesses.	Waste and water contribute to the overall emissions from businesses and households. Improving our waste and water management systems will help reduce this impact and be resilient.	Decarbonising the city and local economy will require changing what we consume, how we consume it and how it is produced.

2017 Scope 1 & 2 Emissions*



Scope 3 Emissions*

The target covers direct and indirect energy related CO₂ emissions, referred to as Scope 1 and 2. It does not cover Scope 3 or imported emissions. This is for several reasons, including:

- Ability to monitor and measure effectively
- Alignment with the local carbon budget model embedded
- Ability to influence and shape sources of emissions directly.

Some of these emissions may occur outside of the city boundary. As with the city target, the Council will consider wider embodied emissions in its internal policy to affect those emissions outside of the main target. The City Council is also very much part of the city target, but the Council will address wider greenhouse gases in the form of a CO₂e target for scope 1 and 2 (and scope 3 where possible) emissions for our estate, consumption, travel and services.

Transport



Chapter One: Transport

Transport emissions contributed 357 thousand tonnes of CO₂ in 2017, 30.5% of Nottingham's total CO₂ emissions. 98% of these emissions come as a result of road transport on 'minor' and 'A' roads from cars, vans, lorries and buses for example.

Since 2005, there has been a 13.3% decrease in transport emissions across the city. However, during this same period there has only been a slight decrease in the number of vehicle miles travelled by cars and taxis. Until recently, concentrations of the air pollutant NO₂, emitted mainly by diesel vehicles, were above limits set to protect public health.

The implementation of the UK's first Workplace Parking Levy and the construction of two new tram lines has led to 9.7 million additional public transport journeys each year. Efforts to increase the uptake of Ultra Low Emissions Vehicles (ULEVs) are now beginning to show results however, ULEVs currently account for only less than 0.5% of all Nottingham's vehicles. To achieve the 2028 carbon neutrality ambition, it will be necessary to almost entirely replace existing fossil-fuel based Internal Combustion Engine (ICE) vehicles with ULEVs. Recent research suggests that the lifetime carbon emissions of ULEVs are half those of a conventional vehicle, with more efficient electric vehicles saving the equivalent carbon produced in the batteries in just two or three years.

There are still considerable numbers of people who commute into Nottingham by means of single occupancy car journeys. This is one

of the key areas of emissions that the Council will need to address alongside businesses, communities and partner, shifting this behaviour towards shared and public transport, and much greater walking and cycling.

Nottingham City Council has historically pursued policies that encourage the use of public transport together with walking and cycling, for example the Workplace Parking Levy, as well investment in a high quality, high frequency public transport network. These policies have resulted in a rising number of people using public transport and despite a rising population, traffic volumes in Nottingham have remained static for several years.

Current activities, actions and programmes

- Workplace Parking Levy (WPL)
- Tram extension
- Integrated public transport – investment in biogas and electric bus fleet
- Personal journey planning and seed funding for shared transport solutions
- Hackney and private hire vehicle strategy
- Decarbonisation of Nottingham City Council owned fleet
- Go Ultra Low Nottingham – building charging infrastructure for electric vehicles.

Objectives

This can be achieved by:

- Reducing the need to travel within the City
- Encouraging and enabling more walking and cycling
- Improving the quality and availability of low carbon public transport
- Reducing the impact of freight moving around the city
- Improving our traffic demand management
- Improve low carbon transport infrastructure
- Moving away from internal combustion powered vehicles to ULEV such as electric or hydrogen vehicles.

Opportunities and Benefits

The steps taken towards low carbon transport will have broader positive impacts within the City. These will include:

- Improving air quality
- Creating more vehicle free public spaces to enjoy
- Making cycling safer and active healthier lifestyles easier
- Making it cheaper and quicker for everyone to get around.

Case Study: Workplace Parking Levy

The Workplace Parking Levy (WPL) was introduced into Nottingham in 2012. It is a charge payable by employers whose work premises have more than 10 employee parking spaces.

The revenue generated is ring fenced for local transport improvements. The WPL has helped to fund the construction of two new tramlines, the redevelopment of Nottingham Station and supports a network of electric buses.

As well as acting as a demand management tool, the WPL also makes grants available to employers for infrastructure to encourage the use of sustainable travel. Grants to employers have included shower and locker facilities for cyclists as well as secure cycle parking.

Independent academic research concluded the introduction of the WPL has had a positive impact on congestion and thus air quality and carbon emissions.

Actions

Objective	Action	Timescale
1.1 Reduced need to travel, particularly by car, within the city boundaries	Actions Nottingham City Council can take	
	1.1.1 The Council and Nottingham City Homes continue to set an example through implementing smarter working practices and further encourage employers to implement home working or smarter working initiatives in order to reduce employees' travel time and distance travelled	Ongoing
	1.1.2 Encourage employers to use shared hubs and new technology which will reduce the need to travel, such as video conferencing and cloud services	Medium Term
	1.1.3 Continue to ensure that new developments promote walking and are within easy reach of high quality public transport and within easy reach of high quality Cycle Network routes, such as through the Local Plan which allocates the most sustainable locations for development in order to reduce the need to travel	Ongoing
	Actions we can take in partnership	
	1.1.4 Work with partners across D2N2 to offer greater connectivity over the region	Medium Term
	1.1.5 Nottingham City Council will continue to work with voluntary sector organisations to encourage the shift away from the use of the private cars	Ongoing
	How Central Government can help	
	1.1.6 Consider using fiscal policy to incentivise home working	
	1.1.7 Double the proportion of Department for Transport capital funding delegated to Local Authorities	
	1.1.8 Review vehicle excise duty in order to encourage a switch to sustainable forms of transport	
1.2 Increased uptake of active travel and availability of safe and green walking/ cycle networks	Actions Nottingham City Council can take	
	1.2.1 Develop and publish a Local Cycling and Walking Infrastructure Plan (LCWIP) for the D2N2 area with Local Enterprise Partnership support	Medium Term
	1.2.2 Prioritise the development of a high quality cycling network and secure cycle parking in Nottingham and beyond	Medium Term
	1.2.3 Seek to secure ongoing funding to support education, co-design and engagement to help commuters and visitors feel safe to make the switch to walking and cycling	Ongoing
	Actions we can take in partnership	
	1.2.4 Work with schools and employers to encourage pupils, parents, and employees to travel by walking and cycling where possible. Car Free Days, Clean Air Days and other events will promote the benefits of walking and cycling, in conjunction with communities and voluntary organisations.	Short Term
	1.2.5 Through the workplace travel grant, the City Council will continue to provide grants for employers to encourage their employees to commute to work by cycling	Ongoing
	1.2.6 Expand the local and national cycle networks in partnership with voluntary sector organisations	Medium Term

Objective	Action	Timescale
	<p>How Central Government can help</p> <p>1.2.7 Department for Transport will be consulted on the local cycling and walking infrastructure plans and asked to support its recommendations</p> <p>1.2.8 Provide support for investment into cycling and walking infrastructure and complementary promotional activities (e.g. encourage people to walk/cycle for short journeys and review signage of active travel routes)</p>	
1.3 Increase in the quality, accessibility and frequency of public transport for all	<p>Actions Nottingham City Council can take</p> <p>1.3.1 Continue to promote the use of the most sustainable forms of public transport in the city, demonstrate value for money and journey time savings</p> <p>1.3.2 Actively seek to expand the tram network to cover more of the city and conurbation of Nottingham bringing High Quality high frequency public transport to more of the population of Nottingham</p> <p>1.3.3 The Council will commit to investing in Real Time Public Transport information through on street variable message signs and mobile devices</p> <p>1.3.4 Continue to run the link bus network using 100% electric buses linking key points to areas not served by the commercial network</p> <p>1.3.5 Improve bus infrastructure and priority measures e.g. bus lanes, high quality bus stops and new technologies</p>	<p>Ongoing</p> <p>Long Term</p> <p>Medium Term</p> <p>Ongoing</p> <p>Medium Term</p>
	<p>Actions we can take in partnership</p> <p>1.3.6 Expand Public Transport networks in partnership with public transport operators and large employers e.g. hospitals</p> <p>1.3.7 Work with drivers and operators to ensure that we have a cleaner hackney carriage and private hire fleet by 2025</p> <p>1.3.8 Develop a Mobility As A Service platform in partnership with public transport operators and service providers of shared transport solutions such as car clubs and bike hire</p> <p>1.3.9 The city council will continue to invest in ticketing integration rolling out new ways to pay for Public Transport E.g. by using mobile devices bank cards and contactless payment systems and developing mobility credits packages for low income households</p> <p>How Central Government can help</p> <p>1.3.10 Central Government can help with the electrification of the Midland Mainline rail link into Nottingham and enable more accessible, affordable and frequent services</p> <p>1.3.11 Provide support for investment into public transport</p>	<p>Medium Term</p> <p>Medium Term</p> <p>Medium Term</p> <p>Ongoing</p>
1.4 A clean system for freight to enter and move around the city	<p>Actions Nottingham City Council can take</p> <p>1.4.1 Investigate the possibility of freight consolidation centres in the city to reduce freight journeys by road</p> <p>1.4.2 The City Centre Clear Zone will be modified to ensure that only the cleanest delivery vehicles will be able to access the city centre</p> <p>1.4.3 Encourage freight organisations to make the switch to electric vehicles and promote the use of cargo-bikes for final stage deliveries</p> <p>Actions we can take in partnership</p>	<p>Short Term</p> <p>Medium Term</p> <p>Medium Term</p>

