NET ZERO CITIES

EU MISSION PLATFORM | CLIMATE NEUTRAL AND SMART CITIES

Climate City Contract

Bristol One City Climate Action Plan

2030 Climate Neutrality Action Plan of Bristol

BRISTOL CLIMATE ACTION

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Summary

Summary and purpose of this document

This document has been drafted as part of Bristol's participation in the European Union (EU) Horizon Europe funded Climate Neutral and Smart Cities Mission (the Mission).

This Mission aims to support cities who have an ambition to reduce their carbon emissions significantly by 2030 so that other cities may follow their lead and enable whole countries (or groups of countries as in the EU) to meet their aims of ending their contribution to climate change by 2050.

Ending their contribution to climate change means that by 2050 the greenhouse gas emissions will be reduced to as close to zero as possible, with the small amount of remaining emissions absorbed through natural carbon sinks like forests and new technologies like carbon capture. If this is achieved, the emissions of greenhouse gases will be 'net zero'. The term net zero is used in UK policy. For the EU, the equivalent aim - to be an economy with net zero greenhouse gas emissions - is referred to as being 'climate neutral' by 2050. The template of this action plan also uses that terminology of climate neutrality. In Bristol, our One City Climate Strategy talks about achieving carbon neutrality but essentially these three terms – net zero, climate neutrality and carbon neutrality – describe the same concept.

This 2030 Climate Neutrality Action Plan (the plan) follows a template established by the Mission to present a logical framework setting out which greenhouse gas emissions need attention, where these come from (which sector e.g. transport and mobility), therefore where work needs to be done to reduce them (the field of action) and how this can be done (through actions or projects).

This document represents a set of actions (described as individual action outlines) that could be implemented to achieve a large (more than 80%) reduction in relevant carbon emissions from the city – see the inventory for details.

The actions are compiled into 'impact pathways' which illustrate what the short-term changes and long-term impacts would be if these actions were taken. The impact pathways provide a check that the actions would be effective and also act as a guide to how the actions and impacts could be monitored.

The plan has been created by partners in Bristol and has been documented here by Bristol City Council. The partners have been working together as a team - the Transition Team. The Transition Team includes organisations from the public, private and not for profit sectors as well as academia.

The individual action outlines described here have been suggested by the Transition Team as potential actions to address the city's greenhouse gas emissions. Whereas there is commitment from the Transition Team to strive to support the process of prioritising and developing these actions with further stakeholder involvement with a view to successfully realising the actions in future, this plan does not represent a commitment by any of the Transition Team members to implement these actions. It should also be noted that action to address the city's greenhouse gas emissions needs a collaborative approach involving action locally, regionally, nationally and internationally.

The plan also sets these suggested actions within the context of Bristol as a city, previous work on climate action in Bristol and potential next steps.

List of figures

The list identifies the titles and page numbers of all the visual elements in the plan.

List of tables

The list identifies the titles and page numbers of all tables in the plan.

Abbreviations and acronyms

The list identifies the abbreviations and acronyms used in the plan.

Abbreviations and acronyms	Definition
BACCC	Bristol Advisory Committee on Climate Change
BAU	Business As Usual
BCC	Bristol City Council
CCC	Climate City Contract
CO2e	Carbon Dioxide Equivalent
DESNZ	Department of Energy Security and Net Zero
DFES	Distribution Future Energy Scenarios
EPC	Energy Performance Certificate
EU	European Union
EV	Electric Vehicle
HE	Higher Education
HWRCs	Household Waste and Recycling Centres
GHG	Greenhouse Gas
GPC	Global Protocol for Community-Scale Greenhouse Gas Reporting
LGV	Large Goods Vehicle
LIDP	Local Industrial Decarbonisation Plan
MW	Megawatts
NGED	National Grid Electricity Distribution
NHS	National Health Service
PV	Photovoltaics
SDG	Sustainable Development Goals
TT	Transition Team
WECA	West of England Combined Authority

1 Introduction

The introduction outlines the local geographic and policy context in which the city´s 2030 Climate Neutrality Action Plan is being developed and describes the gap it addresses in broad terms.

Introduction

Introduction to Bristol

Population

Bristol is the largest city in the South West of England with a population of 479,200 in mid-2022. Bristol was one of the fastest growing cities in the UK over the last decade and it is forecast to grow to around 550,000 by 2040.

Bristol is home to a wealth of cultures and creative ideas and the city continues to build on its strengths as a place welcoming to all, including as a City of Sanctuary. The population of Bristol is increasingly diverse with at least 45 religions, 185 countries of birth, 287 different ethnic groups and 90 main languages.

Bristol aims to be a city of ambition and compassion, where everyone has the opportunity to thrive and succeed. But there are many challenges to tackle, especially with the national cost of living crisis and the continuing inequalities still faced by many Bristolians. Over 70,000 people in the city live in the top ten per cent most deprived areas in England and Bristol has some of the lowest rates of people going to university despite having two world class universities.

With the city's population continuing to grow, work is ongoing to tackle the housing crisis and reduce the number of people currently on the housing waiting list including those in temporary accommodation. More housing is already being built, with some 11,000 new homes delivered since 2016, providing secure, affordable low carbon homes for a growing population.

Administration

City Council

Bristol City Council is the local government institution for the city and its administrative area is 235 square kilometres (Figure 2) and the area is mostly urban. All geographical areas of the Bristol City Council area are included in the scope of this plan.

Bristol City Council is governed by 70 Councillors elected from all parts of the city and they make decisions in 7 policy committees (each focusing on different areas such as strategy and resources, environment and sustainability), several regulatory committees and meetings of all councillors – Full Council. The policy committee's membership is designed to reflect the political balance of the council. Councillors select a Leader and Deputy Leader of the Council and chairs of each of the Committees. Full council meetings are chaired by a (ceremonial role of) Lord Mayor who is one of councillors appointed for annual terms.

The One City Approach

The city has established the Bristol One City Approach; this brings together public, private, voluntary and third sector partners to work together to make Bristol fairer, healthier and more sustainable convened by the Bristol City Office. The One City Approach involves boards of city partners (One City Boards) which cover the six thematic areas of the One City Plan: Economy and Skills, Children and Young People, Transport, Homes and Communities, Environment and Health and Wellbeing. These themes are reflected in the Bristol City Council governance model described above with Committees related to similar themes. The elected councillor who chairs the Council's Committee on a given theme is also the co-chair of the respective One City Board, along with another city partner to assist with that integration.

There is no direct governance of the local authority by the city boards nor governance of the city boards by the local authority implied by the integration between boards and committees; there is only a coordinating relationship. The One City Boards are advised on climate change by two bodies: The Bristol Advisory Committee on Climate Change and the Community Leadership Panel on Climate and Just Transition.

The One City Approach is significant as it was the One City Environment Board who commissioned the One City Climate Strategy. This process is further described below in the description of the development of Bristol's One City Climate Strategy. The One City approach is further discussed in Section A 3.1.

The West of England Region
The urban area extends to the north and east into other local authority administrations. These authorities have come together to form the regional West of England Combined Authority. The combined authority is responsible for some key climate related activities in transport, economic development and skills areas and is led by a directly elected mayor.

Local government in the UK is often seen as having less autonomy compared to many European counterparts. It operates under a more centralised system where significant powers and funding are controlled by the central government. Local governments in the UK have limited fiscal autonomy. They rely heavily on grants from the central government and have limited powers to raise their own revenue.

Many of the UK's utilities (e.g. energy generation and distribution, water) were privatised in the 1980s and 1990s and are owned by trans-national corporations. They are regulated by national bodies established by the government as part of privatisation. A similar situation exists in public transport.

Economy
Bristol has one of the most vibrant and successful economies in the UK, with the highest productivity levels per capita, employment and qualification rates of the major cities. The Bristol area acts as a centre of employment for the communities which live in adjoining administrative areas.

In 2022, gross average earnings (median) in Bristol were £34,215 a year compared to £33,111 in Great Britain. In December 2022, the employment rate in Bristol was 78.5% with 257,100 working age residents in employment. This is the highest of the UK Core Cities and well above the national rate (75.6%).

Key employment sectors include health and social care, education, advanced engineering, legal and financial services, digital and creative industries, renewable energy and environmental technologies. It also has prominent wildlife film making, national charities (particularly environmental charities) and it is home to the environmental regulator for England, the Environment Agency.

Environment
Bristol is known for being an environmental, innovative and creative city. It is well known globally as a leader in sustainability and is the only UK city to be awarded European Green Capital (in 2015). Bristol Climate and Nature Partnership has over 1,200 member organisations. The community concern about the environment and climate change in addition to the wealth of city organisations involved in sustainability underpin the leadership in this area for which the city is known. There are numerous community initiatives including notable community energy networks and co-operatives Bristol Energy Network and Bristol Energy Co-operative.

Most recently Bristol delivered £100 million of low carbon energy investment from 2012 to 2022. It has created a pioneering public private partnership - Bristol City Leap. This new partnership between Bristol City Council and Ameresco supported by Vattenfall Heat UK plans to deliver £1 billion of investment in low carbon projects in the city. There is a small district heat network in Bristol which will be further developed. The current network supplies the centre of the city and includes the Castle Park Energy Centre – the UK's largest single water source heat pump - which saw Bristol named Heat Pump City of the Year at the 2022 European Heat Pump Association Awards.

Introduction to Bristol's greenhouse gas emissions reduction ambition
Bristol's stated ambition is carbon neutrality by 2030 for all scopes of emissions, covering the six greenhouse gases listed in the EU Mission. This has been established in the city's climate strategy – the One City Climate Strategy. However, for the purpose of this plan we are only considering territorial emissions and not all scopes of emissions.

Development of Bristol's One City Climate Strategy

In 2019, Bristol City Council commissioned three key studies:
a carbon emission baseline of its territorial and consumption-based emissions
analysis of the impacts of the policies that were in place to understand the likely scale of carbon reduction by 2030.
modelling of the measures that would be needed to achieve carbon neutrality by 2030.

The One City Environment Board commissioned the development of the One City Climate Strategy (published in 2020) drawing directly on this evidence base. That strategy was developed with engagement across the thematic One City Boards and with key partners. The Bristol One City Climate Strategy set out the key city systems to be decarbonised in ten key themes (emissions domains) as well as the six key factors to creating the appropriate 'enabling conditions' for achievement of carbon neutrality in the city.

Development of the One City Climate Action Plan

As part of the development of this plan we undertook a more detailed stakeholder mapping exercise and from that invited organisations to join the Transition Team. Many members of the Transition Team are also represented on the One City Boards but in addition some regional and national organisations with key roles in decarbonisation of the city have joined the Transition Team. It includes organisations from the public, private and not for profit sectors as well as academia.

This action plan has been developed to realise the principles and objectives of the One City Climate Strategy, with a particular focus on the principle of fairness. It also considers the six enabling conditions. These have all informed the Impact Pathways underpinning the plan. The Impact Pathways cover:

1. Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills
2. Energy Systems including both Electricity and Heat
3. Built Environment
4. Mobility and Transport
5. Waste and Circular Economy
6. Green Infrastructure and Nature-based Solutions

The plan also sets these actions within the context of Bristol as a city, previous work on climate action in Bristol and key initiatives taking place in the city. The action plan has then been used as the basis for the creation of the One City Climate Investment Plan which has been developed with input from consultants. The suite of information and documents that now form the city's climate plans is shown below in Figure 1.

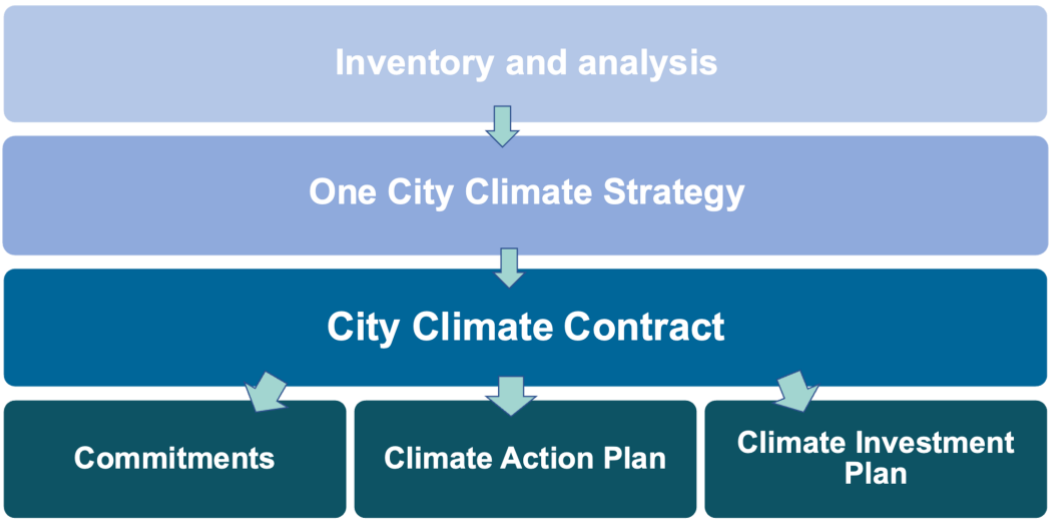


Figure 1: Bristol's Climate Mission Approach

Looking ahead

The development of this action plan and the investment plan will now be used by members of the Transition Team to:

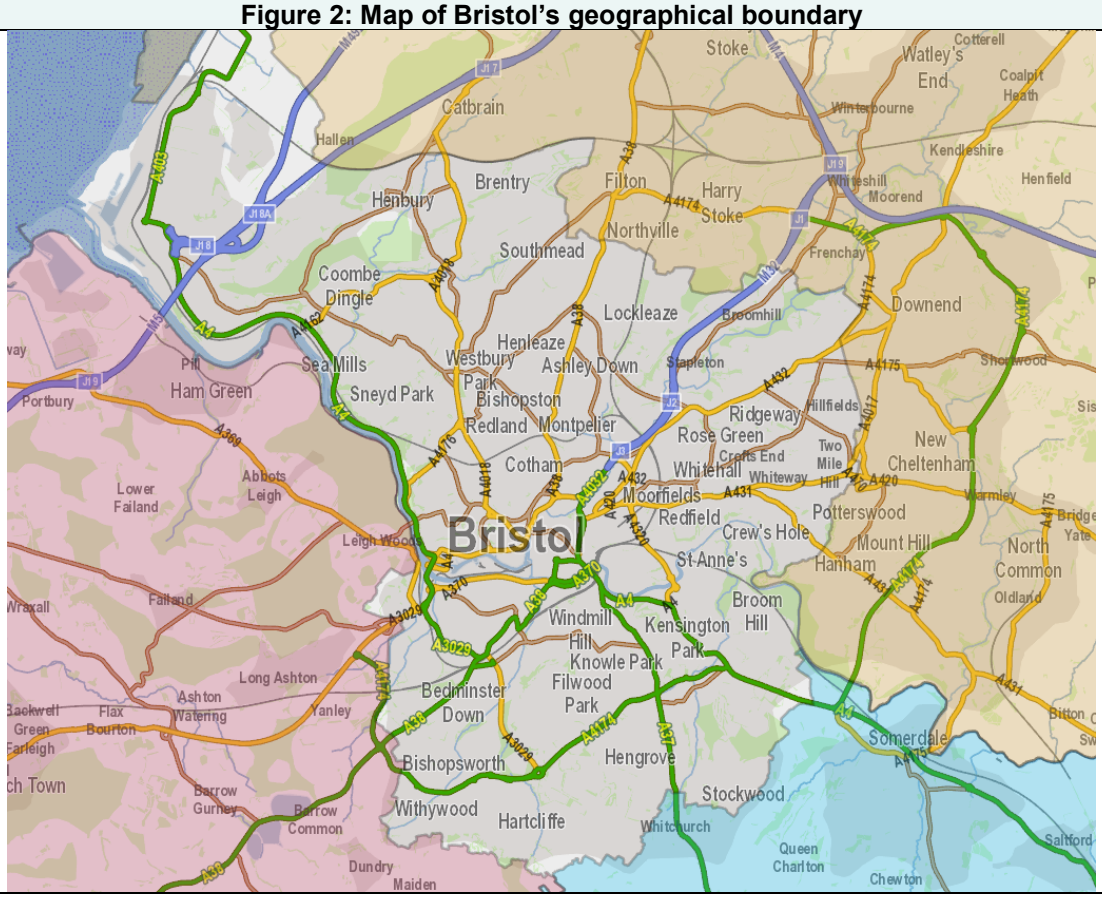
- deepen teamworking
- prioritise actions from the Climate City Contract for development with a view to implementation
- focus on where the Transition Team can help to develop partnerships to bring forward the priority actions and
- work towards obtaining the related funding required to implement actions

This will be a continuous process of development but we plan to review the Climate City Contract (CCC) in two years and update as appropriate. We consider that the plan is comprehensive in its scope but that additional information and detail will be needed actions as are developed and implemented.

Whilst the Transition Team forms the core group working to develop the actions in this plan we shall engage with a much wider group of stakeholders in the city, drawing upon the One City approach and the Mission Net Zero Project (see section A-3.1).

Table I-1.1: Climate Neutrality Target by 2030			
Sectors	**Scope 1**	**Scope 2**	**Scope 3**
Stationary energy	Included	Included	Not applicable
	No exclusions	No exclusions	Not applicable
Transport	Included	Included	Not applicable
	No exclusions	No exclusions	Not applicable
Waste/wastewater	Included	Not applicable	Included
	No exclusions	Not applicable	No exclusions
Industrial Process and Product Use (IPPU)	Included	Not applicable	Not applicable
	No exclusions	Not applicable	Not applicable
Agricultural, Forestry and Land Use (AFOLU)	Included	Not applicable	Not applicable
	No exclusions	Not applicable	Not applicable
Other	Not applicable	Not applicable	Not applicable
Geographical boundary	**Same as city administrative boundary**		

Figure 2: Map of Bristol's geographical boundary



2 Part A – Current State of Climate Action

This section describes the city's greenhouse gas emissions, the current policies and strategies which are aiming to reduce emissions and some of the systemic barriers and opportunities to achieving carbon neutrality.

2.1 Module A-1 Greenhouse Gas Emissions Baseline Inventory

Bristol's Greenhouse Gas Emissions Baseline Inventory

Summary

Bristol has been reporting the city's emissions for many years. The inventory used here is fully aligned with this Climate Neutrality Action Plan, which has been used to model the gap between reductions achievable through other plans, and the 2030 climate neutrality target, as well as the projected impact of the Climate Neutrality Action Plan.

The tool ClimateView was used to create the baseline and emissions pathway as this tool models the relative impact of interventions within the Climate Action Plan. There is confidence in the use of the ClimateView model to create the emissions pathway as the greenhouse gas (GHG) inventory created in ClimateView and used in this Climate City Contract shows strong alignment with national data sets.

An emissions inventory created in 2019 was used to inform Bristol's climate strategy (the One City Climate Strategy, discussed further in section A 2.1). This inventory was used in conjunction with the ClimateView model, to inform the Transition Team's action planning and the design of the actions proposed. These inventories are further supplemented by central government data, all of which show that the energy and transport sectors are the largest sources of territorial emissions (see Figures 3 and 4), which is reflected in the actions presented here. This approach meets the requirements set out in the Cities Mission's Info Kit for Cities.

Further detail

For the purpose of this Climate Neutrality Action Plan, Bristol has produced a territorial greenhouse gas (GHG) emission inventory for the year 2018 (see Tables A1.1 and A1.2 below) using ClimateView, a transition pathway modelling tool. As an activity-based inventory, with dynamic models linking across a range of 'activity shifts', this tool allows real time modelling of different transition pathways, enabling assessment of the emissions impact of different individual and combinations of actions. The model has been used to calculate the level of activity shift and resulting emissions impacts for all of the actions in this Carbon Neutrality Action Plan (see Tables A.2.1 and B.2.2 for further details). The geographic boundary of the emissions inventory and transition pathway modelling is the same as the city of Bristol.

The approaches used in creating the inventory have been checked and validated by the Bristol Advisory Committee on Climate Change (BACCC), an independent, technical committee established by the University of Bristol and the University of the West of England. Further information about Bristol's use of the ClimateView tool is publicly available at www.bristolclimatehub.org/bristols-carbon-emissions/

Whilst some actions covered within this Carbon Neutrality Action Plan relate to consumption-based emissions, the emissions inventory and modelled impacts presented here cover territorial emissions only. This is for clarity and alignment with the requirements of the Climate Neutral and Smart Cities Mission, and because modelling GHG reductions for territorial emissions is regarded as more robust than for consumption-based emissions. Bristol will continue working with partners to understand, act upon and monitor consumption-based emissions through ongoing participation in the EU Mission programme and through its other strategic partnerships and projects.

Emissions arising from Industrial Process and Product Use (IPPU) are excluded from our inventory due to a lack of reliable data. The developing Local Industrial Decarbonisation Plan for Bristol and the West of England region will continue to address data gaps and improve accuracy of emissions data over the coming years, with reliable inventories for IPPU expected before 2030. As new data becomes available it will be added to our inventory to guide further iterations of the Climate Neutrality Action Plan.

All of the figures in ClimateView are calculated in tonnes of carbon dioxide equivalent (tonnes / CO_2e). The model does not currently allow direct input of data for individual GHG types. However, where data for individual GHGs is available, national conversion factors have been applied to include their relative GHG impact in carbon dioxide equivalent terms.

Emission Source by Sector		Total GHGs (metric tonnes CO2e)					
		Scope 1	Scope 2	Scope 3	Basic	Basic+	Basic+ S3
STATIONARY ENERGY	Energy use (all emissions except I.4.4)	690885	375921	0	1066806	0	0
	Energy generation supplied to the grid (I.4.4)	518					
TRANSPORTATION	Transportation	739526	6243	1	745770	0	0
WASTE	Waste generated in the city (III.X.1 and III.X.2)	143130		0	143130	0	0
	Waste generated outside city (III.X.3)	0					
IPPU	(all IV emissions)	0				0	0
AFOLU	(all V emissions)	3000			3000	0	0
OTHER SCOPE 3	(all VI emissions)			0			0
Total		1577059	382164	1	**1,958,706**	**All Basic+ Emissions**	**All Basic+ S3 Emissions**

Table A1.1 Bristol's territorial greenhouse gas emission sources by sector in 2018, produced using ClimateView

GPC ref No.	GHG Emissions Source (By Sector and Sub-sector)	Total GHGs (metric tonnes CO2e)			
		Scope 1	Scope 2	Scope 3	Total
I	**STATIONARY ENERGY**				
I.1	Residential	408582	139467	0	548049
I.2	Commercial and Institutional	191727	219331	0	411058
I.3	Manufacturing Industries and Construction	84055	17123	0	101178
I.4.1/2/3	Energy Industries	0	0	0	0
I.4.4	Energy Generation Supplied to Grid	518			
I.5	Agriculture, Forestry and Fishing	1508	0	0	1508
I.6	Non-specified Stationary Energy	5013	0	0	5013
I.7	Fugitive Emissions from Mining, etc. of Coal	0			0
I.8	Fugitive Emissions from Oil and Natural Gas Systems	0			0
SUB-TOTAL	(city induced framework only)	**690885**	**375921**	**0**	**1066806**
II	**TRANSPORTATION**				
II.1	On-road transportation	625714	281	1	625996
II.2	Railways	9700	5962	0	15662
II.3	Waterborne navigation	38311	0	0	38311
II.4	Aviation	0	0	0	0
II.5	Off-road transportation	65801	0	0	65801
SUB-TOTAL	(city induced framework only)	**739526**	**6243**	**1**	**745770**
III					**WASTE**
III.1.1/2	Solid waste generated in the city	13788		0	13788
III.2.1/2	Biological waste generated in the city	1140		0	1140
III.3.1/2	Incinerated and burned waste generated in the city	120065		0	120065
III.4.1/2	Wastewater generated in the city	8137		0	8137
III.1.3	Solid waste generated outside the city	0			
III.2.3	Biological waste generated outside the city	0			
III.3.3	Incinerated and burned waste generated outside city	0			
III.4.3	Wastewater generated outside the city	0			
SUB-TOTAL	(city induced framework only)	**143130**		**0**	**143130**
IV	**INDUSTRIAL PROCESSES and PRODUCT USES**				
IV.1	Emissions from industrial processes occurring in the city boundary	0			0

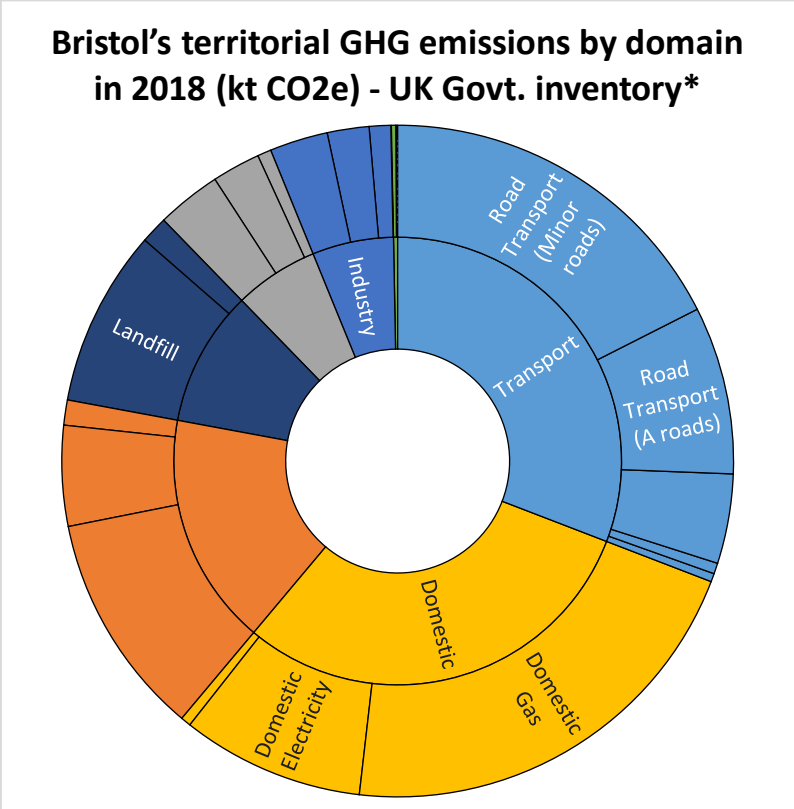
IV.2	Emissions from product use occurring within the city boundary	0			0
SUB-TOTAL	(city induced framework only)	**0**			**0**
V	**AGRICULTURE, FORESTRY and OTHER LAND USE**				
V.1	Emissions from livestock	0			0
V.2	Emissions from land	3000			3000
V.3	Emissions from aggregate sources and non-CO2 emission sources on land	0			0
SUB-TOTAL	(city induced framework only)	**3000**			**3000**
VI	**OTHER SCOPE 3**				
VI.1	Other Scope 3			0	0
Total	(city induced framework only)	1576541	382164	1	**1,958,706**

Table A1.2 Global Protocol for Community-Scale Greenhouse Gas Inventories compliant report: Bristol's territorial greenhouse gas emission sources by sector and sub-sector in 2018, produced using ClimateView

Primary energy	Emission factor	Unit	Secondary energy	Emission factor	Unit
Emission factor natural gas	231	g CO2e / kWh	Emission factor imported grid district heating	198	g CO2e / kWh
Emission factor hydrogen (climate neutral)	20	g CO2e / kWh	Emission factor produced electricity current grid mix average	214.947	g CO2e / kWh
Emission factor atmospheric methane in CO2e	2056.277	g CO2e / kWh	Emission factor solar parks production	36100	g CO2e / kWh / year
Emission factor petrol WTW	319.4	g CO2e / kWh	Emission Factor hydro reservoir production	72500	g CO2e / kWh / year
Emission factor fossil diesel WTW	331.6	g CO2e / kWh	Emission factor solar panel rooftop production per year	36100	g CO2e / kWh / year
Emission factor burning of oil	303.6	g CO2e / kWh	Emission Factor wind onshore production	24000	g CO2e / kWh / year
Emission factor LPG	230.31	g CO2e / kWh	Emission Factor wind offshore production	24000	g CO2e / kWh / year
Emission factor marine diesel	284.84	g CO2e / kWh	Emission factor consumed electricity average	149	g CO2e / kWh
Emission factor aviation turbine fuel	260.86	g CO2e / kWh	Emission factor grid electricity (future) *	45	g CO2e / kWh
Emission factor liquefied natural gas (LNG)	204.49	g CO2e / kWh	Emission factor district heating	47.7	g CO2e / kWh
Emission factor liquefied biogas	0.22	g CO2e / kWh	Emission factor district cooling	62	g CO2e / kWh
Emission factor coal	417.1	g CO2e / kWh	Emission factor residual heat	0	g CO2e / kWh
Emission factor biogas	53	g CO2e / kWh	Emission factor electricity produced PV	25	g CO2e / kWh
Emission factor landfill gas	0.3825	g CO2e / kWh	**Construction**	**Emission factor**	**Unit**
Emission factor ethanol	1.415806867	g CO2e / kWh	Emission factor cement construction	934000	g CO2e / m2
Emission factor biodiesel WTW	79.8	g CO2e / kWh	Emission factor low carbon construction	582000	g CO2e / m2
Emission factor marine biodiesel	18.02867758	g CO2e / kWh	Emission factor limestone calcination in clinker production	520000	g CO2e / tonne
Emission factor aviation biofuel	18.02867758	g CO2e / kWh	Emission factor limestone calcination in lime production	768000	g CO2e / tonne
Emission factor solid biofuel	23.4	g CO2e / kWh	Emission factor wastewater treatment	272	g CO2e / m3
Emission factor geothermal heat	0	g CO2e / kWh	Emission factor sludge	706	g CO2e / kWh
Emission factor active travel	0	g CO2e / kWh			
Waste	**Emission factor**	**Unit**	Waste	**Emission factor**	**Unit**
Emission from open burning of solid waste	487000	g CO2e / tonne	Emission factor solid waste landfill	456204	g CO2e / tonne
Emission factor recycling of solid waste	21317	g CO2e / tonne	Emission factor incineration of solid waste	330000	g CO2e / tonne
Emission factor emission factor solid waste composting	8918	g CO2e / tonne	Emission factor emission factor solid waste anaerobic digestion	22800	g CO2e / tonne

Table A1.3 Emissions factors used in this emissions inventory

UK government data produced by the Department of Energy Security and Net Zero (DESNZ) are not presented in a GPC format and take a different approach to aggregating emission domains. However, this data still provides a useful comparison for our emissions inventory, which shows a similar proportionate breakdown of emissions domains (see Figures 4 and 5).



