

GREEN CITY Strategy

Our strategy for a low carbon,
resilient and sustainable Sheffield



Sheffield





Cllr. Jack Scott
Cabinet Member for Transport
and Sustainability



Cllr. Craig Gamble Pugh
Cabinet Advisor
'Green City'

Foreword

Objectives

We have great pleasure in introducing our Green City Strategy. This sets out Sheffield's approach to be a 'Green City', a city which is more resilient to climate change, is taking action to reduce its impact on the climate and helping the city to make the transition towards a clean, low carbon economy.

Climate and sustainability are amongst the biggest social justice issues of the 21st century. Our Green City strategy begins to forge an approach focussing on the twin priorities of green sustainability and social justice, in order that our city can grow and provide for all its citizens in a sustainable way.

The signing of the Paris Climate Agreement in 2015 marked a significant turning-point for the world, demonstrating universal consensus that climate change is taking place and that we have to take action now. The sheer scale of the challenge - a global one - can often make it feel like it's either someone else's problem or that the impact we can make as an individual, a community or city is minuscule compared to what governments or global institutions can do. The reality however is that the solutions, as well as the opportunities to tackling climate change lie in the hands of cities.

And whilst the Paris agreement was signed by national Governments, it is widely recognised cities are critical to delivering these objectives. Around the world, cities like Sheffield are delivering rapid, practical changes and getting things done. Cities now hold the key to solving

these challenges and to create resilient, low carbon places to live and work. Cities, and more importantly the people, communities, businesses and institutions that reside within them can make the difference, implementing solutions which work at the local level, improve local quality of life and also reduce greenhouse gas emissions.

That is not to say that cities do not require Government support. Clearly some of the challenges will require us to work closely with Government, and in some instances there is will be a need for investment or national policy to support our ambitions.

At a local level however the our Green City Strategy will help us to address some of the City's challenges and promote a city which grows and evolves in a 'clean and green' way - clean air for all our communities, opportunities for clean energy or jobs in a rapidly growing clean growth sector.

It is an ambitious strategy, and has implications for how we live and work in the Sheffield. It sets out the changes we need to make to be prepared for challenges like more extreme weather, as well as the investments and opportunities that will help to improve our health, clear our air, make our city easier to get around and make our energy more affordable and resilient for everyone.

The good news is that we already have assets that help us on this journey. Sheffield was one of the first cities in the UK to introduce district heating and implement clean air powers in the

1970s', private sector investment has created a further two biomass-powered decentralised energy plants in the city, and our educational establishments are world-leaders in research and development of low carbon and energy innovation and the city is home to companies who are already reaping the benefits of developing products and services that address these challenges.

We recognise that the transition to a low carbon economy will not always be easy, and will involve difficult choices at times. But this is about doing the right thing for people across our city, in order to create a fairer city, as the effects of climate change are not just environmental or economic ones. Climate change is also a social justice issue adversely affecting our less-well-off residents.

We want to enable all Sheffields, businesses, institutions and organisations to play a role developing and delivering the solutions that will take Sheffield towards a zero carbon future. Success will be determined by how well we can all work together, to develop and implement the actions which are proposed in this strategy.

We will build on the radicalism that the city has shown in the past to ensure that everyone in Sheffield breathes clean air, can access reliable, clean transport, can feel safe and secure from the threats posed by climate change and has access to affordable, sustainable energy to heat and power their homes and businesses.

1. REDUCING OUR IMPACT ON THE CLIMATE

PRIORITY 1

Leading by example, we will put in place a plan which enables the Council to reduce its carbon emissions

PRIORITY 2

Establishing a city-wide carbon reduction programme

2. A CLIMATE RESILIENT CITY

PRIORITY 3

Working together to help our communities, residents, public sector and businesses to become more resilient to climate change

PRIORITY 4

Designing, planning and developing our city in ways which enable it to adapt and provide greater resilience to climate change

3. SUSTAINABLE AND AFFORDABLE ENERGY, FOR HOMES AND BUSINESSES

PRIORITY 5

Ensuring that our city's homes are energy efficient and can access low cost, low carbon energy

PRIORITY 6

Collaborating to expand our city's energy networks and to increase the level of renewable and low-carbon energy generation

4. MODERN, RELIABLE AND CLEAN JOURNEYS FOR EVERYONE

PRIORITY 7

Ensuring that everyone can access opportunities without transport or movement constraints. Residents, businesses and visitors in our thriving city can safely move themselves and their goods or products with confidence and without delay. The negative impacts of transport including air quality and noise are minimised, and safety and quality of life is improved in the city as a result.

Reliable and clean journeys for everyone in a flourishing Sheffield.

5. CLEAN AIR FOR ALL

PRIORITY 8

Ensuring that the air in Sheffield to be safe to breathe, regardless of where people live, work or visit.

We will work together to tackle the sources of air pollution and we will create

a healthy, thriving city where many more journeys are made using active travel and low emission public transport.

6. A GREEN AND INNOVATIVE ECONOMY

PRIORITY 9

Working with local businesses to improve their environmental performance and ensure they are 'climate-resilient' and transitioning to a low carbon economy

PRIORITY 10

Supporting Sheffield's businesses to become more energy efficient, to harness low carbon, locally generated energy sources, potentially unlocking competitive advantage and reliable, sustainable energy to support their growth

PRIORITY 11

Supporting with the development and growth of our low carbon economy, enabling cleaner and sustainable growth. Developing and growing our 'low carbon and clean growth' sector

PRIORITY 12

Delivering new low carbon jobs with local people

Background

Page 45

Sheffield, like other large and diverse cities is a significant driver of regional economic growth. This growth can help bring major social, financial and cultural opportunities for our residents, communities and businesses. However, as we know from evidence discussed in the annual State of Sheffield Report¹ this growth has so far not resulted in a less polluted or more equal city. A move towards a lower carbon and cleaner economy would enable our city to grow and evolve whilst at the same time improving our environment and the quality of life of our citizens.

Across the world, cities from Curitiba² to Pittsburgh³ are recognising the benefits that such an approach can deliver. Understanding how such cities are embracing and leading the change towards lower carbon economies, greater social and environmental equity and climate resilience will allow Sheffield to fully develop such an approach.

The solutions these cities are adopting are helping to reduce pollution and ensure greater equality for their residents, communities and businesses through cleaner air, warmer and more energy efficient homes and buildings, lower cost low carbon energy and places which have greater resilience to climate change and the subsequent impact on their communities and businesses.