Objective	Action	Timescale
	<p>1.4.4 Investigate the potential for extra-urban freight consolidation centres - transfer to electric freight vehicle into the city</p> <p>1.4.5 Investigate the use of drones and other alternative technologies for smaller deliveries</p> <p>1.4.6 Encourage the transport of goods and freight onto rail</p> <p>How Central Government can help</p> <p>1.4.7 Review vehicle regulations particularly looking at refrigeration in transport and how this can be made cleaner</p> <p>1.4.8 Provide legislative support for alternative delivery systems e.g. drones</p>	<p>Short Term</p> <p>Short Term</p> <p>Medium Term</p>
1.5 Reduced and better managed demand of traffic on the City's streets	<p>Actions Nottingham City Council can take</p> <p>1.5.1 Understand impacts of road user and congestion charging. For example, emissions-based Parking Tariff Policy – for public and internal NCC parking charges, occupancy-based parking signposting, reviewing all WPL scheme exemptions and discounts</p> <p>1.5.2 Promote the park and ride facilitates and investigate expansion to other areas of the city and county</p>	<p>Medium Term</p> <p>Medium Term</p>
1.6 High quality infrastructure across the city to enable low emission and low carbon transport	<p>Actions Nottingham City Council can take</p> <p>1.6.1 Expand the D2N2 electric vehicle charging network across the region</p> <p>1.6.2 Introduce Vehicle to grid (V2G) in order to help deal with peaks in energy demand</p> <p>1.6.3 Deploy integrated on and off-street vehicle charging infrastructure in NCC operated car parks</p> <p>1.6.4 Develop a ULEV procurement framework</p> <p>1.6.5 Introduce incentives for residents and businesses to make the switch to ultra-low emission vehicles. e.g. helping taxi drivers with licensing costs for new EV's and try before you buy schemes</p> <p>Actions we can take in partnership</p> <p>1.6.6 Local Enterprise Partnership will play a role in linking the network of vehicle charge points across the region. (Public and HGV) and understanding and coordinating the potential role and requirements of hydrogen as a transport fuel</p> <p>1.6.7 Work with the local DNO, Western Power Distribution, to address power supply constraints in parts of the city</p> <p>1.6.8 Explore opportunities for maximising the potential for transport along the river and canal network</p> <p>How Central Government can help</p> <p>1.6.9 Continue to provide funding for local authorities to implement measures that support their Road to Zero Strategy ambitions</p> <p>1.6.10 Implement green number plate changes so that zero emission vehicles can more clearly be identified</p>	<p>Medium Term</p> <p>Short Term</p> <p>Short Term</p> <p>Medium Term</p> <p>Medium Term</p> <p>Ongoing</p> <p>Medium Term</p> <p>Medium Term</p>

Objective	Action	Timescale
	<p>1.6.11 Provide clear and coordinated communications campaigns to help raise public awareness, alongside providing incentives to switch the ULEV vehicles to aid the switch from petrol/diesel vehicles.</p> <p>1.6.12 Invest in more research in innovative on street charging solutions</p> <p>1.6.13 Introduce changes in planning policies for electric vehicle charge points in new developments</p> <p>1.6.14 Change Ofgem rules to enable proactive investment into power supply where it is needed</p> <p>1.6.15 Require charge point suppliers to provide contactless payment options and support interoperability (roaming) across networks (powers under the Autonomous Vehicles Bill)</p>	
1.7 Shift to ULEVs and Investigate additional demand management measures encouraging shared travel and introduce new technology solutions	Actions Nottingham City Council can take	
	1.7.1 Introduce and expand a high quality electric vehicle charging network across the region	Medium Term
	1.7.2 Introduce new technology and use smart cities developments to improve the efficiency of the transport network	Medium Term
	1.7.3 NCC to open Nottingham Electric Vehicle Services (NEVS) to help Establish a network of ULEV maintenance workshops	Short Term
	1.7.4 Transition NCC and Nottingham City Homes operational and grey fleet to ULEV	Medium Term
	1.7.5 Develop local electric car club/car sharing schemes and investigate applications/communications to support greater uptake	Short Term
	Actions we can take in partnership	
	1.7.6 Working with Universities to identify opportunities for research into clean transport technology	Short Term
	1.7.7 Mobility as a service will become an increasingly important part of the way people travel the city council will work with transport operators to ensure this happens in order to provide a viable alternative to car travel	Medium Term
	1.7.8 Work with city employers on making changes to their fleet, travel plans and ways to help employees switch to ULEVs and ebikes for personal use	Medium Term
	1.7.9 Work with key public sector organisations, for example hospitals, to investigate demand and capacity for accommodating greater numbers of ULEVs	Medium Term

The Built Environment



Chapter Two: The Built Environment

Space heating is the largest contributor to domestic CO₂ emissions (25% of city's overall emissions), with 294,000 tonnes of CO₂ emitted for heating and hot water by properties in Nottingham. This demonstrates that the need for a transformation in the way we heat our homes, with 84% of households currently heated by gas, towards low carbon electric heat pumps and heat networks.

From 2005 to 2016, industry and commercial energy demand decreased by 35.5% and domestic by 26.3%. Though industry/commercial and domestic sector energy demand is decreasing, their gas use accounts for almost half of total energy consumption in Nottingham.

Space and process heating contributed approximately 30% of the City's NOx concentrations. In the coming decade, Nottingham will have to reduce gas consumption, and replace its usage with lower carbon alternatives, as well as improve the efficiency of products, buildings and vehicles to reduce the demand for energy.

Nottingham's current housing stock poses a key challenge. There are 135,000 homes in Nottingham (27,000 managed by Nottingham City Homes). Many of these were built pre-1980 and over 58.2% are below an EPC rating of C, which is the national target for all homes to be at by 2030. The Domestic Energy Efficiency and Fuel Poverty Subgroup (DEEFP) created the 2018 Fuel Poverty Strategy to tackle this challenge in a low carbon and sustainable approach, with the aim of providing affordable warmth and healthy homes for all citizens.

Significant improvements must be made to Nottingham's houses, requiring a sustained level of household retrofits. In addition, there will be an estimated 9,400 new build homes by 2028, which should be built to the highest possible standards, be climate smart in their design and affordable to run. There is an opportunity to use work on NCH properties to create improvements in private sector housing.

Nottingham's non-domestic properties also pose a challenge with 69% of the 8480 non-domestic properties below an EPC rating of C.

Significant new developments at the Boots site, Southside and Eastside Regenerations Zones, and the Eastcroft area of the Waterside Regeneration Zone, provide an opportunity to create more energy efficient and climate smart housing and commercial premises.

Current activities, actions and programmes

- Over 40,000 energy efficiency measures in local homes
- Nottingham City Homes have installed 14,221 boilers, 4140 loft installations and 12,588 cavity wall measures
- A project called REMOURBAN has involved treating over 400 homes with energy saving measures to make them warmer and reduced energy bills
- Delivered efficiencies within the District Heating Scheme network to enable new connections to take place

- UK's first Energiesprong retrofit on 27 homes, upgrading them with new outside walls and windows, a solar roof, and a state of the art heating system extending the District Heating Scheme.

Objectives

Reducing carbon emissions and energy demand from the built environment can be achieved by:

- Heating our buildings with low carbon and/or renewable heating and changing behaviours towards energy consumption
- Monitoring and encouraging energy efficiency standards and improvements
- Increasing the adoption of energy efficiency technologies and low-cost solutions in both commercial and domestic buildings
- Minimising emissions in construction of new buildings and through procurement of technologies and materials.

Opportunities and Benefits

- Reducing energy bills for residents and local businesses
- Upgrading the quality of housing stock, making homes healthier and creating new sustainable homes
- Improving the quality of commercial premises, helping make more productive and better working environments

- Improving air quality by reducing emissions of NOx from gas boilers.
- Creating new skilled employment and commercial opportunities within the sustainable construction sector.

Case Study: Energiesprong

Winner of a national innovation award, the first pilot project for Nottingham City Homes (the ALMO managing and maintaining Nottingham's council housing) completed in early 2018 radically transformed ten social rent homes in Sneinton (seven terraced three-storey houses and three bungalows). It delivered super insulated, low maintenance and almost net zero energy homes.

This project was the first in the UK to pioneer the Dutch 'Energiesprong' (energy leap) initiative, which has radically upgraded the energy efficiency of thousands of homes in the Netherlands.

New wall panels were prefabricated off-site and arrived in 'full storey heights' complete with ample insulation and a durable board finish ready to crane into place. The radical retrofit was completed in less than one week with occupants able to remain in residence throughout the works. Tenants report warmer homes, cheaper bills, and the exteriors look fantastic and have really enhanced the neighbourhood. This project is now being rolled out to many more homes across the city.

