Net-zero carbon

Annex 06

Severn Trent
29 January 2021

WONDERFUL ON TAP

Executive summary

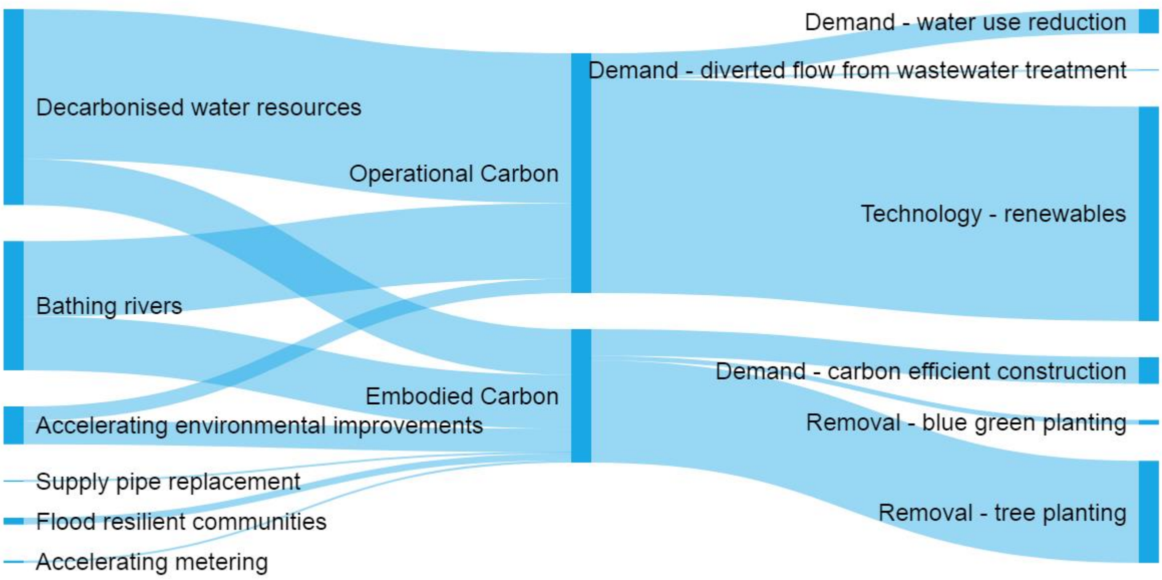
We have assessed the proposals in all the projects for their carbon footprint and identified a balanced suite of mitigation to ensure that our Green Recovery case is net-zero carbon. The total net cost of this in AMP7 is £18.6m.

Table: Summary of carbon in the Green Recovery (carbon in tCO_2e)

Project	Carbon impact of proposals without any action	Reduction in carbon through design & innovation	Reduction in carbon through renewable energy	Reduction in carbon through green removal	Gross cost	Annual Opex saving	Net cost included in proposals
Decarbonised water resources	108,120	11,672	68,804	20,279		[redacted]	
Bathing rivers	71,265	5,933	41,599	23,733			
Supply pipe replacement	729	1,796	-	583			
Flood resilient communities	3,797	1,276	-	3,038			
Accelerating metering	1,215	5,442	-	972			
Accelerating environmental improvements	20,827	2,588	7,888	10,351			
Total	205,953	28,707	118,291	58,955	£20.9m	£2.3m	£18.6m

The same data is displayed visually below.

Figure: 25 year carbon balance for the Green Recovery projects



Carbon emissions are shown on the left, activities giving a carbon benefit are shown on the right

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1. Our approach to carbon in the Green Recovery

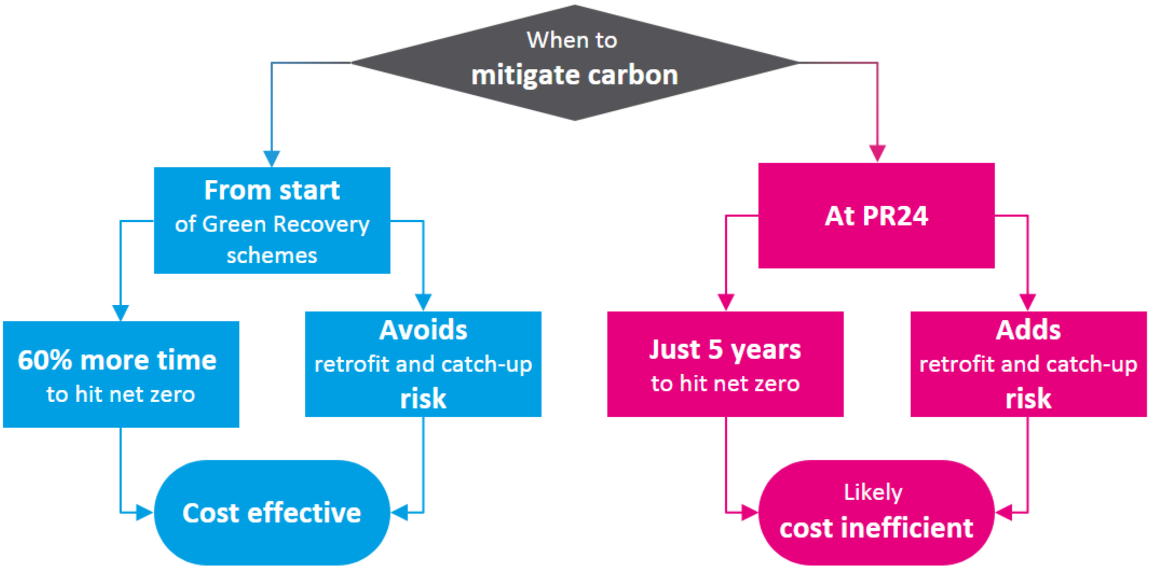
Severn Trent is committed to achieving net-zero carbon emissions by 2030 as part of our triple pledge on carbon. Our commitment to delivering net-zero is reflected right through our organisation including in our Executive remuneration. At Severn Trent we are all proud to be held to account for the delivery of our commitments to our customers and our wider sustainability ambitions in support of our purpose of taking care of one of life's essentials.