Sheffield is already on this path; it was one of the first cities in the UK to introduce district heating and develop a decentralised energy network in the 1970's that provides energy from waste. Recently the city won a number of environmental awards for its 'Grey to Green' scheme - the largest planned retrofit sustainable urban drainage scheme in the UK which converted former dual carriageway into greenspace and seating, a cycle route and generous foot ways whilst also improving the area's resilience to flooding.

As a city we are fortunate to have a significant number of organisations, institutions and private businesses that are also engaged in delivering services and products that embody sustainable thinking or are seeking solutions to the challenges we face. Many of our communities are already involved in delivering projects and the current and potential future action of the 570,000 residents in our city should not be underestimated.

Sustainability and climate change resilience is a priority for nations and global institutions

There is a clear consensus that we need to take action to reduce our impact on the climate. Climate change is already occurring, driven by the continued accumulation of greenhouse gases in the atmosphere. It is also widely recognised that if we take action now we can avoid the worse impacts of a changing climate. Predictions are for warmer and wetter winters, with increased flood risk, hotter and drier summers, with potential for increased heat stress and drought, combined with heavy downpours.

In December 2015, almost 200 countries including the UK signed-up to the Paris Climate Agreement. This agreement commits signatories to "holding the increase in the global average temperature to well below 2°C above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels."

Cities have a key role to play in ensuring this can be achieved, particularly as it is forecast that over 70% of the world population will be living in urban areas by 2050.

In the UK many cities have made a clear commitment to reduce their carbon emissions, divest from fossil fuels and establish and develop programmes to adapt and become more resilient to the anticipated effects of a changing climate.

In Sheffield, the Council has already made such commitments and to transition to 100% clean energy by 2050 as part of the UK100⁴.

UK commitments to tackling climate change

The UK has committed to reducing its greenhouse gas emissions to at least 80 % of 1990 levels by 2050, through a process of setting 'Carbon Budgets', which are five-yearly caps on greenhouse gas emissions.

The Climate Change Act 2008 sets up a framework for the UK to achieve its long-term goals of reducing greenhouse gas emissions and to ensure steps are taken towards adapting to the impact of climate change.

The 2008 Act requires central Government to prepare a policy that will enable these carbon budgets to be met;

¹ <http://www.welcometosheffield.co.uk/business/news/2017/feb/21/state-of-sheffield-2017-a-real-picture-of-life-in-the-city>

² <http://www.c40.org/cities/curitiba>

³ http://www.100resiliencities.org/wp-content/uploads/2017/07/Pittsburgh_-_Resilience_Strategy.pdf

⁴ UK100 is a network of local government leaders seeking to devise and implement plans for the transition to clean energy that are ambitious, cost effective and take the public and business with them www.uk100.org



to report on the impact of climate change every 5 years, publishing an adaptation programme to address those risks and deliver resilience to climate change on the ground.

Since 1990 the UK has cut emissions by 42 % while the economy has grown by two thirds. This reduction in carbon emissions has been largely been achieved through a range of activities including an increase in the level of national renewable energy generation and the decommissioning of coal-fired power stations, combined with a switching to natural gas-fired power stations.

The current national Carbon Budget, which runs from 2018 – 2022, requires a reduction of 35% by 2020, with the 4th (2023-2027) requiring a 50% reduction in UK emissions by 2027. This is less than a decade away, and is expected to require significant changes to how the UK generates, stores, distributes and utilises its energy. The Government expects that there will be significant opportunities associated with moving towards a low carbon future, and recently released its **Clean Growth Strategy**⁵, which aims to combine economic growth and decarbonisation ambitions.

Implementing the actions contained within this strategy will be crucial in helping Sheffield contribute to the national commitment, whilst enabling us to bring wider benefits locally to our residents and businesses.

A Sheffield approach to climate change resilience and city sustainability

This Strategy is the critical next step in the development of our city-wide approach to tackling climate change and becoming a successful, sustainable city.

The challenges brought by climate change cannot be solved by one organisation and our starting point was to stimulate broad debate and draw on a wide range of expertise and knowledge to build the city's existing approaches. In 2015, Sheffield established an independent Green Commission to consider how the city could become a more sustainable place to live and work⁶.

The Commission's final report⁷ in 2016 argued that Sheffield had already embarked on the journey towards sustainability with a strong base to

build from. The report sets out a vision for how, **working together as a city, Sheffield could become a smarter, more sustainable, more competitive 'future city'**.

The report was shaped around four visions - 'connected city'; 'transformative energy'; Sheffield as a 'European Green city'; and a 'learning city' which set out what Sheffield could aspire to in becoming a more sustainable city.

In response to the Commission's findings, lead organisations in the city took on the responsibility and started by reviewing their own organisational approaches to sustainability in response to the Commission's findings. Sheffield City Council's response, entitled *Growing Sustainably: a bold plan for a sustainable Sheffield*⁸, took the evidence, consultation and intelligence from the Commission and set out six key objectives which are now detailed and set out in this strategy.

This **Green City Strategy** captures the knowledge, ideas and visions from the Green Commission and sets out the specific key actions that the city needs to take. To succeed will involve our entire city evolving over time - with changes to the way we live, work and play. This



means that everyone has a role to play - residents and communities, businesses and city institutions. We will work to engage with people across our city. We will also need the support of national government, to create the policy needed to go beyond our initial plan, and support the delivery of an approach which will help us to support the UK in achieving its commitment to reduce greenhouse gas emissions by at least 80% by 2050, relative to 1990 levels.

We also need whole-city leadership to co-ordinate our city's approach and drive collaboration across our communities and organisation. We will establish a new **Green City Partnership board** which will establish how our objectives and actions can be delivered, and how through working together we can ensure that Sheffield becomes a resilient city, and a city which is working to reduce levels of greenhouse gas emissions and its impacts on the environment.