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Actions

Objective	Action	Timescale
2.1 Have all heating from low carbon and/or renewable heating sources	<p>Actions Nottingham City Council can take</p> <p>2.1.1 Provide information and materials to educate and engage citizens and businesses with low carbon sources of heating</p> <p>2.1.2 Investigate the requirements for large scale installation of low carbon sources of heating (air/ground/water source heat pumps), using council owned homes as a test bed in partnership with Nottingham City Homes, grid operators and supply chains</p> <p>2.1.3 Promote incentives for low carbon heating such as the Renewable Heat Incentive (RHI) and investigate additional finances/funding opportunities for low carbon heating, including Heat or Energy as a Service models</p> <p>2.1.4 Expand on D2Grids project exploration of mine-water for heat</p> <p>2.1.5 Undertake heat mapping exercises for ground, water, air, waste heat and other sources for low carbon heating, considering locally appropriate scale of infrastructure, for example communal networks</p> <p>Actions we can take in partnership</p> <p>2.1.6 Investigate approaches for local low carbon heating provision to domestic and commercial customers, attracting investment and supporting the local economy with commercial opportunities</p>	Short Term
2.2 Enforce regulations effectively to monitor and encourage energy efficiency standards and improvements	<p>Actions Nottingham City Council can take</p> <p>2.2.1 Enforce private rented and non-domestic Minimum Energy Efficiency Standards regulations</p> <p>2.2.2 Review and evaluate the potential of an offset fund (106 agreements) or allowable solutions mechanism for developers to pay into when a certain high level of energy efficiency of buildings is not able to be met in the development and use this money for carbon saving projects</p> <p>2.2.3 Expand planning policy to progress a Carbon Neutral Supplementary Planning Document to expand on a range of actions developers can consider/incorporate into development plans to reduce their carbon impact (covering building materials, design and orientation, natural ventilation and lighting, landscaping and off-setting). This may include the requirement of a Carbon Statement to be submitted as part of the Development Management process.</p> <p>2.2.4 Investigate setting up a pre-application advice service in regards to carbon statements for future developments (which may be required under new Carbon Neutral Supplementary Planning Documents)</p> <p>2.2.5 Implement compliance in existing core strategy policies for all new development proposals, where they will be expected to comply with national and local targets unless it can be demonstrated that compliance with the policy is not viable or feasible</p> <p>2.2.6 Stay up to date with government policies that may help shape and enforce energy efficiency improvements in buildings</p> <p>2.2.7 Promote awareness and understanding of Energy Performance Certificate for domestic and commercial properties to foster greater action in the city.</p> <p>Actions we can take in partnership</p> <p>2.2.8 Stay up to date and help promote an emerging Carbon Neutral Supplementary Planning Document which may require developers to produce carbon statement</p> <p>2.2.9 Support the launch of Co-Place, a partnership between community organisations and NCC to provide training and support for designers, developers, officers and communities to engage in collaborative planning processes, working together in co-design and place making schemes.</p>	Medium Term Ongoing Ongoing Ongoing

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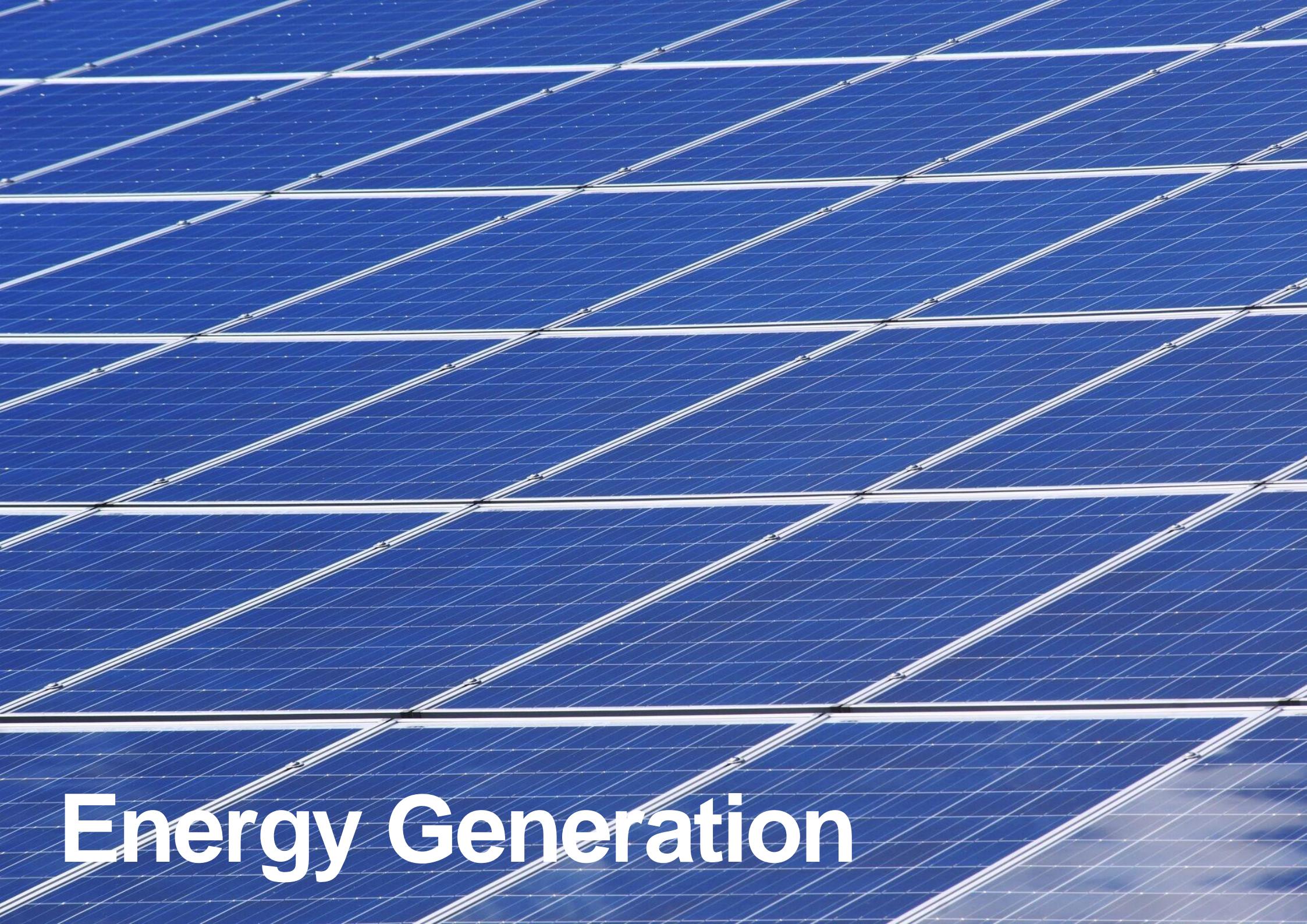
Objective	Action	Timescale
	How Central Government can help 2.2.10 Look to implement support and regulations to set a high level of energy efficiency in buildings as standard	
2.3 Have greater and more frequent citywide uptake of energy efficiency technologies both commercial and domestic	Actions Nottingham City Council can take <ul style="list-style-type: none"> 2.3.1 Look to increase the number of EnergieSprong Household retrofits in partnership with Nottingham City Homes in line with available Government funding 2.3.2 Investigate the potential for and funding sources to develop our approach to affordable net zero energy retrofits 2.3.3 Contribute to making household retrofits commercially viable through creating local sites for retrofit material and ensuring sufficient skills and infrastructure is in place, as well as attracting investment in future retrofit measures 2.3.4 Capitalise on available funding and expand Energy Company Obligation (ECO) measures where appropriate 2.3.5 Find ways to address over 50,000 solid wall or inadequately insulated properties across the city 2.3.6 Continue to lead by example through regenerating areas of the city with more energy efficient and climate smart buildings e.g. Waterside – Trent Basin 2.3.7 Seek to prioritise building new builds on council land to a high energy efficiency (e.g. Passivhaus Standard / AECB Standard), including NCH properties, ensuring they are built to a 'carbon neutral' standard 2.3.8 Investigate the implementation of a set carbon intensity for construction of new council buildings (e.g. KgCO₂e/m²) 2.3.9 Continue to develop Council strategies to help influence and shape the movement towards improved energy efficiency within the built environment (e.g. Housing Strategy) 2.3.10 Ensure the Council's own estate's energy efficiency is maximised through invest to save practices, such as using SALIX financing 	Short Term Medium Term Ongoing Medium Term Long Term Medium Term Ongoing Short Term Ongoing Ongoing
	Actions we can take in partnership <ul style="list-style-type: none"> 2.3.11 Engage and collaborate with large public and private sector organisations to improve the energy efficiency of their buildings 2.3.12 Work with partners to support citizens and businesses to understand the case and means for installing different low-carbon technologies. 2.3.13 Explore the possibility of trusted vendor approaches and frameworks for suppliers to domestic and commercial customers 	Long Term Medium Term Medium Term
2.4 To help businesses and citizens reduce energy demand from buildings	Actions Nottingham City Council can take <ul style="list-style-type: none"> 2.4.1 Inform citizens and businesses across the city on energy saving measures through developing materials and engagement i.e. local pop-stalls, with the aim to also reduce fuel poverty. 2.4.2 Provide information and engage with citizens and organisations to encourage switching to renewable energy tariffs, for example via Robin Hood Energy 	Short Term Ongoing
	Actions we can take in partnership <ul style="list-style-type: none"> 2.4.3 Explore the potential to empower action through gamification 2.4.4 Work with key partners to use procurement approaches to encourage suppliers to report on their operational emissions, and look to establish a public-facing citywide energy and carbon ratings scheme for businesses 	Short Term Medium Term
2.5 Maximise the uptake of low-cost technologies to reduce the demand for energy across all buildings	Actions Nottingham City Council can take <ul style="list-style-type: none"> 2.5.1 Ensure low cost technologies such as LED lighting are rolled out across the council estate, including parks and open spaces, as well as included in new developments, to reduce energy use. 	Ongoing

