

Our routemap to Net Zero Carbon by 2030

Foreword

Bristol Water supplies 1.2 million customers who depend on us every day to provide clean drinking water. This essential service utilises our most important natural resource. We collect water, store it, treat it to industry leading standards and deliver it to our customers' taps. We've been doing this successfully for 175 years.



Mel Karam, CEO of Bristol Water

We recognise that our role in society goes well beyond the business transaction of supplying water. It is impossible to disconnect what we do from caring for the environment and protecting it for our future. It's a daily focus for us and is deeply embedded into how we run our business. Whether our focus is on protecting local water catchments, increasing biodiversity or on reducing our carbon impact, its always at the forefront of the decisions which we make.

In 2018 we made history by being the first water company to formalise our view of our role within society through our social purpose and our industry leading social contract. Our purpose is to have a positive impact on our customers, communities, employees and the environment. Our social contract provides a means of prioritising our actions and reporting on performance, allowing our stakeholders to hold us to account. So now I am delighted to bring to you our plans to decarbonise our operations as the next important step in our history.

We have close connections with our local communities, and we have worked with local stakeholders to align our plans. Bristol City was the first city in the UK to declare a climate emergency, and other cities, towns and villages in our supply area have followed suit.

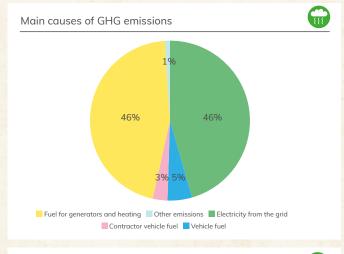
Through testing a range of options and scenarios, we think we can achieve carbon neutrality by 2030. As ever there are trade-offs and as a next step, we will seek feedback from our customers and stakeholders test the balance which we have struck.

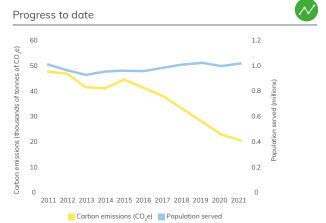
> Our routemap to Net Zero Carbon by 2030

Executive Summary

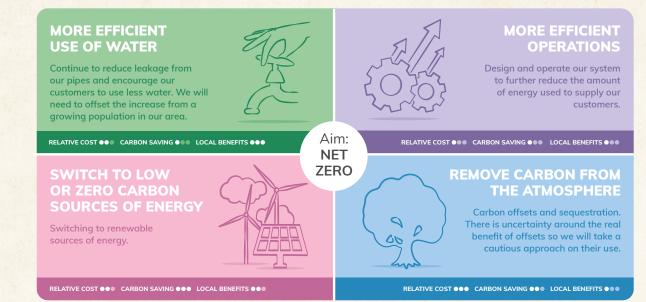
Our carbon footprint

We have identified a range of ways that we can meet the challenge of hitting Net Zero carbon by 2030. Almost half of our carbon footprint comes from the electricity used to treat water and pump it around our network. The gas generator at our largest water treatment works also contributes a significant amount to our footprint.





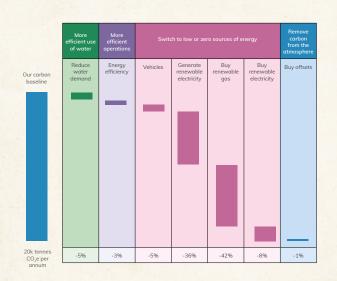
The four pathways to reduce our carbon footprint



Our proposed carbon routemap

Our proposed carbon routemap provides the best overall balance of cost versus benefit and is lower risk in the long-term.

We will continue our efficiency and renewable energy programmes and build on our plans in the period to 2025, with a view to significant investment in the period 2025 to 2030.



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Background

Every year we distribute around 275 million litres per day (a hunderd million tonnes per year) through our network. Water is heavy and this equates to 100 million tonnes of water being abstracted, treated and pumped around our supply network.



80GWh

To do this we consume around 80 Gigawatt hours (GWh) of electricity per annum.



Extra electricity

In addition, to keep supplies flowing we need to run our offices, sites and a fleet of vehicles. All of these consume energy.

22,000

Our current carbon footprint is around 22 thousand tonnes of CO_2 equivalent.

4,000

This is the equivalent to the carbon footprint of around 4,000 households in the UK¹.