⁵ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/651916/BEIS_The_Clean_Growth_online_12.10.17.pdf

⁶ The Green Commission was made up of stakeholders from across the city, including; business, industry, universities, public sector and voluntary and community sectors and those representatives considered evidence from UK wide experts to understand the challenges and opportunities facing cities. <https://www.sheffield.gov.uk/greencommission>

⁷ Sheffield's Green Commitment https://www.sheffield.gov.uk/content/dam/sheffield/docs/planning-and-development/city-wide-plans-and-reports/Sheffield%20Green%20Commitment%20Report_FINAL.pdf

⁸ Growing Sustainably: a bold plan for a sustainable Sheffield <http://democracy.sheffield.gov.uk/documents/s25838/Growing%20Sustainably%20Green%20Commission%20Report%201.pdf>



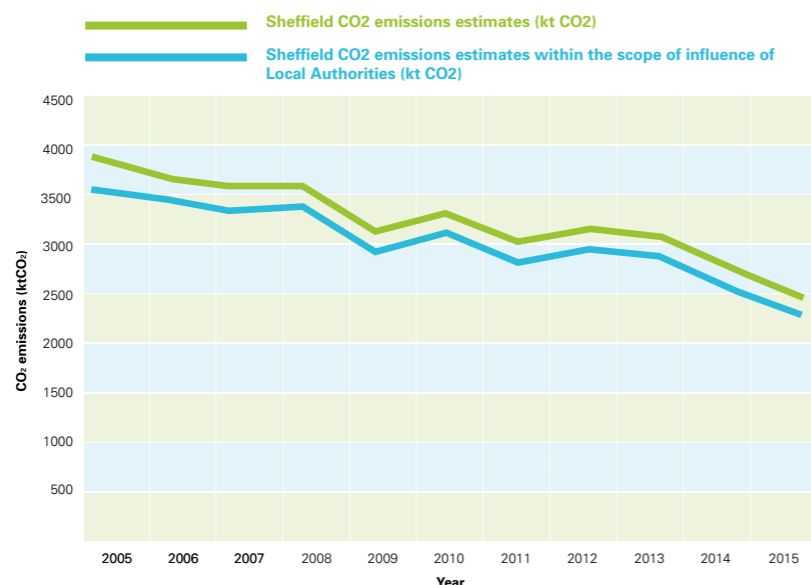
Objective One

OBJECTIVE ONE: REDUCING OUR IMPACT ON THE CLIMATE

There is broad agreement that we are already experiencing the effects of climate change and that we need to take action now and reduce our impact in order to ensure that avoid the worse effects that have been predicted.

Cities are recognised as being critical to achieving this, ensuring that countries can deliver the commitments their Governments made in Paris in 2015, and holding the increase in the global average temperature to well below 2°C above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels.

Many cities around the country, as well as globally have already established plans to reduce their cities greenhouse gas emissions towards a zero carbon target by 2050. There is no time to waste. A report commissioned by one global organisation⁹ has suggested that cities must already be on this trajectory by 2020 if we are to avoid significant impacts. Cities which participated



Carbon dioxide (CO2) emissions in the city have reduced by 34% in the period 2005 - 2015

in this study reported that some of hazards they face will become more serious and more frequent as the climate changes. The potential impacts on people, infrastructure, environments, and local and national economies could be even more profound

We will work to mitigate or reduce our city's impact on the climate by emitting less greenhouse gases. This will be achieved by increasing the energy efficiency of our buildings, increasing the

use and production of renewable energy in the city and by reducing the use of internal combustion engine vehicles. We need to develop a plan which will help us to reduce emissions from our homes, how we travel and move around and across the city, and how our business, industry and commerce operate.

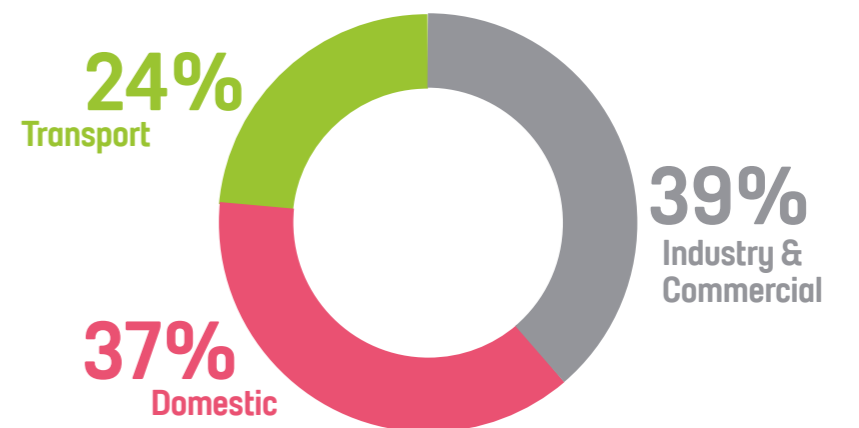
Carbon dioxide (CO2) emissions in the city have reduced by 34% in the period 2005 to 2015. This has primarily been as a result of the decarbonisation of

the energy produced nationally. Whilst the Council and other organisations have made progress in reducing carbon emissions (for example, over the period 2013/14 to 2016/17 the Council has reduced its annual CO2 emissions by 19%¹⁰), we need to develop a city-wide approach and plan to ensure that this progress is maintained and where necessary, improved upon.

Emissions of carbon dioxide in our city come from a number of sources. In 2015 over a third of these emissions came from domestic sources; primarily space heating and hot water generation, a similar quantity was produced by industrial and commercial sources and a quarter came from transport sources.

Like many cities around the world, Sheffield is taking already taking steps to mitigate its impact on the climate. Working with partners across the city the council has a number of initiatives which have resulted in reducing the emissions of greenhouse gases:

As a landlord with over 40,000 homes, Sheffield City Council has invested in improving the fabric and insulation of our homes and installed high-efficiency gas central heating boilers in the majority



Sheffield CO2 emissions estimates within the scope of influence of Local Authorities 2015

of homes. As a result, our homes have increased their SAP¹¹ (Standard Assessment Procedure) energy rating from 64 out of 100 in 2005 to 71 in 2016-17.

The Council has been using hydrogen fuel-cell electric vehicles as part of its vehicle fleet since last year (2017). The five vehicles are part of a government-funded programme and use the wind-powered mini-grid hydrogen refuelling station operated by ITM Power at the Advanced Manufacturing Park.

Organisations including Sheffield Hallam University operate accredited energy management systems which provides a framework to measure, manage and reduce their energy consumption and carbon emissions.

The progress and innovation seen to date is a good starting point, however it is recognised that the city would benefit significantly from greater co-ordination to make further progress. Experience and knowledge generated through the city's Green Commission tells us that cities which are succeeding in this arena have clearly defined carbon reduction programmes in place, and are working across all sectors of their city. Public support and participation is a critical element, and therefore we want to ensure that our communities, residents and businesses have opportunities to be involved in our city achieving this outcome.