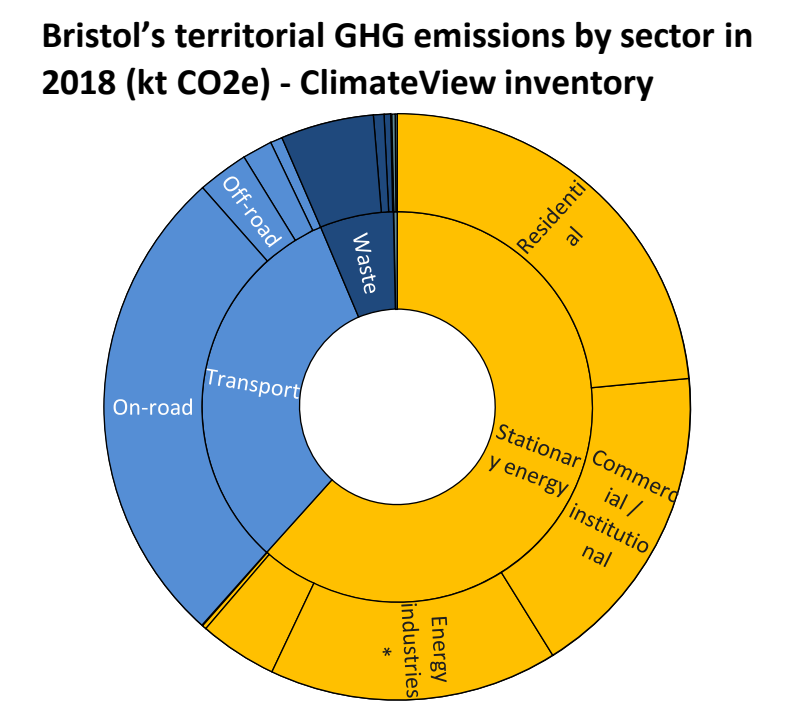


Figure 3 (above): Bristol's territorial GHG emissions by domain in 2018 – adapted from DESNZ data 2024
Figure 4 (below): Bristol's territorial GHG emissions by sector in 2018 – adapted from ClimateView data

The UK government data also provides a historical lookback to 2005 (see Figure 5), which is not easily achievable using ClimateView. This data set further supports the conclusions reached when considering our emissions inventory, which shows that the primary areas of focus for emissions reductions must be targeted at transport and heat for buildings.

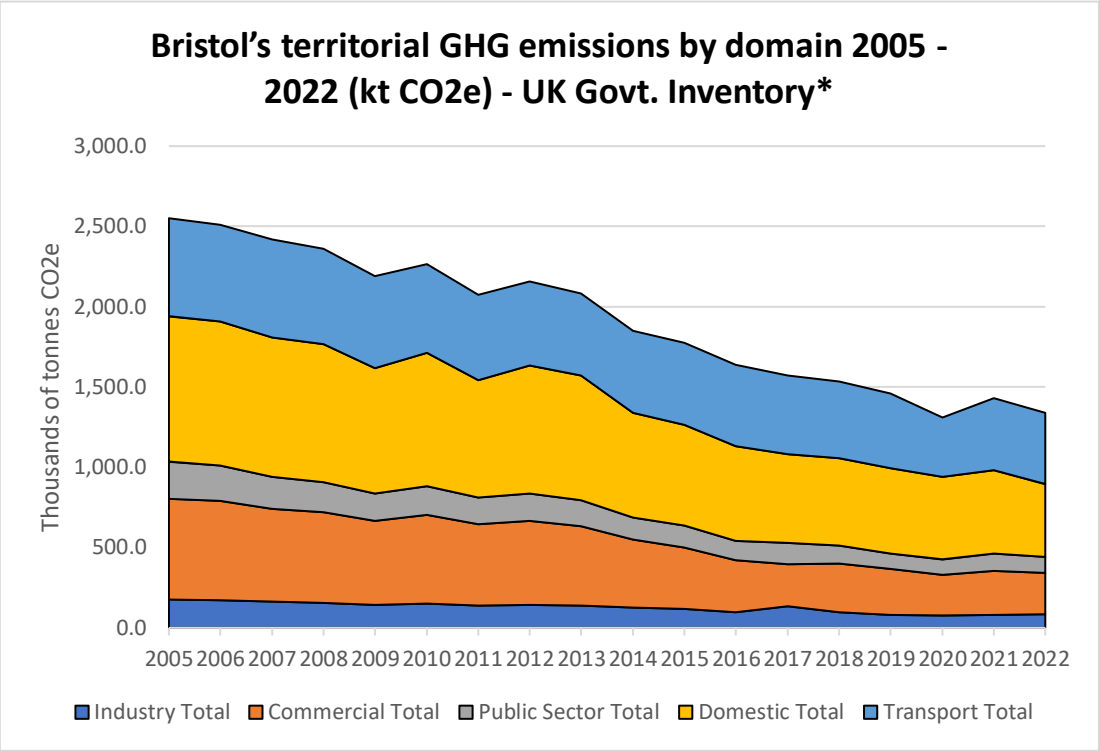


Figure 5: Bristol's territorial GHG emissions by domain 2005-2022 - adapted from DESNZ (2024)

The emissions inventory forms the 2018 baseline presented here (see tables A.1.1 and A.1.2). This has then been used to create an assessment of existing policies and their likely emissions impact out to 2030, serving as the business-as-usual (BAU) scenario and remaining emissions gap which needs to be addressed through this Climate Neutrality Action Plan (see Figure 6 and Table A.2.1).

The modelled emissions impact of all the actions in this plan have been presented in terms of their net impact, that is minus the projected impact of actions arising in the BAU scenario. In this way **there is certainty that none of the modelled emissions reductions resulting from the actions in this plan have been double counted**. A summary of these scenarios is presented in table A.2.1.

Finally, it shoud be noted that ClimateView is a whole city-system model which links multiple activity changes together. This approach is beneficial for understanding the relationships between changes to different combinations of energy producing and consuming activities now and in the future. However, the approach can also show the potential abatement of certain actions as being relatively low in 2030. For example, the emissions reduction achievable through retrofitting of domestic properties is significantly lower in 2030 than it is today, if in 2030 those properties are served by low carbon heating systems.

2.2 Module A-2 Current Policies and Strategies Assessment

A-2.1: Description & assessment of policies

Summary – Bristol's policy context
The national UK target is for carbon neutrality by 2050 and its policies have been designed with this timeframe, and not 2030 in mind. The current UK Nationally Determined Contribution to the Paris Agreement is to reduce emissions in 2030 by 68% compared to 1990 levels. The independent advisory body to the UK government has said that the UK is not currently on track to meet its next carbon budget saying that only a third of the emissions reductions required to achieve the 2030 target are currently covered by credible plans.

Currently, there is neither sufficient public sector funding for climate action to support Bristol's work, nor sufficient support for capacity building so that Bristol may adequately engage with private investment to close the gap in investment required for the city to become carbon neutral. However, we anticipate a more favourable future national policy context following the change of government in July 2024.

To date, national support for climate action has been directed to interventions at the regional level (the South West of England). We anticipate that this principle will continue with the refinement that regional support would potentially be directed to regional combined authorities, in our case the West of England Combined Authority which is the regional administration. The regional policy context has been supportive of carbon neutrality in Bristol with a shared ambition of 2030. In addition, Bristol's Pilot City Project - the Net Zero Investment Co-innovation Lab – has resulted in an increased interest in the use of regional funding to attract private investment in climate action.

We are pleased to have the conditions in Bristol which enable us to go beyond the national policy context including engaged citizens and politicians, networks of organisations with an interest in climate action and capacity of organisations to support innovative climate work. Locally, Bristol is therefore doing the most it can within this policy context although lacks local authority resources for further climate action or to further engage the private sector to resource climate action. **The relative lack of national support and the positive results of local action demonstrate the importance of the support and capacity building which may be obtained via Bristol's continuing participation in the Mission Cities network with assistance from the European Union via Net Zero Cities.**

Summary – Bristol's emissions gap
An assessment of existing policies conducted at the national and local level show that the UK and Bristol are not on track to achieve carbon neutrality by 2030. Bristol's current assessment estimates that without additional action in 2030 the city will have reduced its territorial emissions by one third compared to a 2018 baseline.

Further detail on the relationship to existing policies

National policy
The UK, the West of England Region and the city of Bristol all have policies and strategy frameworks which are at the international forefront of climate action. The UK was the first major economy set to set legal, binding carbon budgets.

In July 2024, a new UK government was elected and is expected to bring forward new climate policies and plans which it is hoped will accelerate climate action in the UK and Bristol. The following text sets out the national policy position prior to the election (other than where the new government's policy has been announced regarding clean power).

There is not a nested approach in the UK where national policy informs a coherent programme of linked national, regional and local action. Instead, local authorities have set their own ambitions which often run ahead of national ambition; this is the case in Bristol.

Significantly, there is limited climate policy support targeted at places who are forerunners/pilots to assist them in achieving carbon neutrality. There is neither sufficient national public sector funding to achieve carbon neutrality in Bristol by 2030 nor is there national support to Bristol or other places to enable them to engage with private investors to fill the gap in funding for climate action. For this reason, Bristol's participation in the Horizon Europe Climate Neutral and Smart Cities Mission is an essential support to enable action towards obtaining the necessary investment in climate action.

The UK has a national target established in legislation to reach net zero by 2050 and a current Nationally Determined Contribution to reduce emissions in 2030 by 68% compared to 1990 levels.[1] The 2024 statutory Progress Report to Parliament prepared by the UK Committee on Climate Change provides a comprehensive overview of the UK government's progress and future plans for reducing emissions. It noted that the UK has committed to reduce emissions in 2030 by 68% compared to 1990 levels, but that *"the country is not on track to hit this target"* and that *"only a third of the emissions reductions required to achieve the 2030 target are currently covered by credible plans. Action is needed across all sectors of the economy, with low-carbon technologies becoming the norm."* This was therefore not a policy context that was helpful to Bristol's ambition to be carbon neutral by 2030 and underlines the importance of Bristol's participation in the Horizon Europe Climate Neutral and Smart Cities Mission.

National policies for decarbonising all sectors of the UK economy to meet the 2050 target are set out in the UK Net Zero Strategy published in 2021. Many of the national actions within the strategy are to be implemented after 2030 including achieving clean electricity (2035) and cessation of sale of new gas boilers (2035) and are therefore not a supportive context to Bristol's action plan. However, some national funding specified within this strategy - such as the Social Housing Decarbonisation Scheme, Home Upgrade Grants and the Public Sector Decarbonisation Scheme - could be used for the implementation of certain actions such as retrofitting private homes or decarbonising public sector buildings. Bristol organisations well understand and are able to maximise the use of these public funding schemes (and have consortia in development for this purpose) and would demonstrate this within potential private sector investment cases but the amounts available are insufficient to fully fund the actions envisaged in this plan.

Sector-specific national policies

Energy

Further updates to the UK Net Zero Strategy, Powering Up Britain, published in 2023 looked at energy security and economic growth in relation to net zero but these do not create any opportunities to advance climate action in Bristol.

As regards the decarbonisation of the energy sector, the new government has announced a mission to achieve clean power by 2030. This should assist Bristol's ambition but we await the details of this approach. There is an existing National Grid Network Development Plan which guides local upgrades to the electricity network. As discussed in the Impact Pathways concerning energy, the upgrades are required to support the increased electrification of services but this has been tempered by the energy sector regulator requirement to keep consumer costs low.

Transport

Similarly for the transport sector, the Decarbonising Transport guidance published in 2021 sets out a proposed plan including the pathway to net zero transportation in the UK by 2050 but does not imply any positive context as regards achieving Bristol's 2030 target.

Spatial planning

Within national policy concerning building regulation the Future Homes Standard aims to reduce waste energy in new buildings which will contribute to the national 2050 net zero target. This is reflected in local planning policy discussed in the local context below.

Regional policy
The local climate action section within the UK Net Zero Strategy focuses on knowledge sharing and support to regional net zero hubs. Directing support to the regional level has been the standard model for national climate policy support to date. For Bristol this has meant national resource has been directed to a hub for the whole South West of England. We anticipate that future national government support would continue to follow the regional model but potentially be directed to regional combined authorities, in our case the West of England Combined Authority which is the regional administration which covers only the West of England, a smaller geography than the South West of England.

The regional policy context has been supportive of carbon neutrality in Bristol with good cooperation between the local authorities which make up the West of England Combined Authority. The West of England Combined Authority has a Climate and Ecological Emergency Strategy and Action Plan that covers climate and ecology strategy and action. It was agreed by all the constituent authorities of the Combined Authority who all share a 2030 ambition for carbon neutrality and sets out a framework for action. Some of the actions in that plan have been implemented at an initial scale and would need to be scaled up to achieve the 2030 ambition. Where relevant these scaled-up actions have been included within this action plan. For example, our proposed action to implement a programme to install or encourage/incentivise installation of heat pumps in homes in the city is designed to be a scaled-up version of the existing Retrofit Accelerator offer developed by the West of England Combined Authority (delivered by Retrofit West) first established in the regional action plan.

In addition, Bristol's Pilot City Project - the Net Zero Investment Co-innovation Lab, is intended to result in a £100 million investment fund to invest in businesses and projects providing goods or services contributing to transitioning to a low carbon economy in the West of England. In this way, the support of Horizon Europe and the dedication of Bristol City Council to leading the Net Zero Investment Co-innovation Lab can be seen to be critical to the progress being made at a regional level.

City-level policy and plans
We are pleased to have the conditions in Bristol which enable us to go beyond the national policy context including engaged citizens and politicians, networks of organisations with an interest in climate action and capacity of organisations to support innovative climate work.

For example, setting the strategic framework for action at the city level, Bristol's One City Environment Board published the One City Climate Strategy in 2020. It contains objectives for 2030 which the Transition Team members took as their framework for creating the actions in this plan.

Foundations for current action
Foundational projects
Numerous individual projects have been completed since 2020 which help to realise the One City Climate Strategy and act as forerunners to the actions in this plan. These projects include Bristol's Black and Green Ambassadors; Bristol Climate Hub; Bristol Climate Ask; Climate Action Programme and Climate Leaders' Group plus the Community Leadership Panel on Climate and Just Transition; Bristol's Liveable Neighbourhoods; REPLICATE (which used the 6 step Bristol Approach to engage people with technological innovations) and the Bright Green Homes Programme as well as projects related to how to finance city action including Bristol's Net Zero Investment Co-Innovation Lab and City Funds. There have been upgrades to city streetlighting to LED lighting and significant community energy projects including the community-owned wind turbine at Lawrence Weston. These all provided a helpful context as the Transition Team members were aware of how to build on these successful projects and experience to create this plan.

Many Transition Team members have plans to decarbonise their own operations but all are making a significant contribution at city level. For example, Bristol City Council has volunteered to coordinate the efforts to achieve the One City Climate Strategy (action at the city level). This coordination work includes employing a Climate Strategy Coordinator role to work with city partners, encouraging and supporting them to take action in relation to the city strategy; this includes convening the Transition Team and leading the process of production of this Climate City Contract. This coordination work was therefore a very helpful component of this action plan.

Foundational approaches - Community Climate Action Plans
To date, 11 Community Climate Action Plans have been co-created with Bristol residents. Community organisations hosted accessible climate conversations exploring the themes of transport, energy, food, waste, nature, buildings, jobs/economy and inequality. These conversations enabled each community to create a unique set of climate priorities as part of a comprehensive community climate action plan. These action plans help secure the community consent and co-design which is vital to create services which meet people's needs (therefore more likely to be used) and achieve carbon reduction measures in the city aligned to a just transition. As such, this people-centred approach is very supportive to Bristol's ambition. Further expansion of this approach to more communities in Bristol is reflected in the actions in this action plan.

Sector-specific local policies
The most significant Bristol policies, strategies and partnerships in addition to the One City Climate Strategy are analysed below.

Transport
Bristol City Council's Bristol Transport Strategy provides a supportive context in that the framework sets out how Bristol will improve transport to meet increased demand from the growth in housing, jobs and regeneration create an inclusive transport system that provides realistic transport options for everyone create healthy places that promote active transport, improve air quality and improve road safety make better use of our streets to enable more efficient journeys enable more reliable journeys by minimising the negative impact of congestion support sustainable growth by enabling efficient movement of people and goods, reducing carbon emissions and embracing new technology

Spatial planning
The new Bristol Local Plan (currently in draft but expected to come into force following independent examination) will provide a new policy framework that will govern development in Bristol up to 2040. It has a key role to play in supporting sustainable development, by setting out policies that address a range of complex issues. The plan contains policies that support the sustainable location of development, improvements to transportation, and the creation of more sustainable and climate resilient buildings. It is a key component of Bristol's 2030 climate neutrality ambition and provides a supportive context for Bristol's actions.

Joint venture partnerships - Bristol City Leap
Bristol City Leap is a 20-year joint venture partnership between Bristol City Council, Ameresco and Vattenfall Heat UK which will enable delivery of over £1 billion of investment into Bristol's energy system. Bristol City Leap has created a substantial pipeline of decarbonisation projects, many of which will take place on the Council's corporate estate, social housing and vehicle fleet, and are expanding the Bristol Heat Network. They are also working with key local organisations, commercial partners and communities to invest in local decarbonisation projects, while generating social value. The business plan sets out what they have achieved in their first year and updated their plans to deliver approximately three quarters of a billion pounds investment by 2029. These future actions form an essential part of this action plan. Therefore, a positive contribution to this action plan will be made by the Bristol City Leap Investment Plan and Business Plan.

Conclusions on the policy context
All of the above demonstrate that Bristol is doing the most it can within the national policy context although lacks local authority resources for further climate action or to further engage the private sector to resource climate action. The limitations of national support and the positive results gained from local action both underline the importance of the support and capacity building derived from Bristol's participation in the Mission Cities network.

The remaining gap to the 2030 climate neutrality target to address in this Action Plan
The emissions inventory presented here (see Tables A.1.1 and A.1.2) and impact modelling were used to create an assessment of existing national, regional and local policies and their likely emissions impact out to 2030. This serves as the business-as-usual (BAU) scenario to assess the emissions gap which needs to be addressed through this Climate Neutrality Action Plan (see Figure 6 and Table A.2.1).

This modelling estimates that in 2030 the city's territorial emissions will have reduced by approximately 33% compared to 2018, leaving 1,315,592 tonnes CO_2e to be addressed through this climate neutrality action plan.

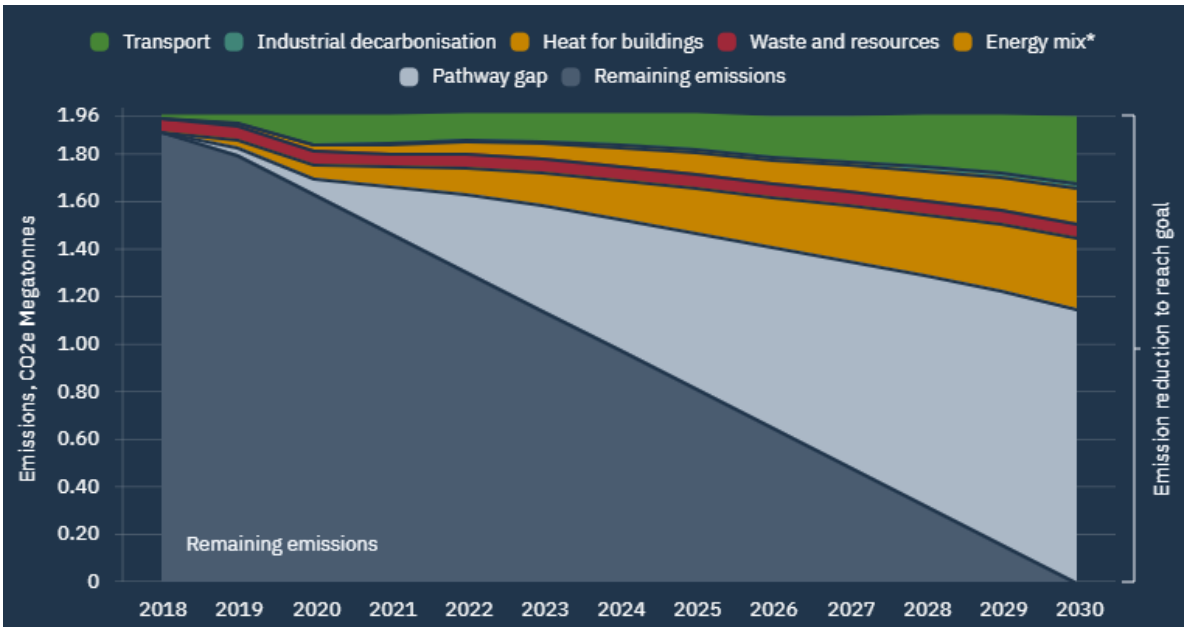


Figure 6: **Assessment of the projected impact of existing policies by 2030 and emissions gap to climate neutrality**

The modelling of our Climate Neutrality Action Plan estimates that in 2030 the city's emissions will have reduced by a further 55%, a reduction of **1,068,016** tonnes CO_2e (see Figure 7).

The combined emissions impact of this Climate Neutrality Action Plan has been modelled using the same baseline inventory and method as the BAU scenario and is presented in terms of their net impact; that is minus the projected impact of actions arising in the BAU scenario. In this way **there is certainty that none of the modelled emissions reductions resulting from this action plan have been double counted**. A summary of these scenarios is presented in Table A.2.1.

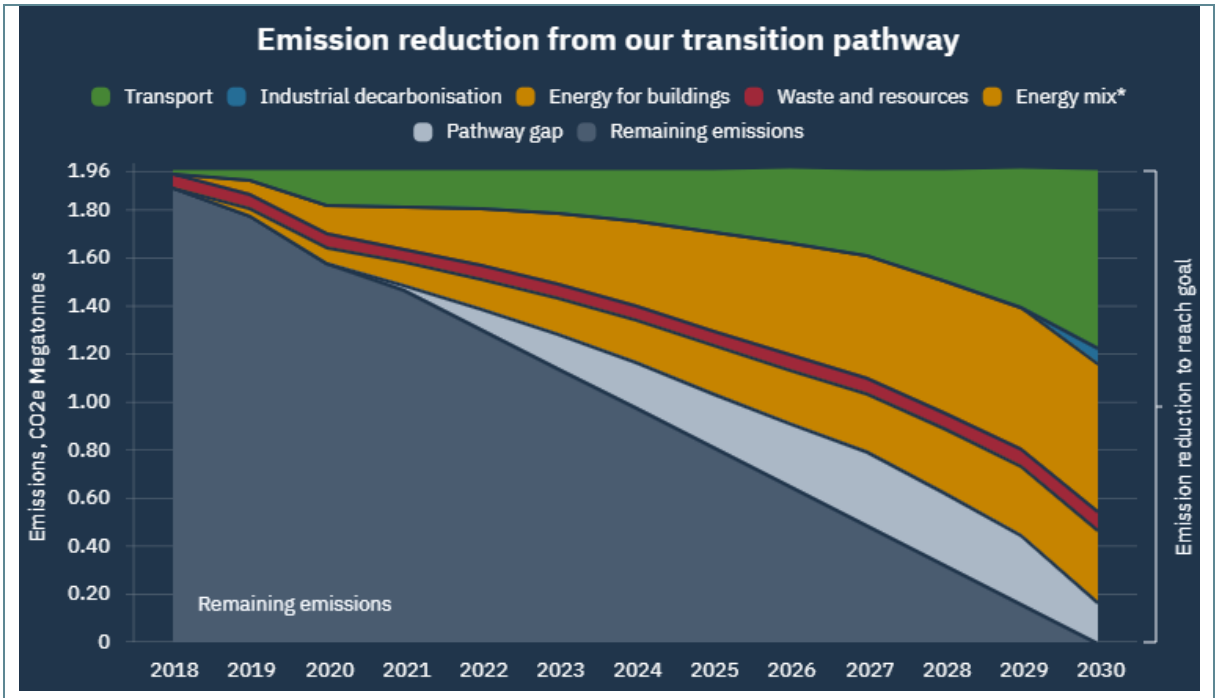


Figure 7: Transition pathway for this Climate Neutrality Action Plan

Residual GHG emissions estimated for 2030

The pathway above models the emissions impact of full implementation of each of the actions within this plan. However, even with full implementation of these actions we estimate residual emissions in 2030 to be **247,576** tonnes CO_2e.

The reasons for these emissions being unavoidable within the action plan timeframe are that electricity consumed for both stationary and transport energy is expected to retain a carbon intensity of 45-42g CO_2e / kWh in 2030. In addition, the carbon intensity of the heat network is expected to be 21g CO_2e / kWh in 2030. Currently, it is not believed that the carbon intensity of both these networks can be further reduced within the timeframe given the constraints of the existing and planned infrastructure this decade. However, it should be noted that this assessment is based on the information that is presently available; further reductions in the carbon intensity of the national electricity grid are possible but cannot yet be confidently assumed.

Table A-2.1	(1) Baseline emission in 2018	(2) Emissions Reduction Target for 2030 (One City Climate Strategy)	(3) Estimated emission reduction achievable through other Action Plans		(4) Emissions Gap		(5) Emissions reduction achievable through the CCC Action Plan to address the Gap		(6) Residual emissions (Projected remaining after full implementation of CCC Action Plan)	
Emissions domain	**(absolute) (tonnes CO2e)**	**(%)**	**(absolute)**	**(%)**	**(absolute)**	**(%)**	**(absolute)**	**(%)**	**(absolute)**	**(%)**
Stationary Energy	1,066,806	100	312,934	29.33%	753,872	70.67%	529,716	49.65%	224,156	21.01%
Transport	745,770	100	268,350	35.98%	477,420	64.02%	457,000	61.28%	20,420	2.74%
Waste	143,130	100	61,830	43.20%	81,300	56.80%	81,300	56.80%	0	0
Industrial Process and Product Use (IPPU)	0	100	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Agricultural, Forestry and Land Use (AFOLU) Sources	7,500	100	0	0	7,500	100.00%	0	0	7,500	100
Agricultural, Forestry and Land Use (AFOLU) Sinks	-4,500	N/A	N/A	N/A	-4,500	N/A	N/A	N/A	-4,500	
Total	**1,958,706**	**100.00%**	643,114	**32.83%**	1,315,592	**67.17%**	1,068,016	**54.53%**	247,576	12.64%

Table A-2.1 shows Bristol's territorial emissions baseline in 2018, the city's carbon reduction target, an assessment of emissions impact of existing policies, the remaining gap to be addressed through this plan, assessment of the emissions impact of this plan, and the projected residual emissions after its full implementation.