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Objective	Action	Timescale
	Actions we can take in partnership 2.5.2 Work with businesses and citizens across Nottingham by providing information and advice on low-cost technologies to reduce energy consumption in buildings (e.g. through web materials, pop-up question information stands, hosting engagement events or supplying leaflets).	Ongoing
2.6 Minimise emissions in construction of new buildings and through procurement	Actions Nottingham City Council can take 2.6.1 Trial the open-source Embodied Carbon in Construction Calculator ("EC3") tool 2.6.2 Investigate available tools to incorporate whole-life costing into procurement process with support from finance 2.6.3 Include carbon reduction into procurement specification and set appropriate minimum standards 2.6.4 Measure Scope 3 emissions impacts of current construction approaches and procurement 2.6.5 Promote more sustainable materials for new constructions based on the BREEAM tool Actions we can take in partnership 2.6.6 Develop and support, with NCH, localised offsite manufacturing for new build and retrofit 2.6.7 Influence regional procurement frameworks 2.6.8 Undertake research with partners to facilitate a local circular economy for material reuse in construction to reduce emissions, costs and improve sustainability	Short Term Short Term Short Term Medium Term Short Term Medium Term Medium Term Medium Term





Energy Generation

Chapter Three: Energy Generation

The vision of a carbon neutral Nottingham requires producing more renewable and low carbon energy locally in addition to reducing the overall amount of energy consumed. Storing energy locally and managing our energy in a smarter and timelier way will be essential. This can reduce the peaks that make energy demand hard to cater for, and get more out of the renewable energy we produce, reducing bills and carbon.

Since 2010, the UK electricity national grid has seen its CO₂e intensity figures decrease by 47%. These are expected to continue to decrease as the mix of electricity sources nationally become lower carbon, with increased generation from renewable sources such as wind and solar.

Nottingham has been active in helping to decarbonise electricity. It is estimated around a fifth of all local energy demand is provided from local low-carbon energy sources.

As of March 2019, over 6,200 solar PV installations had been deployed across the city, covering 4.5% of domestic properties, with an installed capacity of 21MW. Moving forward, Nottingham will continue to increase its local renewable generation, with a particular focus on solar Photo Voltaic (PV) combined with energy storage.

The City Council will continue to participate and lead on innovative solutions to energy generation and look to have a range of sources in place including energy from waste, wind, sewage, water, land and movement.

Current activities, actions and programmes

- An extensive heat network linked to Energy-from-Waste
- Solar PV programme on City Council owned estate and on properties across the city
- Nottingham has pioneered innovative approaches to renewables, such as solar carports, and working with partners to combine solar PV with domestic, community and commercial energy storage facilities.
- Nottingham hosts the government (BEIS) funded Midlands Energy Hub to develop local energy action, and is working with partners to support the D2N2 Energy Strategy.

Objectives

Decarbonising local energy generation can be achieved by:

- Have a vision of how the energy system would ideally look to align energy development and secure funding
- Expand local low carbon sources of energy within the city
- Improve the capacity to store local low carbon energy
- Have a stable and secure energy system that maximises energy from local diverse mix of low carbon sources

- Enable the city to be a test bed for new energy generating technologies
- Ensure low carbon energy is affordable and accessible to all

Opportunities and Benefits

- Increased energy security through local low carbon generation
- Creating a global reputation as a leader in low carbon energy research and development
- Attracting investment into the City's sustainable infrastructure
- Reducing the cost of energy to local businesses and communities.



Case Study: Harvey Hadden Solar

Harvey Hadden leisure centre is a large site with available rooftop space and car parks making it an ideal site for solar energy generation. Energy Services have delivered two solar projects for the centre. A 200 kWp roof solar panel system and the UK's first publicly-owned solar car park a 67 kWp system. These PV systems were installed without any disruption to the day-to-day running of the popular leisure centre. Since generation started, Harvey Hadden has regularly benefited from 100% off-grid energy through the summer.

Actions

Objective	Action	Timescale
3.1 Have a vision of how the energy system would ideally look to align energy development and secure funding	<p>Actions Nottingham City Council can take</p> <p>3.1.1 Align to smart city strategy and maximise the use of local generation through technology</p> <p>3.1.2 Embed decentralising energy generation and reducing carbon dioxide emissions from energy in existing core areas of compliance within planning policy</p> <p>3.1.3 Align Future Parks Accelerator (FPA) Parks and Heritage Strategy to 2050 to deliver aspects of the vision and attract funding as part of service redesign through the exploration of national and local policy and specialist consultant advice</p> <p>3.1.4 Align to national objectives on clean growth and decarbonisation</p> <p>Actions we can take in partnership</p> <p>3.1.5 Develop energy strategy and new citywide energy steering group</p> <p>3.1.6 Create common and/or aligned energy plans with neighbouring local authorities and partners to create a joined up and consistent approach under the D2N2 Energy Strategy</p> <p>3.1.7 Support an active and visible community of energy discussion and working groups to tackle energy challenges collectively</p> <p>3.1.8 Work with partners to understand the potential for low-carbon hydrogen gas in the distribution network for heating and hot water provision</p> <p>How Central Government can help</p> <p>3.1.9 Continue the devolve funding into local energy infrastructure and capacity building</p>	<p>Short Term</p> <p>Ongoing</p> <p>Short Term</p> <p>Medium Term</p> <p>Medium Term</p> <p>Short Term</p> <p>Ongoing</p> <p>Medium Term</p>
3.2 Expand local low carbon sources of energy within the city	<p>Actions Nottingham City Council can take</p> <p>3.2.1 Installation of solar PV on all viable NCC properties and encourage uptake across the city</p> <p>3.2.2 Perform a viability survey at all existing sites (structures under parks remit) to potentially accommodate further solar PV wherever possible with shared surplus income towards sustaining parks and open spaces.</p> <p>3.2.3 Investigate the potential for expanding the District Heat Network and smaller neighbourhood district heating schemes</p> <p>3.2.4 Investigate mine water as a heat source</p> <p>Actions we can take in partnership</p> <p>3.2.5 Increase local renewable electricity generation and map out the potential across buildings and sites, particularly in conjunction with research and other public sector partners</p> <p>3.2.6 Identify areas of the city that would not practically go onto the heat network and model potential technologies for example heat pumps</p> <p>3.2.7 Invest in low carbon generation assets within the D2N2 region to increase regional manufacturing supply for local consumption</p> <p>3.2.8 Explore the opportunities for Anaerobic Digestion to produce clean energy (e.g. electricity and biogas), deal with waste, and produce resources</p> <p>3.2.9 Explore the potential for local water source heat pumps</p> <p>3.2.10 Through engagement with citizens and partners, develop information and guidance materials through different media to facilitate greater uptake of renewable energy generation</p> <p>How Central Government can help</p>	<p>Medium Term</p> <p>Medium Term</p> <p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p> <p>Short Term</p> <p>Medium Term</p> <p>Medium Term</p> <p>Medium Term</p> <p>Short Term</p>

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Objective	Action	Timescale
	<p>3.2.11 Remove/refine current regulation which causes significant barriers in re-enforcing the network ahead of need and that current pricing rules (a ceiling on the amount companies can earn from charges to use the networks) set by Ofgem mean the end user has to meet the majority of these costs once a connection request comes in that tips the balance</p> <p>3.2.12 Strategic investment by Government, and close working with the Distribution Network Operator (DNO), is required in order to meet growing demands as new technology and green priorities mean more of a move to electricity for transport and heating</p>	<p>Short Term</p> <p>Medium Term</p>
<p>3.3 Improve the capacity to store local low carbon energy</p>	<p>Actions Nottingham City Council can take</p> <p>3.3.1 Increase electricity storage on council properties to allow maximum use of locally generated energy</p> <p>3.3.2 Investigate the potential of Parks and Open Spaces sites for local storage</p> <p>Actions we can take in partnership</p> <p>3.3.3 Increase electricity storage locally, through communicating benefits, understanding financial and business cases</p> <p>3.3.4 Increase thermal storage (e.g. hot water and ground inter-seasonal storage) for greater maximisation of local energy generation</p> <p>3.3.5 Investigate the potential of caves for energy storage</p>	<p>Ongoing</p> <p>Medium Term</p> <p>Medium Term</p> <p>Medium Term</p> <p>Long Term</p>
<p>3.4 Have a stable and secure energy system that maximises energy from local diverse mix of low carbon sources</p>	<p>Actions Nottingham City Council can take</p> <p>3.4.1 Improve the resilience and coordination of the Council's energy systems to manage demand response which is sensitive to weather conditions and local energy needs</p> <p>Actions we can take in partnership</p> <p>3.4.2 Create a roadmap and platform for private, municipal, co-operative and community developments to align in one energy system</p> <p>How Central Government can help</p> <p>3.4.3 Have a nationally smarter grid to make energy assets work together, with timely rollout and engagement for smart meters</p>	<p>Long Term</p> <p>Medium Term</p> <p>Medium Term</p>
<p>3.5 Enable the city to be a test bed for new energy generating technologies</p>	<p>Actions Nottingham City Council can take</p> <p>3.5.1 Frame challenges in Innovation Gateway to ensure difficult problems can be met with new solutions</p> <p>3.5.2 Participate in Domestic Mission UKRI trial with carbon neutral challenges to SME market</p> <p>3.5.3 Living Lab development - New sustainability and energy impact research initiatives co-designed with citizens and organisations in 2020</p> <p>Actions we can take in partnership</p> <p>3.5.4 Innovative testbed city for new technologies e.g. micro-wind, fuel cell, pumped storage</p> <p>How Central Government can help:</p> <p>3.5.5 Provide nationally available funding to drive the national low carbon agenda at a city level which the City Council can access</p>	<p>Short Term</p> <p>Medium Term</p> <p>Medium Term</p> <p>Ongoing</p> <p>Ongoing</p>
<p>3.6 Ensure low carbon energy is affordable and accessible to all</p>	<p>Actions Nottingham City Council can take:</p> <p>3.6.1 Reduce energy poverty with support from sister organisation Robin Hood Energy, Enviroenergy, Nottingham City Homes and Nottingham Energy Partnership</p> <p>Actions we can take in partnership</p> <p>3.6.2 Increase in community and cooperative energy projects in partnership with NCH</p> <p>3.6.3 Explore the potential for time of use tariffs and energy as a service model</p> <p>How Central Government can help:</p> <p>3.6.4 Enable access to appropriate nationally available funding, incentives and access to finance, to support affordable energy generation for all</p>	<p>Ongoing</p> <p>Medium Term</p> <p>Medium Term</p> <p>Short Term</p>