PRIORITY 1

Leading by example, we will put in place a plan which enables the Council to reduce its carbon emissions

by 2018

We will produce a 'Sustainable Energy Action Plan' and sign-up to a recognised carbon reporting framework.

by 2020/21

The Council will have achieved a 30% reduction in greenhouse gas emissions, against a 2009/10 baseline for our corporate estate.

by 2025

The Council and its partners will have increased the level of low carbon and renewable energy generation in the city.

by 2030

A significant level of the city's energy will be supplied from locally generated low carbon and renewable technologies.

PRIORITY 2

Establishing a city-wide carbon reduction programme

We will commence a city-wide debate around how as a city we can adopt and stay within an agreed carbon budget, that enables Sheffield to deliver its share of the Paris Agreement; this will limit average temperature increases to well-below 2 degrees Celsius, and will have the aim of ensuring Sheffield becomes a zero carbon city by 2050.

We will seek the commitment and support of other organisations, businesses and communities in our city, to take a pledge and commit to contributing towards this.

We will report our progress annually through a Green City Partnership Board.

by 2050

Sheffield will be a zero carbon city.



Objective Two

OBJECTIVE TWO:

A CLIMATE-RESILIENT CITY

According to data from the World Meteorological Organisation (WMO), 2015, 2016 and 2017 have been confirmed as the three warmest years on record¹². The WMO explain that this is a clear sign of continuing long-term climate change caused by increased atmospheric concentrations of greenhouse gases. This is part of a long term warming trend and created extraordinary weather events around the world; very high temperatures, hurricanes and devastating monsoons. Locally, these changing weather patterns have had a significant impact on our city's communities. In 2000 and again in 2007 the city experienced severe flooding with many residents and businesses affected. Two people lost their lives and hundreds of millions of pounds of damage and disruption was caused to businesses and infrastructure.

In addition to increased rainfall, warmer and wetter winters, and extreme weather events which lead to substantial surface water runoff, climate scientists are also predicting that we can expect

hotter and drier summers. This could lead to heat stress of people and the environment, and potential hospital admissions for vulnerable residents, as well as water shortages.

The Council and its partners have begun to develop a number of programmes which are intended to increase the resilience of the city.

Flooding and water management

Sheffield is renowned for its seven hills and five rivers. We have over 150 miles of flowing watercourses in five main valleys that converge in the city centre, our rivers are linked to our communities and nowhere in Sheffield is far from a river. Our rivers and waterways are where the effects of climate change are likely to be felt first. The city's Waterways Strategy¹³, sets out how our city is increasingly likely to suffer from the risk of flooding.

Our city's drainage infrastructure is close to capacity, and whilst the Council and its partners, primarily the Environment Agency and Yorkshire Water have been working to develop schemes to reduce flood risk to homes and businesses in

the city, significant investment is needed for sustainable and innovative ways to manage river and surface water.

Taken as a whole, our rivers and their corridors offer a great opportunity for the creation and extension of a citywide green infrastructure network¹⁴.

Our approach will be to provide greater resilience for the city - to help to adapt to climate change and manage flood risks more sustainably by restoring the natural water cycle as far as practicable, ensuring the use of sustainable drainage systems, promoting low carbon opportunities for travel and development along river corridors and delivering robust yet sensitive approaches at the scale of the entire river catchment, which protect and promote biodiversity.

We will aim to promote and adopt more environmentally-friendly building types; our urban riversides offer good locations for redevelopment when climate change resilience measures such as sustainable urban drainage, living roofs and biodiversity enhancing features are incorporated.

Effects of heat and drought

As well as increased rainfall throughout the year, we also need to ensure that our city is prepared for summer heatwaves, which can have a serious effect on vulnerable people and our health services. Associated with this is the risk of more severe summer droughts, lower river levels and water shortages.

'Urban heat islands'

An urban heat island is an urban area which is significantly warmer than surrounding areas. These areas absorb heat from the sun. This increased heat has the potential to directly influence the health and welfare of urban residents, and the effect can be more significant during the night as the surfaces continue to give off heat.

As the main cause is due to the surfaces of roads or buildings absorbing heat from the sun, we can aim to help reduce urban heat island effects by designing places to absorb heat through the use of green and blue infrastructure, as well as ensuring that our city is more resilient to the risk of drought through appropriate planting,

use of grey water and water harvesting and storage systems.

Food

We will explore opportunities to reduce our city's food supply chains and to increase the amount of locally produced, seasonal food, with sustainable levels of meat consumption. This could help to reduce the city's carbon emissions as well as significant health benefits. Growing food in the city and its environs, will help to contribute towards increasing the resilience of our food supply networks, as well as creating business and job opportunities to Sheffield.

¹² <https://public.wmo.int/en/media/press-release/wmo-confirms-2017-among-three-warmest-years-record>

¹³ www.sheffield.gov.uk/content/sheffield/home/planning-development/sheffield-waterways-strategy

¹⁴ Green Infrastructure – PPS 12, 2010 pg7 of City of Rivers



PRIORITY 3

Working together to help our communities, residents, public sector and businesses to become more resilient to climate change

by 2020

We will work with our partners to develop and put in place flood plans to so that our city can cope with more extreme weather events.

Our Green City Partnership Board will produce a Plan to help ensure that our communities, residents, public and private sector are more resilient to climate change impacts, and that they are prepared and able to respond to and recover from extreme weather events should they occur.

PRIORITY 4

Designing, planning and developing our city in ways which enables it to adapt and provide greater resilience to climate change

Together with our partners, we will work to protect communities from flooding through co-ordinated investment in flood and drainage infrastructure so that our rivers and waterways can cope with more extreme events.

We will ensure that our flood and water assets are maintained to a high standard and put in place plans to activate defences in emergencies.

We will design places to absorb heat through the use of green and blue infrastructure, as well as ensuring that our city is more resilient to the risk of drought through appropriate planting, use of grey water and water harvesting and storage systems.

Investment in our waterways and rivers will aim to restore the natural water cycle as far as practicable, promoting the use of sustainable drainage systems and reducing the load on our sewerage system, promoting low carbon opportunities for travel and development along river corridors and delivering robust yet sensitive approaches at the scale of the entire river catchment.

We will explore opportunities to reduce our city's food supply chains and to increase the amount of locally produced, seasonal food.

The City's Local Plan policies promote the use of natural cooling, to reduce urban heat island effect by using tree planting and living roofs and screens, as well as promoting the use of sustainable drainage systems.