2.3 Module A-3 Systemic Barriers and Opportunities to 2030 Climate Neutrality

A-3.1: Description of urban systems, systemic barriers, and opportunities

The main systems in Bristol related to GHG emission domains are set out below.

Main governance systems
The city has established the Bristol One City Approach. The Bristol One City Approach brings together a huge range of public, private, voluntary and third sector partners to work together to make Bristol fairer, healthier and more sustainable.

The Bristol City Office, funded by Bristol City Council, University of Bristol, University of the West of England, City of Bristol College, North Bristol NHS Trust and University Hospitals Bristol and Weston NHS Foundation Trust, provides a convening space for everyone who wants to be involved in the One City Approach.

The One City Approach involves boards of city partners which cover 6 thematic areas of the One City Plan: Economy and Skills, Children and Young People, Transport, Homes and Communities, Environment and Health and Wellbeing. These themes are reflected in the Bristol City Council governance model with Committees related to similar themes: Adult Social Care, Children and Young People, Economy and Skills, Environment and Sustainability, Homes and Housing Delivery, Public Health and Communities, Strategy and Resources, Transport and Connectivity. This committee system replaced the former Mayor and Cabinet system in May 2024. The elected councillor who chairs the Council's Committee on a given theme is also the co-chair of the respective One City Board, along with another city partner to assist with that integration.

It should be noted that, whilst there is a relationship between the boards and the council committees, there is no direct governance of the local authority by the city boards nor governance of the city boards by the local authority implied by the integration between boards and committees; there is only a coordinating relationship. Nor is there a governance relationship between the Transition Team and any of these boards or committees.

The 6 thematic One City Boards are supported by a Culture Board, the Bristol SDG Alliance and the Bristol Advisory Committee on Climate Change.

Specifically, the One City Boards are advised on climate change by two bodies:

- The Bristol Advisory Committee on Climate Change. The committee is an independent, technical committee established by the University of Bristol and the University of the West of England at the request of the former Mayor. Its purpose is to provide technical advice to help the city of Bristol to understand and accelerate progress towards its ambition to be a carbon neutral and climate resilient city by 2030. They review evidence and provide independent advice and recommendations to the One City Boards on progress made against carbon neutral targets and climate resilience planning. We provide critical commentary on the climate consequences of plans, policies and strategies affecting the city.
- The Community Leadership Panel on Climate and Just Transition. The panel is a pioneering initiative to develop strategic community influence on important climate and nature planning and decision-making. The panel bring diverse community insights and lived experiences and can advocate for the priorities of Bristol communities. The panel complements other climate expert groups in the city, such as the Bristol Advisory Committee on Climate Change, by bringing a climate justice-oriented approach to strategic thinking and planning in the development of climate and ecological emergency work.

A key part of the city's governance model is the Bristol Climate and Nature Partnership. This network of over 1,200 organisations aims to catalyse collective citywide action towards a zero carbon, nature-rich and socially just Bristol. They collaborate with policy makers, the public sector, businesses, charities, communities, and underrepresented groups, helping partners design and implement their own responses to the climate and nature crises – in a fair, fast and inter-connected way. They provide the

secretariat to the One City Environment Board, the Bristol Advisory Committee on Climate Change and the Community Leadership Panel on Climate and Just Transition.

The One City Approach was used to develop the One City Climate Strategy (2020), reflecting the fact that no one organisation can tackle climate change alone. **This need for integrated action is one of the key challenges for action on climate change.**

The main city systems to be decarbonised (emissions domains)
The Bristol One City Climate Strategy set out the key city systems to be decarbonised in ten key themes (emissions domains) as well as the six key factors to creating the appropriate 'enabling conditions' for achievement of carbon neutrality in the city. These are both shown in Figure 9 below, with the key city systems shown in the outer circle and the enabling conditions for change (barriers to change) in the inner circle. The enabling conditions can be seen to relate to the Mission Systemic Levers as shown in Figure 8 below. They also relate to the main risks to enabling carbon neutrality by 2030 as discussed in the Investment Plan risk management framework.

One City Climate Strategy Enabling Condition	**Related Mission Systemic Lever**
Data	Learning and capabilities
Funding	Finance and funding
National action	Governance and policy
Skills	Learning and capabilities
Engagement	Social innovation; Democracy and participation
Infrastructure	Technology and infrastructure

Figure 8: The relationship between enabling conditions and systemic levers

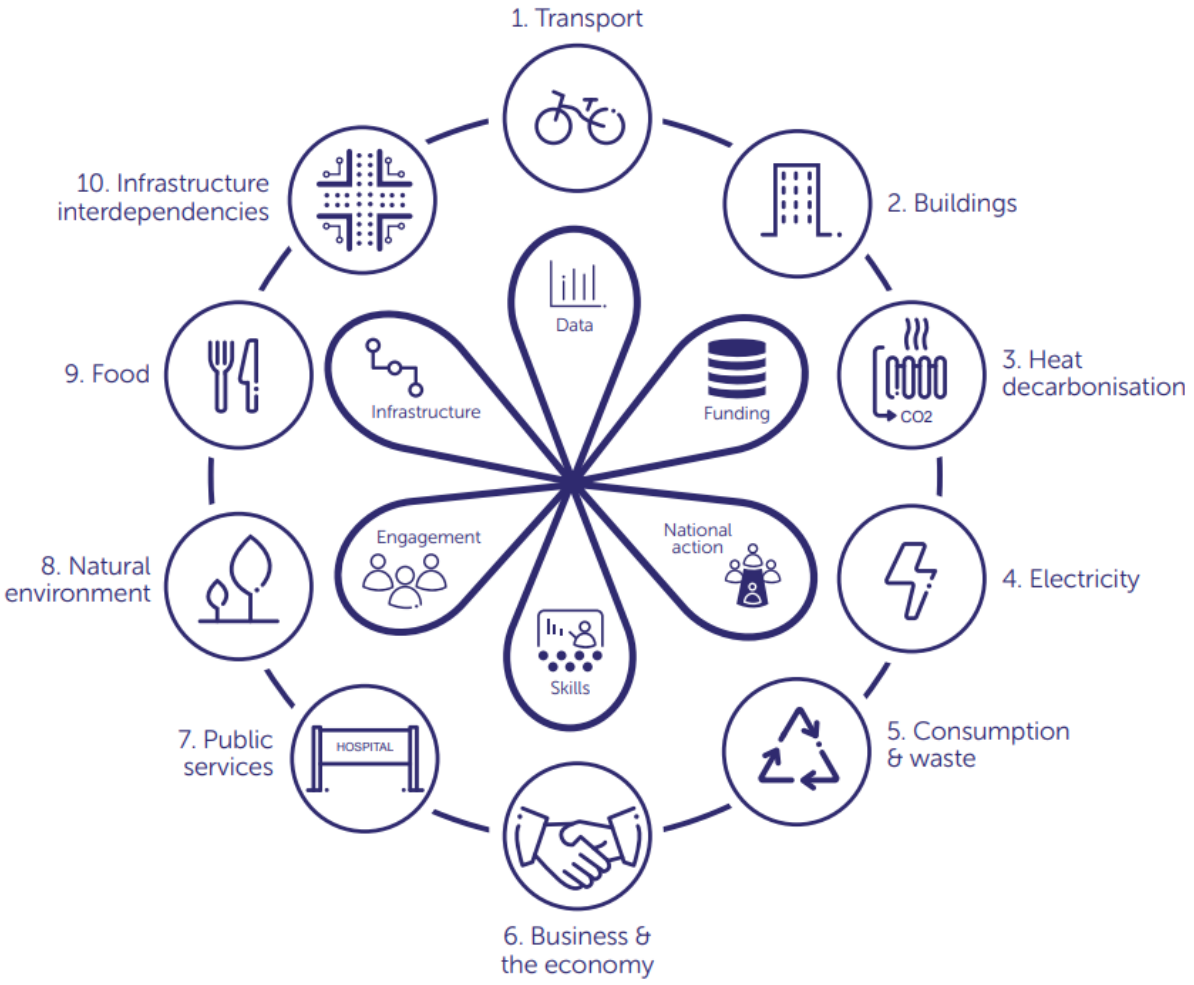


Figure 9: The 10 key themes (emissions domains) for climate action in Bristol and 6 enabling conditions

Of these 10 key themes, the majority of emissions (related to the Mission definition) are associated with these priorities:

1. Transport
2. Buildings
3. Heat decarbonisation
4. Electricity

Emerging areas to take forward in the portfolio design below reflect these priority themes, particularly the emissions associated with transport and heat for buildings as noted in baseline inventory.

Stakeholder Mapping

Whilst all of the One City Boards in some way relate to climate change, there are One City Boards covering Environment; Transport; Economy and Skills; Homes and Communities. Separate stakeholder mapping by One City Climate Strategy theme (emission domain) was not documented in 2020 as part of the strategy. However, as part of the Climate City Contract preparation stakeholders have been identified both to join the Transition Team and by their relationship to the emissions domains set out in this Action Plan. See Table A3.2 for a high-level mapping of proposed stakeholders to emissions domains.

The Transition Team

As part of the development of this plan we undertook a more detailed stakeholder mapping exercise and from that invited organisations to join the Transition Team. Many members of the Transition Team are also represented on the One City Boards but in addition some regional and national organisations with key roles in decarbonisation of the city have joined the Transition Team. However, there is no formal

connection or governance of the Transition Team by the One City Boards. All member organisations were chosen to be part of the team because of their previous actions which have made a contribution at city level. The networked partnership model (model C in the Transition Playbook) was chosen as the basis of the Transition Team which comprises 27 member organisations.

The membership by sector is as follows:

Public sector

Bristol City Council (coordinator), North Bristol NHS Trust, Bristol's City Office, West of England Combined Authority

Not for profit sector

Bristol and Bath Regional Capital, Bristol Energy Network, Bristol Climate and Nature Partnership, Future Leap, Centre for Sustainable Energy, Retrofit West, SevernNet

Public and private sector

Bristol City Leap

Private sector

Bristol Waste, Bristol Water, Business West, Enterprise Mobility, National Grid, NatWest, OVO Energy, TLT Solicitors, Wales and West Utilities, Wessex Water, Vattenfall UK

Academia

City of Bristol College, University of Bristol and also Cabot Institute for the Environment - University of Bristol, University of the West of England

The Transition Team have considered the priority areas of emissions and a future step will be to prioritise in what order to tackle the suggestions for the 26 individual actions set out in this plan.

Barriers

Within the One City Climate Strategy we refer to the barriers to change as the 'enabling conditions' required for change. As shown above they are cross-cutting relating to all the ten themes (emissions domains) of the strategy and also have relevance to risk management. The Transition Team considered these enabling conditions during action planning. Whilst this strategy was developed in 2020, the enabling conditions are largely unchanged. They can be summarised in six themes:

- Engagement, culture and inclusion
- Funding and finance
- National and regional action and city leadership
- Skills and capacity
- Data and knowledge
- Infrastructure

Opportunities and strengths

In more detail the opportunities and strengths in relation to the six themes taken in turn are as follows:

Engagement, culture and inclusion

The citizens of Bristol are concerned about climate change – with over 80% reporting being concerned of very concerned about in the Annual Quality of Life survey. Many residents are also taking action on the basis of this concern, changing how they travel, reducing waste and improving the energy efficiency of their homes. These concerns are reflected in the priorities of the political parties elected by the citizens. For nearly 20 years all of climate targets set by the city council have been unanimously supported by elected councillors.

Achieving carbon neutrality offers many benefits beyond reducing our contribution to climate change, such as improved air quality from a reduction in combustion of diesel, petrol and gas in the city and warmer homes from better insulation.

A key area of development since the strategy was created is the increased focus and definition of the Just Transition with the creation of the Bristol Just Transition Declaration. Working towards a Just Transition provides an opportunity for net zero projects to contribute to addressing existing inequalities whilst avoiding new ones. This is an important matter for Bristol where there are significant inequalities.

These opportunities and concerns therefore led to the actions suggested under Impact Pathway 1: Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills.

Funding and finance

A key opportunity in Bristol is the existence of Bristol City Leap. In 2023, Bristol City Council signed a world-first partnership, known as Bristol City Leap, that will secure over £1 billion of investment in low carbon projects. This joint venture with Ameresco Limited, and Vattenfall Heat UK as an essential subcontractor, will rapidly increase the scale and pace of investment in low carbon energy infrastructure. This includes wind energy, solar energy, low carbon heat networks as well as other energy efficiency measures and smart energy systems. The current business plan 2024-2029 includes £770m of investment. Bristol City Leap is a Transition Team member and has been involved in the action planning. The stakeholder partnerships coming together to implement this work provide a good foundation for future work to develop further stakeholder partnerships for other actions foreseen in the action plan.

Bristol City Council and partners are also working on two related projects which seek to build the capabilities and capacity of the city and region to be able to secure and deliver investment in decarbonisation. These are:

1. The Mission Net Zero Project which focuses on addressing some of the barriers to achieving a fast and just transition to net zero – or creating the enabling conditions set out in the One City Climate Strategy. Specifically, it looks at the interconnected barriers of Engagement, culture and inclusion; Funding and finance; Skills and capacity and is underpinned by Data and knowledge.

   It draws directly on the thinking and model behind the Climate Neutral and Smart Cities Mission.

   The project runs from March 2024 to November 2025 and is part of the Innovate UK funded Net Zero Living Programme. Funding will be used to:
   - Support three communities in Bristol to plan the climate action projects that they want in their neighbourhoods and help them secure money to take them forward (Engagement, culture and inclusion). This could include improving the energy efficiency of homes, generating more renewable energy or other actions.
   - Create structures and arrangements for the creation of net zero neighbourhoods by focusing place based public and private finance to meet the needs of local people (Funding and finance).
   - Support small businesses and people wanting to work on these climate projects, creating jobs and providing training for local people (Skills and capacity).
   - Link the local action with a more strategic climate investment plan for Bristol and the West of England, to help direct investment into projects that will help reduce carbon emissions and create the infrastructure such as electricity grid enhancements that will enable local delivery (Data and knowledge).

   The outputs of Mission Net Zero will be used to support the future iterations of the One City Climate Action and Investment Plans.

2. The Net Zero Investment Co-innovation Lab, a Net Zero Cities Pilot Project, is developing a suite of new investment models. The Lab brings together a number of local partner and national experts in finance to understand the existing opportunities for net zero funding and finance. It is creating several funds to enable citizen investment in climate action, impact funding in net zero projects and businesses and blended investment in net zero neighbourhoods. It is targeting the creation of £100m of funding by May 2025. The Lab, with its partnership and associated advisory group provides the ideal platform for continued capacity building.

Skills and capacity

A further opportunity/strength of Bristol is the Bristol Climate and Nature Partnership. The partnership has over 1,200 members from all sectors and catalyses collective citywide action towards a zero carbon, nature-rich and socially just Bristol. It collaborates with policy makers, the public sector, businesses, charities, communities, and underrepresented groups. It is helping them to design and implement their own responses to the climate and nature crises – in a fair, fast and inter-connected way. The city is also home to many national organisations with clear remits and strong track records of improving our

environment, such as Sustrans, the Soil Association, the Environment Agency headquarters and the Centre for Sustainable Energy.

The One City Climate Strategy references that replacing fossil fuels consumed in Bristol would require 7,500 – 10,000 full time workers for 10 years. This creates a great opportunity to increase employment and replace jobs that are no longer needed. This replacement of jobs highlights the importance of a just transition in which the impacts and opportunities are justly shared. A number of the impact pathways contain actions on skills and training to enable the capacity to deliver the programmes of work envisaged e.g. for heat pump installation. Impact Pathway 1 also contains suggested actions for green skills and jobs to be available to a diverse range of people.

Data and knowledge
We need to build on and develop current knowledge to focus on the key issues and understand the emissions reduction impact of actions. We have used ClimateView to model the suggested actions in this plan. The Transition Team would be able to review the foreseen impacts as they prioritise where to focus. There is also an opportunity to share data between Transition Team members where agreed.

Infrastructure
A number of the actions are infrastructure actions. Significant new infrastructure needs to be delivered across the city and beyond to create the emissions reductions envisaged. Existing infrastructure also needs to be maintained. Infrastructure is important to both emissions reduction and resilience to a changing climate.

National and regional action and city leadership
In July 2024, a new UK Government was elected. This administration is setting out much more ambitious policies, plans and investment for climate change and this creates new opportunities from which the Transition Team will seek to ensure the city benefits.

A-3.2: Systems & stakeholder mapping			
System	**Suggested potential stakeholders (* starred stakeholders are members of the Transition Team)**	**Influence on the city´s climate neutrality ambition**	**Interest in the city´s climate neutrality ambition**
Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills	Bristol City Council* Bristol's City Office* Business West* West of England Combined Authority* Bristol Climate and Nature Partnership* University of Bristol* Cabot Institute for the Environment* University of the West of England* Future Leap* SevernNet* Bristol and Bath Regional Capital* City of Bristol College* Black South West Network Disability Climate Justice Consultant Future Economy Network Natural History Consortium Black and Green Ambassadors Babbasa Bristol's Women's Commission Federation of Small Businesses	**High**	**High**

	The West of England Centre for Inclusive Living Trades Union Congress We The Curious ACH Bristol Older People's Forum Eastside Community Trust Quartet Community Foundation		
Energy systems	Bristol City Council* Bristol City Leap* Bristol Energy Network* National Grid Electricity Distribution* Wales and West Utilities* Vattenfall* Centre for Sustainable Energy* OVO Energy* Jacobs	**High**	**High**
Mobility and transport	Bristol City Council* Business West* West of England Combined Authority* Enterprise Mobility* Jacobs Bristol Port Company First West of England Great Western Railway Highways England Motability National Express Sustrans Priority Express Zedify University Hospitals Bristol and Weston NHS Foundation Trust	**High**	**High**
Waste and circular economy	Bristol City Council* Bristol Waste Company* Business West* Wessex Water* Jacobs Resource Futures North Bristol NHS Trust	**High**	**High**
Green Infrastructure and nature-based solutions	Bristol City Council* West of England Combined Authority* Avon Wildlife Trust Environment Agency Natural History Consortium Jacobs	**High**	**High**
Built environment	Bristol City Council* West of England Combined Authority* Bristol City Leap* Business West* Retrofit West CIC* Centre for Sustainable Energy* North Bristol NHS Trust*	**High**	**High**

	University of Bristol* Cabot Institute for the Environment* University of the West of England* NatWest* TLT* ACH Brighter Places Jacobs University Hospitals Bristol and Weston NHS Foundation Trust Bristol Association of Letting and Management Agents Bristol Community Land Trust Bristol Housing Festival Housing Management Board The Crown Estate Bristol Water		

Figure 10: Bristol's Transition Team Members

Bristol's Transition Team Members

The Transition Team members who have participated in this initial phase of action planning are:

Bristol and Bath Regional Capital

Bristol City Council

Bristol City Leap

Bristol City Office

Bristol Climate and Nature Partnership

Bristol Energy Network

Bristol Waste Company

Bristol Water

Business West

Centre for Sustainable Energy

City of Bristol College

Enterprise Mobility

Future Leap

National Grid Electricity Distribution

NatWest

North Bristol NHS Trust

OVO Energy

Retrofit West CIC

SevernNet

TLT

University of Bristol

Cabot Institute for the Environment, University of Bristol

University of the West of England

Vattenfall UK

Wales and West Utilities

Wessex Water

West of England Combined Authority

3 Part B – Pathways towards Climate Neutrality by 2030

Part B represents the core of the CCC Action Plan, shaped by local authorities, local businesses, and stakeholders, comprising of the most essential elements including suggested action portfolios and proposed indicators suitable for monitoring, evaluation, and learning.

3.1 Module B-1 Climate Neutrality Scenarios and Impact Pathways

The Impact Pathways show the earlier and later outcomes and direct and indirect impacts (co-benefits) which might occur should the actions in the action plan be implemented. The Impact Pathways have been developed in a graphic format for ease of understanding. Please see annexes 1-6 for detailed overviews of all impact pathways.

B-1.2: Description of impact pathways

Our impact pathways are included as annexes 1 – 6. They cover:

1. Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills
2. Energy Systems including both Electricity and Heat
3. Built Environment
4. Mobility and Transport
5. Waste and Circular Economy
6. Green Infrastructure and Nature-based Solutions

Overall context for all impact pathways

The impact pathways presented here are based on long-standing work and analysis in Bristol which were the foundation for the One City Climate Strategy published in 2020. Developed as part of the One City Approach, which brings together a range of public, private and third sector partners across Bristol and is centred around six themed aims and associated supporting boards, the One City Climate Strategy is led by the Environment Board. Through engaging with the other five supporting boards, recognising the need for an integrated approach, and with the advice and technical guidance from the Bristol Advisory Committee on Climate Change, an analysis of the city's context and emissions baseline was undertaken to formulate the One City Climate Strategy.

Identified in that analysis and detailed in the strategy are ten thematic areas for climate action, each with their own objectives relating to how carbon neutrality and climate resilience could be achieved by 2030. In co-creating the actions portfolio for this action plan, the Transition Team used these One City Climate Strategy objectives to inspire and guide their design of actions, thereby ensuring that the actions meet the city's strategic framework which in turn is based on the city context and emissions. Underpinning and informing the Transition Team's creation of the action portfolio are the six enabling conditions also identified in the One City Climate Strategy. These represent the main cross-cutting changes required to support delivery of actions and Bristol's ambition to be a fair, healthy and sustainable city.

Process for creation of individual action outlines

The Transition Team collaborated in emissions domain-specific working groups to design a broad set of actions that would help to achieve the One City Climate Strategy objectives in these thematic areas. The working groups generated a large number of separate actions along with the expected early changes, later outcomes, impacts and co-benefits associated with each action. Just Transition aspects of the actions were also considered during these working group meetings. These separate actions were then organised according to emission domain, distilled and compiled into a smaller number of representative actions. These actions were then given high-level descriptions which created the 26 individual action outlines listed in module B-2 below.

Process for creation of impact pathways

These individual actions were organised into impact pathways - five impact pathways for the emissions sectors and one for the cross-cutting enabling actions. Each pathway was checked and refined by local experts with the relevant knowledge. This refinement was a valuable step in ensuring that the individual actions outlined were appropriate and logical in that, if actioned, they would be likely to lead to the predicted short-term changes and long-term outcomes.

Alongside the visual diagrams of the impact pathways (see annexes 1-6) which show the actions per emission sector along the NetZeroCities theory of change model, the narrative descriptions below intend to provide more detail on their context and rationale.

Description and rationale by impact pathway

The impact pathways describe the impact of actions designed to reach climate neutrality in five emissions domains: Energy Systems (combining both Electricity and Heat Energy Systems), Mobility and Transport, Built Environment, Waste and Circular Economy, Green Infrastructure and Nature Based solutions, as well as the pathway describing the cross-cutting actions required for Just Transition, Communications and Engagement and Skills.

B-1.2: Description of impact pathways

Pathway 1: Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills

Systemic levers applied: All -Technology and Infrastructure; Social Innovation; Finance and Funding; Democracy and Participation; Governance and Policy; Learning and Capabilities
Main action areas: Transition Team engagement and Just Transition (including actions to develop communications, consultation and engagement with diverse stakeholders as alongside action on green jobs).

Rationale and context: One City Climate Strategy Enabling Conditions
The Climate City Contract and the costed actions within it would enable Bristol to deliver on its existing priorities to reach carbon neutrality by 2030. In addition, the One City Climate Strategy outlines the necessary enabling conditions on which climate action in the city must be built: namely engagement, skills, data, funding, infrastructure and national action. Without these, the implementation of actions will likely be severely hampered and strategic risks to investment will be presented.

For this reason, a prior focus on the actions to enable a Just Transition to net zero are required. Their impacts are not expected to directly reduce greenhouse gas emissions, but instead create the necessary conditions for actions to be implemented. These actions also reduce potential strategic risks associated with investment. It is expected that a focus on Just Transition, communications, consultation and engagement, as well as employment and skills, will enable more effective design of actions, provide a skills base to implement them, and leave no-one behind in the transition to carbon neutrality. Prior to implementing actions, support for effective engagement with the Transition Team needs to be continued and deepened to enhance collaboration between Transition Team members. Systems and processes to enable ongoing effective functioning of the Transition Team should be co-created amongst members, such as governance, strategic planning of next steps, prioritisation of actions, partnership brokering and management and development of business cases.

Bristol has benefitted from a good grounding in work to encourage more diverse engagement with climate change. Since the release of Bristol City Council's Just Transition Declaration in 2023, an increasing number of organisations (including organisations within the Transition Team), are making statements of intent to adopt Just Transition principles in their work. The creation of the CCC involved the mapping of Bristol's existing city level initiatives to promote inclusivity and Just Transition within in the environmental sector. Approximately 25 pre-existing organisations and initiatives were mapped.

However, barriers to inclusion in the local environmental sector mirror national conditions being less diverse than other sectors. Engaging with diverse stakeholders should also mean that Bristol's climate work and decision making are influenced by the contributions of a wider range of people - particularly those who are currently unable to access existing or planned environmental interventions.

Tools and best practice can be shared to help Bristol meet its aims to be a city of ambition and compassion, where everyone has the opportunity to thrive and succeed. One such tool - Arnstein's Ladder of Participation, a framework consisting of levels used to measure levels of citizen engagement - is listed as a possible tool to be explored to aid planning of city consultation and engagement work.

In addition, a clear focus on skills development, aligned with pre-existing jobs and skill creation in the region is included and goes further to support the development of green skills for the effective implementation of green technology and stimulation of green innovation. This would provide opportunities for those not currently able to access green jobs and skills to do so.

More effective planning, with a wider citizen base would reduce inequality by facilitating the targeting of interventions so that they can benefit more people. The evidence this has been built on includes Bristol's Strategies and declarations, Bristol's Citizen's Assembly, SDG local voluntary review, expertise from Bristol City Council's Climate Change Engagement and Diversity Project manager as well as specialists from BCC's engagement teams, Bristol's City Office staff; Community Climate Action plans, academia, and the evaluation of the Black and Green Ambassadors Programme.

B-1.2: Description of impact pathways

The Cross-cutting Enabling Actions impact pathway involves actions to increase engagement is expected to create the following impacts which will enable Bristol to reach its 2030 net zero goals:

- Create the enabling conditions to deliver actions to reach net zero more effectively through the participation of a wider range of people
- Facilitate a Just Transition to net zero
- The metrics for skills development work will be led by a key stakeholder and is under development.
- Total Capital Value of Projects for which Business Cases Developed
- Number of Transition Team organisations which have adopted the JT Principles
- Number of Climate City Contract actions updated following feedback from engagement with diverse stakeholders
- Number of learners on green skills courses
- Number of people employed in green jobs
- Demographic data on workforce in green jobs

Pathway 2: Energy Systems (including both Electricity and Heat Energy Systems)

Systemic levers applied: All – Technology and Infrastructure; Social Innovation; Finance and Funding; Democracy and Participation; Governance and Policy; Learning and Capabilities.
Main action areas: Reinforcement of the local energy network; renewable energy generation; heat pump installation (domestic and non-domestic); expansion of the heat network; reduction of carbon intensity of the existing gas network and skills development related to heat pump installation and heat network development.

Rationale and context

Electricity

Electrification is a core component of the transition away from fossil fuels alongside decarbonisation of the electricity grid. In Bristol, the electrification of heat and transport will be significant additional demands for the electricity network and the capacity of the network will need to increase.

National Grid Electricity Distribution (NGED) creates Distribution Future Energy Scenarios and a Network Development Plan which assess how demands on the network are likely to change to 2050 and what reinforcement, if any, is needed for the network to cope. According to the Network Development Plan, 57% of primary substations in Bristol will reach capacity and require upgrades or alternative solutions to manage demand ahead of 2030 according to NGED's best view scenario for how the city will decarbonise over the period to 2030.

