Green Bond Impact Report 2020

Anglian Water Services Limited

THE QUEEN'S AWARDS FOR ENTERPRISE: SUSTAINABLE DEVELOPMENT 2020

WINNER UtilityWeek AWARDS 2018 Utility of the Year

Contents

Cover:

A low carbon project at Marston Water Recycling Works saw assets recycled and refurbished to deliver increased capacity and meet the demands of population growth.

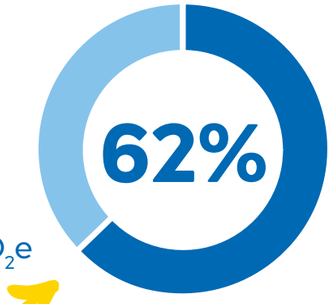
Green Bond summary 2020

£876m
total funding for Green Bond projects

c.850
green projects funded by Green Bonds

Reduction in CO_2e
161,474 (T)

62% CO_2e reduction from 2010 capital carbon baseline on green bond portfolio projects (Anglian Water overall CO_2e reduction 61% in AMP6 versus 60% target)



Actual CO_2e
102,677 (T)

Five environmental objectives

- Climate change mitigation
- Pollution prevention and control
- Climate change adaptation
- Natural resource conservation
- Biodiversity conservation

Impact of £1m investment

£ efficiency
£185k

Capital carbon reduction in CO_2e
185 (T)

Sustainable financing for a sustainable future:

Green Bond funding supports delivery of greener, more resilient outcomes for our customers and our environment

Big businesses like ours have a huge role to play in securing a sustainable future for the communities and the environment in which we operate. We've made our own commitment crystal clear through our Purpose and in the changes we made to our Articles of Association in 2019 to enshrine public interest at the heart of our constitution, becoming the first major utility to do so.

That commitment also extends to the way we finance the capital investments we make, directly benefiting our customers and our region because of the increased investor universe green finance opens up to us.

Sustainable finance has never been higher on the corporate agenda than it is today. Forward-thinking investors recognise that environmental and social responsibility is no longer an add-on to decision making, but a fundamental element in addressing climate change and making the right choices to safeguard both the planet and their investment. As Larry Fink, chairman of BlackRock, the world's biggest money management firm, wrote to CEOs in his annual letter earlier this year, "While government must lead the way in this transition, companies and investors also have a meaningful role to play."

This approach to finance is not new to Anglian Water. We led the way when we became the first European utility company to launch a Sterling Green Bond in 2017, and with six Green Bonds now in operation, green finance has become 'business as usual' for us.

> **Sustainable finance has never been higher on the corporate agenda than it is today. Forward-thinking investors recognise that environmental and social responsibility is no longer an add-on to decision making, but a fundamental element in addressing climate change.**

> **The £876 million of Green Bond funding we have secured in AMP6 has gone to fund some 850 projects, include innovative water abstraction projects, drought and flood resilience schemes, and progressive water recycling and water resource management projects saving over 161,000 eT of CO_2e.**

Many businesses choose not to finance investments with Green Bonds as they consider it too difficult to meet or evidence the necessary standards for demonstrating sustainability. Crucially, in our case we didn't have to change any day-to-day processes to qualify. Our strong governance culture ensures we continuously drive to generate value for customers and society while delivering environmental benefits.

The £876 million of Green Bond funding we have secured in AMP6 has gone to fund some 850 projects, include innovative water abstraction projects, drought and flood resilience schemes, and progressive water recycling and water resource management projects saving over 161,000 tonnes of CO_2e.

As we head into AMP7, we have an even more ambitious capital programme to fund. The centrepiece of our Business Plan is the creation of a strategic interconnector which will see us create up to 500km of interconnecting pipelines and associated infrastructure to move water from areas of surplus in Lincolnshire down to the drier south and east of our region. The resulting network will safeguard water supplies for years to come, protecting against drought risk and giving hundreds of thousands of customers a second source of supply.

We propose to raise the vast majority of the capital we need in AMP7 as sustainable finance, as well as using liquidity bank facilities that incentivise the delivery of agreed environmental and social goals.

Our investors recognise that running our business sustainably, with long-term resilience in mind, isn't just the right thing to do, but makes good business sense too.

Peter Simpson, CEO
Anglian Water

Steve Buck, CFO
Anglian Water

Green Bonds funded our £36 million AMP6 programme at Heigham Water Treatment Works to safeguard the local environment

Towards net zero carbon - and getting #FitforFour

We are committed to reaching net zero carbon by 2030. For many years Anglian Water has been at the forefront of carbon reduction in the water industry, and we are now playing a leading role in the delivery of the joint 2030 commitment made by all water companies in England in 2019.

Our CEO Peter Simpson is one of the co-sponsors of this ambitious target, while Anglian Water chairs the steering group which has developed the detailed industry routemap, described by the UK's HIgh Level Climate Champion for COP26 Nigel Topping as "one of the most significant steps taken by any indsutry anywhere in the world".

Peter Simpson also plays a key role in driving progress to net zero across the UK business sector through his role as co-Chair of the Prince of Wales's Corporate Leaders Group; this year he chaired one of the official UN Climate Change Race to Zero Dialogues in the run up to the global COP26 climate conference in Glasgow next November, and he has taken many opportunities to highlight the importance of tackling capital carbon alongside operational carbon.