The new Local Plan is currently being developed and we will seek to enhance existing policy where appropriate.

Our new City Centre plan will promote and support schemes and projects which deliver greater resilience and are adaptive to climate changes.



Objective Three

OBJECTIVE THREE:

SUSTAINABLE AND AFFORDABLE ENERGY FOR RESIDENTS AND BUSINESSES

Sheffield has a strong track record in developing energy projects in the city. We were one of the first UK cities to develop a district heat network, and the Council continues to develop this network through innovative investment partnerships with the private sector and central government.

Veolia operate the Council's Energy Recovery Facility at Bernard Road. This facility turns local waste into electricity and heat for the city. Up to 45MW of heat is produced and supplied to over 140 buildings connected to the District Energy Network. This includes homes, offices, theatres and university buildings. In addition, the facility generates up to 21 MW of electricity to the National Grid, which is enough to power 25,000 homes.

E.ON's 30MW biomass energy plant at Blackburn Meadows was built in 2014, costing £100m. The company have completed installing the largest battery storage facility in the UK, which has a

capacity of 10 MW and will supply low-carbon electricity to the National Grid at times of high demand as part of a smart-grid system.

UYE have constructed a 6.5 MW biomass energy plant at Holbrook in the south east of the city, which is now completed and being operated by Veolia. Proposals for a renewable energy business park are in development at Claywheels Lane in the north of the city.

Funding secured from Government will enable the connection of the Blackburn Meadows biomass plant, built and operated by E.ON, to the Council's District Energy Network which heats public and private buildings, as well as homes across Sheffield city centre. As well as increasing the resilience of the heat network, this will also provide opportunities for expansion of the district energy network, for example into the new Sheffield Retail Quarter.

The University of Sheffield is operating a state-of-the-art solar photovoltaic (PV) installation designed to test the use of PV technologies in northern latitudes and field-test new technologies in the city.

Lowering our city's carbon emissions through the energy we consume is a critical part of our response to climate change. However, we need to ensure residents and businesses have energy supply security, and that energy is affordable so people in the city can adequately heat their homes. It is estimated that 12% of households (around 29,000), in Sheffield are living in fuel poverty due to a combination of low income, high fuel prices and homes which are expensive to heat and run.

Our Housing Strategy¹⁵ recognises the need to improve the energy efficiency of some of the city's housing stock, by investing in the fabric of homes through insulation programmes, by providing residents with access to competitive energy providers, and by providing education and advice.

The Council has previously provided free insulation programmes and energy efficiency advice, with the insulation scheme offered to around 80% of private properties in the city.

Our approach to developing local low carbon energy supplies will help to alleviate risks associated with energy

supply security. Cities and organisations which generate their own energy through renewable sources are likely to be less affected by future energy price fluctuations.

The Centre for Low Carbon Futures (founded by the Universities of Sheffield, Leeds, Hull and York) explored the most cost effective and efficient ways to decarbonise a city. A review was undertaken for the Sheffield City Region which established that 13% of GVA leaves the local economy every year through the payment of energy bills, and this is forecast to grow significantly, the 2011 SCR energy bill of £3.41 billion is expected to reach £4.59 billion by 2022¹⁶.

Compared to the rest of the country, energy demand is disproportionately high in the SCR. This is due to the presence of energy intensive commercial and industrial sectors. In particular, commercial and industrial energy use is 11.5% higher for electricity and 9.4% higher for gas compared to the rest of England.

This review recommended that implementing cost effective measures and deploying renewables has an

enormous potential to advance the local economy of the SCR through reducing the energy bill. Investment in measures from 'cost effective' to 'exploiting all realistic potential' could reduce the projected bill increases by between 61-86%, freeing up capital for investment and growth.

Recent analysis the University of Sheffield¹⁷ suggests that approximately £350m of electricity and £230m of gas was consumed within Sheffield Local Authority area in 2015 (using the assumption of 15 pence per kWh for electricity and 5 pence per kWh for gas). As there is only a limited amount of generation in the area, this annual total of nearly £600 million is leaving the area to pay for these 'imports' of energy. Reducing these by just 10% by reducing demand or increasing low-carbon generation in the Sheffield Local Authority area equates to a reduction of almost £60m from leaving the area for energy. This gives an indication of the scale of market opportunity to reduce demands and to develop local generation capacity.

The recently published Northern Energy Strategy (IPPR¹⁸) outlines a strong

ambition for the north to become leaders in the low carbon energy sector. It makes the case for the devolution of energy to give city regions and local authorities the powers to invest in an energy system which is fit-for-purpose and forward-facing, that will enable the accelerated transition to a low carbon economy.

Our main approaches to this objective will be to reduce energy demand in the city through increasing energy efficiency of our buildings and homes and for the city to increase the level of renewable and low carbon energy generation, and to help to provide access to lower cost and lower carbon sources of heat and power for our homes and businesses.



PRIORITY 5

Ensuring that our city's homes are energy efficient and can access low cost, low carbon energy

Our approach to reducing **energy and carbon emissions from transport** is detailed on the next section, and our approach to **business** is set out in **Green and Innovative Economy** section

We will develop an approach to promote domestic affordable warmth and energy efficiency, which will help households in fuel poverty to invest in measures in their homes, which will save households money, reduce ill health and reduce carbon emissions.

We will develop an Energy Company partnership that will work to provide our city's residents with access to lower cost energy tariffs and provide advice and support on energy efficiency and domestic renewables. Support for business and industry is detailed in section.

New homes built in the city will be very low or zero carbon - Our Local Plan includes policies which promote the development of low carbon homes; constructed to high standards of energy efficiency, which will generate their own heat or power. These homes will use significantly less energy and as a result have lower running costs for residents, as well as reducing the city's overall carbon emissions.

The new Local Plan is currently being developed and we will seek to enhance existing policy where appropriate.

Our council home building programmes will create very low or zero carbon, energy efficient homes. Where funding allows homes will also generate their own heat or power.

PRIORITY 6

Collaborating to expand our city's energy networks and to increase the level of renewable and low carbon energy generation

We will continue to work with partners to expand our energy networks, and increase the level of renewable and low-carbon energy generation.

We will continue to explore the opportunities to expand our own heat networks and work with commercial partners, residents and customers.

We will develop an approach to decarbonise our existing heat networks, exploring further approaches to decarbonise domestic heating across the city.