That's why, in addition to the existing measures which are part and parcel of our annual bonus schemes and which run throughout our organisation from top to bottom, we are proposing this year to introduce an additional performance measure into our long term incentive plan which relates to our commitments and long term ambitions around our net-zero ambition.

Our Green Recovery business cases show how we can deliver large improvements for our customers and the environment without adding net carbon emissions. Implementing the schemes will reveal information that will help us and other companies to achieve net-zero carbon emissions more efficiently over the coming decade.

It is much more efficient for our customers for us to deal with carbon emissions now rather than wait for PR24. This allows us to identify ways of avoiding footprint upfront, and build mitigation in as we go, rather than retrofit inefficiently. Therefore, we consider the Green Recovery business cases should be net-zero as a minimum requirement.

Figure 1: The logic for embedding net-zero from the start



When we say net-zero, we mean that the amount of carbon emissions produced is balanced by removing or reducing greenhouse gases in other ways.

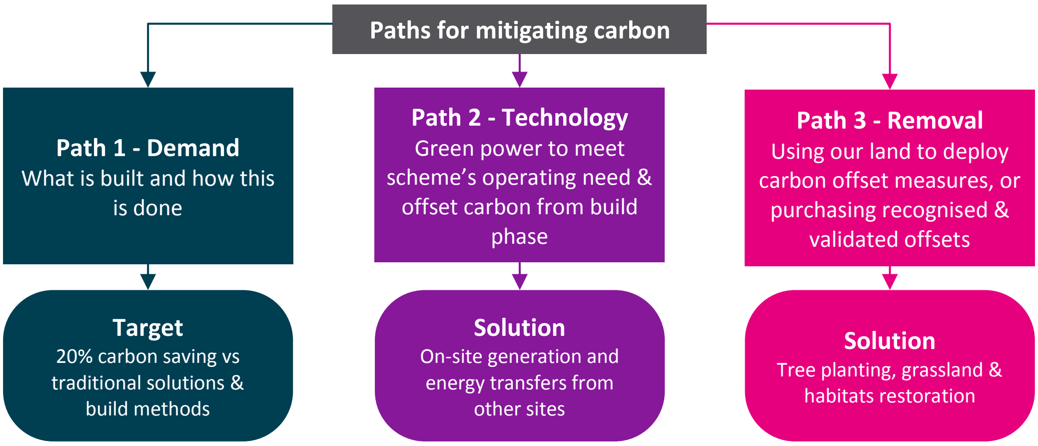
The first step is to measure the impact of every project that is being proposed to establish a baseline. In doing this we will consider both embodied carbon as part of construction and operational carbon from energy to give a total carbon footprint for the project concept. This has been done using a carbon calculator tool, which is based on industry-wide carbon data for embodied carbon and emissions from energy use based on the carbon intensity of the electricity grid in 2020.

2. Paths for mitigating carbon

We are considering the ways of addressing carbon impacts in the same way that has been used in the Water UK Net Zero 2030 Routemap, which is in three groups:

- demand-led reductions from doing things differently;
- technology-led reductions from deployment of new techniques and processes; and
- removal-led reductions using the natural environment to lock up carbon for the future.

Figure 2: The paths for mitigating carbon

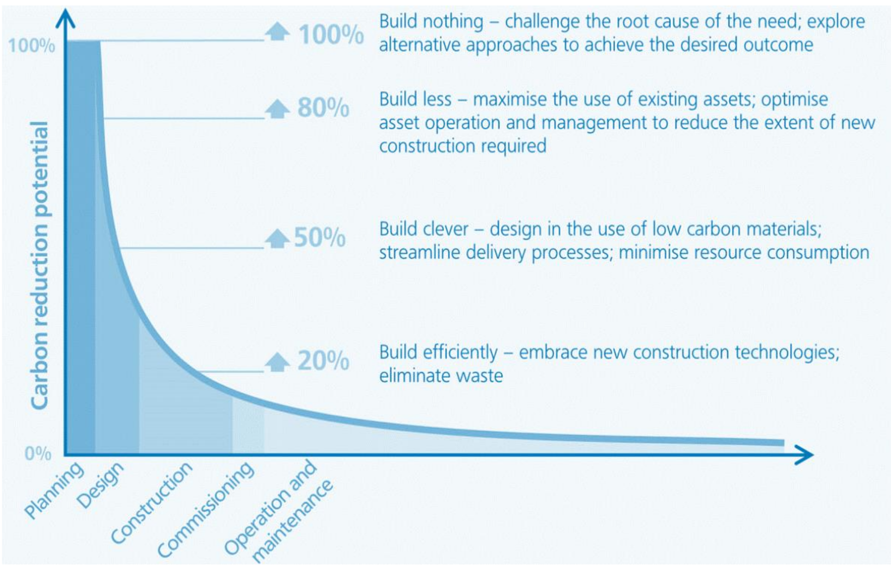


2.1 Path 1 – Demand

The first path can be summarised by what we build, and the way we build it. If we can identify other ways of doing things such as reducing customer consumption or different ways of providing the same output, we can prevent locking in carbon from the start.

The Green Recovery projects are at a high-level feasibility stage so there is still time to identify demand related savings. Options for demand related savings will be completed in the early stages of solution development. We are aware that, for some projects, the location of sites will be key to this and is something that has been on our radar right from the start of the process.

Figure 3: Carbon reduction potential



As we progress through design and construction, the opportunities grow smaller but remain important, so we will continue to use best practice such as low carbon construction materials, reuse and reduction of waste during construction. In our calculations we have adopted a 20% carbon efficiency target to be achieved against traditional solutions and methods of construction.

2.2 Path 2 - Technology

The second path for a given project is the deployment of technology. This is most likely to be renewable energy generation to provide a direct offset of the increase in grid energy that would otherwise be needed. The ways that will be considered are shown below in approximate order of likelihood.