Our strong track record places Anglian Water on a solid footing from which to advance. Back in 2010 we set two ambitious goals: one for operational carbon and the other for capital carbon. Our capital carbon goal was to halve the carbon embodied within our construction projects by 2015. At the time, measuring and managing capital carbon, let alone setting such a stretching goal for reduction, was unheard of.

In delivering against them, we demonstrated the strong link between carbon and cost, achieving financial efficiencies in the investment programme of more than 20 per cent. In collaboration with our integrated supply chain, we have created a strong 'reduce carbon, reduce cost' culture. This approach has delivered innovation and financial efficiency through the reuse of assets, low-carbon materials, off-site build, low-carbon standard products and advanced 3D design tools.

To achieve this level of success we have made fundamental changes to the way we run our organisation, aspiring, wherever we can, to lead the way on sustainable business practices. Working with government and other leading businesses, we developed the world's first standard for managing carbon in infrastructure (PAS 2080), which is now being used nationally and internationally.

In 2020 we have raised the bar again and are reporting a capital carbon reduction of 61 per cent – beating the updated target of 60 per cent that we set ourselves in 2015. On operational carbon we've achieved more than we hoped possible. This year we are reporting a reduction in our emissions of 34 per cent against a 2015 baseline, and we delivered our best-ever performance on renewable energy, generating a total of 131GWh of electricity from the renewable energy generation assets across our estate; enough to power 40,000 homes for a year.

We recognise that achieving net zero together will require innovation and the full support of everyone in the value chain, including our employees, our customers, our supply chain, partners and policymakers. We've already seen what is possible when everyone lines up behind a bold vision and ambitious targets. We're confident that together we can achieve the net zero carbon 2030 commitment.

Getting #FitforFour

While reaching net zero is vital to help mitigate the impacts of climate change, we firmly believe that mitigation must go hand in hand with adaptation. Our long-term ambition, set out in our Strategic Direction Statement in 2017, is to make the East of England resilient to the risks of drought and flooding. This year we became the first organisation in the UK to report in the latest round of reporting under the Adaptation Reporting Power, publishing our draft Adaptation Report for consultation in March.

In the face of ever more frequent extremes of weather, we cannot assume that our collective efforts to mitigate the impacts of climate change will limit global temperature rises to 1.5-2°C. Our next steps, therefore, will include updating all our plans to use the latest climate science and using scenario planning to prepare for a less optimistic scenario of a potential 4° rise in global temperatures - what we describe as getting #FitforFour.

Adapting well to climate change will enable us to meet the ambitious goals we have set and deliver the commitments we have made to our customers in a way that keeps bills affordable.

Creating a rainwater garden using sustainable drainage at All Saints Primary School, Newmarket

Embedding six capitals thinking

Our Board has committed to using six capitals thinking to inform decision making as we begin to deliver our new five-year Business Plan.

Using six capitals thinking will help us keep our responsibility to customers, communities and the environment at the front of our minds when making business decisions.

Over the past year we have developed a set of metrics for each of the capitals to help us understand, track and report on our impact on them at the corporate level.

We will report on the capitals metrics as we deliver our five-year Business Plan.

We have also identified key metrics to embed in our decision-making processes, starting with our capital delivery programme, but with the aim of integrating these into the processes for purchasing, strategic and operational decisions over the course of AMP7 (2020–2025).

In the capital delivery programme these metrics are designed to stimulate the creation of options with a wider range of value creation across the six capitals, and therefore move examples of best practice and innovation into business as usual. Teams have already begun applying the new metrics in totex investment projects and the approach will be rolled out more widely over the coming year.

Our six capitals approach has been externally validated by sustainability consultants Route 2, who have given us feedback which we have embedded into a routemap to further development.

At a regional level, the multi-sector Natural Capital East initiative, driven by Anglian Water, has met and agreed its approach including the creation of a baseline map, looking at how to work together to deliver individual objectives while creating most value in areas such as biodiversity net gain, carbon offsetting and catchment management.

Natural

The health of the natural systems and resources that we rely on and impact in our region and beyond; the availability and quality of water in our rivers and aquifers; the protection of our soil and biodiversity; and our impact on carbon emissions.

Social

The value of our relationships with stakeholders, including customers, communities and other organisations; the impacts we have on people and society (both positive and negative) and the trust they place in us as a result.

Financial

The financial health and resilience of the organisation and our access to and use of sustainable finance.

Manufactured

The ability of our infrastructure to provide resilient services to meet the current and future expectations of our customers.

People

The knowledge, skills and wellbeing of our people; the health, happiness and safety of our working environment; and our organisational culture and ways of working.

Intellectual

The knowledge, systems, processes, data and information we hold, create and share within our business and with our alliance partners.

Climate-related financial disclosures

The management of climate change is embedded into everything we do. In 2017 we signed up as a supporter of the Task Force on Climate-related Financial Disclosures (TCFD).

Since then we have published climate-related information in line with its recommendations. For the second year we have also made a disclosure through CDP (formerly Carbon Disclosure Project). This follows CDP modifying the structure of its climate change questionnaire to align with TCFD (CDP-TCFD technical note).

In addition to our CDP disclosure, we have published greenhouse gas (GHG) reports since 2008 and have reported under each round of the UK's climate change adaptation reporting power.