Regarding renewable generation, at the end of 2022 the city of Bristol already had around 81 Megawatts (MW) of renewable electricity capacity installed, including 41 MW of wind power and 40 MW solar PV.

Smart meters are a very important component of a decarbonised electricity system as they make it easier to make best use of renewable generation, either in individual buildings or in the wider network. UK government statistics suggest that 67% of homes in Bristol have a smart meter installed.

Figure 11 (below) shows key indicators for decarbonising Bristol's homes, including solar PV and smart meters.

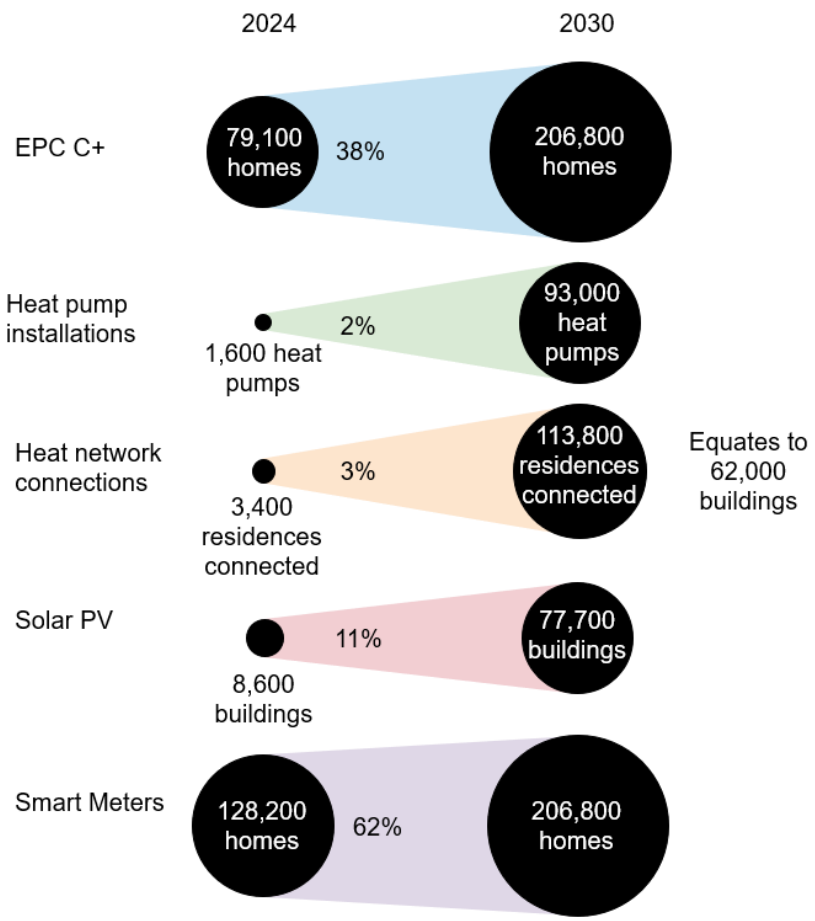


Figure 11: Key indicators of the transition to decarbonise homes, showing where the city is in 2024 and where it needs to get to in 2030 (Data from Parity Projects, Micro-generation Certification Scheme, Bristol City Council Housing Energy Data, UK Gov Heat Network Statistics, UK Gov Smart Meter Statistics)

The One City Climate Strategy includes the following objectives related to electricity:

1. Decarbonisation of the national grid will be supported by the extensive adoption of smart electricity solutions in Bristol.
2. Renewable generation within the city will be maximised, including approx. 350MW solar.
3. The local electricity network is reinforced, managed more smartly and made more resilient to accommodate increased demand.

The first set of actions in the Electricity field of action relates to the need to reinforce the electricity network in Bristol. Reinforcement of the electricity network can be done efficiently through maximising smart management of electricity demand before deploying physical reinforcement solutions. This means that peak demand is smoothed through shifting demands to other times of day or using batteries. Smart management also maximises the use of renewable energy when it is abundant (e.g. sunny, windy days) and minimises use of electricity generated by fossil fuels when renewable energy is not being produced. National Grid Electricity Distribution (NGED) are limited in the amount of money they can invest in reinforcement by Ofgem (the energy regulator), as these costs are shared by all NGED customers and Ofgem need to protect customers from price rises. The more certainty NGED have over the need for reinforcement, the more likely Ofgem will approve the network investment.

Bristol can further contribute to the decarbonisation of the electricity grid through maximising renewable electricity generation in the city. Due to the urban environment of the city, this is most likely to be through rooftop solar PV on domestic and non-domestic buildings.

B-1.2: Description of impact pathways

Heat

Bristol's One City Climate Strategy identified that individual heat pumps and low carbon district heating networks would be the lowest cost options for decarbonising heating in the city. The carbon emissions of the electricity grid are rapidly decreasing so it is expected that the carbon impact of electricity use, including for heat pumps and heat networks, will diminish over time. To date, there are around 1,600 known heat pumps installed in the city from available data sources (MCS and Bristol City Council housing data). In 2022, there were 27 district heating networks and 91 communally heated buildings in Bristol, with a total of 3,796 customers connected to a heat network or communally heated building (3,413 residential, 376 commercial, 2 public sector and 5 other – note many customers can occupy one building).

There are over 160,000 buildings in Bristol that need to switch to a low-carbon heating source. Around 7,000 of these are non-domestic buildings and 155,000 are domestic buildings. Within these domestic buildings there are around 206,800 homes; 26,800 (13%) are owned and managed by Bristol City Council, 13,000 (6%) are owned and managed by other Registered Social Landlords, 53,600 (26%) are owned and managed by private landlords and 113,400 (55%) are owner-occupied. It is useful to understand this breakdown as the challenge is approached differently for homes of different tenure.

Besides existing buildings, Bristol has an ambition to build 2,000 new homes every year and these homes need to be built with low carbon heat. This is already dealt with through existing local planning policy and will be strengthened in upcoming planning policy.

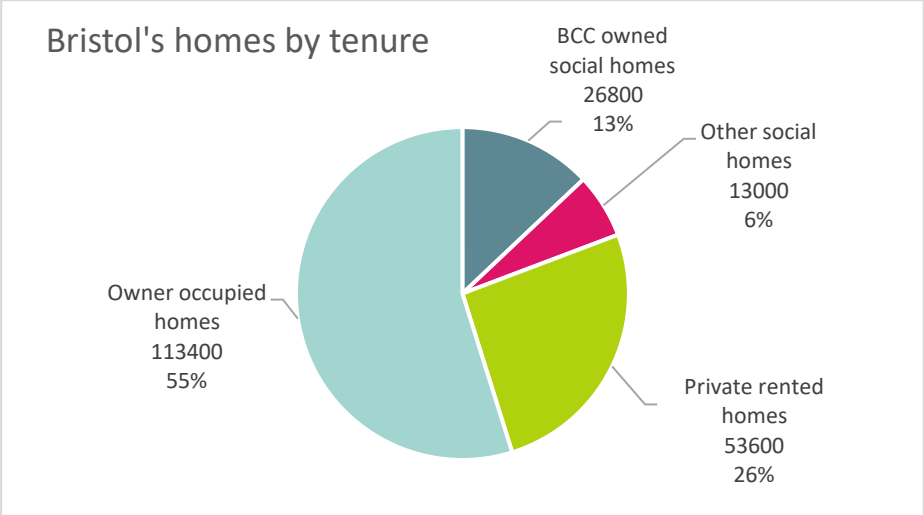


Figure 12: Number of Bristol homes by tenure

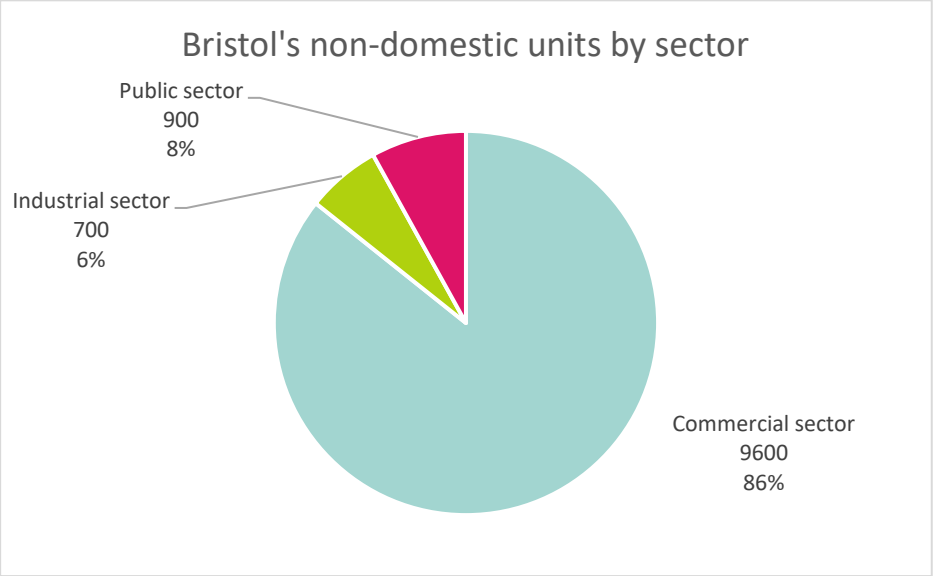


Figure 13: Number of Bristol's non-domestic units by sector (data from Energy Performance Certificate database so only captures units with an EPC)

The One City Climate Strategy includes the following objectives related to heat:

1. Individual electric heat pumps installed in 95,000 buildings which have been well insulated to support the phase out of gas heating in Bristol.
2. 65,000 buildings connected to heat networks to support the phase out of gas heating in Bristol.

Figure 11 shows the increase in low carbon heating installations required for homes to meet these objectives.

To realise heat pump installations this can be split into activity in the domestic and non-domestic sectors and further broken down by who the key decision makers are and how those decisions are made. In the domestic sector, there are a large proportion of homes (about 20%) owned by a relatively small number of social housing landlords. Therefore, it could be feasible for these landlords to roll out a programme of heat pump installation for suitable homes. Government grant funding for domestic heat pumps is expected to be available for low-income households, so it is possible that these programmes could provide for a proportion of low-income homes alongside social housing. In the private housing sector, there are many decision makers, (homeowners and landlords) so suggested activity here focuses on removing the barriers to these decision makers choosing to install a heat pump in their home. These suggested activities are communications and engagement to demonstrate new technologies and provide advice, as well as providing financial support through new funding and financing mechanisms. These actions would result in heat pump uptake distributed throughout the city. However, alongside this is an action to trial an area-based approach, for example installations of heat pumps along a whole street or in a neighbourhood, that would bring efficiencies of community engagement and delivery.

Likewise, in non-domestic buildings, there are some building owners with significant building stock in the city (for example, Bristol City Council, the universities, the NHS trusts, community buildings). These building owners could implement a programme of heat pump installation in suitable buildings. For other non-domestic building owners, actions focus on encouraging heat pump installation through communications, advice and access to funding and finance.

Heat networks require more centralised management and Bristol City Council has appointed a heat network developer, Vattenfall, to build the city-wide heat network. The action here is for Vattenfall to expand the network and to facilitate upcoming UK government policy for heat network zoning. However, building owners and occupiers would need to see the benefits of connecting to the network in order for the network to expand, so engagement and communications are a crucial element as well as financial support for the upfront costs of connection to the network. Finally, whilst connections to large buildings and blocks of flats are business as usual for the Bristol Heat Network, the feasibility of connecting individual homes has not yet been proven. Therefore, a demonstrator project is required to explore this.

B-1.2: Description of impact pathways

As the transition to low carbon heating takes place over time, the remainder of buildings will continue to be heated by gas. There are steps that can be taken to reduce the carbon impact of the gas in the network through an increased proportion of biogas or the future potential to blend up to 20% hydrogen. The carbon reduction achieved would depend on the amount of low carbon gas introduced into the gas network and how 'low carbon' the gas is (for example hydrogen can be produced in many different ways, some are carbon intensive and some are not). As the transition away from gas proceeds, the gas network will become redundant for the distribution of gas. The potential to use this infrastructure for a new low carbon purpose is to be explored in future.

To realise the transition to low carbon heat, it is crucial that there is a sufficient supply chain to install heat pumps, build heat networks and carry out all the ancillary roles involved. In the West of England region (Bristol, South Gloucestershire and Bath and North East Somerset council areas), it is estimated that the number of insulation and low carbon heat installers needs to increase 100 to 200 fold to meet the pace and scale of demand if we are to transition to decarbonised heat in buildings by 2030 (data from West of England Combined Authority and South West Net Zero Hub). More broadly, carrying out these works on the many buildings in the city will create jobs in installation, design, engineering and commissioning as well as other supporting roles such as education and planning. It is important that the benefits of this opportunity are maximised in the local area to ensure a Just Transition.

Therefore, with this context taken into account, the actions in this impact pathway are aimed at reinforcement of the electricity network and actions to support focused programmes of work in relation to the maximisation of renewable energy, installation of heat pumps in domestic and non-domestic settings, the expansion of the heat network, the reduction of the carbon intensity of the gas network and the training of skilled people to undertake the work.

The outcomes are expected to be measured through:

- Megawatts of installed renewable capacity
- Number of dwellings directly served by heat pumps
- Number of non-domestic buildings directly served by heat pumps
- Number of heat network connections to 'low carbon' heat networks.
- Carbon intensity of gas network
- Learner numbers on low carbon heat training courses in the region

Pathway 3: Built Environment

Systemic levers applied: All – Technology and Infrastructure; Social Innovation; Finance and Funding; Democracy and Participation; Governance and Policy; Learning and Capabilities.
Main action areas: Building retrofit (domestic and non-domestic) with integration of renewables generation and skills development for retrofit and renewable energy generation

Rationale and context

The built environment impact pathway refers to actions which seek to improve the energy performance of Bristol's existing buildings through tailored retrofit solutions in order to minimise heat demand and prevent overheating. Improving energy efficiency before installing low carbon heat means that the amount of electricity required to run a heat pump or heat network is reduced, reducing running costs. From a system-wide perspective, this also reduces the amount of renewable electricity the UK must generate and saves costs for all electricity customers. However, it must be noted if the priority is to decarbonise the building, installing low carbon heat first will be the fastest and most impactful route, and energy efficiency improvements can be made later.

Similarly, as with the heat energy system, it is useful to understand the breakdown of number of buildings in the city (over 160,000) by domestic (155,000) and non-domestic (7,000) category. Figure 12 shows the breakdown of number of homes by tenure. Figure 13 shows the breakdown of non-domestic units by sector.

B-1.2: Description of impact pathways

Energy Performance Certificates (EPC) are an indicator that can be used to understand the energy efficiency of buildings. Whilst there are limitations to this approach it is currently the only system available with a large dataset. An EPC rating of C or above can be considered a 'good' level of energy efficiency.

38% of Bristol's homes are EPC C or above and 44% of Bristol's non-domestic units are EPC C or above. The breakdown of homes by tenure and non-domestic units by sector can be seen in Figures 14 and 15. Figure 11 shows the increase in domestic retrofit required for all homes to meet good levels of energy efficiency.

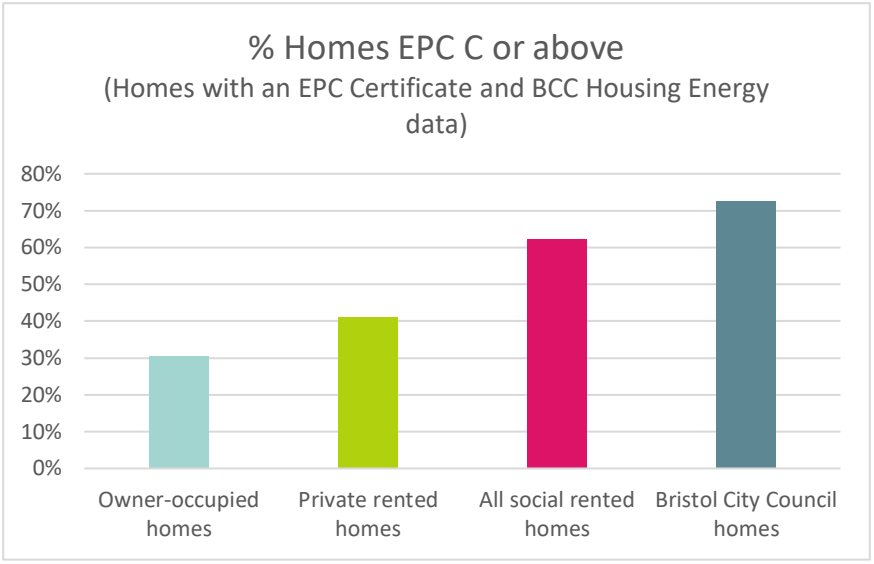


Figure 14: Percentage of homes with Energy Performance Certificate of C or above, by tenure

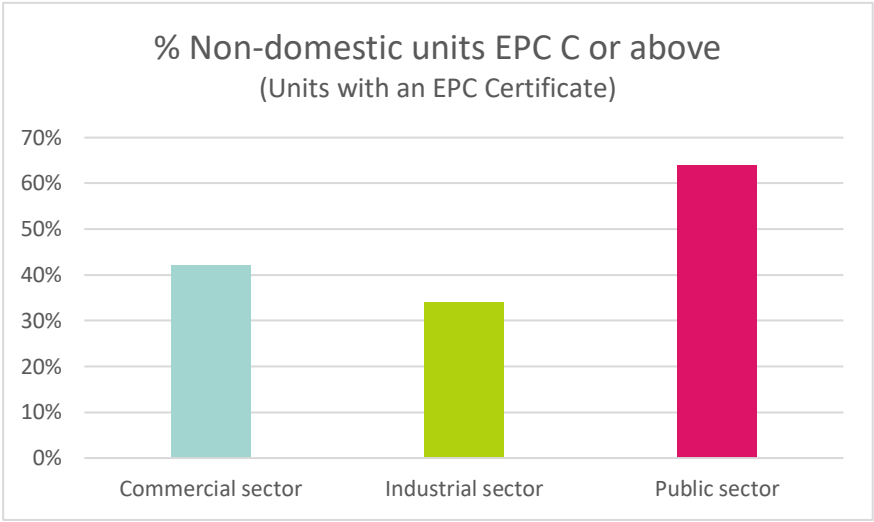


Figure 15: Percentage of non-domestic units with Energy Performance Certificate of C or above, by sector

The One City Climate Strategy includes the following objectives related to the built environment:

1. New buildings are carbon neutral and climate resilient (aligning heat provision to the city's heat decarbonisation programme).
2. The energy performance of existing buildings in the city is improved to minimise heat demand, whilst preventing overheating, through tailored retrofit solutions.

B-1.2: Description of impact pathways

As with the heat energy system, the actions in the Built Environment pathway are split into activity in the domestic and non-domestic sectors and further broken down by who the key decision makers are and how those decisions are made.

In the domestic sector, there are a large proportion of homes (about 20%) owned by relatively small number of social housing landlords. Therefore, it could be feasible for these landlords to roll out a programme of retrofit to improve insulation and minimise heat demand. It is likely that there will be Government grant funding available for low-income households for retrofit, so it is possible that these programmes could capture a proportion of low-income homes alongside social housing. In the private housing sector, there are many decision makers, (homeowners and landlords) so activity here focusses on removing the barriers to these decision makers choosing to retrofit their home. These are communications and engagement to demonstrate the value of planning retrofit and provide advice, as well as providing financial support through new funding and financing mechanisms. These actions would result in retrofit sporadically distributed throughout the city. However, alongside this is an action to trial an area-based approach, for example retrofitting a whole street or in a neighbourhood, that would bring efficiencies of community engagement and delivery and an opportunity to attract new financing models.

Likewise in non-domestic buildings, there are some building owners with significant building stock in the city (for example, Bristol City Council, the universities, the NHS trusts, community buildings). These building owners could implement a programme of retrofit. For other non-domestic building owners, actions focus on encouraging retrofit through communications, advice and access to funding and finance. An area-based approach can be trialled in non-domestic settings too, for example a business park, or a sector specific approach where non-domestic buildings have similar requirements. Again, this is likely to bring efficiencies of delivery.

To realise the transition to low carbon buildings, it is crucial that there is a sufficient supply chain to retrofit buildings and carry out all the ancillary roles involved. In the West of England region (Bristol, South Gloucestershire and Bath and North East Somerset), it is estimated that the number of insulation and low carbon heat installers needs to increase 100 to 200-fold by 2030 to meet the pace and scale of demand if we are to transition to decarbonised heat in buildings by 2030 (data from West of England Combined Authority and South West Net Zero Hub). More broadly, carrying out these works on the many buildings in the city will create jobs in installation, design, engineering and commissioning as well as other supporting roles such as education and planning. It is important that the benefits of this opportunity are maximised in the local area to ensure a Just Transition.

For the transition to decarbonised buildings (considering both heat and built environment themes) to realise the benefits of a just transition and result in high quality installations, as a city and a region we should aim to develop a ‘retrofit ecosystem’. This ecosystem would have some element of central management that ties together the key stakeholders, including the supply chain, training providers, the ‘demand’ from building owners, the funding and finance providers. It would make sure that messaging is consistent, local businesses can see the pipeline of work and can benefit from it, training providers know which courses to prioritise and the public sector can be strategic about grant funding applications and maximise the use of grant funding.

Therefore, with the above context taken into account, this impact pathway focuses on sets of actions which tackle the domestic and non-domestic sectors and implement a training pathway to support this implementation.

The outcomes are expected to be measured through:

- Number of homes with EPC rating C and above
- Number of non-domestic buildings with EPC rating C and above
- Learner numbers on relevant training courses

Pathway 4: Mobility and Transport

Systemic levers applied: All – Technology and Infrastructure; Social Innovation; Finance and Funding; Democracy and Participation; Governance and Policy; Learning and Capabilities.

B-1.2: Description of impact pathways

Main action areas: Reducing car miles; modal shift to active travel; modal shift to public transport; freight consolidation and low carbon deliveries; modal shift to electric vehicles.

Rationale and context

In 2018, transport accounted for approximately 32% of Bristol's territorial emissions, with the majority of those emissions arising from road transport. After stationary energy, this is the largest domain of territorial emissions within the city. As well as the environmental impact, how we travel also has significant societal and economic impacts and transport can play a major role in tackling inequality.

Despite Bristol having higher than average levels of active travel compared to other UK cities, internal combustion engine vehicles dominate, accounting for approximately 71% of total distance travelled within the city and 48% of all trips in 2018.

Cars in particular account for 85% of all motor traffic and have led to Bristol being one of the UK's most congested cities (Inrix, 2023) with average traffic speed of 16.1 mph – well below the national average. The city experiences traffic congestion and low bus service speed and reliability. Public health is also negatively impacted through the resulting effects on air quality, which has been a significant issue in Bristol, resulting in the introduction of a Clean Air Zone within the city in 2023. According to Bristol's quality of life survey, 67% of citizens feel that air quality and traffic pollution are a problem locally.

Congestion also causes economic impacts in terms of lost productivity and poor connectivity across the city can exacerbate systemic inequality. Stark differences in the accessibility of work and essential services are currently found in different areas of the city. Car ownership is unevenly distributed across neighbourhoods and limited public transport options further reduce equal opportunities for access to jobs, training, health care and green space for residents living in areas of multiple deprivation in the city. Around 40% of jobseekers say that lack of personal transport, or poor public transport, is a key barrier preventing them from getting a job. Furthermore, high traffic volumes have been shown to have a negative effect on community cohesion, with improved social connectivity arising in communities with lower levels of traffic. Effective and well distributed transport connectivity is therefore an important driver of economic inclusion, social equality and of economic growth.

A large proportion of people both live and work in the city, among whom active and public transport modes are more highly utilised compared to those commuting into Bristol from surrounding areas. Among the approximately 85,000 people commuting from outside of the city, there is a much higher prevalence of travel by car.

The most effective way to reduce congestion and the negative associated impacts on public health, economic inclusion and social cohesion is to reduce volumes of car traffic. Doing so not only directly improves many of those measures but critically creates space for greater, faster, and more reliable public transport services, and increases the safety and desirability of active travel modes.

For these reasons the first group of actions focus on achieving significant reductions in car miles across the city. Whilst these actions are envisaged to make alternative travel easier and more accessible through the provision of single ticketing for multi-modal travel, advice, support, training, discount and loan schemes, and other priorities identified through the Community Climate Action Plans, they will also need to be accompanied by demand management measures such as a Workplace Parking Levy. The shape and extent of those measures is not yet possible to know. However, it is proposed than such measures are co-designed with citizens and businesses to ensure that they are both effective and equitable.

Actions that create significant reductions in car miles may be controversial. However, there is strong support amongst Bristolians for improvements to walking and cycling (Walking and Cycling Index 2023: Bristol sustrans.org.uk), and pedestrianisation schemes have recently been enacted in Princess Victoria Street, Old City, King Street and Cotham Hill. A (small) survey reported by bristol247.com shows overwhelmingly positive public perception of the Cotham Hill and half of people surveyed are spending more time on that high-street. Cotham Hill pedestrianisation pilot made permanent. However, pedestrianisation schemes must be accompanied by effective consultation and engagement to ensure that local residents are involved in design.

B-1.2: Description of impact pathways

The next set of actions focuses on increasing active transport in the city, first through a significant expansion of the programme of walking and cycling infrastructure already being delivered through the existing City Region Sustainable Transport Settlement to create more high quality segregated walking and cycling lanes throughout the city. Secondly, through a programme of engagement with citizens on promotion of safe active and public travel and help address inequalities in access to mobility. Thirdly, through an expansion of the liveable neighbourhoods schemes to all residential neighbourhoods of central Bristol. These three actions are envisaged to take place throughout the remainder of this decade and would radically alter the dominance of private car transport in favour of safer, and more accessible active travel.

The next set of actions focuses on increasing the provision, quality, and use of low carbon public transport. This will be achieved through the delivery of a rapid mass transit system, as well as the establishment of new bus routes, improvements to existing services and the creation of more integrated services that better serve all communities across Bristol.

The distribution and delivery of goods across the city is another key area that needs to move to more low carbon methods. Road freight accounted for approximately 28% of road transport emissions in 2018. Regarding heavy freight, national policy and transport companies are likely to deliver investment in hydrogen. As the local role in this becomes clearer new actions may be added to future iterations of this plan. Regarding light freight, whilst private companies have made strong progress in electrifying their fleets to date, further support is called for to stimulate freight consolidation centres that facilitate low carbon and low impact deliveries by modes such as electric cargo bike. Policy changes and the provision of innovation funding are intended to expand the network of private businesses already operating in this field within Bristol.

Finally, for all remaining vehicle traffic there is a need to electrify as quickly as possible. It is expected that by 2030 approximately 23% of private vehicles will be electric without significant interventions. However, through the provision of an extensive network of public charging infrastructure it is believed that this can be increased to 42%. Further actions may be required as this plan develops to look at solutions for properties without off-street parking.

The outcomes are expected to be measured by:

- Car miles per year
- Active travel miles per year
- Public transport passenger miles per year
- Number of low carbon freight consolidation centres
- Number of public charging points

Pathway 5: Waste and Circular Economy

Systemic levers applied: All – Technology and Infrastructure; Social Innovation; Finance and Funding; Democracy and Participation; Governance and Policy; Learning and Capabilities.
Main action areas: Reduced waste and consumption through increased repair and reuse of retail products; engagement campaigns; waste reduction efforts and improved waste collection, recycling and processing services.

Rationale and context

In 2018, waste accounted for approximately 6% of Bristol's territorial emissions, with the majority of those emissions arising from incineration of residual waste.

The majority of Bristol's residual waste is processed at two Energy from Waste plants in the Avonmouth area, but only one of these is within the Bristol local authority boundary. To reduce these territorial emissions, actions have been designed to deliver continuing improvements in recycling rates for both domestic and commercial waste, so that the carbon content of residual waste is reduced. In this context particular focus has been placed on reducing both the food and plastic content of residual waste.

B-1.2: Description of impact pathways

Increasing the separate collection of food waste not only reduces the carbon content of residual waste, but also provides greater feedstock for Bristol's primary anaerobic digestion plant, which in turn provides low carbon methane for use in the national gas grid, electricity generation, and gas-powered busses.