- **Solar generation** – the most widely deployable technology where land is available. It is subject to daily generation patterns and some seasonal effects with higher generation in summer so may need to be considered alongside energy storage. If required in a specific location may be limited by land availability.
- **Micro-renewables** – the use of smaller scale generation such as micro wind turbines and low head, in-pipe hydro generation to supplement or reduce the size of larger installations can be considered but needs to be done in detail on a site-by-site basis.
- **Bioresources and biogas-based generation** – only applicable for wastewater sites and where there are not existing plans to expand the existing anaerobic digestion, CHP or biomethane operations in AMP7.
- **Wind generation** – may not be suitable for all locations, and subject to more difficult planning requirements. Output is weather dependent and can be seasonal.
- **Energy storage** – this may be required in practice to balance out generation and supply as solar and wind output is less constant than biogas processes. Battery storage systems are well developed and particularly suited to solar generation.
- **Hydrogen** – Hydrogen is one of the ten points in the Prime Minister’s plan for the Green Industrial Revolution, and it is intended to explore hydrogen production using electrolysis where renewables are required on a seasonal basis. This may apply to both solar or wind generation.
- **Other new technologies** – our innovation team continue to work on trials and scout for new technologies that may become relevant to these projects as the solutions develop in detail. Some examples include:
    - Ammonia recovery from strong wastewater streams which would reduce process emissions from wastewater and may provide a valuable source of ammonia for fertiliser and hydrogen production.
    - Gasification or pyrolysis of sludge at high temperatures for more energy recovery than is possible with digestion processes, which produces synthetic hydrogen and captures carbon in the form of biochar.
    - Heat recovery from wastewater to recover otherwise wasted household heat from domestic hot water that ends up in the sewers, which would take advantage of the growth in heat pump systems.

For each of these ways the full range of funding and operating models will be thought through as the projects develop. This will include Severn Trent ownership and construction, third-party power purchase agreement arrangements and other strategic energy projects around the UK.

2.3 Path 3 – Removal

The remaining path for a given project is using natural resources to remove carbon from the atmosphere. This can be done by Severn Trent, which we call insetting, or by third parties, which we call offsetting. The activities we are likely to carry out to achieve this are tree planting and habitat restoration, for example peatland or grassland.

For the purpose of the Green Recovery projects the purchase of recognised and validated carbon offsets would be considered as the path-of-last-resort as the markets for offsets are anticipated to become oversubscribed and it is unclear how offsetting would support our commitment to Science Based Targets and we would be contributing to offset markets being oversubscribed in the future.

Insets or offsets will need to meet the requirements of PAS 2060 or other internationally recognised standards.

2.4 Basis of assessment

We have assessed the carbon footprint and mitigation measures over a 25 year period. This is for two reasons:

- Based on our experience the life of a renewable energy asset is 25 years. In the Committee for Climate Change's 6th Carbon Budget the balanced pathway for the UK electricity grid shows that by this time the grid is expected to be operating at zero carbon intensity. Therefore, at the end of the life of any renewables mitigation the decision to replace or to import energy will not affect the carbon footprint any further.
- The life of trees and other removal methods is assumed to last in perpetuity. The life of a typical tree is 80 years so after 25 years they will continue to remove carbon for the remainder of their lives. The asset life of concrete assets is assumed to be no more than 80 years so there will be no further carbon footprint within the life of the natural capital.

3. The projects

3.1 Creating bathing rivers

The bathing rivers project has been analysed based upon the scope of the project, this includes:

- Avon catchment including treatment improvements at five wastewater treatment works and several combined sewer overflows, plus some new sewerage to support the rebuild of Longbridge.
- Teme catchment including treatment improvements at Ludlow and several combined sewer overflows.

Because this project involves the building of large pipelines and extension to treatment works, there is a large embodied-carbon footprint. The need to move and treat large volumes of wastewater means that there is also a large operational carbon footprint.

Table 1: Carbon impact of bathing rivers

Embodied Carbon tCO_2e	Annual Operational Carbon tCO_2e
29,666	1,664

We have considered the following measures to address this.

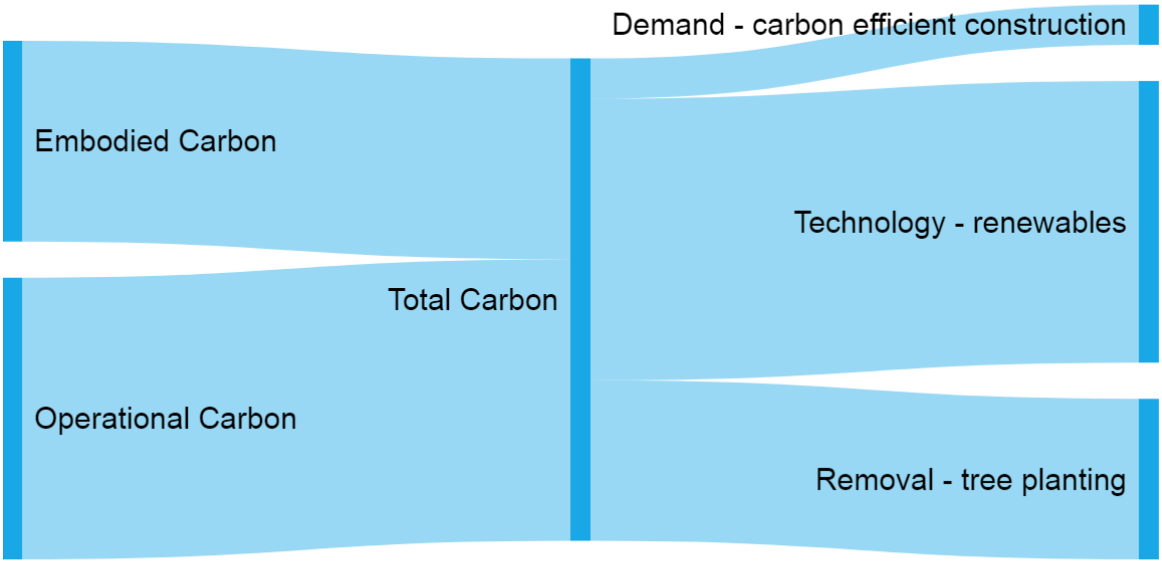
Table 2: How the paths apply to bathing rivers