Background

Scientists have been debating the occurrence of man-induced climate change since the late 19th century. 100 years later in the 1990s, improved computer modelling combined with fieldwork studies formed a consensus position that greenhouse gas induced climate change was real and dangerous.



1995

UN Conference of Parties (COP) members have been meeting every year since 1995 to discuss ways to stabilise greenhouse gas emissions. COP21 was held in December 2015 and resulted in the Paris Agreement, which governed climate change reduction measures from 2020.

2018

In November 2018, Bristol was the first city in the UK to declare a climate emergency and to commit to net zero by 2030.

2019

In 2019, the UK was the first major economy to make a legally binding commitment to reach net zero by 2050. In the same year, the water industry as a whole published a 'Public Interest Commitment', which set out five ambitious goals for the sector, including a pledge to reach net zero on operational emissions by 2030².

2020

In 2020, Bristol City published its climate strategy and was joined by Greta Thunberg who addressed some 15,000 people at the Bristol Youth Strike for Climate event³.

In November 2020, Water UK published the Net Zero 2030 Routemap on behalf of the water industry⁴.

2021

Now we look towards the long awaited COP26 in Glasgow in November 2021, where world leaders will discuss climate change and agree actions plans.

² https://www.water.org.uk/wp-content/uploads/2019/04/Public-Interest-Commitment.pdf
 ³ https://www.bristolonecity.com/wp-content/uploads/2020/02/placeholder-climate-strategy.pdf
 ⁴ https://www.water.org.uk/routemap2030/

About us

We are the oldest water company in continuous operation in the UK, and one of the oldest in the world, among the pioneers developing the science of modern water supply and treatment. We've been serving our customers for 175 years – that's a good 40 years before electricity was first used in the home.

In the 1840's we started by developing a gravity fed carbon neutral feed from springs in the Mendip hills outside the city. As population and the need for continuous water supply grew, so did our supply infrastructure and with it, energy use for water supply and treatment.

Bristo

Bristol Water supply area

KEY Groundwater source

- Reservoir source
 Biver obstraction
- River abstraction
 Population supplied

Today we supply water to 1.2 million customers in an area of 2,400 square kilometres, which stretches well beyond our birthplace of Bristol. Wessex Water provides the sewerage services in our area, and together we provide one joint bill to our customers.

Around half of our supply comes from reservoirs in the Mendips, together with smaller groundwater abstractions around our supply area. The rest comes from the River Severn via the Gloucester and Sharpness Canal. We have a network of treatment works, pipes, pumps, and service reservoirs to get the water to the tap.

We have close connections with our local communities, believing that a partnership approach connected into local plans is required to deliver our social purpose. We take an interest beyond our own activities, such as through the Bristol Environment Board and have actively contributed to Bristol's carbon and ecological emergency strategies. Whilst Bristol has been leading the way on a response to these emergencies, we are also working with stakeholders across our supply area to support local and regional plans, including the West of England Combined Authority (WECA)

You might have seen us out and about with our Water Bar, or refilled your water bottle from one of our public water fountains, or maybe you've logged onto our sister site Bristol Water the Foundation to make use of our 50 free learning resources and mentoring opportunities. Perhaps we've been working in your area, fixing a problem or upgrading our pipes.

We are a values orientated company and we really care about the environment, it's part of our purpose "to have a positive impact on customers, colleagues, community and the environment". On top of all the great work which we do to support our local aquatic environment, we have set ourselves the industry's first biodiversity enhancement target. We are really pleased to be building on these existing commitments with this net zero routemap.

What do we mean by "Net Zero"?

The gases that contribute to climate change are collectively known as "Greenhouse Gases" — or GHG.

Our ambition is that by 2030 we will not cause any GHG emissions to Earth's atmosphere through our activities to supply water to customers.

To produce zero emissions in some areas of our operation may not be directly achievable, but in these cases we can look to remove GHG from the atmosphere by other means (e.g. tree planting).

Our emissions to the atmosphere are our "gross" emissions. Once we take account of any GHGs we have helped remove from the atmosphere these are "net" emissions, and this is our target area for net zero.

Carbon dioxide is one of the largest contributors to climate change, so the impact of other gases emitted to the atmosphere is often simplified by describing these in terms of their " CO_2 equivalent": the term used for this CO_2e .