We will develop an Energy Prospectus for Sheffield, that clearly sets the commercial opportunities and community benefits for future investment (including private sector, community share and infrastructure-type funds).

Our Local Plan includes policies which promote the generation and utilisation of low carbon energy.

The new Local Plan is currently being developed and we will seek to enhance existing policy where appropriate.



Objective Four

OBJECTIVE FOUR: MODERN, RELIABLE AND CLEAN JOURNEYS FOR EVERYONE

Cities at their heart are networks - social, physical, digital. The ability of cities to move huge numbers of people, connect communities to their homes and to jobs and do it in a reliable, rapid and affordable way is vital. Doing this sustainable and clean way is the challenge for the 21st century. Sheffield is growing with more and more demand on our transport network and so we need to consider how we create a cleaner, sustainable transport network with more public transport, cycling, walking and a more efficient use of the road space we have to improve the environment and quality of life for all Sheffielders.

And the benefits for the city could be huge – cleaner air, healthier people, more reliable connectivity making Sheffield an attractive place for people to live, work and businesses to invest.

Sheffield, alongside 30 other cities has been identified by the Government in its newly-released UK Air Quality Plan¹⁹ as an area in exceedance for Nitrogen

Dioxide (NO₂) gas. This means we need to tackle vehicle emissions in order to become compliant with European health based limits for this air pollutant in the shortest possible time. A Sheffield Clean Air Strategy²⁰ has been developed which aligns with our emerging Sheffield Transport Vision²¹. Both these documents were approved by Sheffield City Council in December 2017.

Research undertaken by The Centre for Low Carbon Futures, which includes the University of Sheffield, has sought to identify the most effective and efficient way to decarbonise a city²². The report highlights opportunities to reduce both energy bills and carbon footprints. The work highlights the potential contribution that transport can make in this respect. There are two main themes:

- modal shift to reduce the impact of private car travel
- decarbonisation of existing vehicles through the adoption of alternative methods of propulsion (e.g. hybrid, electric or Compressed Natural Gas).

The best performing measures identified in this report to reduce carbon emissions included Park & Ride schemes, smarter

travel choices, cycling and demand management as well as investment in more fuel efficient and hybrid vehicles. This research will be integrated into our emerging evidence base and analysed further in the formation of the full Sheffield Transport Strategy.

There is significant travel into Sheffield from across the city region, for work, study, health and leisure. Around 60,000 people commute into Sheffield on a daily basis for work, with more than one third of these journeys from Rotherham. Currently, 28% of journeys to work in Sheffield originate outside the district; and 22% of journeys to work starting in Sheffield go outside the district. Of journeys within Sheffield nearly three quarters are less than 5 miles.

An increase in the number of jobs and houses will increase the demand for travel and movement and doing nothing is not an option. As activity across the city increases, travelling around the ring road in peak hours might take up to 20% longer. The health implications of our travel choices are also substantial. There is still a significant difference between the health of people living in the most and least deprived communities.

Furthermore, estimates state that around 20% of deaths per year in Sheffield could be prevented, with direct causes including factors such as obesity, lack of physical activity, and environmental threats such as pollution from traffic.

We are developing and consulting on the Sheffield Transport Vision, which is the first of two stages leading to the publication of the full Sheffield Transport Strategy in 2018. The Transport Vision looks forward over the period to 2034 to understand what issues the city may face when considering the challenges of sustainable and inclusive growth. Following this Vision, the full Sheffield Transport Strategy will explore the issues in more detail to set out how our broad actions will be more clearly defined and implemented in each area of the city. This will lead to an aspirational but deliverable plan of action, starting immediately, including how this will be funded.

To achieve economic growth in a sustainable way, we will need to change how we enable and manage movement around the city. Some of this will come from reducing the need to travel (for example - through the use of

technology to access services, the role of technology in the way transport is provided, or by better location of housing and employment). But the remaining success will have to come from changing how travel is made. We cannot simply accept growth in private car trips as this is unsustainable.

We must provide better and more effective choice to enable Sheffield people and visitors to the city to use sustainable modes whenever they can.

We need networks (services, roads, rail, and paths) that allow people to change their travel habits. In getting the most out of our transport network, we will have to consider significant changes, with a range of policies and schemes, no longer trying to fit all road users into the same space, thereby improving road safety as well. For there to be 'transport for all' we need an integrated, affordable and high quality public transport system that provides good access for young people, and a reduction in the isolation experienced by people who are unable to use public transport. Sustainable modes (cycling, walking and public transport) should be seen as the first option for travel, particularly for shorter journeys.

We will make better use of technology to maximise available capacity within existing infrastructure, making best use of what we have.