Path	What have we considered?	Is this included in costings?
Demand	Site location	Included by default in the main project options.
	Low carbon construction methods	Yes assumed delivered within existing cost models
Technology	Solar & wind generation	Yes. Further analysis will be carried out for additional implementation of micro-renewables on a site-by-site basis.
	Ammonia recovery at Finham	Not at this stage, to be considered in detailed feasibility. Not yet mature technology.
	Gasification or Pyrolysis at Finham	Not in this stage, to be considered in detailed feasibility. Not yet mature technology.
	Alternatives to conventional Activated Sludge Process at Longbridge such as anaerobic secondary treatment	Not at this stage, to be considered in detailed feasibility. Not yet mature technology.
	Process emissions capture from Ozone treatment	Not at this stage, to be considered in detailed feasibility. Not yet mature technology.
	Energy storage	Not at this stage but battery storage and electrolysis may be cost beneficial refinements to the business case once developed in detail
	Heat recovery	Not at this stage, to be considered in detailed feasibility.
Removal	Tree planting & habitat restoration	Yes
	Commercial offsets or purchase of additional green energy	It is considered

As the idea behind creating bathing rivers is doing something new, the demand led opportunities are limited to construction.

The bigger opportunities in this project lie very much with work at Finham and Longbridge as these two sites are the biggest contributors. This makes the technology solutions in the table above really important and they will be considered during detailed solution development. We will base this analysis on solar renewable technology as it is proven and has known costs.

Figure 4: 25 year carbon balance for bathing rivers



Carbon emissions are shown on the left, activities giving a carbon benefit are shown on the right.

3.2 Decarbonising water resources

Although we are looking at a range of options for delivering water resilience, we have set a baseline scope so that we can calculate the carbon impact. This scope consists of:

- A new supply and utilisation of capacity at Melbourne.
- Increased supply and new capacity at Church Wilne.
- Balancing flows from the River Severn in Shropshire and increased transfer of water from Trimpley to Frankley for treatment.
- Pumping into distribution.

Because this project involves the building of large pipelines and extension to treatment works, there is a large embodied-carbon footprint. The need to move and treat large volumes of water means that there is also a large operational carbon footprint.

Table 3: Carbon impact of decarbonised water resources

Embodied Carbon tCO_2e	Annual Operational Carbon tCO_2e
25,348	3,311

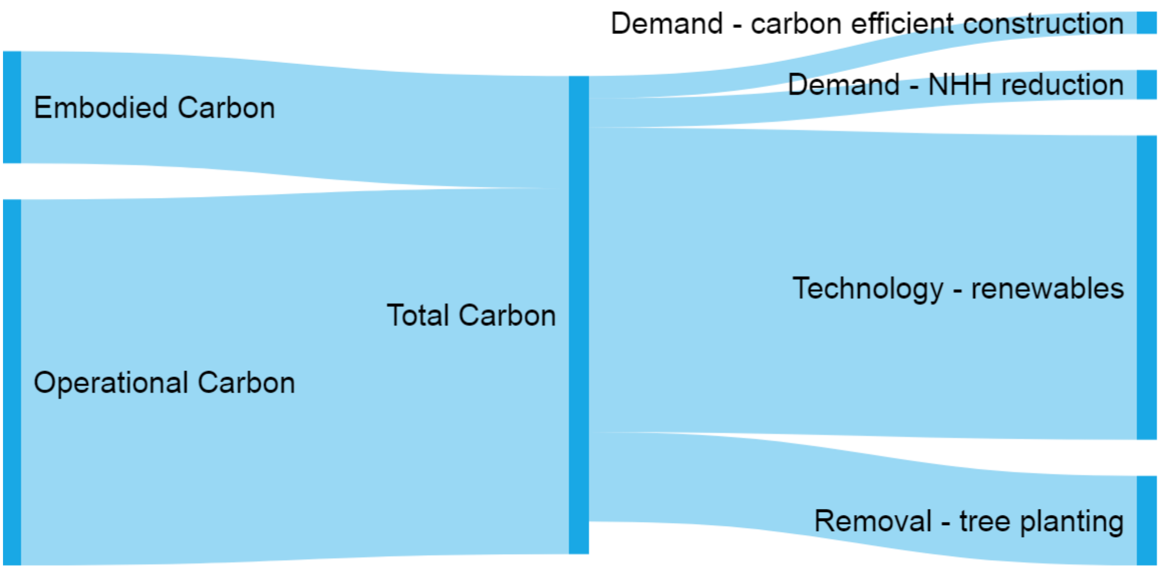
We have considered the following measures to address this.

Table 4: How the paths apply to decarbonised water resources

Path	What have we considered?	Is this included in costings?
Demand	Demand-side water solutions e.g. leakage reduction, metering.	Yes a 4Ml/d reduction in Non Household (NHH) use is included in the analysis.
	Site location.	Included by default in the main project options. We are reviewing brownfield sites which may allow for enhanced renewables opportunities.
	Low carbon construction methods.	Yes assumed delivered within existing cost models.
Technology	Solar & wind generation.	Yes. Further analysis will be carried out for additional implementation of micro-renewables on a site-by-site basis.
	Energy storage.	Not at this stage but battery storage and electrolysis may be cost beneficial refinements to the business case once developed in detail.
Removal	Tree planting & habitat restoration.	Yes.
	Commercial offsets or purchase of additional green energy.	It is considered.

If we take the carbon impacts from decarbonised water resources by themselves, we can see that over our normal 25 year window the largest carbon contributor is the operational carbon resulting from energy use. There are some demand led reductions from construction and the work to reduce NHH use and the remainder is a balance of renewables under the technology path and planting under the removal path.

Figure 5: 25 year carbon balance for decarbonised water resources



Carbon emissions are shown on the left, activities giving a carbon benefit are shown on the right

Our opportunities to improve the impact of the actual delivered solution lie with detailed development of the solution as this will highlight further demand-led solutions for all types of carbon, much of which will be location based.

The shortfall in the 25 year carbon balance is made up by the leakage reductions resulting from the supply pipe replacement and metering projects.