We have followed the water industry standard approach to calculate our carbon baseline.



Our carbon footprint

Our carbon footprint is lower now than it's ever been but this is mainly due to a reduced carbon footprint of the energy we buy.



Our carbon footprint



2.1 Progress to date

Our carbon footprint is less than half the amount it was 10 years ago, despite a 10% increase in the population we serve.

Energy is a significant cost to our business at around 15% of our supply operating expenditure, so we have invested in energy efficiency measures which have reduced our carbon impact. Our success in reducing leakage by over 25% since 2014 has also helped to save energy and therefore carbon. We have also invested in renewable energy in the form of solar power, although this currently only contributes a relatively small amount to the energy we consume.

The most significant factor in the reduction of our carbon footprint of our activities over the last ten years is the reduction in the amount of carbon associated with every unit of electricity we use. This is because lower carbon energy sources now provide a higher proportion of energy to the grid.



2.2 Gas fired generation

At our largest treatment works in Gloucestershire we have recently installed an on-site electricity generation system, which uses natural gas to generate electricity for site use. This system reduces our operating cost but will lead to an increase in our carbon footprint in the short term. We have accounted for this within our current baseline to ensure that the impact is addressed as part of our routemap.

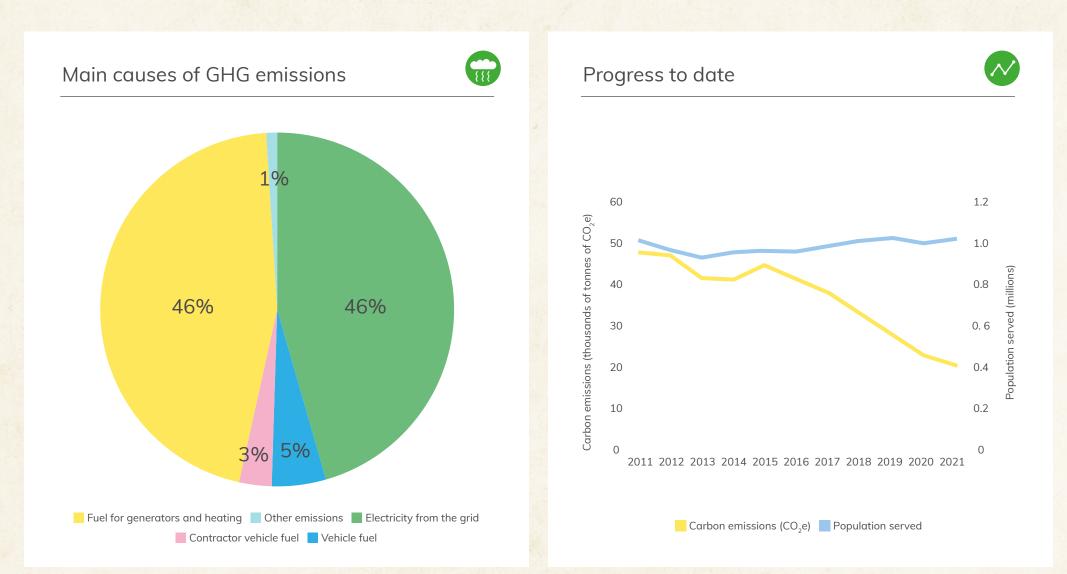


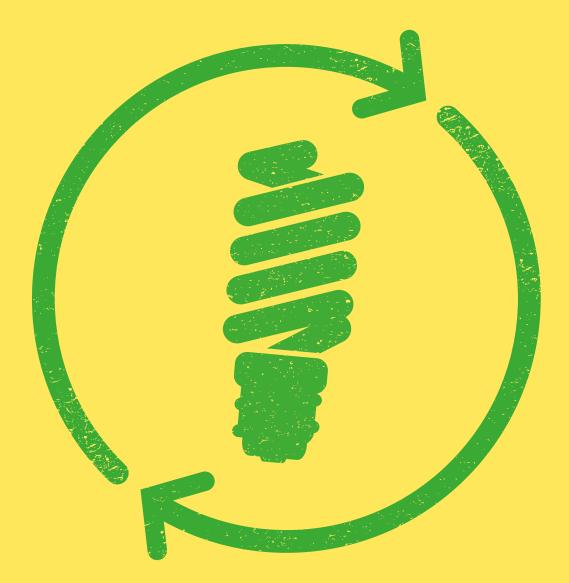
2.3 Main causes of GHG emissions

As a water only company, a large proportion of our GHG emissions come from the energy required to operate the pumps and treatment processes to supply of 100 million tonnes of water per year to our customers.