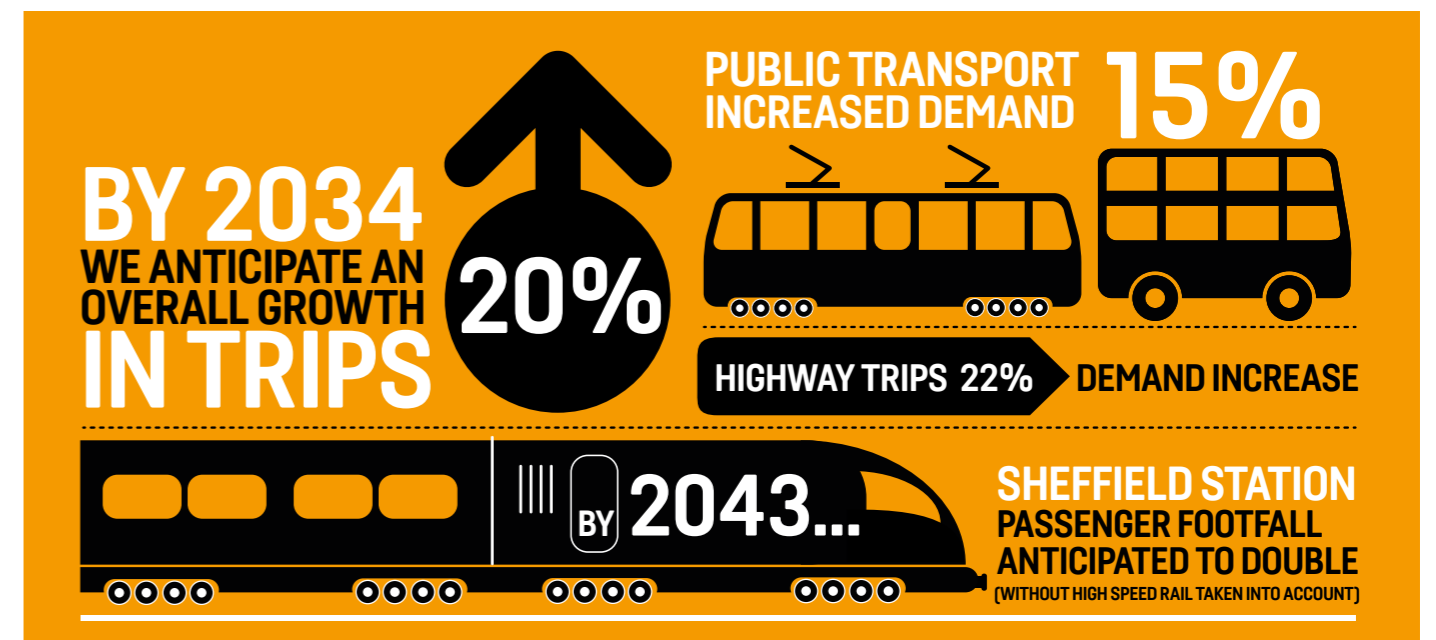


PRIORITY 7

Ensuring that everyone can access opportunities without transport or movement constraints. Residents, businesses and visitors in our thriving city can safely move themselves and their goods or products with confidence and without delay. The negative impacts of transport including air quality and noise are minimised, and safety and quality of life is improved in the city as a result.

Reliable and clean journeys for everyone in a flourishing Sheffield.

- Develop a new Sheffield Transport Strategy.
- Secure community and business support – changing hearts and minds to recognise the need for change, also integrating this within new development.
- Develop an ambitious yet deliverable transport infrastructure programme.
- Explore all existing and future external funding sources.



Objective Five

OBJECTIVE FIVE: CLEAN AIR FOR ALL

Clean Air is a fundamental right - all our lives depend on it. Unfortunately, we face a significant threat from air pollution. Unlike noxious coal-induced smogs of the past, however, it is often an invisible killer, and the threat comes predominantly from the vehicles we use to get around (particularly diesel ones) and the energy we use to power our industry.

Across the UK, air pollution is a public health emergency. It has been linked to strokes, heart attacks, cancer, asthma and dementia. Research shows that children exposed to air pollution have smaller lungs and negative health effects for their whole life. It is estimated that there are 500 early deaths a year in Sheffield linked to air pollution.

Government have delayed making any significant intervention on air quality but the UK has been breaking EU law on Nitrogen Dioxide (NO²) gas since 2010. Levels in Sheffield reflect the national situation - we are in breach of EU limits which should have been met by 1st January 2010.

OUR CLEAN AIR VISION

We want the air in Sheffield to be safe to breathe, regardless of where people live, work or visit.

We will work together to tackle the sources of air pollution and we will create a healthy, thriving city where many more journeys are made using active travel and low emission public transport.

PRIORITY 8

Ensuring that air in Sheffield to be safe to breathe, regardless of where people live, work or visit.

We will work together to tackle the sources of air pollution and we will create a healthy, thriving city where many more journeys are made using active travel and low emission public transport.

Feasibility study - consider in detail the types of measures that we may have to introduce in Sheffield in order to improve air quality and consult with the city to better understand what people think about the specific interventions we could implement.

Buses - work in partnership with the bus companies to improve the bus fleet and reduce emissions through replacement low-emission buses or retrofitting vehicles with cleaner engine technology.

Taxis - ensure that taxis cannot be licensed in the city if they do not meet particular standards by 2022; seek investment from Government for a fund to help taxi operators/owners to improve their vehicles.

Cars - consider specific schemes to support people on lower incomes to change to lower emission vehicles, particularly where their job or responsibilities require unavoidable and frequent use.

Idling - roll out Anti-Idling Zones around schools and other sensitive locations.

Freight/HGVs - support the Eco Stars scheme, which helps commercial vehicle operators to reduce their emissions; promote the use of lower emission vehicles across our fleet.

Promoting clean travel - encourage more walking, cycling and active commuting in the city.

Working with communities - commission a Neighbourhood Clean Air Champion Scheme.

Industry - make the most of technological improvements to reduce emissions and ensure that industry and businesses meet their legal obligations.

Designing a clean air city - build the ambition of clean air into our approaches to transport, economy, housing, planning and health and wellbeing.



Objective Six

OBJECTIVE SIX:

A GREEN AND INNOVATIVE ECONOMY

Sheffield is world-renowned for its innovation capabilities in advanced manufacturing and materials, creative and digital industries and healthcare technology. We have a deserved reputation for invention, for making, and for seizing and exploiting opportunities. The Government has forecast that the UK low carbon economy could grow by an estimated 11 % per year between 2015 and 2030, four times faster than the rest of the economy. This could deliver between £60 billion and £170 billion of export sales of goods and services by 2030.

The Northern Energy Taskforce has established a vision that by 2050 the north of England will be the leading low carbon energy region in the UK, with an energy economy worth £15 billion²³. Several of our strengths in nuclear engineering, battery technology and storage and the digitalisation of industry will be very relevant to delivering the vision as it progresses.

Our vision for a 'Low Carbon' economy here in Sheffield and the opportunities it presents should apply to all sectors of our economy, through commerce and industry, and include large companies and small and medium-sized enterprises, as well as sole-traders.

Sustainability makes good business sense for any business, irrespective of sector; it can lead to lower energy and utility costs, reduced waste and disposal costs producing lower overheads and helping to create competitive advantage through resource efficiency.

The Carbon Trust and other city-regions have programmes in place to support energy assessments, providing technical advice and facilitating the acquisition and financing of capital purchases. These practical inputs are capable of delivering real financial returns. Business Sheffield has a team of experienced Business Advisors who can work with the city's businesses to help them become more efficient in their use of energy, more resilient to changes in price and supply, and more capable of responding to opportunities.

We want to help our city's businesses to understand the challenges that are

expected in transitioning to a low carbon economy and to be in a stronger position to exploit the commercial and community opportunities.

Being a smarter city – using technology and data to help the transition to a low carbon economy

Digital technologies and the intelligence and data this can yield can provide an opportunity to explore and understand our city's low carbon challenges in greater detail, as well as being utilised to develop innovative solutions to challenges such as poor air quality, congestion or rising energy costs.