3.3 Flood-resilient communities

We have calculated that the only source of carbon footprint comes from the construction of the blue/green solutions. As planting is a fundamental feature of the proposed solutions, we have also calculated the benefit from this. One specific benefit of this type of scheme comes from separating and dealing with surface water outside of an existing combined sewerage system, as this reduces the flow that passes onto downstream pumping stations and treatment works. By taking the average carbon intensity of each megalitre of wastewater treated we can calculate the reduction in carbon that will result from the reduction in flow to our treatment works.

The range across all scenarios considered in this business case is shown below.

Table 5: Carbon impact of flood resilient communities

Embodied Carbon tCO_2e	Embodied planting benefit tCO_2e	Annual Operational Carbon tCO_2e
103 to 8,280	-1,029 to -4,848	-10 to -35

Average carbon intensity of 1 ML of treated wastewater = 0.146 tCO_2e

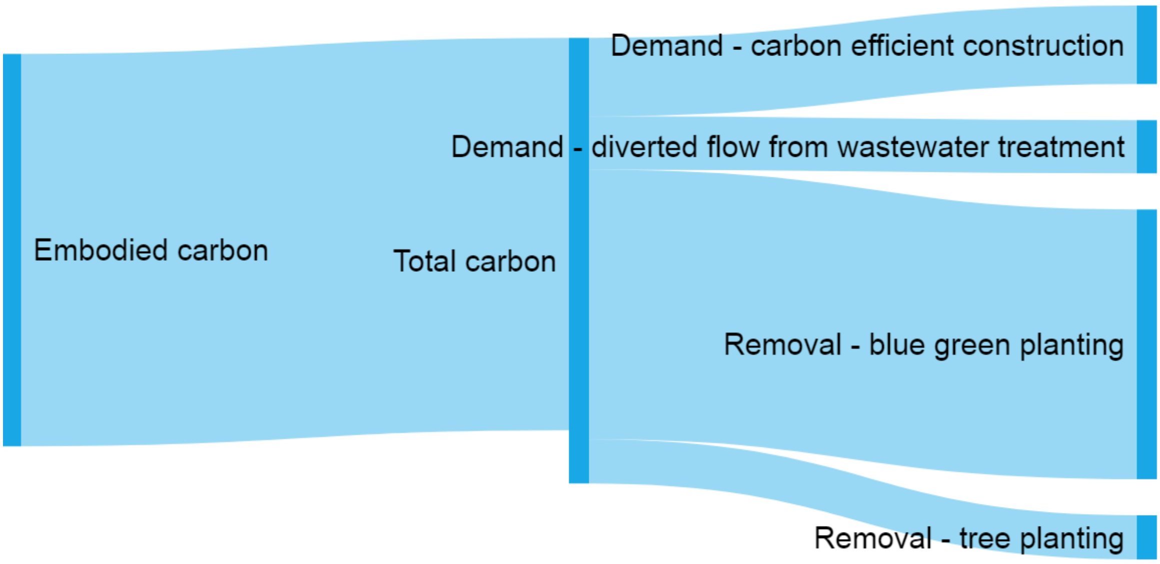
As these are mainly earth-based basins and pits for planting, their carbon footprint is significantly lower than the traditional concrete solution would have been. Providing the same level of storage from traditional solutions would have a carbon footprint of over 27,000 tCO_2e – as we understand the traditional solutions well there is a strong baseline to measure against.

Table 6: How the paths apply to flood resilient communities

Path	What have we considered?	Is this included in costings?
Demand	Avoided energy use from pumping and treating diverted stormwater.	Included by default in the main project options.
	Low carbon construction methods.	Yes assumed delivered within existing cost models.
Removal	Incorporate tree planting into project landscaping.	Yes.

Based upon the average across all scenarios this project becomes climate positive after 20 years without any further measures.

Figure 6: 25 year carbon balance for flood resilient communities



Carbon emissions are shown on the left, activities giving a carbon benefit are shown on the right. In order to balance all projects to net-zero additional planting has been identified and is shown above.

3.4 Taking care of customers' supply pipes

We've calculated that the only source of carbon footprint comes from the embodied carbon arising from the work done to replace supply pipes and the materials used. Using existing carbon models for lead communication pipe replacement and new communication pipe provision we modelled a range of scenarios for 30,000 properties. This gives an estimated range for the embodied carbon.

Table 7: Carbon impact of supply pipe replacement

Embodied Carbon tCO_2e	Annual Operational Carbon tCO_2e
176 to 1,283	-66

Average carbon intensity of 1 ML of water into supply = 0.181 tCO_2e

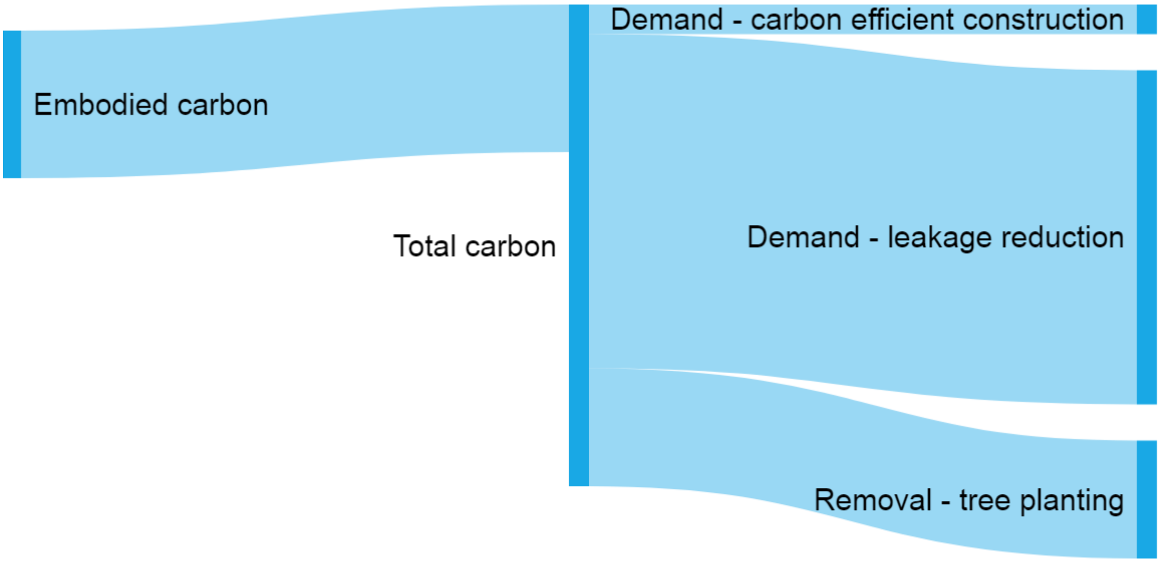
As replacing supply pipes will help reduce leakage, this will bring a positive carbon impact by reducing the units of water treated and pumped across the network. Taking average carbon intensity of each megalitre of water into supply, we can calculate the reduction in carbon from our estimate of 1*ML/d*.