Our footprint is split almost equally between the use of gas and electricity when taking into account the new gas fired generator at our largest water treatment works. Other smaller components are vehicle use and electricity lost through the grid during transmission and distribution.

Our carbon footprint





There are four pathways which we can follow to help us to get to net zero:



RELATIVE COST ••• CARBON SAVING ••• LOCAL BENEFITS •••

Pathway 1: efficient use of water

Pathway	Option	Considerations
	Reduce leakage	 Our ambition is to reduce leakage by 50% by 2050. Leakage reduction activity can be high-cost and has its own carbon footprint Environmental and social benefits linked to lower levels of abstraction
Reduce demand for water	Encourage our customers to use less water	 Our ambition is to reduce per capita consumption to 110 litres/person/day by 2050 a reduction of over 30% from current day levels May be a high-risk option as we are cannot directly control the outcome Environmental and social benefits linked to lower levels of abstraction



Pathway 2: more efficient operations

Pathway	Option	Considerations
Further increase the efficiency of our operations	Optimise how we move water around to meet demand	 Building on our existing pump optimisation systems Additional benefit of cost reduction Limited additional performance is attainable for a system that has been through intensive optimisation programmes
	Invest in energy efficiency measures at our sites	 Our head office already has energy and water efficiency measures Opportunity to introduce at other sites but limited carbon savings attainable Additional benefit of cost reduction



Pathway 3: switch to low carbon or zero carbon sources of energy

Pathway	Option	Considerations
	Invest in renewable energy generation at our sites (solar)	 High certainty of carbon reduction Low net cost in long term but up front investment required Opportunity to link to community schemes Opportunity to meet between 5% and 50% of our energy needs
	Switch to biofuels (for petrol generators, large vehicles)	 Low risk technically but only a small proportion of our carbon footprint impacted Debate over whether biofuels are carbon neutral and they still release air pollutants
Switch to low or zero carbon energy sources	Replace our fleet with electric vehicles (EVs)	 We currently have a fleet of 330 vans, company cars and lorries, with low use of electric vehicles Market and technology for electric vehicles is not fully mature – range uncertainty for larger vehicles and charging points are not always available
	Switch to low carbon heating	Established technology such as heat pumpsLimited impact as heating makes up 1% of our carbon footprint
	Buy green electricity and gas, exploring innovation such as hydrogen-fired generation	 Easy to achieve, low risk Would remove vast majority of our carbon footprint Expensive in short term with long-term cost uncertainty Does not have a net benefit to environment in the short term, but in theory helps to stimulate the market for green electricity and gas

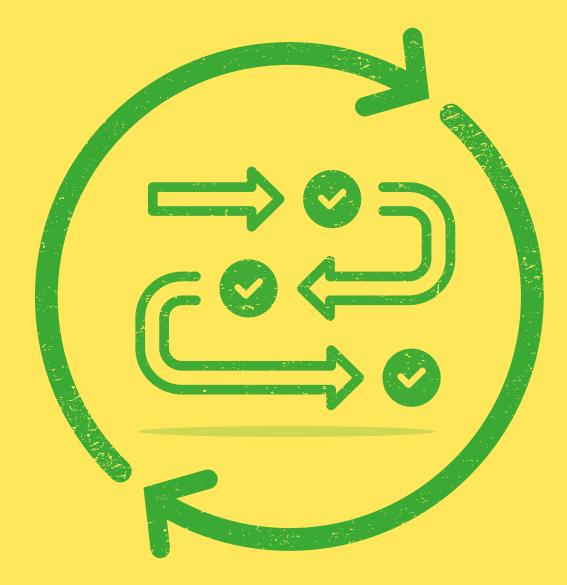
Pathway 4: remove carbon from the atmosphere

Pathway	Option	Considerations
Mitigate the impact of the carbon we produce	Buy energy offsets	 Potential to offset all of our carbon footprint Unlikely to provide any local benefits May be high cost There is uncertainty over the true environmental benefit from offsets
	Increase sequestration at our sites	 Primarily tree planting at our sites Potential for multiple environmental and social benefits Limited land available for tree planting — areas of our sites designated as SSSI due to biodiversity value of grassland