Waste & Water

Chapter Four: Waste and Water

In 2018/19, 113,000 tonnes of household waste was produced by Nottingham, of which 26.5% was reused, recycled or composted, 64.5% was sent for energy recovery, and 7.0% was sent to landfill. Since 2016-17, the mass of household waste re-used, recycled or composted has decreased by 10.6%, waste sent to landfill over the same time period has decreased by 19%, whilst waste sent for energy recovery has increased by 9%. Meanwhile, the overall total amount of household waste collected between 2016/17 and 2018/19 has remained broadly consistent.

As Nottingham transitions to a more sustainable society, the recycling rate will have to increase and landfill decrease even further, alongside a reduction in the total amount of household waste. This will require changes to processes and physical infrastructure, as well as city wide behavioural changes to disposal, sharing, shopping and dietary habits.

Current activities, actions and programmes

- Work in partnership with FCC Environment to manage the city's Energy-from-Waste (EFW) facility at Eastcroft, which provides steam for the district heating network run by Enviroenergy, a company wholly owned by the City Council.
- City Council are now self-billing for its own water supply

Objectives

Reducing the harmful impacts of waste and water consumption can be achieved by:

- Reducing the total volume of waste and eliminating it from landfill
- Reuse, reduce and recycle waste, use it for energy and eliminate it from landfill
- Have better waste management and ownership through effective regulations and policy
- Improve the efficiency of the water supply and water treatment to reduce water demand
- Improve behaviours to reduce water demand

Opportunities and Benefits

- Keeping the City clean and free from waste
- Creating new business opportunities and sustainable employment in the circular economy
- Reducing the cost of more sustainable waste disposal options to businesses and tax payers
- Make household savings, especially on food bills
- Maintaining stability and security of water supply to the City.

Case Study: Low Temperature District Heating

Nottingham City Homes (NCH) has invested in an innovative approach for social housing to supply heat and electricity generated from residual waste collected in Nottingham. Its primary motivation in this has been improvement of tenant comfort and reduction of bills, while supporting the 2028 city ambition.

Low temperature district heating (LTDH) allows heat generated from a wide range of renewable sources to be efficiently transmitted across the City. It can also link to new energy storage technologies to provide stable supply of energy.

Actions

Objective	Action	Timescale
Actions Nottingham City Council can take		
4.1 Reduce the total volume of waste generated through the use of technological and behavioural changes	4.1.1 Engage the public, communities, schools and businesses through citywide behavioural change initiatives and information campaigns to provide a greater understanding of waste issues, where local waste goes and best practices to reduce the volume of waste and recycle correctly	Short Term
	4.1.2 Continue to promote initiatives to reduce waste across the city, such as Love Food, Hate Waste, #Refill and #Longlivethelunchbox campaigns, alongside increasing water fountains across the city to reduce single use plastic waste	Ongoing
	4.1.3 Explore developing repair and reuse facilities, workshops and skill sharing across the city – including Nottingham City Homes project to explore viability of reuse of unwanted but serviceable items	Short Term
	4.1.4 Continue to work towards the Council's commitment to become single use plastic free by 2023	Medium Term
	4.1.5 Explore the opportunities of an initiative with social enterprises to tap into the funding to help change behaviours and/or delivering fuel from waste	Medium Term
Actions we can take in partnership		
	4.1.6 Work with research and industry partners to create innovative solutions for separating and using waste materials in construction and infrastructure	Ongoing
	4.1.7 Develop citywide information and engagement to support citizens and businesses with a transition to zero-waste approaches	Medium

Objective	Action	Timescale
4.2 Reuse, reduce and recycle waste, use it for energy and eliminate it from landfill	<p>Actions Nottingham City Council can take</p> <p>4.2.1 Investigate using food waste for anaerobic digestion to provide energy as an alternative to Eastcroft Energy from Waste and developing a plan for kerbside food collection in line with national strategy for 2023</p> <p>4.2.2 Explore the potential to expand the District Heating network to more properties across Nottingham, using more energy from energy-from-waste plants</p> <p>4.2.3 Investigate ways to eliminate the remaining 7% of waste going to landfill and implement into council policy</p> <p>4.2.4 Conclude an investigation in to alternative ways of collecting and disposing recyclable materials from homes and businesses, in order to maximise the quality and quantity of recyclable materials collected, in particular understanding the cost and benefits of different options.</p> <p>Actions we can take in partnership</p> <p>4.2.5 Encourage organisations and businesses across the city to use re-usable cups for staff, retail and events</p> <p>4.2.6 With partners, support and promote the development of repair cafes, centres and groups, including skills-share and swap shops</p>	Short Term Medium Term Long Term Short Term
4.3 Have better waste management and ownership through effective regulations and policy	<p>Actions Nottingham City Council can take</p> <p>4.3.1 Keep up to date with national policies on waste and seek to contribute and influence new waste regulations</p> <p>Actions we can take in partnership</p> <p>4.3.2 Investigate expanding waste collection services e.g. food collections</p> <p>4.3.3 Progress the Joint Waste Local Plan with Nottinghamshire County Council</p> <p>4.3.4 Keep up to date with national policies on waste and seek to contribute and influence new waste regulations</p> <p>4.3.5 Explore with partners the development of innovative evidence-based approaches to target and tailor recycling / waste management campaigns</p> <p>How Central Government can help</p> <p>4.3.6 Provide financial support to establishment of new waste system infrastructure and initiatives and provide clarity on future upstream and downstream waste arrangements to tackle waste issues systemically, as outlined in the Resources and Waste Strategy for England 2018</p>	Ongoing Short Term Short Term Ongoing Medium
4.4 Improve the efficiency of the water supply and water treatment to reduce water demand	<p>Actions Nottingham City Council can take</p> <p>4.4.1 Investigate the potential to include technologies to improve water efficiency within buildings, such as rainwater harvesting, grey water systems, flow regulators, water efficient toilets and showerheads.</p> <p>4.4.2 Carry out baselining exercise of potential sites with water leaks, and seek to undertake in-depth assessment of water leaks at those sites</p> <p>4.4.3 Continue to provide water to the Council's estate through water self-supply, helping the council work towards more accurate billing and monitoring, helping to reduce water usage</p> <p>Actions we can take in partnership:</p> <p>4.4.4 Work with water supply companies to help identify water leaks across the city</p> <p>4.4.5 Work with Nottingham partners to understand how Green and Blue infrastructure can be better used to manage water</p>	Short Term Short Term Ongoing Ongoing Short-term
4.5 Improve behaviours to reduce water demand	<p>Actions Nottingham City Council can take:</p> <p>4.5.1 Provide information to citizens and businesses on the best practices to reduce water consumption, helping to improve understanding of the issues and solutions to better water management, reducing bills and carbon emissions</p>	Short Term



Consumption

Chapter Five: Consumption

Our consumption of the planet's resources is threatening the wellbeing of future generations and limited natural resources we depend upon. Our material footprint is rapidly outpacing population and economic growth. Evidence shows that our total environmental footprint is greater than what the planet can sustain, something known as 'overshoot'. When you consider the non-local greenhouse gas emissions, around half of our footprint comes from what are called imported emissions – emissions in the things we buy and consume.

This includes everything from appliances, lightbulbs, phones and computers, to tyres, clothing, food and other household essentials. It is often hard to know the environmental, and indeed social, impact of these products due to the complex and global, means of manufacturing and transporting them. As with reducing waste, there are a number of ways to address this: reducing non-essential consumption; reusing, repairing and sharing existing goods; finding local producers, and; using more ethical or sustainable options.

Increased transparency and better data in supply chains and production will empower individuals and businesses to make informed decisions with the knowledge of the impact of their purchases. This in turn can alter markets by changing demand and preferences, with the potential to increase local and/or sustainable production, providing additional social and economic benefits. Innovation can be utilised to help produce high-value, quality products that don't cost the earth.