Actions under this domain have been created and informed by Transition Team member workshops, and the priorities identified by citizens through the Community Climate Action Plans.

Implementing efforts that reduce residual waste and improve recycling collection and processing services have focused on improving collection services to address existing disparities in service provision across the city; engaging businesses and citizens to encourage increased recycling, and working with the emerging Local Industrial Decarbonisation Plan (LIDP) to maximise opportunities for circular economy flows to be improved between the city and industry located in the Avonmouth area, and to implement carbon capture and storage for all remaining emissions arising from the Energy from Waste plants.

Bristol already has the highest domestic recycling rate among England's Core Cities (45% in 2022/23 recitif). However, feedback from citizens and community groups highlights that improvements in the design of waste collection services that support increased recycling are needed, particularly in areas of the city with high density housing. In addition, experience within the local authority shows that public engagement campaigns do result in recycling rate improvements. Finally, the developing LIDP takes a similar approach to that used in the development of this Climate City Contract. Priorities emerging through that plan are likely to focus on developing local carbon capture and storage capabilities and infrastructure by working with a range of public and private actors to identify strategic opportunities for improving circular economy flows and capitalise on the opportunities available in the Avonmouth area's industrial base and commercial port. Continuing collaboration between the Transition Team and LIDP stakeholders is therefore vitally important.

It is assumed that through these actions the local recycling rate will increase to 65% by 2030 and all remaining emissions from residual waste processing will be addressed through fully functioning Carbon Capture and Storage at the local Energy from Waste facilities.

Bristol's One City Climate Strategy has two objectives that relate primarily to consumption-based emissions; transitioning Bristol's retail economy to high quality, durable products that can be easily repaired and encouraging everyone to follow principles of responsible consumption, using and buying less and buying carbon neutral goods and services. Whilst the primary focus of these objectives relate to consumption-based emissions, if fulfilled they will support the development of Bristol's burgeoning circular economy and therefore further contribute to reducing territorial emissions. However, the emissions impact of the actions relating to these objectives has not been modelled due to availability of reliable data and confidence of associated assumptions.

Bristol's Household Waste and Recycling Centres already each have Re-Use and Repair shops where citizens can donate and purchase items that are fit for refurbishment. Expanding and further normalising these schemes so that they have greater civic reach, offer a wider range of affordable and high-quality products, and become a more often considered option for citizens, are believed to be important parts of growing Bristol's circular economy ecosystem. In addition to their expansion, inclusive training and skills programmes for repair and re-use focusing on electrical goods, will grow the local skills base and offer new green jobs in the local area. These programmes are intended to work with existing Further Education providers and reach a diverse group of learners including those from marginalised backgrounds. Finally, supporting the creation of new high quality retail spaces for circular economy goods and businesses is regarded as important to support citizen access to, and demand for, re-useable goods and services. It is envisioned that these would include a city centre-based space with high visibility, as well as retail spaces located in neighbourhoods outside of the city centre.

The final group of actions in this pathway relate to engaging citizens and businesses regarding the impacts of consumption. The approach centres on three areas. Firstly, working with anchor and large organisations to coordinate and harmonise sustainable procurement policies and standards with the intention of decarbonising local, regional and wider supply chains. Secondly, working with small businesses to reduce their waste production and carbon emissions through capacity building, and supply chain engagement. Thirdly, delivering targeted engagement campaigns aimed at high-consumption demographics and businesses and to support innovative solutions and alternatives.

B-1.2: Description of impact pathways

The outcomes for waste reduction are expected to be indicated by the domestic waste recycling rate and the carbon intensity of energy from waste production. Other indicators for increased report and reuse programmes and engagement campaigns are to be determined.

Pathway 6: Green Infrastructure and Nature Based Solutions

Systemic levers applied: Technology and Infrastructure; Democracy and Participation
Main action areas: Providing green infrastructure for climate resilience through raising the quality of existing green spaces, greening the public realm and creating new green spaces.

Rationale and context

Whilst Bristol has some excellent public parks and green spaces, in general it is a very urban area of land and, as such, green spaces are not currently a significant source or sink of greenhouse gases. However, green infrastructure and nature-based solutions provide a wealth of co-benefits for ecosystems and people and increase the city's climate resilience for example through increasing the tree canopy.

The first action proposed here is raising the quality of existing green spaces so that they become more welcoming, more inclusive and safer to all of Bristol's citizens. This would be achieved through making physical changes that improve the accessibility and safety attributes of existing green spaces, as well as increasing tree planting in these areas.

The second group of actions intend to increase ecological and climate resilience (including urban cooling) through greening of the public realm. This includes the planting of new trees and other flora in urban areas such as the city centre and delivering an expansion of the existing Green Recovery Fund supporting an uplift of the total space for nature within the city to 10%.

Creation of new green spaces is the third and final action which looks to incorporate new green spaces as part of long-term strategic regeneration zones and incorporate green infrastructure designs into developing flood defence schemes.

The outcomes in this pathway are expected to be indicated by:

- The number of parks achieving 'good' status
- The area of Bristol City Council park land managed for nature
- The tree canopy cover and/or number of trees
- The area of new green space created

3.2 Module B-2 Climate Neutrality Portfolio Design

The following portfolio represents a plan of actions co-created by the Transition Team. The actions build on the One City Climate Strategy to set out in more detail a suggested portfolio of linked interventions which together, if implemented, would achieve the necessary emissions reductions (as defined by the Climate Neutral and Smart Cities Mission), in the context of a just transition, and taking into account the evidence currently held on citizens' ambitions for climate action.

Prior to detailing actions for emissions reduction, outlined are cross-cutting actions which will provide the enabling conditions for implementing these. These actions have been developed in accordance with the enabling conditions outlined in the One City Climate Strategy and align to Bristol's Just Transition Declaration principles. Where necessary, engagement for specific actions within a field of action is also detailed within table 2.1. This is expected to be the first iteration of this plan, and therefore lists interim measures. It is expected that the next iteration will go further still, to deliver transformative engagement practices to ensure maximum reach of actions and support their delivery.

B-2.1: Description of action portfolios		
Fields of action	Portfolio description	
	List of actions	Descriptions
Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills		
Relates to the One City Climate Strategy enabling conditions		
Stakeholder Engagement Transition Team	1. Continue to engage Transition Team on CCC design and implementation including developing business cases and securing funding	**Programme Overview:** Continue and deepen support for effective engagement with Transition Team (TT). Provide support to continue and enhance collaboration between TT members. Co-create systems and processes to enable ongoing effective functioning of the TT e.g. governance, strategic planning of next steps, prioritisation of actions, partnership brokering and management, development of business cases. 1) Engage with Transition Team to: • Encourage longer term involvement in delivering CCC, develop and strengthen partnerships • Take lead to deliver specific actions • Prioritising actions which should be delivered first • Develop Business Cases for actions • Secure funding and finance 2) Strengthen internal practices of TT members to strengthen relationships and enhance collaboration *between* organisations and *within* their respective teams, departments, boards etc.

Just Transition	2. Further embed Just Transition principles into CCC and support wider adoption in the city through wide engagement.	**Programme Overview:** Embed Just Transition principles more widely in the implementation of the Climate City Contract actions, through excellent practice on engagement, and design of effective and fair solutions which benefit everyone. Support wider adoption of Just Transition principles in climate policy, practice and projects in the city. Embed in decision making, 1) Further embed Just Transition principles into the Bristol Climate City Contract by integrating them into the portfolio of actions as they develop **2) Engage** widely (**especially** with those not previously reached) on Just Transition to design effective net zero strategies and actions. Embed these within decision making with the support of the Community Leadership and Just Transition Panel**, One City** and other processes. 3) Support the wider adoption of Bristol's Just Transition Declaration principles across the city
Communication and Engagement	3. Deliver transformative, inclusive, programmes of environmental communications, consultation and engagement and support	**Programme Overview:** Recognising that current communications and engagement practices are not yet sufficient, deliver a transformative programme of communications, consultation and engagement to both build on existing good practice, and extend reach to groups who have not previously been reached. 1. **Transform existing approaches** to public environmental communications, consultation and engagement, enabling greater effectiveness, inclusivity, scale and reach. Disseminate good practice across the sector. 2. **Communicate, consult and engage** with the public- especially those previously excluded- to effectively design and implement the actions outlined in this plan, and to influence wider policy making and implementation. 3. Building on the priorities identified by residents in the Community Climate Action Plans co-create and deliver a programme of advice, training and support to enable citizens to do more to contribute to reducing their carbon footprints. This includes advice, training and peer to peer support on subjects like DIY insulation, energy use, cycling and food growing.

Green jobs and Skills	4. Widen access to green jobs and skills	**Programme Overview:** Building on existing practice in the region, provide support for strategic planning and delivery of inclusive green skills programmes and support for green job creation. Involve targeted interventions as well as broad offers, to ensure that all are able to access emerging opportunities. 1) **Strategic planning** and implementation for skills development at regional, city, local and community level building on existing activity and learning. 2) **Engagement** on green skills and job opportunities to widen access across the city **3) Develop Green Skills Pipeline and Career Pathways** to support the delivery of the actions set out in this plan **4) Support in-work Green Skills** development
Green jobs and Skills	5. Deliver programme to support employers to create and sustain green jobs	**Programme Overview** Building on existing practice in the region, support the development of a pipeline of green jobs, including strengthening work in existing green sectors, and also enabling transition from fossil fuel-based activities into low carbon ones. *1.* **Support** employers to transition their businesses away from fossil fuel-based activities into the low carbon activities set out in this action plan. Enabling them to re-train and train their employees to retain people in employment, recruit inclusively and enable everyone to benefit from the transition. *2.* **Support** employers in existing green sectors to sustain and create jobs, recruiting inclusively, and developing inclusive pathways for leadership progression *3.* **Support** employers to develop jobs in emerging sectors such as maintenance of new green infrastructure.
Energy Systems: Electricity		
2030 Objective (i) All electricity supplied to and generated in Bristol will be carbon neutral (taking into account the anticipated 50% increase in demand by 2030). *2030 Objective (iii) The local electricity network is reinforced, managed more smartly and made more resilient to accommodate increased demand. NDP*		
Energy systems *Electricity*	6. Reinforce local energy network and manage smartly	**Programme overview:** Deliver a number of projects to help decarbonise the local grid and provide improved flexibility. 1. **Explore** flexibility and smart solutions (technological); NGED procuring improved flexibility to meet local demand; developing more renewable and dynamic tariffs. 2. **Reinforce** the network e.g. at Iron Acton grid supply point.

Energy systems *Electricity*	7. Implement programme to maximise renewable energy generation (esp. solar)	**Programme overview:** Maximise potential to generate energy in the city from renewables with an emphasis on solar. Programme will need to first create enabling conditions. Projects include: creating a Local Area Energy Plan; reviewing the application of new Local Plan/planning conditions to identify any barriers to delivery; maximising renewable energy generation and storage on all suitable buildings and land. **1. Create** a Regional Climate Investment Plan and review the application of new Local Plan to identify any barriers to delivery **2. Engage,** communicate, and provide advice to the private housing sector (tenants/homeowners/landlords) on solar PV and develop initiatives to facilitate market-based delivery, e.g. group buying schemes **3. Engage** large organisations to make commitments to buy renewable electricity, create innovative shared buying solutions and generate their own renewable energy See actions on building retrofit for action to promote solar.
Energy Systems: Heat		
2030 Objective (i) Individual electric heat pumps installed in ~95,000 buildings which have been well-insulated to support the phase out of gas heating in Bristol.		
Energy systems *Heat*	8. Implement a programme to install or encourage/incentivise installation of heat pumps in **homes** in the city.	**Programme Overview:** A programme of heat pump promotion, financing and installation which serves all tenures of homes. **1. Plan and deliver** a programme of heat pump installation in social housing and low-income private homes (BCC social housing and that of other social housing providers) including an associated programme of resident engagement. **2. Trial** community scale heat pump solutions including an associated programme of community engagement **3. Engage,** communicate and provide advice to the private housing sector (tenants/homeowners/landlords) on heat pumps and develop initiatives to facilitate market-based delivery, eg group buying schemes **4.** Provide access to **funding, finance** and favourable tariffs for homeowners and landlords

Energy systems *Heat*	9. Implement a programme to install or encourage/incentivise installation of heat pumps in **non-domestic buildings** in the city.	**Programme Overview:** A programme of heat pump promotion, financing and installation which serves all forms of non-domestic building. **1**. **Plan and deliver** programme of heat pump installation in Bristol City Council buildings, buildings of large asset owners in the city (e.g. universities and hospitals) and community buildings **2. Engage,** communicate and provide advice to non-domestic building owners/managers on heat pumps **3.** Provide access to **funding, finance** and favourable tariffs for non-domestic building owners and managers
2030 Objective (ii) 65,000 buildings connected to heat networks to support the phase out of gas heating in Bristol.		
Energy systems *Heat*	10. Expand the network and connect more buildings to the heat network	**Programme Overview:** A programme to create a city heat network serving a wide range of domestic and non-domestic buildings. **1.** Accelerate pace of **heat network delivery and connection**, including increasing supply of zero carbon heat, in particular large existing and new sources of waste heat, and implement Heat Network Zoning arrangements **2. Engage,** communicate and provide advice to building users/owners/managers on heat networks **3.** Provide access to **funding and finance** for heat network connections 4. Develop a **demonstrator** project for the retrofitting of high density, low rise, hard to treat housing (such as terraces) with connection to low carbon heat networks.
Not related to a specific 2030 objective		
Energy systems *Heat*	11. Reduce carbon intensity of the existing gas network	**1.** Reduce carbon intensity of gas by increasing the proportion of biogas and, pending evidence from industry trials, blending up to 20% hydrogen into the gas supply.
Energy Systems *Heat*	12. Put in place an inclusive **training and skills** programme for heat pump installation and heat network construction.	**1.** Put in place an inclusive training and skills programme for heat pump installation and heat network construction to support supply chain development
Built Environment		
2030 Objective (iii) The energy performance of existing buildings in the city is improved to minimise heat demand, whilst preventing overheating, through tailored retrofit solutions.		

Built Environment	13. Implement a city-wide programme for **housing** retrofit to reduce demand and integrate renewable generation.	**Programme Overview:** Deliver programmes of housing retrofit or encourage/incentivise retrofit for all homes in the city. Develop a joined-up 'retrofit ecosystem' for Bristol and WECA region by systematically coordinating communications, advice, innovation projects, large scale delivery schemes and skills initiatives across buildings and heat themes. **1. Plan and deliver** a programme of retrofit (including renewable energy) in social housing (BCC social housing and that of other social housing providers) including an associated programme of resident engagement. **2. Trial** street retrofit with blended finance building on the Net Zero Neighbourhoods model including significant community engagement related to neighbourhood decarbonisation activities (e.g. External Wall Insulation on a whole terrace). **3. Engage**, communicate and provide advice to the private housing sector (tenants/homeowners/landlords) on housing retrofit. **4.** Provide access and signposting to **funding and finance** for retrofit for homeowners and landlords
Built Environment	14. Implement a city-wide programme for **non-domestic building** retrofit to reduce demand and integrate renewable generation.	**Programme Overview:** Plan and deliver non-domestic retrofit programme or encourage/incentivise non-domestic retrofit for all non-domestic buildings across the city. **1. Plan and deliver** non-domestic retrofit programme in BCC-owned buildings, in buildings owned by large asset owners (e.g. university and hospital campuses) and community buildings. **2. Trial** a business retrofit project by sector or location (e.g. business park) **3. Engage,** communicate and provide advice to non-domestic building owners/ managers/ users on retrofit. **4.** Provide access to **funding and finance** for non-domestic building owners/managers.
Built Environment	15. Implement an inclusive training and **skills** programme for retrofit and renewable energy generation.	**Programme Overview:** Plan and deliver a training and skills programme for retrofit **1. Deliver** large scale training and skills programme for domestic and non-domestic retrofit – in all parts of the system including building works, planning, financing etc. **2. Deliver** targeted support to the supply chain development
Mobility & transport		
2030 Objective (i) Significant reduction in car mileage achieved through mode shift towards public transport, walking and cycling; commercial vehicle mileage reduced through freight consolidation; aiming for a total 40% reduction in vehicle miles. *2030 Objective (iv) Significant improvements made to accessibility and service of sustainable travel infrastructure to ensure it can support carbon neutral, climate resilient transport systems.*		

Mobility & transport	16. Implement programme to significantly reduce car miles	**Programme Overview:** Deliver a range of projects aimed to reduce car miles by 40%, significantly reducing congestion across the city, and creating the conditions and financial support for mass shift to public and active travel modes including: **1. Deliver** demand management measures including a workplace parking levy. **2. Expand** existing mobility as a service offers across the city, supporting single ticketing for multi-modal travel and expanding electric car clubs and schemes such as e-scooter and e-bike hire. 3. **Engage** with citizens and businesses on the design of changes to the transport systems which helps to address existing inequalities of access to mobility. This includes support for citizens and small business to make changes, with advice, support, training, discount schemes, loan schemes etc drawing upon the ideas in the Community Climate Action Plans.
Mobility & transport	17. Implement programme to encourage modal shift to active transport	**Programme Overview:** Deliver improvements to walking and cycling routes and infrastructure so that public enjoyment and safety when travelling by active modes is significantly improved. **1. Deliver** significant expansion of the City Region Sustainable Transport Settlement programme of segregated cycling infrastructure and make public realm improvements for walking. **2. Deliver** expansion of the Liveable Neighbourhoods schemes to all central residential neighbourhoods. **3. Engage** with citizens on promotion of safe active and public travel and help address inequalities in access to mobility.
Mobility & transport	18. Implement programme to encourage modal shift to public transport	**Programme Overview:** Significantly improve bus service routes, frequency and reliability so that people have a realistic alternative to driving. **1. Deliver** upgrades to existing bus services and establish new routes and more integrated services; in particular addressing existing inequalities in access to mobility. **2. Support** full electrification of bus fleet. 3. **Deliver** a Rapid Mass Transit system for the benefit of the city
Mobility & transport	19. Implement policy changes and provide innovation funding to encourage freight consolidation and low carbon deliveries	**Programme Overview:** Supporting the Local Industrial Decarbonisation Plan, implement policy changes to encourage freight consolidation and low carbon deliveries across the city region. **1. Policy** changes to support increased freight consolidation and electrification. **2. Provide** innovation funding to support and encourage operators to further invest in freight consolidation and final mile delivery by e-cargo bike.

2030 Objective (ii) All of Bristol's cars primarily consist of ultralow emission vehicles (ULEVs) and 90% of other vehicles to be ULEV.		
Mobility & transport	20. Implement programme to support accelerated shift from internal combustion engine vehicles to battery electric vehicles	**Programme Overview:** Accelerate market driven uptake of electric vehicles by providing a network of accessible and affordable public charge points to enable households without off-street parking to switch to electric vehicles, ensuring both effective use of the electricity network, city space and ensuring fair access to charge points. **1. Deliver** expansion of public Electric Vehicle Charging Infrastructure to 950 charge points within the city, including on-street, car park and other solutions. **2. Support** electricity network upgrades required for fast and ultra rapid public charge points. 3. **Engage** large organisations to convert their fleet cars to electric; including **to convert** Bristol City Council van fleet (300 vehicles) to electric vehicles with associated charging infrastructure 4. **Provide** access to **funding and finance** for business vehicles to convert to electric vehicles.
Waste & circular economy		
2030 Objective (i) Bristol's retail economy has transitioned to high quality, durable products that can be easily repaired.		
Waste & circular economy	21. Implement citywide programme to support increased repair and reuse of retail products	**Programme Overview:** Support a growing ecosystem of supply and demand for re-usable and repairable goods. **1. Deliver** expansion of local household waste and recycling centre's (HWRC's) Re-Use schemes. **2. Support** expansion of Bristol's burgeoning re-use and repair sector and community owned assets. **3. Deliver** an inclusive **training and skills** programme for repair and re-use, focusing on electrical goods, and a range of support for community-based repair and reuse initiatives based on ideas in the Community Climate Action Plans.

2030 Objective (ii) Everyone follows principles of responsible consumption, using and buying less and buying carbon neutral goods and services.		
Waste & circular economy	22. Conduct targeted engagement campaigns across the city to communicate impacts of consumption to businesses and citizens	**Programme Overview:** Through targeted engagement, increase awareness amongst citizens and businesses of the impacts of consumption, especially among high consumption groups/ businesses and enable significant changes. **1. Deliver** targeted engagement campaigns to communicate impacts of consumption, aimed at high-consumption demographics and businesses and support innovative solutions. **2. Coordinate** the creation and adoption of consistent local circular economy procurement principles, standards, and strategies. **3. Deliver** substantial and sustained programme of activities to inspire and support businesses to reduce their waste production and carbon emissions through capacity building, supply chain engagement etc.
2030 Objective (iii) Significant levels of waste reduction (particularly for food, textiles, and plastic). *2030 Objective (iv) At least 65% of all 'waste' is repaired, recycled or re-used.*		
Waste & circular economy	23. Implement waste reduction efforts and improve waste collection, recycling and processing services	**Programme Overview:** Improve local waste services to reduce waste, increase recycling rates and support the expansion of the local circular economy. **1. Engage** with waste services providers to support changes in local services that reduce food and plastic content of residual waste. **2. Engage** businesses and citizens to increase domestic and commercial recycling rates. **3**. **Support** the emerging Local Industrial Decarbonisation Plan working with Energy from Waste plant operators to find solutions for removal of fossil carbon from residual waste, and implement Carbon Capture and Storage at scale.
Green infrastructure & nature-based solutions		
2030 Objective (i) At least 30% of land in Bristol to be managed for the benefit of wildlife by 2030		
Green infrastructure & nature-based solutions	24. Raise the quality of existing green spaces	**Programme Overview:** Raise the quality of Bristol's existing green spaces from 'moderate' to good, through targeted investment delivering high quality green spaces. 1. **Deliver** improvements to parks and green spaces making them safer, more welcoming, and more inclusive. 2. **Deliver** improvements to parks and green spaces through increased tree planting and wildlife friendly habitat.

Green infrastructure & nature-based solutions	25. Improve climate resilience and ecological recovery through greening of the public realm	**Programme Overview:** Improve access to green spaces and boost climate resilience through street greening and tree planting. 1. **Deliver** a significant expansion of street greening through planting of new trees and other planting in the public realm to mitigate urban heat and improve the city's climate resilience. 2. **Deliver** expansion of the emerging Green Recovery Fund project, resulting in a combined uplift in the total space for nature within the city of 10%.
Green infrastructure & nature-based solutions	26. Create new green spaces across the city	**Programme Overview:** Incorporate the creation of new green spaces into strategic regeneration projects and flood defence schemes. 1. **Deliver** new green spaces in the city centre, Temple Quarter, and St Phillips Marsh as part of long-term strategic regeneration zones. 2. **Deliver** the incorporation of Green Infrastructure designs into the developing river Avon flood strategy. 3. **Deliver** 5,500m^2 of new floating reedbeds in the Floating Harbour.

B-2.2: Individual action outlines		
Impact Pathway 1: Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills		
Action outline	Action name	1. Continue to engage Transition Team on CCC design and implementation including developing business cases and securing funding
	Action type	Cross-cutting Enabling Action
	Action description	Support for Transition Team to engage with CCC long term. Interventions to develop and support effective partnerships, business cases, secure funding and finance etc for members to take the lead on delivering actions in the CCC. Focus on strengthening relations *within* TT organisations allows interdepartmental working, collaboration and fosters innovation. Focus on strengthening relations *between* TT organisations allows collaboration and fosters innovation for problem solving at city level
Reference to impact pathway	Field of action	Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills
	Systemic lever	Democracy and Participation
	Outcome (according to module B-1.1)	Action planning and implementation informed by local opinion achieves a just transition to climate neutrality
Implementation	Responsible bodies/person for implementation	Transition Team
	Action scale & addressed entities	Within Transition Team organisations
	Involved stakeholders	Transition Team
	Comments on implementation – consider mentioning resources, timelines, milestones	The Climate Strategy Co-ordinator in BCC will continue this work. Additional resources will be needed to fully achieve the action.
Impact & cost	GHG emissions reduction estimate (total) per emission source sector	None expected – enabling condition
	Total costs and costs by CO2e unit	Not applicable

B-2.2: Individual action outlines		
Action outline	Action name	*2. Further embed Just Transition principles into CCC and support wider adoption in the city through wide engagement*
	Action type	Cross-cutting Enabling Action
	Action description	Bristol's Just Transition declaration aims to work towards net zero in a way that works for everyone in the city. Embedding the principles more widely in the CCC will help achieve this aim. Excellent practice on engagement to feed into the design of actions will allow for effective solutions. Engagement on Just Transition itself will also be necessary, for both high level decision makers and for citizens more widely.
Reference to impact pathway	Field of action	Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills
	Systemic lever	Democracy and Participation
	Outcome (according to module B-1.1)	Action planning and implementation informed by local opinion achieves a just transition to climate neutrality
Implementation	Responsible bodies/person for implementation	Transition Team
	Action scale & addressed entities	Citizens citywide
	Involved stakeholders	Transition Team. Advice from experts in inclusion and equity in environmental work may also be sought
	Comments on implementation – consider mentioning resources, timelines, milestones	Learn from and build upon the Mission Net Zero Project. Additional resources will be needed.
Impact & cost	GHG emissions reduction estimate (total) per emission source sector	None expected – enabling condition
	Total costs and costs by CO2e unit	Not applicable

B-2.2: Individual action outlines		
Action outline	Action name	*3 Deliver transformative, inclusive, programmes of environmental communications, consultation and engagement*
	Action type	Cross-cutting Enabling Action
	Action description	Transformation of current programmes of environmental communications, consultation and engagement are necessary to develop inclusivity and equity, build on existing good practice and work with new groups- particularly those who have previously been excluded. Sharing good practice allows it to be disseminated widely in the city.

		This could include: • Embed equitable practice at the heart of communications and engagement recognising the multiple barriers to inclusive environmentalism. • Undertake further research to prioritise which audiences to engage with and how to reach them. Ensure that accessible versions of this research are available to the public • Collate and share best practice across the sector. • Co-produce, test and disseminate a set of tools to help organisations across the city to create communications and engagement that are in line with Just Transition principles, building on existing work on inclusive environmentalism and Just Transition, avoids causing harm and trauma, and fosters cohesion across difference, is more consistent across the city and has more impact which is more comprehensively measured • Ensure that engagement influences policy, the design of services and solutions and decision making
Reference to impact pathway	Field of action	Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills
	Systemic lever	Democracy and Participation
	Outcome (according to module B-1.1)	Action planning and implementation informed by local opinion achieves a just transition to climate neutrality
Implementation	Responsible bodies/person for implementation	Transition Team
	Action scale & addressed entities	Citizens citywide
	Involved stakeholders	Transition Team and stakeholders representing wider demographics - particularly those not previously reached. Advice from experts in inclusion and equity in environmental work may also be sought
	Comments on implementation – consider mentioning resources, timelines, milestones	Learn from and build upon the Mission Net Zero Project. Additional resources will be needed.
Impact & cost	GHG emissions reduction estimate (total) per emission source sector	None expected – enabling condition
	Total costs and costs by CO2e unit	Not applicable

B-2.2: Individual action outlines		
Action outline	Action name	*4 Widen access to green jobs and skills*
	Action type	Cross-cutting Enabling Action
	Action description	Further support green skills development in the region. Ensure there is a trained, skilled talent pipeline and workforce for net zero infrastructure supply chain, maintenance and decommissioning. Effective planning for skills development – e.g. targeting areas which would benefit from new employment opportunities, overcoming barriers to entry and tackling exclusion, providing opportunities to tackle inequality. This could include: • Ensure time and resource for effective planning for skills development • Join up strategic thinking from regional to community level to develop long term aspirations for skills and career development • Link effectively to BCC Inclusive Growth Strategy • Develop comprehensive Green Skills training programmes from Primary level to HE as well as alternative provisions, and on the job training • Ensure green skills training is relevant and inclusive to a wider range of people: ○ co-create with stakeholders to overcome barriers to inclusion • Engage on green skills and job opportunities to widen access across the city e.g. careers fairs, information for education providers, online info hubs for signposting, paid work experience opportunities and/or internships • Support inclusive, in-work Green Skills development • Ensure that leadership in Green Skills and Jobs is inclusive • Provide (financial) support and information on available opportunities
Reference to impact pathway	Field of action	Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills
	Systemic lever	All -Technology and Infrastructure; Social Innovation; Finance and Funding; Democracy and Participation; Governance and Policy; Learning and Capabilities
	Outcome (according to module B-1.1)	Action planning and implementation informed by local opinion achieves a just transition to climate neutrality
Implementation	Responsible bodies/person for implementation	The overall responsible body or bodies would be identified as this work progresses. At present, several organisations are playing a role
	Action scale & addressed entities	Citizens citywide
	Involved stakeholders	Transition Team, educational providers. Advice from experts in inclusion and equity in environmental work may also be sought.