Our proposed carbon routemap

We have explored a range of scenarios to achieve carbon neutrality by 2030



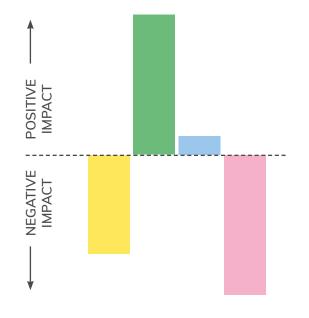
Our carbon routemap scenarios

In developing our routemap we explored three scenarios:

1

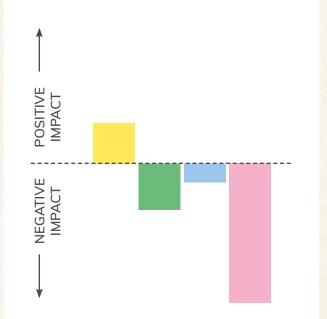
Immediate action

Buying green energy and offsetting remaining emissions.



Delay action until 2030

Buying renewable energy and offsets from 2030 onwards.



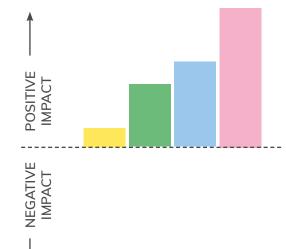
Indicative impacts (to 2030)

Cost saving Community Environment Flexibility

3

Managed rollout

Our preferred routemap uses a mix of pathways.



Routemap scenario 1

Scenario 1 is based on offsetting carbon emissions immediately through green energy and carbon credit purchase:

Scenario	Advantages	Disadvantages	Relative net cost
Immediate purchase of carbon offsets It would be possible for any company to achieve next zero carbon emissions almost instantly by buying green energy and offsetting remaining emissions.	This would have the advantage of lower total emissions by 2030 – recognising the objective to minimise harmful emissions rather than just hit a 2030 target. The logic behind offsets is that longer term investment in renewable energy or carbon removal is stimulated locally or worldwide through the sale of the offsets.	There would be no immediate environmental benefit as there would be the same amount of renewable energy available to the grid. The longer term environmental benefits are uncertain. With no investment in reducing demand for energy or on site renewable generation, there is a high ongoing annual cost, with the added risk of future cost uncertainty. No additional local economic, social and environmental benefits would be realised.	Short term £££ Longer term £££

Routemap scenario 2

Scenario 2 is based on deferring any action beyond demand and energy efficiency until 2030:

Scenario	Advantages	Disadvantages	Relative net cost
Defer action until 2030 Our planned investment over AMP7 on water and energy efficiency measures reduces our carbon footprint. Once these are complete, it would also be possible to defer all action until 2030, simply buying renewable energy and offsets from 2030 onwards.	Low cost in the short term.	No additional local economic, social and environmental benefits would be realised Cost from 2030 would likely be high and there is also high uncertainty around the cost. Likely to be unacceptable to employees, stakeholders and customers.	Short term £ Longer term £££

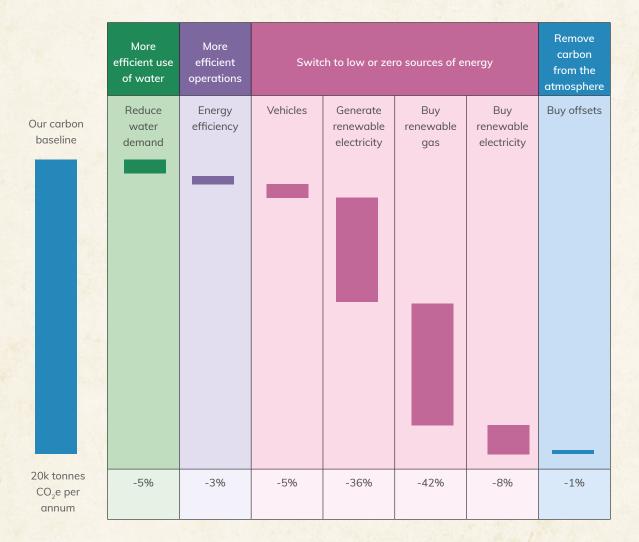
Routemap scenario 3

Scenario 3 considers a mix of the four pathways to reduce our carbon footprint. This is our preferred carbon routemap.