Food and drink in particular has a large and visible impact on the environment, and our greenhouse gas emissions – whether in production, consumption or disposal. This Plan addresses a range of key issues, including local food production, reducing food miles and air pollution. It also considers tackling food poverty, diet related ill health and access to affordable and sustainable healthy food. It is recognised that we have a role to play in a globalised world and to support the most sustainable approaches whether they are local, national or international.

This is not just about changing our diets and our behaviours towards consumption. It is about creating a vibrant and diverse sustainable local and circular economy; building community knowledge, skills, resilience and resources. It is vital that citizens and organisations are enabled and empowered to affect positive change and improve quality of life through their buying power.

Current activities, actions and programmes

- Development of a sustainable food strategy for Nottingham
- Use of local suppliers by Catering Services to reduce food miles and reducing food waste in school kitchens
- Reducing single-use consumption products, particularly plastics

Objectives

- Increase local and low-carbon production
- Reduce the consumption of high carbon products
- Reduce local waste and link all remaining waste to energy, composting and a circular economy
- Encourage more low carbon cooking and meals
- Reduce the carbon emissions of city events and improve their sustainability
- Develop sustainable tourism
- Buy and procure sustainably, and maximise existing resources



Opportunities and Benefits

- Developing a vibrant and diverse sustainable food economy
- Build community knowledge, sharing, skills and resources
- Tackling food poverty and improve access to healthy affordable food
- Improving diet-related ill-health.
- Reduce the financial strain of consumption

Case Study: Nottingham Good Food Partnership

In 2016, Nottingham Green Partnership supported a call from its food sub group members for The City of Nottingham to join the Sustainable Food Cities Network. Sustainable Food Cities Network, helps people and places to share challenges, explore practical solutions and develop best practice in all aspects of sustainable food.

The key themes of SFC were seen as the best route forward to join together and strengthen, the wealth of local food based activity taking place across the city and importantly, to learn from the success and experience of the SFC membership. SFC has over 50 members, including Good Food East Midlands, the first region to achieve network membership.

SFC has now extended its work beyond the UK: Nottingham's membership will provide the city with the opportunity to share its wealth of knowledge and food history with an international audience.

Chapter Five: Consumption

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Actions

Objective	Action	Timescale
	<p>Actions Nottingham City Council can take</p> <p>5.1.1 Development of urban food strategy with Nottingham Good Food Partnership and other partners</p> <p>5.1.2 Increase range of edible fruits, flowers and vegetables in Council owned parks, rooftops, and open spaces</p> <p>5.1.3 Reduce use of fertilizers by increased use of locally produced compost and local allotment growing</p> <p>5.1.4 Develop Nottingham's Clean Growth economy through joined-up plans, strategies and programmes, aligned with regional and national strategies</p> <p>5.1.5 Work with schools, universities, colleges and other institutions to encourage and support sustainable entrepreneurs</p>	<p>Short Term</p> <p>Medium Term</p> <p>Medium Term</p> <p>Short Term</p> <p>Short Term</p>
5.1 Increase local and low-carbon production	<p>Actions we can take in partnership</p> <p>5.1.6 Increase local growing and food sharing through community gardens/hubs and explore the use of technology e.g. an app</p> <p>5.1.7 Develop a package (e.g. Salix) to improve the efficiency of schools' catering equipment, and switch to electric sources to allow for carbon neutral catering</p> <p>5.1.8 Investigate developing a city-wide carbon neutral catering service that combines above elements with broader low-carbon and energy offers for a whole systems approach</p> <p>5.1.9 Explore community-led local composting and vermiculture schemes for citizens and businesses</p> <p>5.1.10 Support the development of cooperative, community owned and other collaborative ventures to foster more effective use and sharing of resources</p> <p>5.1.11 Develop proposals for encouraging and incubating businesses that can deliver low-carbon goods and services to develop in or relocate to Nottingham, and wider region - with the aim of growing the number of jobs and increasing local capacity to deliver carbon neutral programmes in the city, for example building retrofit</p>	<p>Short Term</p> <p>Medium Term</p> <p>Medium Term</p> <p>Medium Term</p> <p>Medium Term</p> <p>Medium Term</p>
5.2 Reduce consumption of high carbon products	<p>Actions Nottingham City Council can take</p> <p>5.2.1 Develop education and outreach programmes to reduce meat consumption/increase plant based diets within Catering Services</p> <p>5.2.2 Create full greenhouse gas footprint for catering functions to identify biggest emissions areas</p>	<p>Short Term</p> <p>Short Term</p>
	<p>Actions we can take in partnership</p> <p>5.2.3 Work with partners to reduce the carbon impact and overall sustainability of food choices, for example meat and dairy</p> <p>5.2.4 Explore carbon reduction opportunities in procurement, by getting suppliers to present lifecycle/carbon assessments and look to adopt appropriate standards</p> <p>5.2.5 Ensure sustainable consumption campaigns and interventions are more effective through recognising and addressing existing inequalities</p>	<p>Medium Term</p> <p>Short Term</p> <p>Ongoing</p>
5.3 Reduce local waste and link all remaining waste to energy, composting and a circular economy	<p>Actions Nottingham City Council can take</p> <p>5.3.1 Reduce food waste at source and increase food waste recycling rate</p> <p>5.3.2 Investigate options for additional food waste collections in alignment with the national waste strategy</p>	<p>Medium Term</p> <p>Short Term</p>
	<p>Actions we can take in partnership</p> <p>5.3.3 Explore the opportunity for commercial food waste collection and potential for Anaerobic Digestion</p> <p>5.3.4 Research a business plan to move towards a near-to closed-loop school catering service in which food waste can create compost (maybe power through AD eventually) to grow veg locally to put back into school meals</p>	<p>Medium Term</p> <p>Short Term</p>

Chapter Five: Consumption

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Objective	Action	Timescale
	5.3.5 Enable more citizens and businesses to understand how to reduce their food waste through buying, storing, preparation and cooking 5.3.6 Work with local partners to support the reduction of waste and to turn waste into a resource in a circular economy	Short Term Medium Term
5.4 Encourage more low carbon cooking and meals	Actions Nottingham City Council can take 5.4.1 Explore adoption of Green Kitchen Standard/ Food for Life 5.4.2 Introduce low carbon menus in City Council and partner catering facilities Actions we can take in partnership 5.4.3 Expand carbon neutral kitchen and refill campaign 5.4.4 Explore the adoption of tools (e.g. EATS - Environmental Assessment Tool for School meals) to help engage school staff (and potentially students) with creating low-carbon meals through consideration of ingredients, food miles and cooking methods	Short Term Medium Term Ongoing Short Term
5.5 Reduce the carbon emissions of city events and improve their sustainability	Actions Nottingham City Council can take 5.5.1 Introduce a deposit scheme at all Nottingham City Council events to reduce single use plastic Actions we can take in partnership 5.5.2 Work with local partners and core cities to explore creating local standards, compliance and incentives How Central Government can help 5.5.3 Align to national days of action to reinforce the message of collective action 5.5.4 Identify options for improving the sustainability of city events	Short Term Medium Term Ongoing Short Term
5.6 Develop sustainable tourism	Actions we can take in partnership 5.6.1 Develop clear standards for leisure, tourism and accommodation venues	Medium Term
5.7 Buy and procure sustainably, and maximise existing resources	Actions Nottingham City Council can take 5.7.1 Investigate available tools to incorporate whole-life costing into procurement process with support from finance 5.7.2 Reuse internal resources and goods wherever possible 5.7.3 Review, update and launch a new Business Charter with a strong environmental focus Actions we can take in partnership 5.7.4 Work with city partners, including Nottingham City Homes, to develop and support sharing platforms and libraries to reduce the need for individual ownership of goods that have occasional usage 5.7.5 Promote ethical sustainable purchasing and swapping of goods through re-use schemes, shops and initiatives 5.7.6 Work with partners and networks in the city to develop supplier engagement days through procurement activities to support SMEs across all sectors to become more sustainable and low carbon in their operations How Central Government can help 5.7.7 Support or regulate greater levels of reusable and recyclable packaging, in line with national Waste Strategy principles	Short Term Short Term Short Term Short Term Medium Term Medium Term Medium Term



Carbon Removal

Section Two – Carbon Removal

Nottingham is considering practices to remove carbon, primarily within the boundaries of the local authority. This includes tree planting, woodland and parks management amongst other means. This increases the capture of CO₂, in a process called sequestration and would allow Nottingham to offset emissions elsewhere in the city, helping to achieve our carbon neutral commitment.

Whilst offsetting practices, which can be undertaken to help Nottingham's carbon neutral ambition, will begin to be identified, offsetting will not be actively promoted above actions to reduce carbon emissions directly.

Nottingham's carbon budget currently assumes that we will not be using technologies to remove CO₂ from the atmosphere. These technologies are currently unproven at scale and relying on them would create uncertainties in Nottingham's contribution to future climate change action. Theoretically, if these technologies were to become widely available and used, Nottingham's carbon budget would become bigger. However, it is important that Nottingham does not assume this before these technologies become well proven, otherwise we risk contributing to a warmer world.