The Adaptation Report that we will submit for the third round was issued for consultation in March 2020. This is the first time we have issued a report for consultation. We were the first company to issue our report, doing so to ensure it was in time to inform the production of the third climate change risk assessment by the UK Government. This report, and the risks and actions contained within it, was drafted with input from stakeholders across our business as well as specialists in adaptation from consultants WSP. The report includes an assessment of our physical and transition climate-related risks, a description of how we are managing these risks and metrics to track our performance.

The section opposite and overleaf summarises how climate change is integrated across the four elements defined by TCFD. This summary should be read in conjunction with the detail in our Adaptation Report and CDP disclosure – both of which are publicly available. References to the relevant CDP questions have been provided and the requirements of the new Streamlined Energy and Carbon Reporting (SECR) regulations have been included within the metrics and targets section.

Governance
C1.1b, C1.2, C1.2a

Our Board has effective oversight of climate-related risks and opportunities. Climate-related risks are included within Anglian Water's top-tier risk register. This is reviewed regularly in detail by the Board. Short-, medium- and long-term climate-related targets have been agreed by the Board. Members of the Management Board chair the groups responsible for reducing carbon emissions and adapting to climate change and are financially incentivised on progress towards achieving the targets.

Strategy
C2.3, C2.3a, C2.4, C2.4a, C3.1, C3.1a, C3.1b, C3.1d, C3.1e, C3.1f

Our long-term strategy is described in our publicly available Strategic Direction Statement, updated in 2017. It includes a description of our climate-related challenges, actions and goals. We have submitted two Adaptation Reports to the Government and will submit our third following consultation. Our most significant physical risks are droughts and flooding. These are being effectively mitigated in line with our long-term plans, which consider more than one climate change scenario. Our most recent Adaptation Report also describes how we are managing transition risks. We are taking a leading role in working with other water companies on a route map to achieve net zero carbon for the sector by 2030, and on helping to lead UK businesses' response to climate change through the Corporate Leaders Group as set out in Towards net zero on pages 6-7.

Risk management
C2.1, C2.1a, C2.2, C2.2a

The processes for identifying, assessing and managing climate-related risks are fully integrated with our strategy and risk management processes. Climate-related risks are identified and assessed during the preparation of our Adaptation Reports. Risks are also identified and managed through the preparation of long-term plans and the delivery of individual investments. The assessment and management of climate-related risks is consistent with the approach used to manage risk throughout the business.

Metrics and targets
C4.1, C4.1a, C4.2, C4.2a, C4.2b, C6.1, C6.3, C6.5, C9.1

The table opposite meets the requirements of the new Streamlined Energy and Carbon Reporting (SECR) regulations. It sets out our 2019/20 audited figures, and relates to the entirety of Anglian Water's carbon footprint rather than specifically to the projects funded by Green Bonds. We publish it here in order to demonstrate the level of carbon reporting and disclosure we undertake across the business, which, in turn, is what enables us to qualify for Green Bond funding.

What sets us apart from many businesses is our disclosure of Scope 3 emissions, under which we report our capital carbon footprint in addition to elements of our operational carbon emissions.

The numbers reported on the next page are impacted by the investments we are making which are funded through Green Bonds. Without these investments, Anglian Water's emissions would increase over time. Funding through Green Bonds and sustainable investment ensures that the assets that we maintain and construct for the future have the same level of rigour in terms of sustainability.

Methodology

The reporting boundary covers the emissions within the regulated activity of Anglian Water Services Ltd where we have operational control. We have followed the 2019 UK Government environmental reporting guidance. We have used the GHG Protocol Corporate Accounting and Reporting Standard (revised edition) and emission factors from the UK Government's GHG Conversion Factors for Company Reporting 2019 to calculate the above disclosures. Where relevant, we have also aligned with industry best practice for emissions measurement and reporting. This approach has been verified, since 2011, by CEMARS as being measured, managed and reduced in accordance with ISO 14064.

Anglian Water operational carbon emissions 2019-20

	Units	2019/20	Inclusions
Energy consumption used to calculate emissions	kWh	1,116,193,544	Electricity, gas, liquid fuels, owned transport, and personal and hire cars for business use
SCOPE 1 – Use of fossil fuels	kg CO_2e	12,535,981	Emissions from heating fuels for our offices and treatment processes and refrigerant gases
SCOPE 1 – Process and fugitive emissions	kg CO_2e	70,691,157	Release of methane and nitrous oxides from treatment processes
SCOPE 1 – Owned and leased transport	kg CO_2e	22,119,099	
SCOPE 1 – Total	kg CO_2e	105,346,236	
SCOPE 2 – Total	kg CO_2e	163,485,177	Purchased electricity (generation)
SCOPE 3 – Business travel	kg CO_2e	973,458	
SCOPE 3 – Outsourced activities	kg CO_2e	14,891,058	Outsourced transport
SCOPE 3 – Purchased electricity	kg CO_2e	13,879,610	Purchased electricity (transmission and distribution)
SCOPE 3 – Total significant	kg CO_2e	29,744,125	We have not included commuting, capital carbon and emissions from use of water in customers' homes
TOTAL ANNUAL GROSS EMISSIONS	kg CO_2e	298,575,539	
Exported renewables	kg CO_2e	-8,309,949	
Green tariff	kg CO_2e	0	
TOTAL ANNUAL NET EMISSIONS	kg CO_2e	290,265,590	
INTENSITY RATIO – Water treated	kg CO_2e per Ml	223.87	
INTENSITY RATIO – Recycled water	kg CO_2e per Ml	219.73	Flow to full treatment
INTENSITY RATIO - Recycled water	kg CO_2e per Ml	431.83	Water distribution input