Scenario	Advantages	Disadvantages	Relative net cost	
Our proposed routemap Mix of pathways – immediate action on water and energy efficiency. Investment in renewable energy. Purchasing green energy and offsets in a managed way to provide a trajectory to 2030. Customer, stakeholder and employee engagement to balance trade-offs.	Greatest potential to provide wider benefits to society. Investment in short term reduces costs in the longer term – savings will be passed on to customers. Ability to be more agile in response to changing markets.	Greater investment required in short term compared to scenario 2 (defer action to 2030).	Short term ££ £	

Our proposed carbon routemap

We propose a mix of methods to achieve carbon neutrality by 2030.



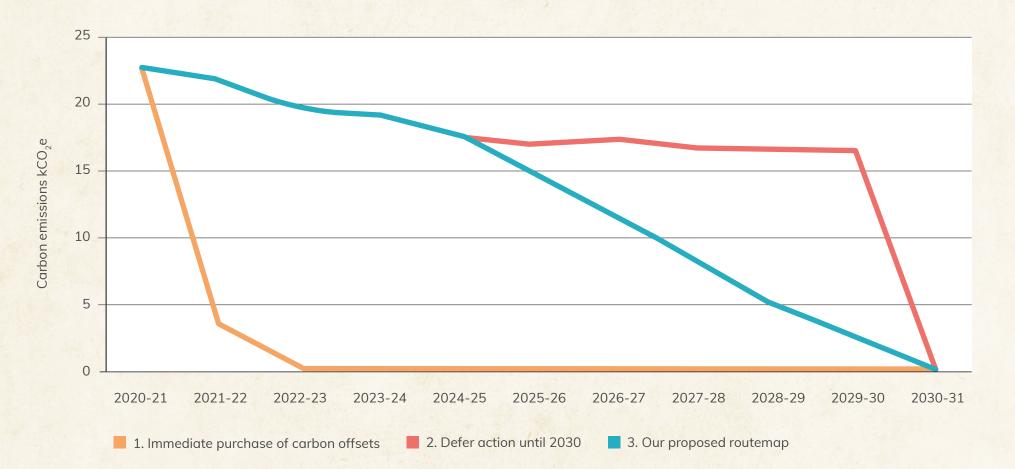
Our routemap includes:

- Making more efficient use of water and investing in more efficient operations to reduce costs as well as carbon. These also have positive additional impacts on society. Savings are less certain, particularly when requiring customers to change their behaviours.
- Replacing our fleet with electric vehicles and switch to biofuels for larger vehicles
- Investing in solar photovoltaic energy to generate our own renewable energy
- Switching to renewable supplies of gas and electricity.
- Buying a small volume of offsets to remove the carbon impact for the 1% of our footprint.

We need to balance investing in renewable energy at our own sites and buying renewable energy from the grid. We will explore this we develop our proposals and gather more information on the full range of costs and benefits. We will engage with our customers, stakeholders and employees to find the right balance of trade-offs as we build the longer-term investment required into our plans.

The impact of our preferred carbon routemap

Scenario three has been taken forward as our carbon routemap as it provides the best overall balance of cost versus benefit and is lower risk in the long-term. The estimated impact of our preferred scenario on our carbon footprint is shown below:



Integration with local strategies and plans

Addressing carbon emissions is a problem which we all share. Together we need joined up strategies to radically rethink how we live and work — we all have our part to play, as both employees and citizens.



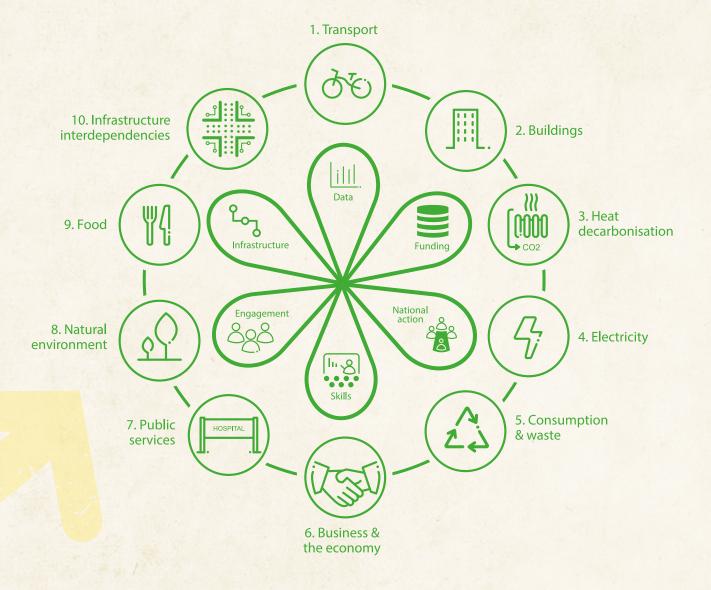
Integration with local strategies and plans