Table 8: How the paths apply to supply pipe replacement

Path	What have we considered?	Is this included in costings?
Demand	Leakage reduction resulting from supply pipe replacement.	Included by default in the main project options.
Technology	Innovative methods of pipe replacement may lower carbon impact.	Included by default in the main project options.
	Alternatives to phosphate dosing.	No as this is a longer-term aim.
Removal	By addressing supply pipes alongside metering and leaks we may be able to roll activities together and reduce visits, work done and mileage.	No as it is too difficult to estimate at this stage.

Our analysis covers the impacts arising directly from this scheme to make sure that it does not overlap or confuse with (i) any existing AMP7 commitments on replacing lead mains or service pipes and (ii) existing lead-related ODIs. Based upon the central estimate of 729tCO_2e embodied carbon this project becomes climate positive after 11 years without any further measures.

Figure 7: 25 year carbon balance for supply pipe replacement



Carbon emissions are shown on the left, activities giving a carbon benefit are shown on the right. In order to balance all projects to net-zero additional planting has been identified and is shown above.

3.5 Smart metering

We've calculated that the only source of carbon footprint comes from the embodied carbon arising from the work done to install the meter and the materials used. Using existing carbon models we modelled the installation of 157,327 meters. This is split between simple and complex installations as set out in the metering business case.

Table 9: Carbon impact of metering

Embodied Carbon tCO_2e	Annual Operational Carbon tCO_2e
1,215	-208

Average carbon intensity of 1 ML of water into supply = 0.181 tCO_2e

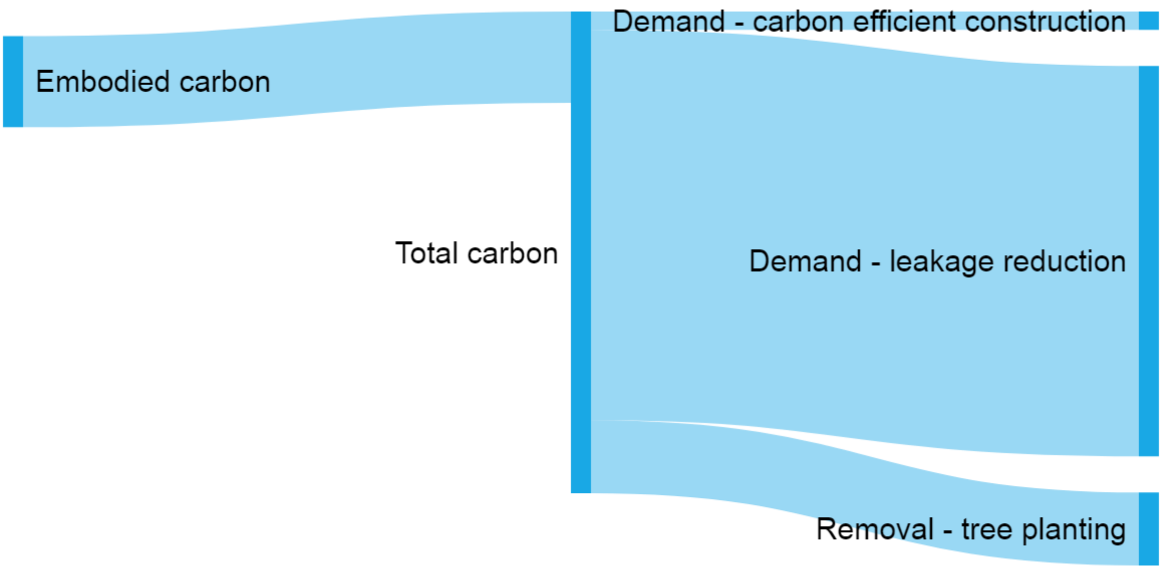
As installing more meters will help identify and reduce leakage, this will bring a positive carbon impact by reducing the units of water treated and pumped across the network. So, if we take the average carbon intensity of each megalitre of water into supply, we can calculate the reduction in carbon from our estimate of 3.15Ml/d.

Table 10: How the paths apply to metering

Path	What have we considered?	Is this included in costings?
Demand	Leakage reduction from meter installation.	Included by default in the main project options.
Technology	Innovative types of meter and methods of installation may lower carbon impact.	Included by default in the main project options.
Removal	By addressing metering alongside supply pipes and leaks we may be able to roll activities together and reduce visits, work done and mileage.	No as it is too difficult to estimate at this stage.

Our analysis on the carbon impacts from meter installation is focused on the impacts arising directly from this scheme. This is to make sure that it does not overlap or confuse with any existing AMP7 commitments on installing meters. This project becomes climate positive after 6 years without any further measures.

Figure 8: 25 year carbon balance for metering



Carbon emissions are shown on the left, activities giving a carbon benefit are shown on the right. In order to balance all projects to net-zero additional planting has been identified and is shown above.

3.6 Accelerating environmental improvements (AMP8 WINEP)

The carbon footprint here comes from building chemical dosing and tertiary solids removal processes, with associated pumping. The contribution from energy is a smaller proportion than bathing rivers as whilst both are wastewater treatment, the WINEP solutions do not have any energy-intensive processes such as ozonation and aeration.