Current Activities, Actions and Programmes

- Planting up to 50,000 trees
- Diversifying amenity grass areas to create wildflower meadows, creating Bee Friendly Habitats in every Ward

- Introducing an integrated weed management and planting plan to reduce pesticide use

Objectives

- Offset residual citywide emissions from hard to reduce sources
- Participate and actively encourage national research/investment into negative emission technologies
- Improve land and building management practices to better retain carbon

Case Study: Trees for Cities

The City Council is committed to planting 50,000 new trees by the end of 2023. This started in winter 2019 with 300 tree 'whips' (young trees) planted at Southglade Park, 1,650 at Clifton Playing Fields and 1,200 planted at Colwick Park.

So far in 2020, a further 2,800 whips have been planted at Southglade Park, and later in the year, 3,200 will be settled at Hadden Wood, Bilborough. Funding for this first stage of planting has come from the Trees for Cities charity and Nottingham City Council.

Section Two – Carbon Removal

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Actions

Objective	Action	Timescale
6.1 Offset residual citywide emissions from hard to reduce sources	<p>Actions Nottingham City Council can take:</p> <p>6.1.1 Explore placing a value on internal unavoidable carbon emissions to seed fund staff-led projects and other invest-save carbon projects</p> <p>6.1.2 Investigate the use of parks and open spaces to offset carbon for individuals and local businesses emissions</p> <p>6.1.3 Ensure Open and Green Spaces are sustainable through the new 25 year strategy and offer diverse, bee friendly habitats, including offering training for bee friendly gardens and establishing 'bee hotels' through Nottingham City Homes</p> <p>6.1.4 Use offsetting practices (e.g. tree planting) as an educational opportunity for local residents and schools about the issues we face and the available solutions</p> <p>6.1.5 Explore creating a climate offset fund through implementing an internal offset charge for council run events from the financial year 2021/22. This fund can be used for activities such as tree planting or installing energy efficient measures elsewhere for example</p> <p>Actions we can take in partnership:</p> <p>6.1.6 Promote schemes to allow homeowners and organisations to access trees and seeds for gardens and premises</p>	Short Term
6.2 Participate and actively encourage national research/investment into negative emission technologies	<p>Actions we can take in partnership:</p> <p>6.2.1 Investigate possible partnerships with academic institutions and local business to generate funding for the exploration of negative emission technologies</p>	Short Term
6.3 Improve land and building management practices to better retain carbon e.g. within soil and reduce particle air pollution	<p>Actions Nottingham City Council can take:</p> <p>6.3.1 Explore the opportunities and feasibility for urban greening (e.g. street trees), tree planting and green roofs/walls and promote them through the new Biodiversity Supplementary Planning Documents</p> <p>6.3.2 Promote local scale offsetting as a normal function of future planning processes</p> <p>6.3.3 Future Parks Accelerator Parks and Heritage Strategy to 2050 to include maximum carbon sequestration through detailed tree/meadow planting/growing, rewilding, soil management, waterways and wetland planning, informed by Phase 1 habitat mapping, opportunity mapping and tree canopy surveys</p> <p>6.3.4 Seek to adopt the biodiversity, green and open spaces supplementary planning document to ensure a consistent approach for developers to take up protection and enhancement measures of key biodiverse areas</p> <p>6.3.5 Investigate the potential for using Supplementary Planning Documents to maximise carbon sink potentials</p> <p>Actions we can take in partnership:</p> <p>6.3.6 Research the carbon released during developments on green spaces and how to mitigate the impacts through on site and off site interventions, whilst understanding the green benefits</p>	Short Term Ongoing Short Term Short Term Long Term

A scenic view of a riverbank. In the foreground, a paved path runs along the right side of a river, bordered by a yellow double line. To the left of the path is a concrete embankment. In the background, there's a suspension bridge crossing the river, some green trees, and a row of buildings on the far bank under a blue sky with white clouds.

Resilience & Adaptation

Section Three – Resilience & Adaptation

Nottingham is already experiencing a range of climate impacts, including heat waves and flooding, but in the future these are expected to become more frequent and severe, alongside a likely increase in water shortages, food shortages and decreased urban biodiversity.

Adaptation refers to actions that reduce vulnerability to climate change impacts, reducing its effect on social, economic and natural systems, whilst, resilience refers to the ability of a system and its components to anticipate, absorb and recover from effects of an event in an efficient and timely manner. Both adaptation and resilience are especially important when taking action against future climate change and must be considered alongside actions to reduce carbon emissions across the city. Interventions must find the right balance of blue, green and grey infrastructure in the city.

Current Activities, Actions and Programmes

- Creating new green and blue infrastructure projects to help defend properties from local flood events.
- Work to protect 1,000 more properties from the risk of flooding

Key Objectives

- Ensure adaptation to climate change has a strong foundation in future policies
- Reduce risk of flooding to properties and infrastructure

- Ensure all core City Council services are adaptable to a changing climate
- Understand the current and future impacts of extreme weather events and climate change.
- Create resilience in communities and business

Case Study: Blue-Green City

The University of Nottingham's Water Works Interdisciplinary Research Cluster is a collection of more than 140 engineers, scientists, geographers, historians, health experts and many more, working in collaboration to pioneer new ways to address global water challenges. Water Works also supports local research, such as transforming Nottingham into a Blue-Green city, and is therefore, assisting in the development of the Blue-Green Cities project between Nottingham City Council and the University of Nottingham.

The future vision of how Nottingham may adapt to become more resilient to the impacts of climate change through the prioritisation of Blue-Green infrastructure to manage water challenges and deliver multiple co-benefits to the environment and society is a key collaboration between the University and City Council. The details of these water challenges, and other environmental and social challenges linked to climate change, are being developed in order to enhance and link blue green infrastructure priorities.

Section Three – Resilience and Adaptation

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Actions

Objective	Action	Timescale
7.1 Ensure adaptation to climate change has a strong foundation in future policies	<p>Actions Nottingham City Council can take:</p> <p>7.1.1 Land and Planning polices documents to include adaption for heatwaves and floods 7.1.2 Integrate adaptation thoroughly into the new citywide Resilience and Climate Change Strategy</p>	Short Term Short Term
	<p>Actions Nottingham City Council can take:</p> <p>7.2.1 Reduce the number of homes and businesses across Nottingham that are exposed to flood risk 7.2.2 Acknowledge flood risk and flood management in all new developments in high flood risk areas 7.2.3 Through development opportunities, seek to open up main rivers and create wetlands, natural flood defences and urban drainage, as supported by the Local Plan and Biodiversity Supplementary Planning Document</p>	Medium Term Ongoing Long Term
7.2 Reduce risk of flooding to properties and infrastructure	<p>Actions we can take in partnership:</p> <p>7.2.4 Work with partners and organisations to conduct in depth flood risk mapping across Nottingham e.g. Nottingham Trent University and Environment Agency. 7.2.5 Ensure Emergency Plans are adapted to reflect the changing risk through the Local Resilience Forum 7.2.6 Explore and encourage innovative technologies and natural interventions (Blue and Green infrastructure) to reduce flood and heat risk within urbanised areas 7.2.7 Maintain highways and other assets, removing blockages, to reduce the risk of surface water floods</p> <p>How Central Government can help:</p> <p>7.2.8 Increase the available funding for flood risk management to meet the growing need for action, particularly related to surface water flooding</p>	Short Term Short Term Medium Term Ongoing
7.3 Ensure all core City Council services are adaptable to a changing climate	<p>Actions Nottingham City Council can take:</p> <p>7.3.1 Improve knowledge and understanding of how the Council is affected by extreme weather events in terms of providing its services and its financial impact 7.3.2 Investigate historic claims information and damages that arise from the impacts of severe weather events, mapping any trends to help inform future actions and understanding 7.3.3 Develop Council and service level plans for adapting to climate change</p> <p>Actions we can take in partnership:</p> <p>7.3.4 Work with partners and other local authorities to help evaluate and develop suitable tools to help understand impacts to council service areas</p>	Ongoing Short Term Medium Term Short Term
7.4 Understand the current and future impacts of extreme weather events and climate change, with an in-depth knowledge of the most vulnerable citizens	<p>Actions Nottingham City Council can take:</p> <p>7.4.1 Establish a methodology with partners to undertake a full citywide vulnerability assessment for extreme weather events and future climate change scenarios. 7.4.2 Identify those most at risk from extreme weather events, such as heat waves and develop mitigating actions 7.4.3 Assist marginalised and vulnerable groups to become more resilient. Deliver educational engagement programme with target communities (Pilot project with Nottingham Trent University in 2020)</p>	Short Term Short Term Short Term

Section Three – Resilience and Adaptation

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Objective	Action	Timescale
	7.4.4 Conduct a Local Climate Impact Profile (LCLIP) for Nottingham, to help understand the impacts on citizens and businesses, building a citywide picture of current impacts.	Short Term
	Actions Nottingham City Council can take: 7.5.1 Work with citizen across Nottingham to ensure those most vulnerable and at high risk to severe weather events are on the priority service register and have signed up to alerts (e.g. flood risk alerts).	Ongoing
7.5 Create resilience to climate change in communities and business	Actions we can take in partnership: 7.5.2 Work with businesses across the city to help them develop business continuity plans in response to climate change and extreme weather events 7.5.3 Work with residents and communities to empower them to become more resilient to current and future climate change impacts, including the use of simple interventions	Ongoing
		Ongoing



Ecology & Biodiversity

Section Four – Ecology & Biodiversity

Biodiversity and climate change are closely related to both seasonality and the distribution of wildlife being impacted by changes in temperatures and rainfall. The loss of habitats can also increase the amount of carbon in the environment. Therefore having robust, well-functioning ecosystems will protect against the negative impacts of climate change and contribute to helping us adapt to further changes in climate. Measures to reduce our carbon footprint help towards safeguarding the biodiversity around us, and this is why the Council recognises the importance of declaring a climate and ecological emergency. The Council recognises this additional challenge to already damaged ecosystems making the United Kingdom “one of the most nature-depleted countries in the world” according to the 2016 State of Nature Report.