Bristol City has a strong history of delivering climate action and has the most developed plans for our region, including the Bristol One City Plan⁵ and One City climate strategy.⁶

We have invested considerable time in working as a member of the One City Environmental Sustainability Board to develop and align our approach. Whilst we recognise that the plans for Bristol City only cover a proportion of our supply area, the approach that we develop is readily transferrable. We will continue to map our activities to the One City Climate Strategy (the diagram opposite shows the components of this strategy) and engage with wider stakeholders across our area to ensure we work together to resolve the climate emergency.

⁵ https://www.bristolonecity.com/about-the-one-city-plan/
 ⁶ https://www.bristolonecity.com/wp-content/uploads/2020/02/one-city-climate-strategy.pdf

Diagram source: Bristol One City Climate Strategy: Ten key areas where climate action is needed to achieve the vision for Bristol in 2030.



Integration with local strategies and plans continued

Our approach includes our social contract, which recognises our ability to use our skills and resources to contribute to wider community wellbeing through the way in which we work.

Our focus as a local community water company is to reflect the priorities of the area we serve, and to make a positive contribution beyond our core role as a water supplier

Our social contract has an annual programme of initiatives which are designed deliver wider social and environmental benefits, including education on the value of water and links to the local environment and to climate change. Our regional strategies approach is built around the Bristol One City Plan. This includes a series of targets to help achieve a fair and sustainable Bristol by 2030. This approach ensures that our social contract activities are linked to local needs and plans. Some examples are given here, together with some of the One City Plan targets.



We have a number of initiatives within our social contract which contribute to our net zero plans. Of particular note are:

- Resource West our partnership with local utility companies, academic and Community Interest Companies aimed at achieving a transformational shift in consumption of resources whilst also supporting more vulnerable members of society
- Bristol Water the Foundation providing resources, knowledge and engagement opportunities to inspire young people on the value of water and the need to use it mindfully.

Our local community ambition for carbon reduction

Because of the key position we hold in the local community, we believe we have an important role to play in helping reduce the carbon footprint of the wider community.

With this in mind, we have set ourselves an innovative reporting ambition, looking beyond the Net Zero scope of the UK water industry commitment and engaging more widely with the communities we serve. Because this reporting will be focused on the reductions in emissions that we believe we can help support, we have referred to these items as "Scope minus one" and "Scope minus two" as shown opposite.

	Defined by	Scope	
		-1	Reducing the carbon emissions of our customers through how they use their water, focusing on water heating.
	Bristol Water	-2	Supporting stakeholders in our catchment to sequester carbon through land management, but we will not be claiming the carbon reduction benefit.

Next steps

We recognise that our journey to net zero needs to be a collaborative one, with support and action from our employees, stakeholders, customers and delivery partners. There are a number of balances and trade-offs which need to be considered in the context of our future investment plans.





Consult with customers, stakeholders and employees within the context of our wider plans.



Ensure that our short and longer term decision making frameworks include carbon impacts.



Expedite our plans for developing options for renewable energy at our sites.



Continue to measure and transparently report on our progress.



Our routemap to Net Zero Carbon by 2030

Meanwhile we'd love to know what you think. Please contact us at: Strategyandregulation@bristolwater.co.uk

Further information on our GHG emissions can be found in our Annual Performance Report 2020/21 at our website: https://www.bristolwater.co.uk/about-us/our-performance/

Further information on our latest social contract annual programme of initiatives, which are designed deliver wider social and environmental benefits, can be found at our website: https://www.bristolwater.co.uk/about-us/our-story/social-contract/

With thanks to the Centre for Sustainable Energy for their assistance in creating this routemap