Aligning our goals with United Nations Sustainable Development Goals

We want to demonstrate how we are contributing to wider societal goals by aligning our activities and the outcomes we deliver to the UN Sustainable Development Goals (SDGs). We are working in the spirit of all 17 goals, but we have mapped our work to the 10 where we have the most material impact at the level of the targets. These are currently being reviewed in line with our next five-year Business Plan and we may add additional goals in line with what will be most material for this period of investment.

> **We made history in 2017 when we became the first ever public utility to issue a Sterling Green Bond, and we are very proud that all our capital activity meets the strict criteria set for Green Bond investment. It's important to be able to demonstrate that our activities not only contribute to positive outcomes in our region but also play a small part in delivering the international objectives of the UN Sustainable Development Goals.**
>
> **Steve Buck**
> Chief Financial Officer

Our 10 outcomes were developed with customers in 2013 and describe the future we are working towards. We refreshed them in 2017 to stretch ourselves further and reflect how central our people are to delivering everything we do.

	3 GOOD HEALTH AND WELL-BEING	4 QUALITY EDUCATION	6 CLEAN WATER AND SANITATION	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	11 SUSTAINABLE CITIES AND COMMUNITIES	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	13 CLIMATE ACTION	14 LIFE BELOW WATER	15 LIFE ON LAND
Relevance of SDG to our business (proportion of targets that we can directly contribute to)										
Example target of material interest (we have mapped our engagement against the 169 targets under the 17 SDGs)	**3.9** By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.	**4.4** By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.	**6.5** By 2030, implement integrated water resources management at all levels.	**8.4** Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation.	**9.1** Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.	**11.7** By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.	**12.8** By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.	**13.2** Integrate climate change measures into national policies, strategies and planning.	**14.1** By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.	**15.5** Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.
Underlying potential for negative impact	Our operations can cause pollution if we get things wrong.	We know we have a future skills gap.	Uncoordinated water management can lead to deficits and impacts on the environment.	We build and operate a large network of assets and infrastructure that use energy and resources.	Without strategic planning the lack of water can be a blocker to growth.	We manage large areas of open space to deliver our service.	Without knowledge our customers are unable to act sustainably.	We are one of the biggest energy users in the East of England and operate in a region that is particularly vulnerable to climate change.	Our operations can cause pollution if we get things wrong.	Our operations have a large footprint within the natural environment.
How the SDG target aligns to our outcomes	Safe, clean water.	Positive impact on communities.	Supply meets demand.	A smaller footprint.	Investing for tomorrow.	Positive impact on communities.	Positive impact on communities.	Investing for tomorrow.	Flourishing environment.	Flourishing environment.

Use of Green Bond funds

All capital expenditure follows Anglian Water's AMP6 (2015-2020) Governance Framework and is subject to BSI (British Standards Institute) PAS2080 verification. This is a standard launched by the Green Construction Board to encourage a consistent approach to the management of carbon by all involved in infrastructure. It sets out principles and components to manage whole life carbon emissions and deliver reduced carbon over the whole value chain.

Accordingly, all capital expenditure which Anglian Water undertakes is capable of being an eligible green project for inclusion in an eligible green project category, outlined in the Green Bond Principles, as being related to: "sustainable water and wastewater management including sustainable infrastructure for clean and/or drinking water, wastewater treatment, sustainable urban drainage systems and river training and other forms of flooding mitigation".

In line with best practice, the Anglian Water Green Bond Framework has been reviewed by DNV GL which has issued a Second Party Opinion. We also engaged DNV GL to perform limited assurance in accordance with ISAE 3000 (revised) standard on 'Reduction in CO_2e (T)' key performance indicator disclosed on pages 15 to 18 of this Green Bond Impact Report. DNV GL's full assurance report, including their conclusions and summary of work, can be found on our website: anglianwater.co.uk/investor-information

In 2017 we became the first European utility company to issue a sterling Green Bond. The £250 million, eight-year bond will mature in August 2025 with a return to investors of 1.625 per cent. Since the successful launch of that debt transaction, we have raised a further £627 million of Green Bonds from investors in the UK and United States in accordance with the Green Bond Principles 2018.

All funds under the AMP6 Framework have now been deployed and the investments financed through this debt are expected to save or avoid 161,474 tonnes of carbon. As we have now begun our next capital investment period (AMP7 2020-2025), all future proceeds will be under the AMP7 Framework and no further reporting will be made on AMP6 expenditure, subject to the conditions set out in the AMP6 Framework.

For further detail on our funding framework for AMP7, please see our Sustainability Financing Framework, published in October 2020.