	Comments on implementation – consider mentioning resources, timelines, milestones	Learn from and build upon the Mission Net Zero Project and WECA Green Skills Programme. Additional resources will be needed.
Impact & cost	GHG emissions reduction estimate (total) per emission source sector	None expected – enabling condition
	Total costs and costs by CO2e unit	Not applicable

B-2.2: Individual action outlines		
Action outline	Action name	*5 Deliver programme to support employers to create and sustain green jobs*
	Action type	Cross-cutting Enabling Action
	Action description	Further support development of a green jobs pipeline of green jobs, including strengthening work in existing green sectors, and also enabling transition from fossil fuel-based activities into low carbon ones to facilitate the actions in this plan being carried out effectively. This could include: • Ensure that Green Jobs pipeline is inclusive and provides opportunities for those previously excluded, and those formerly employed in fossil fuel industry by using equitable practices. • Support for Green Job creation, recruitment and retention, whilst overcoming barriers to entering and progressing in the sector.
Reference to impact pathway	Field of action	Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills
	Systemic lever	Finance and Funding; Democracy and Participation; Learning and Capabilities
	Outcome (according to module B-1.1)	Action planning and implementation informed by local opinion achieves a just transition to climate neutrality
Implementation	Responsible bodies/person for implementation	The overall responsible body or bodies would be identified as this work progresses. At present, several organisations are playing a role
	Action scale & addressed entities	Citizens citywide
	Involved stakeholders	Transition Team, educational providers, employers. Advice from experts in inclusion and equity in environmental work may also be sought
	Comments on implementation – consider mentioning resources, timelines, milestones	To implement in coordination with leadership from key stakeholders with a role in leading work on skills development
Impact & cost	GHG emissions reduction estimate (total) per emission source sector	None expected – enabling condition
	Total costs and costs by CO2e unit	Not applicable

B-2.2: Individual action outlines		
Impact Pathway 2: Energy Systems		
Action outline	Action name	6 Reinforce local energy network and manage smartly
	Action type	Infrastructure
	Action description	Deliver a number of projects to help decarbonise the local grid and provide improved flexibility. 1. Explore flexibility and smart solutions (technological); NGED procuring improved flexibility to meet local demand; developing more renewable and dynamic tariffs. 2. Reinforce the network e.g. at Iron Acton grid supply point.
Reference to impact pathway	Field of action	Energy Systems: Electricity
	Systemic lever	Social Innovation; Tech & Infrastructure
	Outcome (according to module B-1.1)	Increased availability and uptake of renewable and dynamic tariffs. Greater use of flexibility within Bristol's electricity network. Offsetting the need for network reinforcement and allowing the growth of low carbon technologies. Delivery of Network Development Plan (informed by DFES) starts. The network can quickly and easily accommodate new low carbon technologies to connect (e.g. heat pumps and electric vehicle charge points).
Implementation	Responsible bodies/person for implementation	National Grid Electricity Distribution (NGED) is the main responsible body
	Action scale & addressed entities	Citywide across the electricity distribution network, including domestic and non-domestic customers
	Involved stakeholders	NGED and their key stakeholders
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation including timelines would be developed by the stakeholders as the action is developed
Impact & cost	Generated renewable energy (if applicable)	This action is about maximising energy use when it is being produced by renewable sources so that renewable energy is not wasted, rather than installing additional renewable energy generation
	Removed/substituted energy, volume, or fuel type	Through shifting energy use to times of renewable generation, the demand for electricity generated by burning fossil fuels is reduced

	GHG emissions reduction estimate (total) per emission source sector	None expected – enabling condition
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines		
Action outline	Action name	7 Implement programme to maximise renewable energy generation (especially solar)
	Action type	Infrastructure
	Action description	**Delivery** Maximise potential to generate energy in the city from renewables with an emphasis on solar. Programme will need to first create enabling conditions. Projects include: creating a Local Area Energy Plan; reviewing the application of new Local Plan/planning conditions to identify any barriers to delivery; maximising renewable energy generation and storage on all suitable buildings and land. 1. Create a Regional Climate Investment Plan and review the application of new Local Plan to identify any barriers to delivery 2. Engage, communicate, and provide advice to the private housing sector (tenants/homeowners/landlords) on solar PV and develop initiatives to facilitate market-based delivery, e.g. group buying schemes 3. Engage large organisations to make commitments to buy renewable electricity, create innovative shared buying solutions and generate their own renewable energy
Reference to impact pathway	Field of action	Energy Systems: Electricity
	Systemic lever	Governance & Policy; Tech & Infrastructure; Social Innovation; Democracy & Participation; Finance and Funding
	Outcome (according to module B-1.1)	Applications for solar on rooftops in the local area are more readily approved and current 'shovel ready' renewables projects are connected. A significant increase in local generation from PV supports improved flexibility in the local grid, and at household level, supporting increased uptake of heat pumps and EVs. Large organisations are on renewable electricity tariffs and starting to roll out plans for generating their own renewable energy.
Implementation	Responsible bodies/person for implementation	The overall responsible body or bodies would be identified as this work progresses. At present, several organisations are playing a role
	Action scale & addressed entities	Citywide
	Involved stakeholders	To be confirmed as this action is developed

	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation including timelines and potential milestones would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	520,074,511 kWh in 2030
	Removed/substituted energy, volume, or fuel type	520,074,511 kWh of grid supplied energy in 2030
	GHG emissions reduction estimate (total) per emission source sector	Abatement of 14,736 tonnes CO2e in 2030
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines		
Action outline	Action name	8 Deliver programme to install or encourage/incentivise installation of heat pumps in homes in the city
	Action type	Infrastructure
	Action description	**Delivery**: Plan and deliver a programme of heat pump installation in social housing and low-income private homes (BCC social housing and that of other social housing providers) including an associated programme of resident engagement. Trial community scale heat pump solutions including an associated programme of community engagement **Engagement:** Put in place a communications campaign on heat pumps with targeted messaging for different segments of homeowners, tenants and landlords **Finance/Funding**: Assess outcomes of Net Zero Co-Innovation Investment Lab, Mission Net Zero and South West Net Zero Hub Able to Pay Loan Offer and set up appropriate finance instruments. Provide access to electricity tariffs for heat pump customers with reduced price electricity.
Reference to impact pathway	Field of action	Energy Systems: Heat
	Systemic lever	Governance & Policy, Finance & Funding, Tech & Infrastructure, Democracy & Participation and Social Innovation
	Outcome (according to module B-1.1)	Social housing providers have trialled heat pumps in their housing stock. Community scale heat pumps are working, inspiring uptake in other communities. Normalisation of heat pump technology. Sufficient grant funding and finance available to private homeowners who need it.

		Heat pump installations increased exponentially from 2024 across both social housing and private homes.
Implementation	Responsible bodies/person for implementation	To be confirmed as this action is developed
	Action scale & addressed entities	Citywide scale focusing on homes in the city
	Involved stakeholders	To be confirmed
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation including timelines and potential milestones would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Over 75% Bristol's homes are heated by gas boilers, and the majority of the remainder by direct electric heating. Therefore, heat pumps will predominantly be replacing gas boilers, but will replace direct electric in some cases.
	GHG emissions reduction estimate (total) per emission source sector	Abatement of 143,140 tonnes CO2e in 2030
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines		
Action outline	Action name	9 Implement a programme to install or encourage/incentivise installation of heat pumps in non-domestic buildings in the city
	Action type	Infrastructure
	Action description	**Delivery:** Plan and deliver programme of heat pump installation in Bristol City Council buildings, buildings of large asset owners in the city (e.g. universities and hospitals) and community buildings. **Engagement:** Build understanding of the transition to heat pumps in non-domestic buildings. Provide advice on heat pumps for non-domestic building owners/managers **Funding/Finance:** Provide access to funding, finance and favourable tariffs for non-domestic building owners and managers
	Field of action	Energy Systems: Heat

Reference to impact pathway	Systemic lever	Governance & Policy, Finance & Funding, Tech & Infrastructure, Social Innovation and Democracy & Participation
	Outcome (according to module B-1.1)	Plan delivery in Bristol City Council buildings, buildings of large asset owners and community buildings is well underway. Improved awareness of heat pumps as a solution for decarbonising non-domestic buildings. Sufficient grant funding and finance available for non-domestic building owners/managers who need it.
Implementation	Responsible bodies/person for implementation	As a group the Transition Team will look at this action and suggest an appropriate group of responsible organisations
	Action scale & addressed entities	Citywide targeting non-domestic buildings
	Involved stakeholders	To be confirmed as this action is developed
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation including resources, timelines and potential milestones would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	The majority of non-domestic buildings are heated by gas boilers and the remainder by direct electric heating. Therefore, heat pumps will predominantly be replacing gas boilers, but will replace direct electric in some cases.
	Removed/substituted energy, volume, or fuel type	80,176,278.6 kWh shifted from fossil fuel heating sources in 2030
	GHG emissions reduction estimate (total) per emission source sector	Abatement of 27,650 tonnes CO2e in 2030
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines		
Action outline	Action name	10 Expand the network and connect more buildings to the heat network
	Action type	Infrastructure
	Action description	**Delivery:** Accelerate pace of heat network delivery and connection, including increasing supply of zero carbon heat, in particular large existing and new sources of waste heat. Secure funding and investment to extend the heat network Streamline Bristol City Council processes (e.g. planning, legal, highways) Enforce Heat Network Zoning policy when it comes into force [requiring large non-domestic

		buildings and communally heated residential buildings within a heat network zone to connect to a heat network]. Put Zoning Coordinator in place. **Engagement:** Develop approach to consultation on heat networks Put in place a communications campaign on heat networks with targeted messaging for building owners, users and residents. Provide advice on heat networks for building owners, users and residents. **Finance/Funding:** Provide access to funding and finance for heat network connections
Reference to impact pathway	Field of action	Energy Systems: Heat
	Systemic lever	Tech & Infrastructure, Governance & Policy, Finance & Funding, Social Innovation and Democracy & Participation
	Outcome (according to module B-1.1)	Additional heat networks (beyond original Vattenfall plans) are in construction. Existing buildings are connecting to the heat network as a result of zoning policy. Normalisation of heat networks. Sufficient grant funding and finance available to ensure strategically important buildings can connect to the heat network
Implementation	Responsible bodies/person for implementation	Vattenfall and Bristol City Council
	Action scale & addressed entities	Areas of the city where heat networks are the lowest cost low carbon solution, predominantly city centre and some pockets outside the centre. Connections to non-domestic and domestic buildings
	Involved stakeholders	To be confirmed as this action is developed
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	Energy centres will predominantly be large-scale heat pumps and direct electric boilers for peak demand
	Removed/substituted energy, volume, or fuel type	Gas is the main fuel that will be replaces.
	GHG emissions reduction estimate (total) per emission source sector	Abatement of 331,720 tonnes CO2e in 2030
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines		
Action outline	Action name	11 Reduce carbon intensity of the existing gas network
	Action type	Infrastructure
	Action description	Reduce carbon intensity of gas by increasing the proportion of biogas and, pending government policy, blending up to 20% hydrogen into the gas supply.
Reference to impact pathway	Field of action	Energy Systems: Heat
	Systemic lever	Tech & Infrastructure and Governance & Policy
	Outcome (according to module B-1.1)	Ability (or otherwise) to blend hydrogen into the gas supply has been established
Implementation	Responsible bodies/person for implementation	The overall responsible body will be identified as this work progresses
	Action scale & addressed entities	Citywide
	Involved stakeholders	To be confirmed as this action is developed
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	No renewable energy generated
	Removed/substituted energy, volume, or fuel type	Fossil gas replaced with biogas or hydrogen
	GHG emissions reduction estimate (total) per emission source sector	Not yet known
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	Not yet known

B-2.2: Individual action outlines		
Action outline	Action name	12 Inclusive training and skills programme for heat pump installation and heat network construction
	Action type	Supply chain development via training and skills development
	Action description	Plan and deliver a training and skills programme for retrofit 1. Deliver large scale training and skills programme for domestic and non-domestic retrofit – in all parts of the system including building works, planning, financing etc. 2. Deliver targeted support to the supply chain development

Reference to impact pathway	Field of action	Energy Systems: Heat
	Systemic lever	Learning & Capabilities and Finance & Funding
	Outcome (according to module B-1.1)	Increase in skilled local supply chain. Clear pathway from training into jobs
Implementation	Responsible bodies/person for implementation	The overall responsible body or bodies would be identified as this work progresses. At present, several organisations are playing a role
	Action scale & addressed entities	Citywide
	Involved stakeholders	To be confirmed as this action is developed
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Not applicable
	GHG emissions reduction estimate (total) per emission source sector	Not applicable
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines		
Impact Pathway 3: Built Environment		
Action outline	Action name	13 Implement citywide programme for housing retrofit to reduce demand and integrate renewable generation
	Action type	Infrastructure
	Action description	**Delivery:** Plan and deliver a programme of retrofit (including renewable energy) in social housing (BCC social housing and that of other social housing providers) including an associated programme of resident engagement. Trial street retrofit with blended finance building on the Net Zero Neighbourhoods model including significant community engagement related to neighbourhood decarbonisation activities (e.g. External Wall Insulation on a whole terrace). Engage, communicate and provide advice to tenants/homeowners/landlords on housing

		retrofit **Engagement:** Provide advice and casework on energy, fuel poverty, damp and mould for households. Put in place a communications campaign on housing retrofit with targeted messaging for different segments of homeowners, tenants and landlords **Funding, Finance** Provide access to funding, finance for retrofit for homeowners and landlords
Reference to impact pathway	Field of action	Built Environment
	Systemic lever	Governance & Policy, Finance & Funding, Tech & Infrastructure, Democracy & Participation and Social Innovation
	Outcome (according to module B-1.1)	All social housing and low-income homes are retrofitted and achieve EPC C plus rating. Street retrofit pilot completed and more communities are inspired to do the same. Number of private homes with retrofit plans is increasing exponentially. Sufficient grant funding and finance available for private homeowners who need it.
Implementation	Responsible bodies/person for implementation	As a group the Transition Team could look at this action and suggest an appropriate group of responsible organisations
	Action scale & addressed entities	Citywide scale targeting all homes
	Involved stakeholders	To be confirmed as this action is developed
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation including resources, timelines and potential milestones would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Reduced energy demand leads to reduction in use of gas boilers and electricity generated by fossil fuel sources.
	GHG emissions reduction estimate (total) per emission source sector	Abatement of 10,660 tonnes CO2e in 2030
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines		
Action outline	Action name	14 Implement a city-wide programme for non-domestic building retrofit to reduce demand and integrate renewable generation
	Action type	Infrastructure
	Action description	**Delivery:** Plan and deliver non-domestic retrofit programme in BCC-owned buildings, in buildings owned by large asset owners (e.g. university and hospital campuses) and community buildings. Trial a business retrofit project by sector or location (e.g. business park). **Engagement:** Research to understand archetypes of properties, barriers to retrofit and incentives required. Put in place a communications campaign and provide advice on building retrofit for non-domestic building owners/managers/users. **Finance/Funding:** Research to understand different business model options for different ownership models of non-domestic buildings
Reference to impact pathway	Field of action	Built Environment
	Systemic Lever	Governance & Policy, Finance & Funding, Tech & Infrastructure, Democracy & Participation and Social Innovation
	Outcome (according to module B-1.1)	Plan delivery for BCC buildings and buildings owned by large asset owners is well underway. Place/sector based-project has been demonstrated and other are inspired to do the same. Improved awareness of retrofit solutions for non-domestic buildings. Sufficient grant funding and finance available for non-domestic building owners/managers who need it.
Implementation	Responsible bodies/person for implementation	As a group the Transition Team could look at this action and suggest an appropriate group of responsible organisations. At present, several organisations are playing a role. The Transition Team could discuss the value of coordinating work across asset owners
	Action scale & addressed entities	Citywide scale targeting non-domestic buildings
	Involved stakeholders	To be confirmed as this action is developed
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	Not applicable

	Removed/substituted energy, volume, or fuel type	Reduced energy demand leads to reduction in use of gas boilers and electricity generated by fossil fuel sources.
	GHG emissions reduction estimate (total) per emission source sector	Abatement of 1,810 tonnes CO2e in 2030
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines		
Action outline	Action name	15 Implement an inclusive training and skills programme for retrofit and renewable energy generation
	Action type	Supply chain development via training and skills development
	Action description	Deliver large scale training and skills programme for domestic and non-domestic retrofit – in all parts of the system including building works, planning, financing etc. Deliver targeted support to the supply chain development
Reference to impact pathway	Field of action	Built Environment
	Systemic lever	Learning & Capabilities and Finance & Funding
	Outcome (according to module B-1.1)	Increase in skilled local supply chain and increased participation in green jobs. Clear pathway from training into jobs.
Implementation	Responsible bodies/person for implementation	The overall responsible body or bodies would be identified as this work progresses. At present, several organisations are playing a role
	Action scale & addressed entities	Citywide
	Involved stakeholders	To be confirmed as this action is developed
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Not applicable
	GHG emissions reduction estimate (total) per emission source sector	Not applicable
	GHG emissions compensated (natural or technological sinks)	Not applicable

	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines		
Impact Pathway 4: Mobility and Transport		
Action outline	Action name	16 Implement programme to significantly reduce car miles
	Action type	Infrastructure
	Action description	**Delivery:** Deliver a range of projects aimed to reduce car miles by 40%, significantly reducing congestion across the city, and creating the conditions and financial support for mass shift to public and active travel modes including: 1. Demand management measures including a workplace parking levy. 2. Expansion of existing mobility as a service offers across the city, supporting single ticketing for multi-modal travel and expanding electric car clubs and schemes such as e-scooter and e-bike hire. 3. Engagement with citizens and businesses on the design of changes to the transport systems which helps to address existing inequalities of access to mobility 4. Across all transport actions/modes, support and enable citizens and small business to make changes, with advice, support, training, discount schemes, loan schemes etc drawing upon the ideas in the Community Climate Action Plans.
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology & infrastructure; governance & policy; democracy & participation; finance & funding and social innovation
	Outcome (according to module B-1.1)	A 40% reduction in car miles reduces congestion and allows for increased public transport measures. Door-to-door journeys by multiple modes become more feasible and desirable. Shift to replacing private ownership with mobility as a service. Existing and new services are informed by citizen and business priorities. Connectivity across the city becomes more equal, providing improved and more equitable access to employment and leisure opportunities. Community-led local transport initiatives are realised across the city, improving connectivity and ensuring that other transport interventions proposed do not create new barriers for marginalised groups.
Implementation	Responsible bodies/person for implementation	West of England Combined Authority and Bristol City Council
	Action scale & addressed entities	Citywide scale
	Involved stakeholders	To be confirmed

	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Primarily reducing petrol and diesel consumption.
	GHG emissions reduction estimate (total) per emission source sector	Abatement of 160,970 tonnes CO2e in 2030
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines		
Action outline	Action name	17 Implement programme to encourage modal shift to active travel
	Action type	Infrastructure and public engagement
	Action description	**Delivery:** Deliver improvements to walking and cycling routes and infrastructure so that public enjoyment and safety when travelling by active modes is significantly improved. 1. Significant expansion of the City Region Sustainable Transport Settlement programme of segregated cycling infrastructure and make public realm improvements for walking. 2. Expansion of the Liveable Neighbourhoods schemes to all central residential neighbourhoods. **Engagement:** Engage with citizens on promotion of safe active and public travel and help address inequalities in access to mobility.
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology & Infrastructure, Governance & Policy, Democracy & Participation and Social Innovation
	Outcome (according to module B-1.1)	Active travel rates significantly increase across the city, particularly amongst groups with lower-than-average participation, as citizens feel more confident, safe and welcome to move about the city by walking, cycling and wheeling. Neighbourhoods feel and are measurably safer, healthier and more inclusive, where everyone can breathe clean air, access better quality green spaces and safe spaces to play, increasing social cohesion.
Implementation	Responsible bodies/person for implementation	To be agreed
	Action scale & addressed entities	Citywide scale, focusing on areas of greatest inequality

	Involved stakeholders	Citizens, Bristol City Council, West of England Combined Authority and others to be confirmed
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Primarily displacing petrol consumption.
	GHG emissions reduction estimate (total) per emission source sector	Abatement of 56,520 tonnes CO2e in 2030
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines		
Action outline	Action name	18 Implement programme to encourage modal shift to public transport
	Action type	Infrastructure and public engagement
	Action description	**Delivery:** Significantly improve bus service routes, frequency and reliability so that people have a realistic alternative to driving. 1. Deliver upgrades to existing bus services and establish new routes and more integrated services; in particular addressing existing inequalities in access to mobility. 2. Support full electrification of bus fleet. 3. Deliver a Rapid Mass Transit system for the benefit of the city.
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology and Infrastructure; Governance & Policy
	Outcome (according to module B-1.1)	Model share increases to 40% for public transport. Connectivity across the city is improved, reducing barriers in access to employment opportunities and increasing economic productivity. All bus travel within the city is close to zero carbon, as supply of electricity to the bus fleet is 100% renewable energy. Journeys across the city, both work and leisure, are significantly easier and more affordable than by private vehicles, making this mode of travel the preferred option for the majority.
Implementation	Responsible bodies/person for implementation	To be agreed, but would likely be Bristol City Council, West of England Combined Authority and transport providers
	Action scale & addressed entities	Citywide

	Involved stakeholders	Citizens, Bristol City Council, West of England Combined Authority, transport providers and others to be confirmed
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Primarily shifting petrol consumption to low carbon electricity.
	GHG emissions reduction estimate (total) per emission source sector	Abatement of 49,260 tonnes CO2e in 2030
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines		
Action outline	Action name	19 Implement policy changes and provide innovation funding to encourage freight consolidation and low carbon deliveries
	Action type	Infrastructure and business engagement
	Action description	Support the Local Industrial Decarbonisation Plan, implement policy changes to encourage freight consolidation and low carbon deliveries across the city region. 1. Policy changes to support increased freight consolidation and electrification. 2. Provide innovation funding to support and encourage operators to further invest in freight consolidation and final mile delivery by e-cargo bike.
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Governance & Policy; Finance & Funding
	Outcome (according to module B-1.1)	Move to electrification of LGV deliveries is accelerated to 100% by 2030.
Implementation	Responsible bodies/person for implementation	To be agreed
	Action scale & addressed entities	Citywide
	Involved stakeholders	To be confirmed as this action is developed
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation would follow as the action is developed

Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Primarily shifting diesel consumption to low carbon electricity and some hydrogen.
	GHG emissions reduction estimate (total) per emission source sector	Abatement of 131,380 tonnes CO2e in 2030
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines		
Action outline	Action name	20 Implement programme to support accelerated shift from internal combustion engine vehicles to battery electric vehicles
	Action type	Infrastructure and public engagement
	Action description	Accelerate market driven uptake of electric vehicles by providing a network of accessible and affordable public charge points to enable households without off-street parking to switch to electric vehicles, ensuring both effective use of the electricity network, city space and ensuring fair access to charge points. 1. Deliver expansion of public Electric Vehicle Charging Infrastructure to 950 charge points within the city, including on-street, car park and other solutions. 2. Support electricity network upgrades required for fast and ultra rapid public charge points. 3. Engage large organisations to convert their fleet cars to electric; including to convert Bristol City Council van fleet (300 vehicles) to electric vehicles with associated charging infrastructure 4. Provide access to funding and finance for business vehicles to convert to electric vehicles.
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology & Infrastructure; Social Innovation; Learnings & Capabilities and Finance & Funding
	Outcome (according to module B-1.1)	Ownership of EVs becomes viable for citizens without off-street parking at their home address. Fast and ultra-rapid charge points now have coverage across all areas of the city. All fleet vehicles owned by large organisations are now EV, with opportunities to share charging infrastructure.

Implementation	Responsible bodies/person for implementation	The overall responsible body or bodies would be identified as this work progresses. At present, several organisations are playing a role including Bristol City Council
	Action scale & addressed entities	Citywide
	Involved stakeholders	To be confirmed as this action is further developed
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation including timelines and potential milestones would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Primarily shifting from petrol and diesel consumption to low carbon electricity
	GHG emissions reduction estimate (total) per emission source sector	Abatement of 59,880 tonnes CO2e in 2030
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines		
Impact Pathway 5: Waste and Circular Economy		
Action outline	Action name	21 Implement citywide programme to support increased repair and reuse of retail products
	Action type	Infrastructure and public engagement
	Action description	Support a growing ecosystem of supply and demand for re-usable and reparable goods. 1. Deliver expansion of local household waste and recycling centre's (HWRC's) Re-Use schemes. 2. Support expansion of Bristol's burgeoning re-use and repair sector and community owned assets. 3. Deliver an inclusive training and skills programme for repair and re-use, focusing on electrical goods, and a range of support for community-based repair and reuse initiatives based on ideas in the Community Climate Action Plans.
Reference to impact pathway	Field of action	Waste & Circular Economy
	Systemic lever	Social Innovation; Finance & Funding; Technology & Infrastructure; Learning & Capabilities
	Outcome (according to module B-1.1)	Re-Use shops at local HWRC's become well known and normalised as a route for household items, forming an important part of Bristol's circular economy. Citizens across the city have normalised supplying and purchasing reparable and re-usable goods from this ecosystem of organisations. Buying in this way becomes a go-to option for

		an increasingly large number of citizens. A pipeline of students from diverse backgrounds leads to significantly more green jobs in the local circular economy and further supports the positive perception of citizens regarding the desirability of re-used and repaired products.
Implementation	Responsible bodies/person for implementation	To be agreed. Likely to be Bristol Waste and Bristol City Council
	Action scale & addressed entities	Citywide
	Involved stakeholders	To be confirmed but noting the need for public engagement
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Not applicable
	GHG emissions reduction estimate (total) per emission source sector	Out of scope
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines		
Action outline	Action name	22 Conduct targeted engagement campaigns across the city to communicate impacts of consumption to businesses and citizens
	Action type	Infrastructure and public engagement
	Action description	Through targeted engagement, increase awareness amongst citizens and businesses of the impacts of consumption, especially among high consumption groups/ businesses and enable significant changes. 1. Deliver targeted engagement campaigns to communicate impacts of consumption, aimed at high-consumption demographics and businesses and support innovative solutions. 2. Coordinate the creation and adoption of consistent local circular economy procurement principles, standards and strategies. 3. Deliver substantial and sustained programme of activities to inspire and support businesses to reduce their waste production and carbon emissions through capacity building and supply chain engagement.
	Field of action	Waste & Circular Economy

Reference to impact pathway	Systemic lever	Learning & Capabilities; Governance & Policy
	Outcome (according to module B-1.1)	High-consumption demographics and businesses make active efforts to change their consumption patterns switching to local products and services with lower carbon footprints. Suppliers of a wide range of goods and services within Bristol begin to adjust their business practices to reflect the growing and consistent requirement for circular economy principles embedded in supply chains. Minimisation of waste and carbon are mainstreamed into business as usual operations of commercial organisations throughout the city, resulting in Bristol's local economy being an international leader in low waste and low carbon business operations.
Implementation	Responsible bodies/person for implementation	As a group the Transition Team could look at this action and suggest an appropriate group of responsible organisations
	Action scale & addressed entities	Citywide
	Involved stakeholders	To be confirmed
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Not applicable
	GHG emissions reduction estimate (total) per emission source sector	Out of scope
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines		
Action outline	Action name	23 Implement waste reduction efforts and improve waste collection, recycling and processing services
	Action type	Infrastructure and engagement
	Action description	Improve local waste services to reduce waste, increase recycling rates and support the expansion of the local circular economy. 1. Engage with waste services providers to support changes in local services that reduce food and plastic content of residual waste. 2. Engage businesses and citizens to increase domestic and commercial recycling rates.