Table 11: Carbon impact of AMP8 WINEP

Embodied Carbon tCO_2e	Annual Operational Carbon tCO_2e
12,939	316

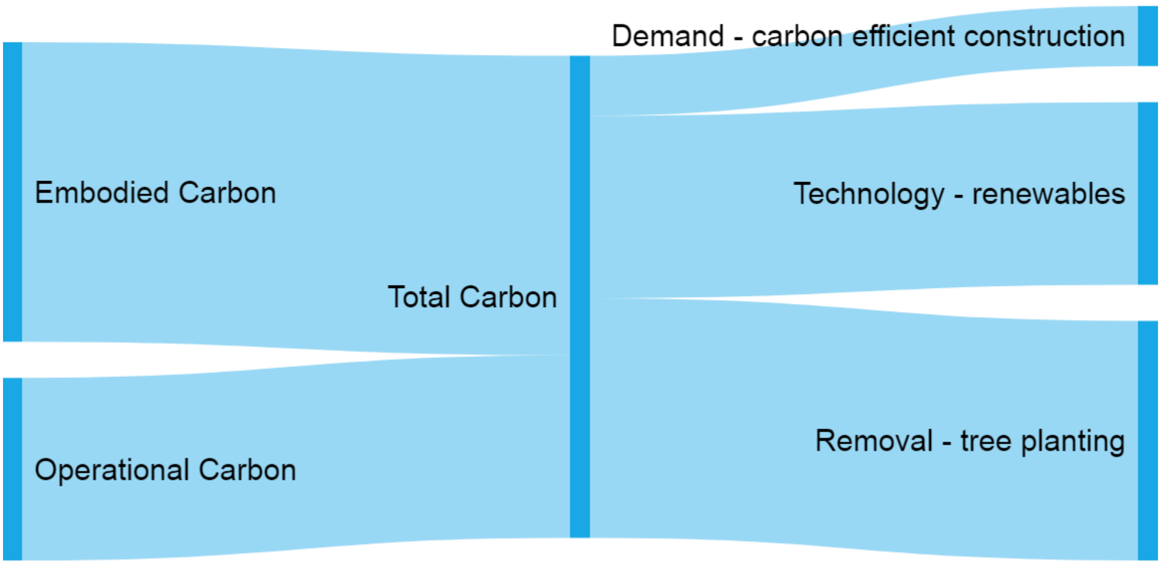
We have considered the following measures to address this.

Table 12: How the paths apply to AMP8 WINEP

Path	What have we considered?	Is this included in costings?
Demand	Site location.	Included by default in the main project options.
	Low carbon construction methods.	Yes assumed delivered within existing cost models.
Technology	Process selection.	Not at this stage, to be considered in detailed feasibility.
	Solar & wind generation.	Yes. Further analysis will be carried out for additional implementation of micro-renewables on a site-by-site basis.
	Energy storage.	Not at this stage but battery storage and electrolysis may be cost beneficial refinements to the business case once developed in detail.
Removal	Tree planting & habitat restoration.	Yes.
	Commercial offsets or purchase of additional green energy.	It is considered.

As the focus of the project is river quality improvements the demand-led opportunities are limited to construction and site location. There should be technology opportunities around process selection however at this stage we have focused on renewables and tree planting.

Figure 9: 25 year carbon balance for AMP8 WINEP



Carbon emissions are shown on the left, activities giving a carbon benefit are shown on the right.

4. Overall impact

In this section we bring together the overall impact for the six projects we have just described.

In line with the paths we outlined earlier, we have considered a full range of implementing them to achieve net-zero carbon emissions in the most efficient way for the Green Recovery business cases. The scenarios we have considered and our thoughts on them are:

Scenario 1 – only use renewables

This scenario provides the highest levels of renewables to cover both embodied and operational carbon. As we are not providing any long-term measures under this scenario we have to oversize the renewables options to deal with the level of embodied carbon by 2030. It has been assumed that the excess generation this results in will be dealt with as self-supply, as all construction is at existing sites with existing energy consumption that outweighs the new renewables, so this is costed as avoided electricity import.

Scenario 2 – only do green removal

As discussed earlier the assumption that the UK electricity grid will be operating at zero carbon intensity by 2045 means that we have scaled up the tree planting to cover the operational carbon footprint over 25 years, in addition to covering the embodied carbon to ensure we do not under-count.

The key influence on cost for this scenario is that we will still need to import energy at market rates in order to operate our new assets and processes so whilst this is a low capex option, the totex is high and will continue to be incurred beyond 25 years for as long as the assets are operational. We believe this represents the worst value for money of all scenarios.

Scenario 3 – the balanced pathway

This pathway is a mix of 1 and 2 and matches mitigation types to carbon sources with long-term mitigation measures to offset embodied carbon and renewables to offset operational carbon. This results in the optimum mix of lower capex than scenario 1, and lower totex than scenario 2. Because we are planting trees with long term carbon capturing properties and using renewables with a 25 year asset life, we do not need to artificially accelerate the operational or embodied carbon mitigation in the same way as with scenarios 1 and 2.

Scenario 4 – buy green energy only

This option presents no real 'additionality' in carbon reduction so whilst we will continue to procure our imported electricity from renewable-backed sources we are not relying on this option alone.

It is not possible to only use green energy purchase to offset anything more than the new electricity demand, as all of our imported electricity is already green and we can't import more than we use. Buying green energy only and offsetting embodied carbon with planting is effectively Scenario 2, given our existing purchase of green electricity. This scenario has therefore been discounted.