Our Green Bond portfolio

Cumulative eligible green projects in the eligible green portfolio as at 31/03/2020 are summarised in the following table:

Eligible green projects	Sustainable water management £	Sustainable water recycling £	Total £
Quality	74,662,259	234,768,021	309,430,280
Capital maintenance	186,252,056	298,602,911	484,845,967
Growth (supply/demand)	102,355,535	201,085,426	303,440,951
Enhanced service level	63,472,762	21,677,986	85,150,748
Grand total	**426,742,612**	**756,134,334**	**1,182,876,946**
Net proceeds			876,215,809
2010 Baseline CO_2e (T)	Actual CO_2e (T)	Reduction in CO_2e (T)	Reduction in CO_2e (%)
260,906	**99,432**	**161,474**	62% from 2010 capital carbon baseline

£250m 1.625% Green Bond maturing 10 August 2025 ISIN: XS1659112626

c. 200 green projects funded by the Green Bond

Eligible green projects	Sustainable water management £	Sustainable water recycling £	Total £
Quality	27,163,976	95,875,728	123,039,703
Capital maintenance	39,531,297	54,563,469	94,094,766
Growth (supply/demand)	41,848,884	37,081,821	78,930,705
Enhanced service level	22,789,252	7,705,756	30,495,008
Grand total	**131,333,408**	**195,226,774**	**326,560,182**
Net proceeds			248,642,500
2010 Baseline CO_2e (T)	Actual CO_2e (T)	Reduction in CO_2e (T)	Reduction in CO_2e (%)
124,441	**47,438**	**77,003**	62% from 2010 capital carbon baseline

Impact of £1m investment

£ efficiency

£313k

Capital carbon reduction (CO_2e)

310 (T)

£300m Green Bond issue maturing 26 October 2029 ISIN: XS1895640404

c. 250 green projects funded by the Green Bond

Eligible green projects	Sustainable water management £	Sustainable water recycling £	Total £
Quality	13,604,637	48,329,704	61,934,341
Capital maintenance	74,169,766	108,416,959	182,586,725
Growth (supply/demand)	38,135,804	93,129,778	131,265,582
Enhanced service level	7,547,620	6,704,675	14,252,294
Grand total	**133,457,827**	**256,581,115**	**390,038,942**
Net proceeds			296,649,000

2010 Baseline CO_2e (T)	Actual CO_2e (T)	Reduction in CO_2e (T)	Reduction in CO_2e (%)
49,475	18,865	30,610	62% from 2010 capital carbon baseline

Impact of £1m investment

£ efficiency

£8k

Capital carbon reduction (CO_2e)

103 (T)

£150m USPP Green Bond issue maturing 6 February 2029 £85m USPP ISIN: GB00BH0PBJ92 £25m USPP ISIN: GB00BH0PBK08 $53m USPP ISIN: GB00BH0PBL15

c. 100 green projects funded by the Green Bond

Eligible green projects	Sustainable water management £	Sustainable water recycling £	Total £
Quality	13,726,369	29,842,344	43,568,713
Capital maintenance	16,053,344	62,726,908	78,780,252
Growth (supply/demand)	7,469,149	36,790,707	44,259,856
Enhanced service level	27,477,492	2,022,390	29,499,882
Grand total	**64,726,354**	**131,382,349**	**196,108,703**
Net proceeds			150,067,000

2010 Baseline CO_2e (T)	Actual CO_2e (T)	Reduction in CO_2e (T)	Reduction in CO_2e (%)
25,901	10,372	15,529	60% from 2010 capital carbon baseline

Impact of £1m investment

£ efficiency

£99k

Capital carbon reduction (CO_2e)

103 (T)

£65m USPP Green Bond issue maturing 16 April 2029 ISIN: G0369ATBD7XX

c. 100 green projects funded by the Green Bond

Eligible green projects	Sustainable water management £	Sustainable water recycling £	Total £
Quality	142,408	31,321,770	31,464,178
Capital maintenance	9,314,338	32,032,342	41,346,680
Growth (supply/demand)	1,351,909	12,362,291	13,714,200
Enhanced service level	1,530,553	4,739,540	6,270,093
Grand total	**12,339,208**	**80,455,943**	**92,795,151**
Net proceeds			65,000,000

2010 Baseline CO_2e (T)	Actual CO_2e (T)	Reduction in CO_2e (T)	Reduction in CO_2e (%)
16,812	5,818	10,994	65% from 2010 capital carbon baseline

Impact of £1m investment

£ efficiency

£224k

Capital carbon reduction (CO_2e)

169 (T)

¥7bn Green Bond issue maturing 20 June 2039 ISIN: XS2010166572

c. 100 green projects funded by the Green Bond

Eligible green projects	Sustainable water management £	Sustainable water recycling £	Total £
Quality	13,015,187	4,814,343	17,829,530
Capital maintenance	12,780,372	29,523,263	42,303,635
Growth (supply/demand)	8,830,974	6,178,028	15,009,002
Enhanced service level	3,532,561	228,001	3,760,562
Grand total	**38,159,094**	**40,743,635**	**78,902,729**
Net proceeds			50,857,309

2010 Baseline CO_2e (T)	Actual CO_2e (T)	Reduction in CO_2e (T)	Reduction in CO_2e (%)
13,771	5,095	8,676	63% from 2010 capital carbon baseline

Impact of £1m investment

£ efficiency

£365k

Capital carbon reduction (CO_2e)

171 (T)