		3. Support the emerging Local Industrial Decarbonisation Plan working with Energy from Waste plant operators to find solutions for removal of fossil carbon from residual waste, and implement Carbon Capture and Storage at scale.
Reference to impact pathway	Field of action	Waste & Circular Economy
	Systemic lever	Technology & Infrastructure, Democracy & Participation; Social Innovation
	Outcome (according to module B-1.1)	Domestic recycling rates continue to improve reaching 65% by 2030. Bristol's domestic waste stream contains almost no food or plastics, increasing the supply of material for local Anaerobic Digestion, and reducing the carbon content of residual waste. All of Bristol's small businesses now separate and recycle their food and plastic waste. Residual waste now contains far less fossil carbon, and emissions from energy from waste plants are significantly reduced through the implementation of carbon capture and storage at scale. Bristol's circular economy is integrated across the city's residential, commercial, and industrial districts. New opportunities arise and are realised through an ecosystem of collaborative stakeholders communicating effectively.
Implementation	Responsible bodies/person for implementation	To be agreed. Likely to be Bristol Waste and Bristol City Council
	Action scale & addressed entities	Citywide
	Involved stakeholders	To be confirmed. Likely to include other waste service providers and noting the need for engagement with the public and businesses
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Not applicable
	GHG emissions reduction estimate (total) per emission source sector	Abatement of 81,310 tonnes CO2e in 2030
	GHG emissions compensated (natural or technological sinks)	Not applicable
	Total costs and costs by CO2e unit	See investment plan

B-2.2: Individual action outlines

Impact Pathway 6 : Green Infrastructure and Nature-based Solutions		
Action outline	Action name	24 Raise the quality of existing green spaces
	Action type	Infrastructure and public engagement
	Action description	Raise the quality of Bristol's existing green spaces from 'moderate' to good, through targeted investment delivering high quality green spaces. 1. Deliver improvements to parks and green spaces making them safer, more welcoming, and more inclusive. 2. Deliver improvements to parks and green spaces through increased tree planting and wildlife friendly habitat.
Reference to impact pathway	Field of action	Green Infrastructure & Nature Based Solutions
	Systemic lever	Tech & Infrastructure
	Outcome (according to module B-1.1)	Greater numbers of citizens from a wider range of backgrounds visit Bristol's parks and green spaces on a regular basis, feeling safe and welcome to do so on their own and with groups of people. Tree canopy cover in existing parks and green spaces begins to mature providing vital new habitat for insects and birds supporting the abundance of wildlife within Bristol. The number of cool spaces also increases improving the provision of respite for citizens during extended heatwaves.
Implementation	Responsible bodies/person for implementation	As a group the Transition Team could look at this action and suggest an appropriate group of responsible organisations. Bristol City Council would have a significant role with regard to actions for parks
	Action scale & addressed entities	Citywide
	Involved stakeholders	To be confirmed
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Not applicable
	GHG emissions reduction estimate (total) per emission source sector	Not applicable
	GHG emissions compensated (natural or technological sinks)	Currently not estimated

	Total costs and costs by CO2e unit	Not applicable

B-2.2: Individual action outlines		
Action outline	Action name	25 Improve climate resilience and ecological recovery through greening of the public realm
	Action type	Green infrastructure
	Action description	Improve access to green spaces and boost climate resilience through street greening and tree planting. 1. Deliver a significant expansion of street greening through planting of new trees and other planting in the public realm to mitigate urban heat and improve the city's climate resilience. 2. Deliver expansion of the emerging Green Recovery Fund project, resulting in a combined uplift in the total space for nature within the city of 10%.
Reference to impact pathway	Field of action	Green Infrastructure & Nature Based Solutions
	Systemic lever	Tech & Infrastructure
	Outcome (according to module B-1.1)	New tree canopy cover begins to mature and, along with other planting, provides improved urban cooling reducing the vulnerability of Bristol's people and wildlife to extreme heat. Insect and other wildlife populations show signs of recovery with increased abundance and diversity. Newly diversified species rich grassland may begin to provide moderate carbon sequestration along with other ecosystem services.
Implementation	Responsible bodies/person for implementation	As a group the Transition Team could look at this action and suggest an appropriate group of responsible organisations. Bristol City Council would have a significant role with regard to actions for parks and public realm. West of England Combined Authority have a significant role with regard to the Green Recovery Fund
	Action scale & addressed entities	Citywide
	Involved stakeholders	To be confirmed as this action is developed
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Not applicable
	GHG emissions reduction estimate (total) per emission source sector	Not applicable

	GHG emissions compensated (natural or technological sinks)	Currently not estimated
	Total costs and costs by CO2e unit	Not applicable

B-2.2: Individual action outlines		
Action outline	Action name	26 Create new green spaces across the city
	Action type	Green infrastructure
	Action description	Incorporate the creation of new green spaces into strategic regeneration projects and flood defence schemes 1. Deliver new green spaces in the city centre, Temple Quarter, and St Phillips Marsh as part of long-term strategic regeneration zones. 2. Deliver the incorporation of Green Infrastructure designs into the developing river Avon flood strategy, to create a 5-10m green corridor running along Feeder canal and river Avon 3. Deliver 5,500m2 of new floating reedbeds in the Floating Harbour.
Reference to impact pathway	Field of action	Green Infrastructure & Nature Based Solutions
	Systemic lever	Tech & Infrastructure
	Outcome (according to module B-1.1)	Public experience of green spaces improves encouraging further active travel; contribution to urban cooling; improved biodiversity and ecosystem connectivity
Implementation	Responsible bodies/person for implementation	The overall responsible body or bodies would be identified as this work progresses. At present, several organisations are playing a leading role across the regeneration projects
	Action scale & addressed entities	Citywide
	Involved stakeholders	To be confirmed as this action is developed
	Comments on implementation – consider mentioning resources, timelines, milestones	Further information on implementation would follow as the action is developed
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume, or fuel type	Not applicable
	GHG emissions reduction estimate (total) per emission source sector	Not applicable
	GHG emissions compensated (natural or technological sinks)	Currently not estimated
	Total costs and costs by CO2e unit	Not applicable

B-2.3: Summary strategy for residual emissions

The residual emissions after the implementation of the actions in this plan are projected to be 247,576 tonnes CO2e.

The reasons for these emissions being unavoidable within the action plan timeframe are that electricity consumed for both stationary and transport energy is expected to retain a carbon intensity of 45-42g CO2e / kWh in 2030. In addition the carbon intensity of the heat network is expected to be 21g CO2e / kWh in 2030. Currently, it is not believed that the carbon intensity of both these networks can be further reduced within the time frame given the constraints of the existing and planned infrastructure this decade. However, it should be noted that this assessment is based on the information that is presently available; further reductions in the carbon intensity of the national electricity grid are possible but cannot yet be confidently assumed.

Bristol's focus is on reducing greenhouse emission reductions from the city. We have explored the potential for nature-based solutions to absorb and store carbon dioxide within the city boundary. However, as a dense urban area, the potential for carbon sequestration is extremely limited at less than 50,000 tonnes. We shall review options for managing and further reducing residual emissions at the next iteration of this plan when national policy options and technology may be more developed.

Whilst it is considered to be highly unlikely that the city will choose to use market-based mechanisms for offsetting residual emissions, the table below demonstrates the hypothetical cost to the city of doing so in 2030 under a number of different price scenarios. The first scenario recognises that the voluntary carbon offset market is currently subject to widespread concerns regarding robustness, a lack of harmonised standards, and therefore valid concerns about potential greenwashing. The remaining scenarios assume different levels of standards harmonisation or market restriction.

Hypothetical price scenario	**Rate**	**Total offset price by 2030**
Lack of harmonised standards and weak quality control	Assumed price of $13 per tonne	**£2,510,421**
Implementation of harmonised robust universal definitions	Assumed price of $20 per tonne	**£3,862,186**
Offset market becomes restricted to only cover carbon removals	Assumed price of $146 per tonne by 2030	**£28,193,955**
Estimated EU market value by 2030	Assumed price of $162 per tonne	**£31,283,703**

Figure 16: Hypothetical price scenarios and cost to offset residual emissions

Rates are based on:
Global Carbon Market Outlook 2024 | BloombergNEF (bnef.com)
USD to GBP $1 : £0.78
Prices are given in nominal terms.

3.1.1 Module B-3 Indicators for Monitoring, Evaluation and Learning

This section contains proposed indicators that could be used for monitoring, evaluation and learning associated with the action proposed if implemented. It comprises an overview table listing the indicators associated with each Impact Pathway followed by a metadata table for each indicator. Where indicators are not available this is noted.

B-3.1 Proposed Indicators Overview Table

Outcomes/ impacts addressed	Action/ project	Indicator No.	Indicator name	Target values
Indicator No. - identified by impact pathway and number eg 1.1 is the first indicator listed in impact pathway 1 **Target values -** Targets for 2025, 2027 and 2030 have not yet been developed for the indicators and are therefore marked 'not available'				
Impact Pathway 1: Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills				
Transition Team Engagement	Continue to engage Transition Team on Climate City Contract (CCC) design and implementation	1.1	Total Capital Value of Projects for which Business Cases Developed	To be developed as actions further defined
Just Transition	Further embed Just Transition principles into CCC and support wider adoption in the city	1.2	Number of TT organisations which have adopted the Just Transition Principles	To be developed as actions further defined
Just Transition	Deliver transformative, inclusive, programmes of environmental communications, consultation and engagement	1.3	Number of CCC actions updated following feedback from engagement with diverse stakeholders	To be developed as actions further defined
Just Transition	Widen access to green jobs and skills, Deliver programme to support employers to create and sustain green jobs	1.4, 1.5	Not available – indicator being developed by key stakeholder. For illustration, may be indicated by number of learners on green skills courses.	To be developed as actions further defined
Impact Pathway 2: Energy Systems				
Energy network reinforcement	Reinforce local energy network and manage smartly	2.1	Indicator to be developed in consultation with key stakeholder	To be developed as actions further defined
Maximisation of renewable energy generation	Implement programme to maximise renewable energy generation (especially solar)	2.2	Megawatts of installed renewable capacity	To be developed as actions further defined
Domestic heat pump installation	Deliver programme to install or encourage/incentivise installation of heat pumps in all homes in the city	2.3	Number of dwellings directly served by heat pumps	To be developed as actions further defined
Non-domestic heat pump installation	Implement a programme to install or encourage/incentivise installation of heat pumps in non-domestic buildings in the city	2.4	Number of non-domestic buildings directly served by heat pumps	To be developed as actions further defined
Heat network expansion	Expand the network and connect more buildings to the heat network	2.5	Number of heat network connections to 'low carbon' heat networks.	To be developed as actions further defined

Reduce carbon intensity of existing network	Reduce carbon intensity of the existing gas network	2.6	Carbon intensity of gas network	To be developed as actions further defined
Supply chain development	Inclusive training and skills programme for heat pump installation and heat network construction	2.7	Not available – indicator being developed by key stakeholder. For illustration, may be indicated by number of learners on low carbon heat training courses in the region	To be developed as actions further defined
Impact Pathway 3: Built Environment				
Reduce energy demand in homes	Implement citywide programme for housing retrofit to reduce demand and integrate renewable generation	3.1	Proportion of homes EPC C and above	To be developed as actions further defined
Reduce energy demand in non-domestic buildings	Implement a city-wide programme for non-domestic building retrofit to reduce demand and integrate renewable generation	3.2	Proportion of non-domestic buildings EPC C and above	To be developed as actions further defined
Supply chain development	Implement an inclusive training and skills programme for retrofit and renewable energy generation	3.3	Not available – indicator being developed by key stakeholder. For illustration, may be indicated by learner numbers on retrofit training courses in the region	To be developed as actions further defined
Impact Pathway 4: Mobility and Transport				
Car mileage reduction	Implement programme to significantly reduce car miles	4.1	Car miles per year	To be developed as actions further defined
Travel mode shift to active travel	Implement programme to encourage modal shift to active travel	4.2	Active travel miles per year	To be developed as actions further defined
Travel mode shift to public transport use	Implement programme to encourage modal shift to public transport	4.3	Public transport passenger miles per year	To be developed as actions further defined
Freight consolidation and low carbon deliveries	Implement policy changes and provide innovation funding to encourage freight consolidation and low carbon deliveries	4.4	Number of low carbon freight consolidation centres	To be developed as actions further defined
Travel mode shift to electric vehicles	Implement programme to support accelerated shift from internal combustion engine vehicles to battery electric vehicles	4.5	Number of public charging points	To be developed as actions further defined

Impact Pathway 5: Waste and Circular Economy				
Consumption and waste reduction	Implement citywide programme to support increased repair and reuse of retail products	5.1	Not available – to be determined	To be developed as actions further defined
Consumption and waste reduction	Conduct targeted engagement campaigns across the city to communicate impacts of consumption to businesses and citizens	5.2	Not available – to be determined	To be developed as actions further defined
Waste reduction	Implement waste reduction efforts and improve waste collection, recycling and processing services	5.3	Domestic waste recycling rate	To be developed as actions further defined
Waste reduction	Implement waste reduction efforts and improve waste collection, recycling and processing services	5.4	Carbon intensity of Energy from Waste production	To be developed as actions further defined
Impact Pathway 6: Green Infrastructure and Nature-based Solutions				
Green infrastructure for climate resilience	Raise the quality of existing green spaces	6.1	Number of parks achieving 'good' status. Area of BCC parks land managed for nature	To be developed as actions further defined
Green infrastructure for climate resilience	Improve climate resilience and ecological recovery through greening of the public realm - Tree canopy cover / number of trees	6.2	Area of BCC parks land managed for nature	To be developed as actions further defined
Green infrastructure for climate resilience	Create new green spaces across the city	6.3	Area of new green space created	To be developed as actions further defined

B-3.2 Indicator Metadata Listed by Impact Pathway

Impact Pathway 1: Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills

B-3.2: Indicator Metadata	
Indicator Name	1.1 Total Capital Value of Projects for which Business Cases Developed
Indicator Unit	Pounds sterling (£)
Definition	Total Capital Value of Projects for which Business Cases Developed
Calculation	Sum total of capital value
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	No
If yes, which emission source sectors does it measure?	Not applicable
Does the indicator measure indirect impacts (i.e., co- benefits)?	Yes
If yes, which co-benefit does it measure?	Strengthened, coherent and joined-up working
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 1: Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills – Transition Team (TT) engagement
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	Data from business cases developed
Is the data source local or regional/national?	Local
Expected availability	To be agreed
Suggested collection interval	To be agreed
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

B-3.2: Indicator Metadata	
Indicator Name	1.2 Number of TT organisations which have adopted the Just Transition Principles
Indicator Unit	Number
Definition	Number of TT organisations which have adopted the Just Transition Principles
Calculation	Sum of number of TT organisations which have adopted the Just Transition Principles
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	No
If yes, which emission source sectors does it measure?	Not applicable
Does the indicator measure indirect impacts (i.e., co- benefits)?	Yes
If yes, which co-benefit does it measure?	Faster progress to 2030 ambition
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 1: Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills – Just Transition
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	

Expected data source	Data from Transition Team organisations
Is the data source local or regional/national?	Local
Expected availability	To be agreed
Suggested collection interval	To be agreed
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

B-3.2: Indicator Metadata	
Indicator Name	1.3 Number of Climate City Contract (CCC) actions updated following feedback from engagement with diverse stakeholders
Indicator Unit	Number
Definition	Number of CCC actions updated following feedback from engagement with diverse stakeholders
Calculation	Sum of number of CCC actions updated following feedback from engagement with diverse stakeholders
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	No
If yes, which emission source sectors does it measure?	Not applicable
Does the indicator measure indirect impacts (i.e., co- benefits)?	Yes
If yes, which co-benefit does it measure?	Reduced inequality
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 1: Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills – Just Transition
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	Data from Transition Team
Is the data source local or regional/national?	Local
Expected availability	To be agreed
Suggested collection interval	To be agreed
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

Please note indicators 1.4, 1.5 and 2.1 are to be developed.

Impact Pathway 2: Energy Systems

B-3.2: Indicator Metadata	
Indicator Name	2.2 Megawatts of installed renewable capacity
Indicator Unit	Megawatts
Definition	Megawatts of installed renewable capacity per financial year
Calculation	Sum of megawatts of installed renewable capacity
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes

If yes, which emission source sectors does it measure?	Stationary energy
Does the indicator measure indirect impacts (i.e., co- benefits)?	No
If yes, which co-benefit does it measure?	Not applicable
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 2: Energy Systems – maximisation of renewable energy generation
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Yes
Data requirements	
Expected data source	UK government Department for Energy Security and Net Zero
Is the data source local or regional/national?	National data, available for local level
Expected availability	Annual (2 years in arrears)
Suggested collection interval	Annual
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

B-3.2: Indicator Metadata	
Indicator Name	2.3 Number of dwellings directly served by heat pumps
Indicator Unit	Number of dwellings
Definition	Number of dwellings directly served by heat pumps
Calculation	Number of dwellings directly served by heat pumps
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Stationary energy
Does the indicator measure indirect impacts (i.e., co- benefits)?	No
If yes, which co-benefit does it measure?	Not applicable
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 2: Energy Systems - Domestic heat pump installation
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	Microgeneration Certification Scheme database
Is the data source local or regional/national?	National and we have a data sharing agreement with MCS to receive detailed data for City of Bristol
Expected availability	Quarterly
Suggested collection interval	Annual
Does the indicator measure indirect impacts (i.e., co- benefits)?	No
If yes, which co-benefit does it measure?	Not applicable
Is the indicator useful for monitoring the output/impact of action(s)?	Yes

B-3.2: Indicator Metadata	
Indicator Name	2.4 Number of non-domestic buildings directly served by heat pumps
Indicator Unit	Number of non-domestic buildings

Definition	Number of non-domestic buildings directly served by heat pumps
Calculation	Sum of number of non-domestic buildings directly served by heat pumps
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Stationary energy
Does the indicator measure indirect impacts (i.e., co- benefits)?	No
If yes, which co-benefit does it measure?	Not applicable
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 2: Energy Systems – Non-domestic heat pump installation
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	Microgeneration Certification Scheme database
Is the data source local or regional/national?	National and we have a data sharing agreement with MCS to receive detailed data for City of Bristol
Expected availability	Quarterly
Suggested collection interval	Annual
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

B-3.2: Indicator Metadata	
Indicator Name	2.5 Number of heat network connections to 'low carbon' heat networks
Indicator Unit	Number of heat network connections
Definition	Number of heat network connections to 'low carbon' heat networks
Calculation	Sum of number of heat network connections to 'low carbon' heat networks
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Stationary energy
Does the indicator measure indirect impacts (i.e., co- benefits)?	No
If yes, which co-benefit does it measure?	
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 2: Energy Systems – Heat network expansion
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	UK Gov Department for Energy Security and Net Zero (for number of connections), Vattenfall carbon intensity statistics for Bristol Heat Network
Is the data source local or regional/national?	National (UK Gov stats) and local (Vattenfall stats)
Expected availability	Annual (one year in arrears for UK Gov Stats)
Suggested collection interval	Annual
References	

Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

B-3.2: Indicator Metadata	
Indicator Name	2.6 Carbon intensity of gas network
Indicator Unit	kilograms of CO2e / kWh
Definition	Carbon intensity of gas provided to end users of the central gas network
Calculation	kilograms of CO2e produced for each kWh of energy produced through consumption of blended gas from the central gas network
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Stationary energy
Does the indicator measure indirect impacts (i.e., co- benefits)?	No
If yes, which co-benefit does it measure?	Not applicable
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 2: Energy Systems – Reduce carbon intensity of existing network
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	Wales and West Utilities
Is the data source local or regional/national?	Regional
Expected availability	Annual
Suggested collection interval	Annual
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

Please note indicator 2.7 with reference to skills programmes is not available as it is being developed by the key stakeholder.

Impact Pathway 3: Built Environment

B-3.2: Indicator Metadata	
Indicator Name	3.1 Number of homes EPC C and above
Indicator Unit	Number of homes
Definition	Number of homes EPC C and above
Calculation	Sum of number of homes EPC C and above
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Stationary energy
Does the indicator measure indirect impacts (i.e., co- benefits)?	Yes
If yes, which co-benefit does it measure?	Numerous suggested co-benefits including increased likelihood of warmer homes; reduced fuel poverty; reduced damp and mould in homes improving health; growth of local supply chain – see Impact Pathway 3

Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 3: Built Environment - Reduce energy demand in homes
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	UK Central government Ministry of Housing, Communities and Local Government, and city-wide housing stock model, e.g. Parity Projects Ltd
Is the data source local or regional/national?	National data, available for local level
Expected availability	Quarterly
Suggested collection interval	Annual
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

B-3.2: Indicator Metadata	
(For each indicator selected)	
Indicator Name	3.2 Number of non-domestic buildings EPC C and above
Indicator Unit	Number of non-domestic buildings
Definition	Number of non-domestic buildings EPC C and above
Calculation	Sum of number of non-domestic buildings EPC C and above
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Stationary energy
Does the indicator measure indirect impacts (i.e., co- benefits)?	Yes
If yes, which co-benefit does it measure?	Numerous suggested co-benefits including lower running costs; properties easier to rent; growth of local supply chain – see Impact Pathway 3
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 3: Built Environment - Reduce energy demand in non-domestic buildings
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	UK Central government Ministry of Housing, Communities and Local Government
Is the data source local or regional/national?	National data, available for local level
Expected availability	Quarterly
Suggested collection interval	Annual
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

Please note indicator 3.3 with reference to skills programmes is not available as it is being developed by the key stakeholder.

Impact Pathway 4: Mobility and Transport

B-3.2: Indicator Metadata	
Indicator Name	4.1 Car miles per year
Indicator Unit	Car miles
Definition	Car miles travelled within city boundary per year
Calculation	GPC Protocol compliant - Data shown includes 50% inbound, 50% outbound, and 100% in-boundary trips per the Global Protocol for Community-Scale GHG Inventories. Further information available at: https://insights.sustainability.google/methodology?hl=en-US#transportation
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Transportation
Does the indicator measure indirect impacts (i.e., co- benefits)?	Yes
If yes, which co-benefit does it measure?	Numerous suggested co-benefits including air quality improvements; road safety improvements – see Impact Pathway 4
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 4 : Mobility and Transport - Car mileage reduction
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	Google Environmental Insights Explorer
Is the data source local or regional/national?	Local
Expected availability	Annual
Suggested collection interval	Annual
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

B-3.2: Indicator Metadata	
Indicator Name	4.2 Active travel miles per year
Indicator Unit	Active travel miles
Definition	Active travel (walking and cycling) miles travelled within city boundary per year
Calculation	GPC Protocol compliant - Data shown includes 50% inbound, 50% outbound, and 100% in-boundary trips per the Global Protocol for Community-Scale GHG Inventories. Further information available at: https://insights.sustainability.google/methodology?hl=en-US#transportation
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Transportation

Does the indicator measure indirect impacts (i.e., co- benefits)?	Yes
If yes, which co-benefit does it measure?	Suggested co-benefits are air quality improvements ; road safety improvements ; public health benefits – see Impact Pathway 4
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 4: Mobility and Transport - Travel mode shift to active travel
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	Google Environmental Insights Explorer
Is the data source local or regional/national?	Local
Expected availability	Annual
Suggested collection interval	Annual
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

B-3.2: Indicator Metadata	
Indicator Name	4.3 Public transport passenger miles per year
Indicator Unit	Public transport passenger miles
Definition	Public transport travel (bus, light rail and train) miles travelled within city boundary per year
Calculation	GPC Protocol compliant - Data shown includes 50% inbound, 50% outbound, and 100% in-boundary trips per the Global Protocol for Community-Scale GHG Inventories. Further information available at: https://insights.sustainability.google/methodology?hl=en-US#transportation
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Transportation
Does the indicator measure indirect impacts (i.e., co- benefits)?	Yes
If yes, which co-benefit does it measure?	Suggested co-benefits are air quality improvements; road safety improvements; public health benefits – see Impact Pathway 4
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 4: Mobility and Transport - Travel mode shift to public transport use
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	Google Environmental Insights Explorer
Is the data source local or regional/national?	Local
Expected availability	Annual
Suggested collection interval	Annual
References	

Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

B-3.2: Indicator Metadata	
Indicator Name	4.4 Number of low carbon freight consolidation centres
Indicator Unit	Number of low carbon freight consolidation centres
Definition	Number of low carbon freight consolidation centres within the Bristol area
Calculation	Sum of number of low carbon freight consolidation centres counted
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	No, however it is the best proxy indicator currently available
If yes, which emission source sectors does it measure?	Transportation
Does the indicator measure indirect impacts (i.e., co- benefits)?	Yes
If yes, which co-benefit does it measure?	Suggested co-benefits are air quality improvements ; road safety improvements – see Impact Pathway 4
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 4 : Mobility and Transport - Freight consolidation and low carbon deliveries
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	Bristol City Council
Is the data source local or regional/national?	Local
Expected availability	Annual
Suggested collection interval	Annual
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

B-3.2: Indicator Metadata	
Indicator Name	4.5 Number of public charging points
Indicator Unit	Number of public charging points
Definition	Number of electric vehicle charging points installed as part of the public network within the Bristol area.
Calculation	Number of electric vehicle charging points installed as part of the public network within the Bristol area.
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Transportation
Does the indicator measure indirect impacts (i.e., co- benefits)?	No, however it is the best proxy indicator currently available
If yes, which co-benefit does it measure?	Suggested co-benefits are air quality improvements ; public health benefits – see Impact Pathway 4
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 4 : Mobility and Transport - Travel mode shift to electric vehicles ravel mode shift to public transport use

Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	Bristol City Council
Is the data source local or regional/national?	Local
Expected availability	Annual
Suggested collection interval	Annual
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

Impact Pathway 5: Waste and Circular Economy

Please note indicators 5.1 and 5.2 and with reference to consumption and waste reduction are not available as they are being determined.

B-3.2: Indicator Metadata	
Indicator Name	5.3 Domestic waste recycling rate
Indicator Unit	% of household waste sent for recycling
Definition	% of household waste originating within the Bristol area sent for recycling
Calculation	Total weight of collections sent for recycling, anaerobic digestion, or composting, divided by total weight of all collections per year.
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Waste
Does the indicator measure indirect impacts (i.e., co- benefits)?	Yes
If yes, which co-benefit does it measure?	Suggested numerous co-benefits including reduced littering – see Impact Pathway 5
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 5 : Waste and Circular Economy - Waste reduction
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	Yes
Data requirements	
Expected data source	UK Central government Department for Environment, Food and Rural Affairs
Is the data source local or regional/national?	National data, produced and available for local level
Expected availability	Annual
Suggested collection interval	Annual
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

B-3.2: Indicator Metadata	
Indicator Name	5.4 Carbon intensity of Energy from Waste production
Indicator Unit	Kilograms of C02e / tonne of waste incinerated
Definition	Kilograms of C02e produced per tonne of waste incinerated at Energy from Waste facilities in Bristol

Calculation	Total tonnes of C02e produced divided by total tonnes of waste incinerated per year
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	Yes
If yes, which emission source sectors does it measure?	Waste
Does the indicator measure indirect impacts (i.e., co- benefits)?	Yes
If yes, which co-benefit does it measure?	Suggested co-benefits are air quality improvements and improved resilience in local circular economy
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 5 : Waste and Circular Economy - Waste reduction
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	UK Central government (Environment Agency) Pollution Inventory
Is the data source local or regional/national?	National data, produced and available for local level
Expected availability	Annual
Suggested collection interval	Annual
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

Impact Pathway 6: Green Infrastructure and Nature-based Solutions

B-3.2: Indicator Metadata	
Indicator Name	6.1 Number of parks achieving 'good' status.
Indicator Unit	Number of parks achieving 'good' status.
Definition	The Bristol City Council Parks Service is developing a new quality standard as set out in the 2024 Parks and Green Spaces Strategy. Whilst this new Bristol Quality Standard is being developed ‘good’ refers to the Green Flag Quality Standard.
Calculation	Number of parks achieving ‘good’ status
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	No
If yes, which emission source sectors does it measure?	Not applicable
Does the indicator measure indirect impacts (i.e., co- benefits)?	Yes
If yes, which co-benefit does it measure?	Suggested co-benefits include improved public health; improved ecosystem resilience – see Impact Pathway 6
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 6: Green Infrastructure and Nature-based Solutions - Green infrastructure for climate resilience
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	Bristol City Council Parks Service
Is the data source local or regional/national?	Local

Expected availability	To be defined
Suggested collection interval	To be defined
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

B-3.2: Indicator Metadata	
Indicator Name	6.2 Area of Bristol City Council-owned (BCC) parks land managed for nature
Indicator Unit	Hectares
Definition	The definition of BCC-owned land being managed for nature is that the land is either being managed on a conservation maintenance regime (mapped in an asset management system); or it has a Habitat Management Plan/Brief which is being actively implemented
Calculation	Hectares of land achieving 'Land Managed for Nature' definition
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	No
If yes, which emission source sectors does it measure?	Not applicable
Does the indicator measure indirect impacts (i.e., co- benefits)?	Yes
If yes, which co-benefit does it measure?	Suggested co-benefits include improved public health; improved pride of place; improved ecosystem resilience – see Impact Pathway 6
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 6: Green Infrastructure and Nature-based Solutions - Green infrastructure for climate resilience
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	BCC corporate reporting or BCC Parks Service
Is the data source local or regional/national?	Local
Expected availability	Annual
Suggested collection interval	Annual
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	This measure could also be applied to assess the improvement in the quality of existing green spaces linked to 6.1 above.