Developing these technologies will help the city, its institutions, businesses, as well as its residents to make more sustainable and climate-conscious decisions. Integration of these systems could help to manage energy demand in the city, help commuters to make real-time travel decisions reducing travel time and promoting clean air or reducing the number of journeys across or into the city.

In addition, new services that are developed could have a high commercial

value which could help support the growth of new local jobs and employment, whilst also improving the quality of life.

Local companies are already exploiting the potential of these technologies to develop new products and services, and the University of Sheffield has established the Urban Observatory, which brings together fixed, mobile and atmospheric sensors and data, and using advanced machine learning and data fusion techniques will create a dynamic understanding of the flows of energy and resources in the city.

We want a city with a successful and growing 'low carbon and clean energy' sector, helping to create and provide local jobs.

The solutions, services and products that these companies create and deliver could help our city to address some of the challenges this report has identified as well help cities around the world. In our approach, low carbon and clean energy is considered in its widest terms, including for example; developers of smart phone apps which help us to navigate our city

in the most carbon-neutral manner or manufacturers of lightweight vehicles or components, new electric propulsion systems or alternative fuels for a low carbon future. We need to embrace the innovation and creativity that exists across all our sectors, and harness this for the advantage of our city and its communities.

We want to create the industries of the future, and to link this to the creation of local jobs and training opportunities. This may be around skills relating to the retrofitting of buildings with energy and carbon-saving measures, as well as renewable energy technologies, and may also include new skills around how our energy and utility networks are developed, public transport and electric vehicles or how our public spaces are utilised and adapt to climate change.



PRIORITY 9

Working with local businesses to improve their environmental performance and ensure they are 'climate-resilient' and transitioning to a low carbon economy

Working through the Business Sheffield events programme, we will help our city's businesses to be more aware of the challenges and opportunities relating to transitioning to a low-carbon economy.

In the short term, we will signpost businesses to the most appropriate support currently provided locally and nationally. Over the medium term, we will work with our businesses and partners to review the support and identify the gaps that exist.

Working with local businesses, we will work with our city partners and wider stakeholders to consider how local support for products can be developed. This will include working with our education and knowledge institutions, community and third sector organisations, as well as the investment community.

We will continue to facilitate and support private sector investment into our city that will contribute towards the overall delivery of this strategy.

PRIORITY 10

Supporting Sheffield's businesses to become more energy efficient, to harness low carbon, locally generated energy sources potentially unlocking competitive advantage and reliable, sustainable energy to support their growth

We will work to expand the city's heat networks and encourage new commercial and industrial businesses to connect.

We will explore the potential to develop a Sheffield Energy revolving loan fund for businesses to invest in energy efficiency and low carbon measures.



PRIORITY 11

Supporting the development and growth of our low carbon economy, enabling cleaner and sustainable growth

Developing and growing our 'low carbon and clean growth' sector

Working with businesses, educational and knowledge institutions, community and third sector organisations, as well as the investment community and gov., we explore the potential to develop a local accelerator programme.

We will facilitate and support private sector investment into the City into this sector, and into wider environmental and energy investment – this will be essential to achieve the level of investment that is envisaged, noting that the SCR Mini-Stern Review²⁴ outlined a programme of £8b in order to reduce SCR emissions by 40% with an 8 year payback period based on energy savings.

We will look to develop other innovation programmes which aim to create the technological solutions and behaviour change we need.

PRIORITY 12

Delivering new low carbon jobs for local people

Working with businesses, educational and knowledge institutions including our Universities and Sheffield College and our community and third sector organisations, we explore and develop a programme for new low carbon jobs for local people.

We will explore the potential for programmes such as new vocational training and skills for school leavers, apprenticeship schemes or support for innovative low carbon entrepreneurs.

We will explore the potential for programmes to ensure that Sheffield residents have the skills and experience to secure local jobs.



Partnership and Collaboration

Leadership

Sheffield City Council has a pivotal role in providing civic leadership, inspiring and facilitating across all sectors and parts of our city to help to create a low carbon future.

This is a major opportunity for Sheffield to become a leading sustainable city with communities and businesses that are resilient to the effects of climate change; part of a growing economy that can fully exploit its innovative capacity to help us transition towards a zero carbon city and part of a city where our decisions and behaviours, both collectively and as individuals are more sustainable.

Partnership

The Council recognises that delivering the actions set out in this Strategy, and enabling the city to transition towards a low carbon economy is not something we can do alone. Delivering the actions will require strong partnerships and a collaborative approach. As this strategy has evidenced, the city is already making progress and we aim to build on this collective experience and knowledge, its existing networks and communities.

We will be engaging with people across the city on this strategy, to establish the most effective ways and approaches to implement the actions contained within the strategy.

We will establish a **Green City Partnership Board**. This board will have representation from across the city, its stakeholders and partners, communities and businesses.

The Partnership Board will work to develop a city-wide approach, exploring the opportunities to secure investment to enable the actions set out to be delivered and will help to monitor and review our city's progress and provide an independent voice for the city on climate change and wider sustainability.

We will also aim to establish an Office for Climate Change. This Office could be a collaboration between the Council and business, industry our educational establishments and public agencies and will work to co-ordinate the delivery of projects and programmes across the city, as well as working with the City region and national Government to secure resources and investment from national and international programmes.

Governance

The Council will establish a Sustainability Programme Group as part of its internal Programme Management approach. This Group will be accountable for the delivery of the Sustainability programme and oversees progress across all of its component projects. The Group will directly commission and deliver projects, as well as facilitate and assist delivery in-directly

For example, it will support project sponsors in the development of new business cases, where there is an opportunity to add value and achieve or increase wider sustainability outcomes. In addition, it has a role in challenging sponsors of existing projects to help to deliver wider sustainability outcomes. It is envisaged that it will have a close role co-ordinating sustainability-related activity with our external partners, primarily through a Green City Partnership Board.

The Council will ensure that our wider strategies and plans consider their implications and impact on Sheffield's sustainability, and develop appropriate actions to ensure they contribute positively towards the six priority themes contained within this document.

Engagement and facilitation

We want to enable everyone in the city – its residents, businesses, institutions and organisations to play a role developing and delivering the solutions that will take Sheffield towards a zero carbon future, and we will be using a variety of approaches and networks to engage people and organisations.

As already identified, we have a large number of organisations, communities and businesses who are engaged in delivering services and products that embody sustainable thinking or are seeking solutions to the challenges we face. Success will be determined by how well we can all work together, to develop and implement the actions which are proposed in this strategy.