£65m Green Bond issue maturing 3 April 2040 ISIN: XS2151024598

c. 70 green projects funded by the Green Bond

Eligible green projects	Sustainable water management £	Sustainable water recycling £	Total £
Quality	7,009,682	24,584,133	31,593,815
Capital maintenance	34,402,938	11,339,969	45,742,907
Growth (supply/demand)	4,718,815	15,542,792	20,261,607
Enhanced service level	595,285	277,623	872,908
Grand total	**46,726,720**	**51,744,517**	**98,471,237**
Net proceeds			**65,000,000**

2010 Baseline CO_2e (T)	Actual CO_2e (T)	Reduction in CO_2e (T)	Reduction in CO_2e (%)
30,506	11,844	18,662	61% from 2010 capital carbon baseline

Impact of £1m investment

£ efficiency

£279k

Capital carbon reduction (CO_2e)

287 (T)

The pumping station at Kings Road, Cleethorpes (see page 24)

Featured projects

The project categories contribute to five environmental objectives:

1. Climate change mitigation
2. Climate change adaptation
3. Natural resource conservation
4. Biodiversity conservation
5. Pollution prevention and control

We are mapping our contribution to the United National Sustainable Development Goals (SDGs) - see pages 12 and 13 for further details.

	Project	Capital maintenance	Enhanced service level	Growth	Quality	Environmental objectives	SDGs
Water recycling	Marston Water Recycling Centre			✓		1, 3, 4, 5	6, 9, 12, 15
	Tempsford Water Recycling Centre				✓	1, 4, 5	6, 9, 12, 15
	Sutton on Sea		✓			**1, 2, 5**	9, 13
Water	Cloves Bridge Intake				✓	1, 4	**6, 9, 15**
	Kings Road, Cleethorpes	✓				**1, 3**	**6, 9, 12**
	Chilton Leys			✓		**1, 3, 4**	6, 9, 12, 15
	Black Horse Drove		✓			**1, 3**	**6, 9, 12**

Marston Water Recycling Centre:

Recycling a Recycling Centre

Marston Water Recycling Centre (WRC), near Grantham in Lincolnshire, currently processes waste water for a population of approximately 63,500.

This is expected to rise to 76,000 by 2031, and there are plans for significant new housing developments in the area.

The capacity at the WRC would be insufficient to cater for this growth, and the centre was also at the limit of its ability to remove ammonia to required discharge water quality standards.

The tertiary treatment process at Marston WRC consists of four large grass plots covering 64 acres. Initially, the plan was to stop using these existing grass plots and build a new pumping station and nitrifying sand filter, which would involve erecting new concrete structures and phasing out the natural cleaning process.

However, the area is a designated Local Wildlife Site, and home to an abundance of wildlife including otters, badgers, bats, grass snakes and nesting birds. It's also enjoyed by walkers and birdwatchers, with several public rights of way that run alongside and through the site. The original plans would have a detrimental effect on this biodiversity and public amenity.

So the Anglian Water team came up with a revised plan to remodel the grass plots to provide greater treatment capacity instead.

Adopting specialist digital surveying techniques, the project team was able to create a 3D model accurately detailing the site's topography, vegetation, crevices, water bodies and pipework.

Existing grass plots 1-3 were cleared of vegetation before all pipework was sluiced to ascertain the amount of additional drainage needed, and remedial works were undertaken on the inlet channel to ensure flows across all four plots were correctly distributed.

Recycling was the key word throughout the project. Soil from excavations and maintenance was reused to repair crevices on the grass plots and gravel that had been used on previous works was also reused. The water used to clear the draining pipes was recycled in a circular system to minimise the amount needed and dirty water was taken back to the head of the treatment works for cleaning and discharge. One hundred per cent of waste from the project was diverted from landfill, including 1,608 tonnes of green waste which was composted.

Completed in December 2019 after 12 months on site, the project delivered a 90 per cent capital carbon saving and newly planted trees promise to help offset the site's carbon footprint further.

Capital carbon saving:
534 CO_2e (T) (90%)

Total project spend:
£3,053,000

Efficiency saving:
£1,957,000 (39%)

Tempsford Water Recycling Centre:

Flexible approach to planning reaps dividends

The Water Recycling Centre (WRC) at Tempsford, a village seven miles east of Bedford, discharges treated water into the local waterbody.

When a chance came to improve treatment capability at Tempsford for the benefit of wildlife and the local environment, the design and planning team got to work.

The key focus of the scheme was to better equip the relatively small WRC so it could remove more ammonia from the effluent before discharging it into the River Great Ouse.

The initial plan drawn up involved the construction of a new tertiary nitrifying plant.

However, manufacturing and transporting the materials used in the construction of such an asset - mainly steel and concrete - can generate a significant carbon footprint.

The actual construction process can also be carbon-intensive, bringing heavy machinery on to site with the potential for disrupting normal operations.

With high costs another significant issue, a different solution was deemed necessary.

Eventually, it was decided to improve what was already on site - reusing existing assets but making them work better.

The refurbishment programme involved pipework modifications alongside a move to recirculation of the trickling filters and new motorised filter arms. These motorised filter arms now work round the clock, improving their effectiveness.

The revised plan provided a quicker, significantly cheaper and lower-carbon solution to what was proposed initially.

The scheme formed part of a wider ammonia compliance programme running across Anglian Water, which ensured its delivery was streamlined and efficiencies were maximised.