B-3.2: Indicator Metadata	
Indicator Name	6.3 Area of new green space created
Indicator Unit	Hectares
Definition	The BCC Parks Strategy 'Minimum Standards for publicly accessible new space' defines that new green spaces should be a minimum size of 0.2 hectares
Calculation	Additional hectares of green space compared to baseline year
Indicator Context	
Does the indicator measure direct impacts (reduction in greenhouse gas emissions?)	No

If yes, which emission source sectors does it measure?	Not applicable
Does the indicator measure indirect impacts (i.e., co- benefits)?	Yes
If yes, which co-benefit does it measure?	Suggested co-benefits include improved public health; improved pride of place; improved ecological resilience – see Impact Pathway 6
Is the indicator useful for monitoring the output/impact of action(s)?	Yes
If yes, which action and impact pathway is it relevant for?	Impact Pathway 6: Green Infrastructure and Nature-based Solutions - Green infrastructure for climate resilience
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	No
Data requirements	
Expected data source	Bristol City Council
Is the data source local or regional/national?	Local
Expected availability	Annual
Suggested collection interval	To be determined
References	
Deliverables describing the indicator	None specified
Other indicator systems using this indicator	None

4 Part C – Enabling Climate Neutrality by 2030

Part C "Enabling Climate Neutrality by 2030" aims to outline any enabling interventions, i.e., regarding organizational setting or collaborative governance models or related to social innovations – designed to support the climate action portfolios (Module B-2) as well as aiming to achieve co-benefits outlined in the impact pathway (Module B-1). These interventions also address the identified opportunities, gaps and barriers identified Module A-2 and A-3.

4.1 Module C-1 Governance Innovation Interventions

C-1.1: Description or visualisation of the participatory governance model for climateC.2 neutrality
Summary The governance of climate action in Bristol is based on our One City Approach enhanced by the Transition Team mechanism; this is described in section A-3.1. Within Bristol City Council climate action is the responsibility of several of the policy committees created as part of the new constitution in May 2024. This new system of council governance is evolving and the council will seek to ensure integrated climate action through the creation of a new Bristol City Council Climate Action Plan in 2025. The key change we are making is the adoption of a Mission Approach to our climate action. This has been directly inspired by the Climate Neutral and Smart Cities Mission. Our Mission Net Zero Project is focuses on addressing some of the barriers to achieving a fast and just transition to net zero – or creating the enabling conditions set out in the One City Climate Strategy. The project runs from March 2024 to November 2025 and is part of the Innovate UK funded Net Zero Living Programme. Funding will be used to:

- Support three communities in Bristol to plan the climate action projects that they want in their neighbourhoods and help them secure money to take them forward. This could include; improving the energy efficiency of homes, generating more renewable energy or other actions.
- Create structures and arrangements for the creation of net zero neighbourhoods by focusing place based public and private finance to meet the needs of local people.
- Support small businesses and people wanting to work on these climate projects, creating jobs and providing training for local people.
- Link the local action with a more strategic climate investment plan for Bristol and the West of England, to help direct investment into projects that will help reduce carbon emissions and create the infrastructure such as electricity grid enhancements that will enable local delivery.

The outputs of Mission Net Zero will be used to support the future iterations of the Climate City Contract Action and Investment Plans.

In addition, the Climate Neutral and Smart Cities Mission has enabled us to change our approach to finance for climate action. The Net Zero Investment Co-innovation Lab, a Net Zero Cities Pilot Project, is developing a suite of new investment models, including municipal bonds and impact funding. It is targeting the creation of £100m of funding by May 2025. The Lab, with its partnership and associated advisory group provides the ideal platform for continued capacity building.

Table: C.1.2: Relations between governance innovations, systems and impact pathways

Intervention name	Description	Systemic barriers / opportunities addressed	Leadership and stakeholders involved	Enabling impact	Co-benefits
One City Approach	It brings together a huge range of public, private, voluntary and third sector partners to work together to make Bristol fairer, healthier and more sustainable.	Its main focus is to facilitate integrated action addressing the challenge that no single organisation can deliver a climate neutral city.	See Module A3 for the full list. All boards are co-chaired by a the chair of the relevant council policy committee chair and a senior representative of a partner organisation.	Responsible for One City Climate Strategy	The more integrated approach of the Approach creates the conditions which facilitate realisation of co-benefits
Transition Team	Multi-partner team of the main actors in net zero.	As above	See A3.1	Co-ordinated development and delivery of this action plan	
Mission Net Zero Project	See text box above in this section	Focused on citizen engagement, infrastructure, skills and finance	Local and regional government, community and voluntary sector organisations and infrastructure providers	To combine customer demand, supply chain capacity and investment on a platform of robust data.	Skills and focus on Just Transition

4.2 Module C-2 Social Innovation Interventions

This module lists the actions taken by the city to address the systemic barriers identified. As our social innovations have been included in this action plan as actions in the action portfolio table B2.1 they are not repeated here.

C.2.1 Relations between social innovations, systems, and impact pathways					
Intervention name	**Description**	**Systemic barriers / opportunities addressed**	**Leadership and stakeholders involved**	**Enabling impact**	**Co-benefits**
Just Transition	Further embed Just Transition principles into CCC and support wider adoption in the city.	Engagement, culture and inclusion	Transition Team and partners in the One City Approach	See Impact Pathways for details	See Impact Pathways for details
Communication and Engagement	Deliver transformative, inclusive, programmes of environmental communications, consultation and engagement and support	Engagement, culture and inclusion	BCC, Transition Team, Mission Net Zero Project and all organisations involved in the design and delivery of major projects in the city.	See Impact Pathways for details	See Impact Pathways for details
Green jobs and Skills	Widen access to green jobs and skills	Skills and capacity	BCC and WECA and others skills sector partners	See Impact Pathways for details	See Impact Pathways for details
Green jobs and Skills	Deliver programme to support employers to create and sustain green jobs	Skills and capacity		See Impact Pathways for details	See Impact Pathways for details

C-2.2: Description of social innovation interventions

The actions that would have been in this section are set out as actions in the action portfolio table B2.1.

Further work is needed to address the barriers/strategic risks set out in the One City Climate strategy, action plan and investment plan. Some of these will build on existing projects such as Mission Net Zero Project and the Net Zero Investment Co-innovation Lab.

5 Outlook and next steps

Plans for next Climate City Contract (CCC) and CCC Action Plan iteration

Aligned to Bristol's One City Climate Strategy, the actions and impact pathways co-created by partners in the Transition Team and set out in this One City Climate Action Plan represent a comprehensive route map for Bristol to achieve carbon neutrality by 2030.

Costing of actions in the Investment Plan outlines the ambition and requirements in terms of the funding and financing which could bring the actions to fruition. It is clear that successful investment and delivery of the plans will generate substantial benefits for the citizens and businesses of Bristol alongside the substantial carbon reduction.

The key principles and processes which guide the implementation of the climate and investment plans would follow those set out in the One City Climate Strategy. The One City Climate Strategy is based on principles of being Fair (achieving a Just Transition); Collaborative; Transformative (as a city leading the way); Learning (with other cities and regions and adapting our approach) and Evidence-based. The Climate City Contract would also follow these principles. The Impact Pathways for the Climate City Contract also reflect a clear need for inclusion and co-creation in the development of the proposed actions in order for them to be successfully implemented.

The process of monitoring progress on the Climate City Contract will be the same as the process for monitoring progress of the One City Climate Strategy. The One City Environment Board will continue to provide leadership and oversight of the delivery, supported by all five other Boards, who all came together to support the development of the One City Climate Strategy. The Bristol Advisory Committee on Climate Change will continue to provide evidence and advice to city partners including the Transition Team and to regularly produce an assessment of the city's progress to carbon neutrality. The monitoring, evaluation and learning framework for the Climate City Contract

The Climate City Contract will be treated as a dynamic document but with a scheduled update every two years.

The immediate next steps will focus on planning three main areas of work:

1. Engaging with Transition Team to encourage longer term involvement in delivering CCC develop and strengthen partnerships and develop a reflective learning process for monitoring, evaluation and learning
2. Implementing transformative, inclusive, programmes of communications and engagement in order to update CCC actions to further align to Just Transition Principles and citizen needs.
3. Refining the approach to residual emissions

1. Engage with Transition Team to encourage longer term involvement in delivering CCC, develop and strengthen partnerships and develop a reflective learning process for monitoring, evaluation and learning

Bristol City Council has volunteered to be responsible for the overall coordination of the One City Climate Strategy and has employed the role of One City Climate Strategy Coordinator. The role is currently held as a job share. The two One City Climate Strategy Coordinators have coordinated the Transition Team in the production of the Climate City Contract. In order to implement this action plan, they will continue to coordinate the Transition Team's work.

The next step will to be to prioritise those actions which Transition Team member organisations wish to develop further, working towards securing the resources need for project development and implementation.

The Transition Team will continue its work to:
- deepen teamworking
- prioritise actions from the Climate City Contract for development with a view to implementation
- focus on where the Transition Team can help to develop partnerships to bring forward the priority actions and
- work towards obtaining the related funding required to implement actions.

This will be a continuous process of development but we plan to review the CCC in two years and update as appropriate. We consider that the plan is comprehensive in its scope but that additional information and detail will be needed actions are developed and implemented.

Whilst the Transition Team forms the core group working to develop the actions in this plan, we shall engage with a much wider group of stakeholders in the city, drawing upon the One City approach and the Mission Net Zero Project (see section A-3.1).

There more work to be done to develop a comprehensive monitoring, evaluation and learning framework for the portfolio of actions.

2. Implementing transformative, inclusive, programmes of communications and engagement in order to update CCC actions to further align to Just Transition Principles and citizen needs. Partners will seek further resources to support this action as part of the work of the transition team and more widely. One area where we do have resources, from Innovate UK, is the Mission Net Zero project in which partners shall be working through 2025 with three communities to understand their priorities for net zero as they develop their Community Climate Investment Plans. We shall use these priorities and plans to inform future iterations of this plan and the development of the individual actions. Furthermore, the need for transformative programmes of consultation and engagement which encourage more diverse engagement with climate change issues been clearly identified. Each of the actions will need to be developed with engagement with communities and this will need to be resourced as those actions are developed by the appropriate partners.

3. Refining the approach to residual emissions
We will address residual emissions on the first review of the plan. The clear priority is to secure the resources and investment needed to achieve the comprehensive and ambitious set of actions set out in this document.

6 Annexes

Annex 1 – Impact Pathway 1: Cross-cutting Enabling Actions on Just Transition, Communications and Engagement and Skills

Annex 2 – Impact Pathway 2: Energy Systems

Annex 3 – Impact Pathway 3: Built Environment

Annex 4 – Impact Pathway 4: Mobility and Transport

Annex 5 – Impact Pathway 5: Waste and Circular Economy

Annex 6 – Impact Pathway 6: Green Infrastructure and Nature-based Solutions

NET ZERO CITIES

EU MISSION PLATFORM | CLIMATE NEUTRAL AND SMART CITIES

Climate City Contract

One City Climate Neutrality Commitments

2030 Climate Neutrality Commitments of Bristol

BRISTOL CLIMATE ACTION

NetZeroCities has received funding from the H2020 Research and Innovation Programme under the grant agreement n°101036519.

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1 Introduction

Introduction

Bristol has long been an innovator in the field of climate action. Bristol City Council was the first UK local authority to develop a climate strategy 20 years ago and Bristol was recognised as the European Green Capital in 2015. In November 2018, Bristol was the first UK local authority to declare a Climate Emergency, along with many city partenrs; this signalled clear local support for city level action to address the climate crisis collectively. Following this declaration, the city produced a One City Climate Strategy commissioned by the One City Environment Board with the aim to become a carbon neutral and resilient city by 2030. Bristol's current carbon neutrality ambition covers all scopes of emissions. The One City model involves city partners from public, private and voluntary sectors bringing them together to tackle issues affecting the city, recognising that problems cannot be solved from City Hall alone. Bristol also made a declaration of Ecological Emergency in 2020 and produced a parallel One City Ecological Emergency Strategy. Both strategies have served to increase the urgency of action by city partners on these twin crises.

As a Core City (a network of the 11 largest UK cities outside London), Bristol was sharing good practice with other UK Local Authorities and holds the climate portfolio for the network. Bristol City Council also participates in Eurocities and ICLEI and Bristol has participated in successive UN Climate COP meetings to emphasise the importance of city level action and that this should be adequately funded.

Bristol also benefits from the Bristol Advisory Committee on Climate Change who provide technical advice to help the city to understand and accelerate progress towards its 2030 ambition and provide critical commentary on the climate consequences of plans, policies and strategies affecting the city. Furthermore, Bristol benefits from the advice of a Community Leadership Panel on Climate and Just Transition and an advisory group to the Pilot City Project the Net Zero Investment Co-innovation Lab who can offer expert financial advice to this project on how best to fund the decarbonisation of the city.

As well as establishing these structures to advise the city, operationally Bristol was preparing to launch the Bristol City Leap partnership. This is a twenty-year joint venture partnership between Bristol City Council, Ameresco and Vattenfall Heat UK which will enable the delivery of over £1 billion of investment into Bristol's energy system. During the first six years of the partnership, investment of nearly 1 billion euros is planned, in a range of large infrastructure projects including the significant expansion of Bristol's Heat Network; making the council's social housing more energy efficient; installation of solar panels and low carbon heating systems in council-owned buildings including offices, homes and schools plus investment in community-owned renewable energy projects.

European Union funding had been an essential part of the process of achieving Bristol City Leap. The Eurpoean Local ENergy Assistance (ELENA) funding was the start of the journey enabling the Bristol City Council to increase its capacity and capability. This led to the capacity to deliver over €100m of investment in sustainable energy projects. This was the platform for the successful achievement of Bristol City Leap. The City Council assets developed included the Castle Park Energy Centre – the UK's largest single water source heat pump - which saw Bristol named Heat Pump City of the Year at the 2022 European Heat Pump Association Awards.

It is also clear that how to pay for climate action is a critical consideration which city partners must address. This was reflected by some of the recommendations of the Citizens Assembly held in Bristol in 2021. The Assembly considered the questions of How do we rapidly reduce the impact of our homes on climate change? What changes should we make to our neighbourhoods to make how we travel easier, healthier and better for the environment? and How should we tackle health inequalities in Bristol? Many of the recommendations made by the Assembly need substantial, additional amounts of money to achieve for example, *Recommendation 3: Create innovative financing options including grants, and/or loans to support homeowners and landlords to improve the energy efficiency of every home in Bristol and Recommendation 9: By 2030, make Bristol the best city internationally to travel*

around, by prioritising sustainable, safe, healthy, accessible alternatives to the car for all. Some other recommendations are being actioned and some others require funding to be taken forward.

Further work centred on citizens' views was made possible through a project funded by The National Lottery Community Fund. Bristol Climate and Nature Partnership (previously known as Bristol Green Capital Partnership) leads the Community Climate Action Project which supports communities to lead their response to the climate crisis. A key element of the project is the coproduction of community climate action plans which respond to both social and climate priorities – improving quality of life at the same time as responding to climate change. Bristol's first community climate action plans were developed in neighbourhoods experiencing inequality and disadvantage, along with the communities of Disabled people and refugees in the city. Further community climate action plans have followed with a total of 11 plans now published.

As part of the Horizon Europe programme, the European Union launched a Mission "100 Climate-Neutral and Smart Cities by 2030". The objectives of the Mission are to achieve 100 climate-neutral and smart European cities by 2030 and to ensure that these cities act as experimentation and innovation hubs to enable all European cities to follow suit by 2050. As part of the Mission additional cities from countries outside the EU but associated to Horizon Europe were eligible to apply to join.

This sparked interest in Bristol as a chance to work with and learn from other cities who shared the ambition to become carbon neutral by 2030. It represented another chance to develop capacity - through the support of the NetZeroCities consortium of consultants assigned to Mission cities – and capability through learning from current practice in other cities and using the methods recommended by the Mission including the process of creating a Climate City Contract and a Transition Team to orchestrate the decarbonisation of the city. The Climate City Contract includes an action plan for carbon neutrality across all sectors such as energy, buildings and transport, together with a related investment plan. This offered an opportunity to build on the framework of the One City Climate Strategy. The Transition Team approach reflected Bristol's One City approach bringing together actors beyond City Hall to work together to progress action on the One City Climate Strategy. Becoming a Mission City was also a significant chance to focus on the question of how to pay for the action that is needed to achieve decarbonisation.

In April 2022, 100 cities in the EU and 12 cities in countries associated to Horizon Europe, were selected to participate in the Mission. Bristol and Glasgow were the only UK cities selected to join the Mission.

Following selection as a Mission City, Bristol City Council and partners Abundance, Bristol and Bath Regional Capital and Bristol Climate and Nature Partnership applied for associated Pilot City Project funding to support a project focused on innovative ways of financing climate action. Bristol's project the Net Zero Investment Co-innovation Lab is developing new ways to fund climate action in the city.

In 2023, Bristol City Council and a wide partnership was awarded national research funding from Innovate UK to carry out a new project - Mission Net Zero. This project directly builds upon the ideas and approach of the Climate Neutral and Smart Cities Mission. The partners include all local authorities in the region, the West of England Combined Authority, Bristol and Bath Regional Capital, Bristol Climate and Nature Partnership, Bristol City Leap, Bristol Energy Network, Centre for Sustainable Energy, Living Places and National Grid Electricity Distribution. Mission Net Zero aims to speed up Bristol and the West of England's transition to net zero by working with local people to address some of the barriers to progress such as finding money for improvements and having the skilled professionals to do them. Funding will be used to support three communities in Bristol to plan the climate action projects that they want in their neighbourhoods and help them secure money to take them forward; this could include improving the energy efficiency of homes, generating more renewable energy or other actions. It will also build support for climate action through a strategic climate investment plan for Bristol and the West of England, to help direct investment into projects that will help reduce carbon emissions. In addition, it will support small businesses and people wanting to work on these climate projects, creating jobs and providing training for local people. This project complements the Climate City Contract process by developing parallel climate investment plans in the three areas and at the regional level. It builds on the Community Climate Action Project by moving towards creating an investment plan at the local community level.

More recently, Bristol authors formulated a Just Transition Declaration to accompany the Climate and Ecological Emergency declarations again emphasising the urgency of action required on all three interlinked areas. In 2024, it was adopted by Bristol City Council and other city partners. It is set of 10 principles that all climate and ecological work in the city can use in making plans to make them as just as possible. The 10 principles (in no particular order of importance) are:

1. Centring the expertise of disadvantaged communities at every step of the journey
2. Good future-proof jobs for everyone
3. Empowering disadvantaged communities to take climate and ecological action
4. Supporting individual change through system change
5. Fair distribution of costs and benefit
6. Prioritising accessible communication
7. Standing in solidarity with those experiencing the worst climate and ecological impacts across the globe
8. Building inclusive resilience
9. Infrastructure for all
10. Embedding the process internally and at the beginning

The **current opportunities** now available to Bristol via participation in the Mission are:

- to extend and build upon the **partnership working** begun in the city to support the delivery of the One City Climate Strategy through the formation of a Transition Team and production of an initial Climate City Contract
- to work with the Transition Team to compile a **plan of actions** which build on the One City Climate Strategy to set out in more detail a suggested portfolio of linked interventions which together if implemented would achieve the necessary emissions reductions by 2030 (as defined by the Mission) in the context of Just Transition and taking into account the recommendations of the Citizens Assembly and the actions communities have stated as important in their Community Climate Action Plans
- to focus on how to **finance** climate action through compiling a plan of how to match investment to the actions suggested
- to integrate the city plans with community and regional plans being developed in the Mission Net Zero Project.

The Transition Team intend this 2024 Climate City Contract for Bristol to be **an initial view of**:

- **a potential plan of action** which could be developed and revised in 2026
- **investment planning** which could be developed further with the support of specialist advice in this area. Noting that the non-confidential parts of the plan are published whereas the investment planning is confidential.

The **future opportunities** available to Bristol via participation in the Mission are to:

- further develop these initial plans with the benefit of more **community involvement** particularly with regard to the principles of the recent Just Transition Declaration
- offer Bristol's experience to and receive feedback from other Mission Cities through **sensemaking** opportunities.

2 Goal: Climate neutrality by 2030

Goal

In 2020, Bristol published a One City Climate Strategy with the aim to become a carbon neutral and climate resilient city by 2030. Within the strategy Bristol's climate vision is expressed as follows:

In 2030, Bristol is carbon neutral and climate resilient. We have collectively achieved a fair and inclusive transition; capturing the opportunities of new jobs and investment, improved health, wellbeing and education, and a better environment for local people. We have helped lead the way to a safer global climate.

This remains the current carbon neutrality ambition covering all greenhouse gases (expressed as carbon dioxide equivalent), all scopes of emissions and the whole territory of the City of Bristol with no exclusions. It is therefore fully aligned to and surpasses the Mission ambition as it includes all scopes of emissions. No Emissions Trading Scheme facilities are excluded from the target.

Within this Climate City Contract the Transition Team has focused on the actions associated with emissions reductions from territorial emissions in line with the climate neutrality definition used by the Mission.

As stated in the One City Climate Strategy, there are many associated benefits to taking action on climate change. These include improved economic outcomes for people through provision of more cost-effective new services, community energy investment and the provision of green jobs from new services, low carbon construction projects and major projects such as retrofit programmes; improved effectiveness of public transport, public realm and air quality; release of land for other uses, freeing up road space easing congestion and providing space for those whose mobility needs are more acute; addressing fuel poverty; improved health outcomes through active travel, better indoor environments and improved air quality.

3 Strategic priorities

Strategic priorities

The 10 strategic priorities identified in the One City Climate Strategy are:
1. Transport
2. Buildings
3. Heat decarbonisation
4. Electricity
5. Consumption and waste
6. Business and the economy
7. Public services
8. Natural environment
9. Food
10. Infrastructure interdependencies

Of these, the majority of emissions (related to the Mission definition) are associated with these priorities:
1. Transport
2. Buildings
3. Heat decarbonisation
4. Electricity

Emerging areas to take forward drawn from the action plan reflect these priority themes.

Transport:
1. Implement programme to significantly reduce car miles
2. Implement programme to encourage modal shift to active transport
3. Implement programme to encourage modal shift to public transport
4. Implement policy changes and provide innovation funding to encourage freight consolidation and low carbon deliveries
5. Implement programme to support accelerated shift from internal combustion engine vehicles to battery electric vehicles

Buildings:
1. Implement a city-wide programme for housing retrofit to reduce demand and integrate renewable generation.
2. Implement a city-wide programme for non-domestic building retrofit to reduce demand and integrate renewable generation.
3. Implement an inclusive training and skills programme for retrofit and renewable energy generation.

Heat decarbonisaton:
1. Implement a programme to install or encourage/incentivise installation of heat pumps in homes in the city.
2. Implement a programme to install or encourage/incentivise installation of heat pumps in non-domestic buildings in the city.
3. Expand the network and connect more buildings to the heat network
4. Reduce carbon intensity of the existing gas network
5. Put in place an inclusive training and skills programme for heat pump installation and heat network construction

Electricity:
1. Implement programme to maximise renewable energy generation (esp. solar)
2. Reinforce local energy network and manage smartly

Bristol's strategy also identifies signficant enabling conditions required for the priority areas to be actioned. These are:

- Data
- Funding
- National action
- Skills
- Engagement
- Infrastructure

Now the plans are completed, the focus of the Transition Team will be on the enabling conditions required to progress these priorities and on the process for prioritisation of actions on which to focus in order to obtain funding for these actions where this is identified in the investment planning assessment.

The critical stakeholders needed to bring about these changes quickly are:

- the Transition Team members
- in consultation with the people of Bristol with a particular focus on the Just Transition principles of centring the expertise of disadvantaged communities and with the aim of creating infrastructure for all and supported by
- the expertise of financial experts and
- the investor community with an interest in decarbonisation and/or specific asset classes relevant to the decarbonisation actions and the related enabling conditions

For this reason, the Transition Team is particularly interested in demonstrating the quality of our Climate City Contract sufficient to obtain the Cities Mission Label as we aim to be better connected with the expertise and investors associated with the European Climate City Capital Hub to facilitate capital flows to ensure we maximise the use of this to help implement our action plan.

Our next steps working as a Transition Team are to:
- deepen teamworking
- prioritise actions
- focus on where the Transition Team can help to develop partnerships to bring forward the priority actions and
- work towards obtaining the related funding required to implement actions

4 Process and principles

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Process and principles

The process and key principles to guide the implementation of the Climate City Contract would follow those set out in the One City Climate Strategy.

The One City Climate Strategy is based on principles of being Fair (achieving a Just Transition); Collaborative; Transformative (as a city leading the way); Learning (with other cities and regions and adapting our approach) and Evidence-based. The Climate City Contract would also follow these principles. The Impact Pathways for the Climate City Contract also demonstrated a clear need for co-creation in the development of the proposed actions in order for them to be successfully implemented.

Bristol City Council volunteered to be responsible for the overall coordination of the One City Climate Strategy and has employed the role of One City Climate Strategy Coordinator. The role is currently held as a job share. The two One City Climate Strategy Coordinators have coordinated the Transition Team in the production of the City Climate Contract and will continue to coordinate the Transition Team's work.

The process of monitoring progress on the Climate City Contract will be the same as the process for monitoring progress of the One City Climate Strategy. The One City Environment Board will continue to provide leadership and oversight of the delivery, supported by all five other Boards, who all came together to support the development of the One City Climate Strategy. The Bristol Advisory Committee on Climate Change will continue to provide evidence and advice to city partners including the Transition Team and to regularly produce an assessment of the city's progress to carbon neutrality. The monitoring, evaluation and learning framework for the Climate City Contract

The Climate City Contract will be treated as a dynamic document but with a scheduled update every two years.

5 Signatories

This table lists the signatories who are committing to this Climate City Contract and thereby to help the city achieve its goal to reach climate neutrality by 2030.

Name of the signatory (organisation)	Sector / Domain / Level of operation	Legal form	Name of the responsible person	Position of the responsible person
Bristol City Council	Local Government / Local	Local Authority	Councillor Tony Dyer	Leader, Bristol City Council
One City Environment Board	Cross-Sector / Local	City partnership organisation	Councillor Martin Fodor, Ann Cousins	Co-Chairs of the Board
Bristol Climate & Nature Partnership	Environmental network/Local	CIC	Lizzi Testani	Chief Executive Officer
Business West	Business/Regional	Private Limited Company	Jessica Vallentine	Director of Responsible Business
National Grid Electricity Distribution DSO	Electricity distributor/Regional	Public Limited Company	Emily Taylor	Strategic Engagement Officer
Wales & West Utilities	Gas distribution network/Regional	Private Limited Company	Matthew Hindle	Head of Net Zero and Sustainability