Approximately 25% of Nottingham is classed as Green & Open Space Network, with different types of land use ranging from ‘natural’ to ‘institutional’, incorporating protected sites and green corridors. Natural sites provide habitats that store carbon in soils and vegetation; absorb carbon from the atmosphere; provide food and water supplies and provide natural drainage solutions to reduce flooding and the impacts of climate change. Well-functioning rivers and natural wetland systems can slow down water flows and reduce flooding. Trees also provide a range of benefits to us including shade to keep us cool in extreme temperatures, intercepting rainfall, reducing flash flooding and the reduction of soil erosion all adding to the our resilience against impacts of climate change. It should

also be noted that the benefits of contact with nature for human health are now widely recognised, which can also foster greater appreciation and support for protecting and enhancing our natural environment.

It is vital to recognise and understand the importance of the City’s greenspaces as carbon sinks and target management practices to avoid releasing stored carbon. This should be considered too, in the planning and development process and when assessing land use changes.

Current Activities, Actions and Programmes

- Implementation of the Biodiversity Supplementary Planning Document (SPD) and protection in the Local Plan (LAPP) – including the establishment of green roofs and Sustainable Urban Drainage Systems (SUDS)
- Open space network (OSN) – protected in the Land and Planning Policies Document
- Protected sites network including Local Nature Reserves (LNRs), Sites of Special Scientific Interest (SSSIs) and Local Wildlife Sites (LWS)
- Tree Planting and the Bee Friendly Council commitments including rewilding schemes
- Natural flood mitigation along Day Brook and Totte Brook

Key Objectives

- Identify 'more, better, bigger, joined' habitat networks
- Increase woodland cover in appropriate places and manage sustainable woodlands
- Install innovative natural features to developments, as per the Biodiversity SPD
- Contribute towards improved crop production and plant propagation through having a Bee friendly city

In addition to Nottingham's key objectives, there are a range of national objectives within the government's 25 Year Environment Plan that we will support, including:

1. Using and managing land sustainably
2. Recovering nature and enhancing the beauty of landscapes
3. Connecting people with the environment to improve health and wellbeing

Opportunities and Benefits

- Enhance biodiversity
- Increase trees for shade and lower the heat of urban areas
- Increase carbon storage by providing habitats
- Sustain, increase and enhance a network to build resilience of species and habitats
- Reduce flooding

- Build on research and knowledge of how Nottingham's open space network can contribute towards the City being carbon neutral



Case Study: Bee Friendly Nottingham

As part of the Council's commitment to biodiversity, we have set the following corporate target to 'Ensure Nottingham is a "bee-friendly" city with suitable habitats in every neighbourhood'.

A programme of relaxed mowing throughout the city has been introduced to improve feeding and nesting habitats for bees and other pollinating insects. Reducing vehicle use will decrease carbon emissions, by mowing the vegetation once a year. Targeted along roadside verges, the rewilding of corridors for wildlife will help create 'corridors' of open space, building resilience to the changes in climate.

Visual displays of wildflowers help to improve both people's experience of the City and their connectedness to nature, as well as undoubtedly improving habitats for our pollinators and the benefits they bring us.

Other planting schemes, educational activities and increased community engagement are key to contributing towards a 'Bee Friendly Nottingham' and will be introduced as part of this scheme.

Section Four – Ecology & Biodiversity

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Actions

Objective	Action	Timescale
8.1 Identify more, better, bigger, joined habitat network	<p>Actions Nottingham City Council can take:</p> <p>8.1.1 Identify sites for additional tree planting, relaxed mowing, wildflower growth, hedge planting through opportunity mapping, helping to create diverse habitats in Council owned parks and open spaces</p> <p>8.1.2 Identify sites which meet the criteria for Local Nature Reserve designation to expand protected sites' network</p> <p>Actions we can take in partnership:</p> <p>8.1.3 Update Phase 1 habitat mapping and biodiversity opportunity mapping to understand development opportunities and future habitat options for the open space network outlined in open and green space plans</p> <p>8.1.4 Work in partnership with the Nottinghamshire Biodiversity Action Group and other stakeholders to build future resilience of habitats and species and identify habitats for carbon sequestration</p>	Short Term Long Term Medium Term Medium Term
8.2 Increase woodland cover in appropriate places and managing sustainable woodlands	<p>Actions Nottingham City Council can take:</p> <p>8.2.1 Update Nottingham's Urban Forestry Strategy including the assessment of existing woodlands, with understorey planting and expansion programmes introduced where necessary</p> <p>8.2.2 Continue to sustainably manage existing woodland and prevent its degradation</p> <p>Actions we can take in partnership:</p> <p>8.2.3 Work with partners to identify sites for woodland creation and promote tree planting across privately owned land, schools and businesses</p>	Short Term Ongoing Short Term
8.3 Install innovative natural features to developments, as per the Biodiversity SPD	<p>Actions Nottingham City Council can take:</p> <p>8.3.1 Support the Biodiversity SPD by including biodiversity enhancements to all developments, ensuring net gain in biodiversity</p> <p>8.3.2 Consider green roofs, green walls, and sustainable urban drainage systems, in new developments</p> <p>Actions we can take in partnership:</p> <p>8.3.3 Identify aspirational projects for small scale wetland creation, biodiversity enhancement opportunities and natural flood defences</p> <p>8.3.4 Encourage sustainable and nature friendly development beyond the levels mandated by legislation</p>	Ongoing Medium Term Long Term Medium Term
8.4 Contribute towards improved crop production and plant propagation through having a Bee friendly city	<p>Actions Nottingham City Council can take:</p> <p>8.4.1 Introduce phased implementation of bee friendly projects that have been identified across Nottingham's parks and open spaces, this includes rewilding, shrub, tree and bulb planting and seeding.</p> <p>Actions we can take in partnership:</p> <p>8.4.2 Work with partner organisations to encourage developers, businesses, schools and private homeowners to become pollinator friendly</p>	Short Term Short Term

Glossary

1.5°C Temperature rise	This refers to the rise in the average global temperature above the pre-industrial period (pre-1750)	Carbon Offsetting	Practices and technologies to neutralise remaining emissions that cannot be removed entirely.
Adaptation	Actions to reduce vulnerability to climate change impacts, reducing its effects on social, economic and natural systems	CO₂e	Carbon dioxide equivalence; this includes all greenhouse gasses converted into the equivalent amount of carbon dioxide.
ALMO	Arms Lengths Management Organisation	D2N2	The Local Enterprise Partnership for Derby, Derbyshire, Nottingham and Nottinghamshire.
BEIS	UK government department of Business, Energy and Industrial Strategy	Ecosystem	Community of living organisms and the natural environment
Biodiversity	The variety of animal and plant life on Earth	Future Parks Accelerator	The FPA fund will support Nottingham to grow the contribution parks make to civic life whilst becoming financially sustainable. It will involve discovering how parks and green spaces could be better used, managed and funded to serve community needs and aspirations now and over the next generation.
Business as usual	Future emissions trend if the current state of affairs continue as they are today	Global warming	Increase in temperature of the Earth's atmosphere over long timescales, caused by increased levels of greenhouse gasses
Carbon budget	The maximum amount of carbon dioxide that can be emitted to be in line with keeping temperatures well below 2°C and pursue a 1.5°C limit to rising temperatures	Greenhouse gas (GHG)	The Earth can maintain a regular average temperature (about 15°C) despite heat leaving the planet's surface because a layer of gases in the atmosphere absorb and release heat – a process known as the greenhouse effect. Greenhouse gases are those that have this effect, each with differing lifetimes and abilities to capture heat (infrared radiation).
Carbon dioxide (CO₂)	A key greenhouse gas with a long-lifetime in the atmosphere and both natural and human sources.	kWp	The peak power of a PV system or panel.
Carbon neutral	Having no net release of carbon dioxide into the atmosphere		
Climate change	The long-term change of climate, typically measured over decades or longer. This is different to weather, which is now.		
Climate emergency	Climate change presents the greatest threat to life: on the economy, social well-being and the natural environment		

MtCO₂	Millions of tonnes of carbon dioxide	Scope 2 Emissions	Greenhouse gas emissions occurring as a consequence of the use of grid-supplied electricity, heat, steam and/or cooling
NOx	Term for the nitrogen oxides that are most relevant for air pollution, namely nitric oxide and nitrogen dioxide.	Scope 3 Emissions	All other greenhouse gas emissions that occur as a result of activities taking place within wider operations, supply chains, investments etc
Resilience	The ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions	Solar PV	Solar Photovoltaic
Scope 1 Emissions	Greenhouse gas emissions from using owned or controlled sources (mainly energy related)	Sustainability	Meeting the needs of current generations, without compromising future generations or the natural environment
		ULEV	Ultra-Low Emission Vehicle



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