Capital carbon saving:
161 CO_2e (T) (81%)

Total project spend:
£1,210,000

Efficiency saving:
£622,000 (34%)

Embodied water saving:
23.6 H_2Oe m3 (76%)

Sutton on Sea:

Protecting homes from flooding

Colleagues from the @One Alliance completed a scheme earlier in the year to protect a number of customers' homes in Lincolnshire from flooding.

The aim of the project was to reduce the risks of both internal and external flooding to 14 homes on private land in Highgate Lane, Sutton on Sea. The flooding was triggered by the existing sewer system becoming overwhelmed during increasingly frequent heavy rainfall and storms, reflecting the impact of climate change on weather patterns.

Teams from Sweco designed the project while Barhale worked as the principal contractor.

The scheme saw a capital carbon saving of 69 per cent. This was mainly due to having switched from the original design, which would have involved introducing major storage in the form of a tank, to individual property protection, with two multi-property Offline Pumping Station (MOPS) chambers made from materials chosen for their lower carbon footprint installed to protect nine properties.

Meanwhile, two high-capacity non-return valve chambers made of high strength alternative lower carbon materials were built on site and then fitted to protect another five properties from flooding during heavy rainfall.

Colleagues also installed three monitors in the area to check how the equipment was performing to protect customers' homes from flooding.

The scheme was completed at the end of March 2020 and cost around £612,700.

Capital carbon saving:
34 CO_2e (T) (69%)

Total project spend:
£613,000

Efficiency saving:
£709,000 (54%)

Cloves Bridge Intake Eel Directive:

Saving carbon while saving eels

In recent years, there has been a severe decline in eel stocks in the UK. To help reverse this decline, a portfolio of schemes to protect eels was identified during AMP6 at several of Anglian Water's water abstraction intakes. These were presented as obligations to Anglian Water following assessment against the Eels (England and Wales) Regulations 2009.

A £1.5 million capital solution at Cloves Bridge pumping station in Lincolnshire was completed in spring 2020 by the @one Alliance to protect the eel population there.

The existing intake structure needed modifications in order to screen water that needed to be abstracted to a 2mm tolerance, so that the eels would be protected from harm within the intake. The screening had to be a 'positive exclusion', which means that excluded eels are not drawn onto or stuck to the screening.

Based on discussions with the Environment Agency and Anglian Water's supply chain, the scheme was assessed as suitable for using Rotorflush self-exclusion screens. These innovative screens have much lower capital carbon compared to larger, traditional screening solutions.

This is the first time these types of screens have been used by Anglian Water to provide a positive exclusion solution for an intake. The screens are fully submerged, so require a much smaller mesh area than traditional screens. These smaller screens also provide operational carbon benefits, as they have fewer moving parts and need smaller wash water pumps. This carbon-saving solution also needs less power, saving even more carbon.

Employing modular, build off-site methods also resulted in large carbon efficiencies, as well as saving time spent on site.

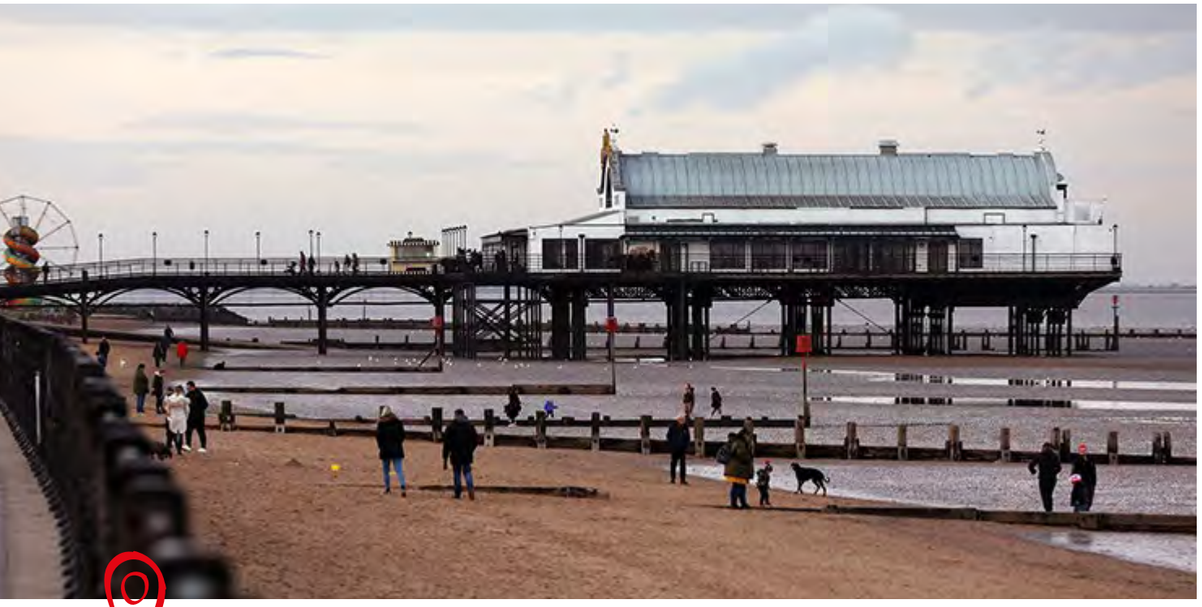
A structure - fully sealed around the edges of the intake to prevent eels from getting in - was needed to support the screens, and also to provide access for their removal and maintenance. Using 3D modelling and laser scanning, a steel structure was designed that could be fabricated and assembled off site and lowered into the intake as a single piece. This allowed a move away from traditional heavy civil alterations to the intake's geometry. The result was outperformance in capital carbon reduction.