Scenario 5 – do it all by identifying demand opportunities

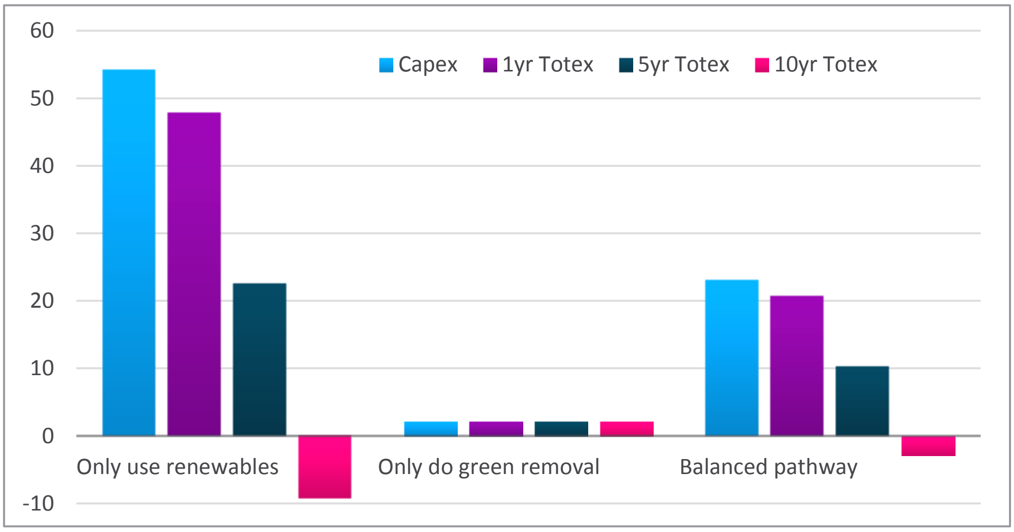
Whilst we have identified a good amount of demand-led opportunities and included them in the reckoning, it is just not possible to reach net-zero by this alone. This scenario has therefore been discounted.

Capex and Totex comparison

We have looked at these three scenarios in terms of both capex and totex, and we have looked at totex over 1, 5, and 10 years as shown below. We have focused on 1 year totex as this net cost represents the likeliest operating scenario for delivery within AMP7.

- The highest net cost is scenario 1 at £47.9m due to the higher generation requirement.
- The lowest net cost is scenario 2 at £2.1m however as the imported energy costs in the individual project business cases are not offset by any renewables, this scenario never pays back.
- Scenarios 1 and 3 both benefit from electricity import cost avoidance resulting from renewables meaning they each pay back in under ten years.
- Scenario 3 offers a lower net cost impact than Scenario 1 at £20.7m but a similar longer-term benefit.

Figure 10: Capex & Totex for each scenario £m



Due to the combination of capex and totex, we will focus on Scenario 3 – the balanced pathway. This aligns with the Water UK Routemap.

The total carbon balance for the balanced pathway is shown below. This includes a small reduction in renewables required to achieve a net-zero position thanks to the reduction in energy use across the decarbonised water resources, supple pipe replacement, flood resilient communities and metering projects.

The split of carbon mitigation across the different paths is shown below. This mirrors the split between embodied and operational carbon as discussed earlier.

Table 13: Percentage of carbon measures from each path

Demand	Technology	Removal
14	57	29

5. Costs

This is a breakdown of the costs given in the capex and totex section for Scenario 3.

Tree planting and habitat restoration

At the time of writing we have the most confidence in costs for tree planting. Our initial work in this area has shown that we have very limited amounts of peatland for restoration, and whilst we are very excited about the impact that grassland restoration may have, we do not yet fully understand its long term impact and costs are not well known.

Table 14: Cost of tree planting

tCO_2e to remove	Number of trees planted	Cost of tree planting £
56,345	225,380	[redacted]

Tree planting density is assumed at 1000 trees per hectare. Four broad leaved trees are required to remove 1t CO_2e over their life, at a cost of £3 per tree to plant. The costs assume planting can be done on land we already own or will be acquiring as part of the Green Recovery projects, or can be done on third party land, for example by working with local community groups.

Renewables

Costs have been derived from the BEIS Electricity Generation Costs 2020 models for solar PV.

The estimate is based on installation of capacity to meet the net electricity demand of the overall set of projects having taken into account energy savings elsewhere such as through leakage. It will need to be assessed in detail on a site by site basis along with the feasibility of combined micro-renewables.

Table 15: Cost of renewables to self-supply the Green Recovery projects

Annual energy requirement MWh	Capex to provide all as solar £
20,295	[redacted]

Costs are for construction in the period up to 2025, 2018 price base.

Buying residual green electricity

As a result of optimising the level of renewables installed in the most cost-efficient way, there is a small energy import residual. This is shown below and is the annual cost of energy required to operate the Green Recovery projects. It has been taken into account in the net Opex values used in this document.

Table 16: Cost of buying green electricity for the Green Recovery projects

Annual energy requirement MWh	Annual cost of green electricity £
2,397	[redacted]

Energy price based of [redacted] is taken from the Severn Trent supply contract for half-hourly metered sites. BEIS fuel price indices for the industrial sector indicate this is representative for 2018 price base given normal fluctuation in energy costs.

By way of context if we needed to purchase all electricity for these projects a total of 22,692 MWh would cost [redacted].

6. Cost breakdown by project

Table 17: Creating bathing rivers - Avon

Item	Amount
Annual energy offset MWh	7,004
Annual energy cost avoided £	[redacted]
Renewables capital cost £	
Tree planting cost £	
Land required for planting Ha	
Net cost included in proposals £	7,079,112

Table 18: Creating bathing rivers - Teme

Item	Amount
Annual energy offset MWh	133
Annual energy cost avoided £	[redacted]
Renewables capital cost £	
Tree planting cost £	
Land required for planting Ha	
Net cost included in proposals £	137,897

Table 19: Decarbonising water resources

Item	Amount
Annual energy offset MWh	11,805
Annual energy cost avoided £	[redacted]
Renewables capital cost £	
Tree planting cost £	
Land required for planting Ha	
Net cost included in proposals £	12,017,509*

* *[redacted]*

Table 20: Flood resilient communities

Item	Amount
Tree planting cost £	[redacted]
Land required for planting Ha	2

Table 21: Taking care of customer supply pipes

Item	Amount
Tree planting cost £	[redacted]
Land required for planting Ha	2

Table 22: Smart metering

Item	Amount
Tree planting cost £	[redacted]
Land required for planting Ha	4

Table 23: AMP8 WINEP

Item	Amount
Annual energy offset MWh	1,353
Annual energy cost avoided £	[redacted]
Renewables capital cost £	
Tree planting cost £	
Land required for planting Ha	
Net cost included in proposals £	1,438,759