Although more costly than the traditional solution, as well as saving carbon, the finished solution provides a tangible biodiversity benefit by providing an area where eels and other fish species can thrive and enjoy safe passage.

Capital carbon saving:
445 CO_2e (81%)

Total project spend:
£1,476,000

Efficiency saving:
-£607,000 (70%)



Kings Road, Cleethorpes:

Mains redesign saves carbon, time and cost

A water main on the Kings Road promenade in Cleethorpes, a seaside town on the Humber, had burst 12 times over the past five years.

Not only was this causing interruptions to supply for customers in the area, but the bursts were also having a negative impact on key seaside attractions.

The Anglian Water team discovered a range of factors at the root of the issue. Joints in the network's cement mains had degraded, cast iron mains had corroded due to age and the high corrosivity of the soil, and PVC mains had become brittle due to age and the way they had been laid.

A like-for-like replacement of 2.7km of mains network was initially considered. As any works would involve a lane closure to important access roads, works were planned to take place during the 'off-season' and a 'no dig' technique was proposed. However, in this specific case a 'no dig' method required excavation in the highway, would take longer and involved road repairs.

So, with the aid of sophisticated design technology, the team was able to come up with a better solution that would not only cut works time but the cost and carbon impact too.

Using a network modelling system, they were able to reconfigure the mains network and reduce mains replacement to 2.3km. As part of the process, virtual simulation was used to check the design's viability and ensure no loss of flow or pressure for customers. Due to the type of main required and the specific circumstances of the site, the team saved carbon, time, cost and disruption by opting to use traditional open-cut techniques to take place on the highway verge instead of the 'no dig' approach.

A 242m section of mains was replaced using 'slip-lining' inserted into existing pipe, also saving on time and cost.

Additionally, the scheme, which was completed in 2019, had no impact on the adjacent Site of Special Scientific Interest (SSSI).

Capital carbon saving:
219 CO_2e (66%)

Total project spend:
£721,000

Efficiency saving:
£101,000 (12%)

Chilton Leys:

Delivering a new water supply with minimum impact on customers

Anglian Water was asked to supply water mains and services to a new residential development of more than 800 properties near the market town of Stowmarket near Ipswich. The Chilton Leys site also included a sports pavilion, public open space and recreation facilities.

Previously, there was no capacity or connections within the existing network.

The team completed the project by the developer's deadline of December 2019, , supplying up to 25 litres of fresh, clean water per second for the estate's new residents, using a highly carbon-efficient approach.

Smart route planning for the new network reduced the number of landowners affected by the works from six to two, avoided the need to build new access roads and protected a nearby Site of Special Scientific Interest (SSSI).

Constructing the pumping station off-site reduced the time needed to build on site. As well as being more efficient and safer, this saved carbon and reduced the impact on the environment.

All the scheme's materials were chosen for their carbon credentials. This included using 2.7km of alternative lower carbon materials pipework rather than steel, and installing the latest, most efficient pump technologies to improve whole-life operational carbon impact and cost.

When it came to installation, the team used seven 'drill spots' under roads and the river rather than the open-cut methods used elsewhere, which helped to avoid traffic disruption and road repairs.

The team also maximised the reuse and recycling of all the scheme's excavation materials.

Costs were higher than anticipated at the outset due to the scope of the development being extended, requiring a 30kw pumping station as opposed to the 8.8kw station in the original plans.

Capital carbon saving:
108 CO_2e (T) (34%)

Total project spend:
£2,535,000

Efficiency saving:
-£956,000 (61%)

Black Horse Drove:

Increasing the pressure while reducing carbon emissions

Black Horse Drove is a small, rural hamlet near Littleport in Cambridgeshire. Householders in its 80-plus properties, located off the Ten Mile Bank, a long road that runs parallel to the north-western bank of the River Great Ouse, were suffering from inadequate water pressure.

The problem stemmed from the existing water main not being large enough to keep up with demand in the area, due to the growth of the local population and increased usage. The decision was taken to replace the main, as it was also judged to be an ageing asset that was prone to bursts.

The scheme, carried out by the Integrated Maintenance and Repair Alliance, was completed in a little over eight weeks, which included a two-week pause over Christmas, and successfully addressed all the issues with the asset in a single project, minimising the impact on residents and business.

The project saw approximately 1.85km of water main replaced. Cost and carbon reduction were key considerations in the planning and delivery of the scheme. The replacement main was installed by horizontal directional drilling as opposed to digging a trench. Due to the ground conditions and the type of main required, this solution was the lowest capital carbon option available as it reduced the need for excavation, the restoration of roads, traffic disruption, plant use and time on site - all potentially carbon-heavy processes.

In addition, replacing rather than repairing a failing asset reduces the prospect of more visits to the area to carry out new repairs.

Capital carbon saving:
65 CO_2e (T) (50%)

Total project spend:
£241,000

Efficiency saving:
£185,000 (43%)

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