



ANNUAL EMISSIONS REPORT 2021





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Introduction

This Annual Emissions Report sets out the water industry’s annual greenhouse gas emissions for the period 1 April 2020 to 31 March 2021. To illustrate how our emissions have changed over time, we compare the data with a 2018/19 ‘emissions baseline year’ where possible.

Gross emissions have fallen in the industry by 15%, while net emissions have fallen by 29%.

Considerable investment in renewables and green tariff electricity across the sector has played a significant part in the reduced greenhouse gas emissions, and transport emissions have fallen by 52% largely as a result of the coronavirus pandemic and staff working from home.

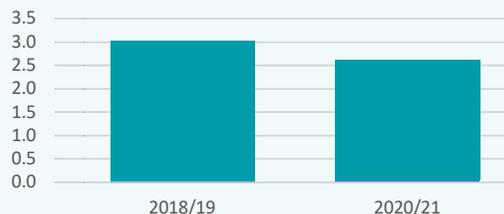
The sector’s emissions have fallen despite rises in demand on the industry from population growth; greater treatment standards; systemic changes to the energy markets; increased demand for clean water for hygiene during the coronavirus pandemic; and changes to the way process emissions are reported.

Also, during this year water companies published their own detailed plan for reaching net zero emissions, and links to those plans are provided in the Annex.

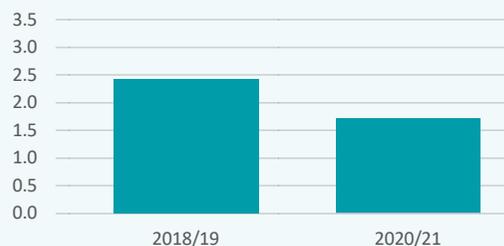
For the year ahead, the impact of pandemic continues to cause significant uncertainty and climate change will continue to put new strains on UK infrastructure.

We hope you find this report informative, please get in touch if you have any questions or comments about the industry’s greenhouse gas emissions.

Graph 1: Water sector gross greenhouse gas emissions (MtCO₂e) — Location-based

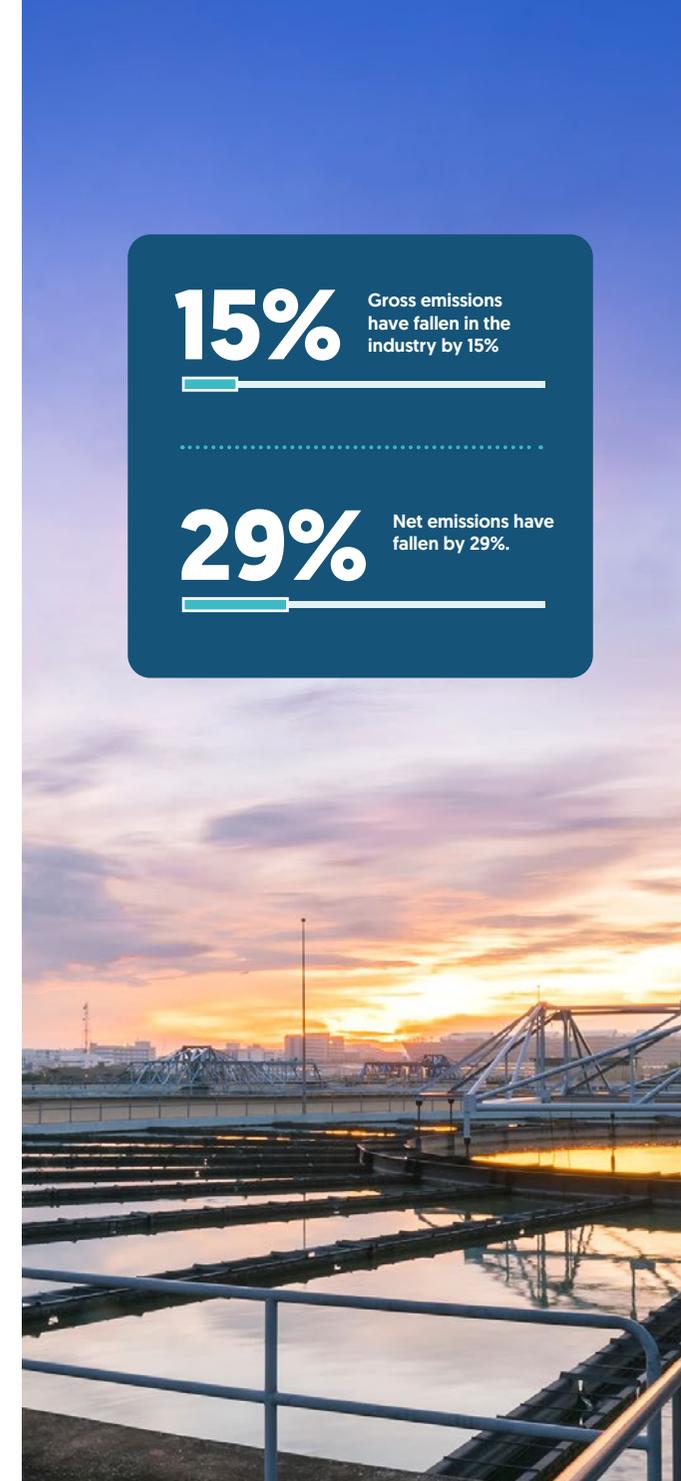


Graph 2: Water sector net greenhouse gas emissions (MtCO₂e) — Market-based



15% Gross emissions have fallen in the industry by 15%

29% Net emissions have fallen by 29%



Data sources and global standards

In the UK, Water companies gather data and calculate their emissions using UKWIR's "Carbon Accounting Workbook", which is updated annually in line with global guidance.

This report brings together emissions data from the English and Welsh water companies, following the approach established by the sector's Net Zero Routemap¹.

In line with the Greenhouse Gas Protocol Scope 2 Guidance and the Companies (Directors' Report) and Limited Liability Partnerships (Energy and Carbon Report) Regulations 2018, this report presents data in two formats:

- **2020-2021 Gross Annual Emissions using the location-based methodology.**
- **2020-2021 Net Annual Emissions using the market-based methodology.**

To illustrate how the sector's emissions have changed over time, we include data from our 'emissions baseline year' where possible. Because the Carbon Accounting Workbook is updated each year to reflect the latest science, figures are not directly comparable to the base line in every respect, but they do serve as a useful illustration of the major trends.



1. Water UK Net Zero 2030 Routemap (November 2020): <https://www.water.org.uk/routemap2030/>

Brief: Reporting Carbon Emissions

It is Defra's guidance to report both location-based emissions figures and market-based figures.

Market-based (MB)

A market-based method reflects emissions from electricity that companies have purposefully chosen. For example, this can be through a Power Purchase Agreement or Renewable Energy Guarantee of Origin certificate.

Location-based (LB)

A location-based method reflects the average emissions intensity of grids on which energy consumption occurs.

Source: [Greenhouse Gas Protocol Scope 2 Guidance](#); [HM Government Environmental Reporting Guidelines \[2019\]](#)



Emissions from processing wastewater

Research undertaken by UKWIR published in October 2020² identified a number of changes for the process emissions methodology:

1. An in-built offset for N₂O emissions should be retired from the Carbon Accounting Workbook. This change to the methodology has increased those emissions by a factor of two compared to the 'emissions baseline year'.
2. An industry monitoring programme is required to develop an 'in-country' methodology that reflects the specifics of the UK's asset base. The sewerage companies are working collaboratively on a package of research projects with some findings expected in late 2022.

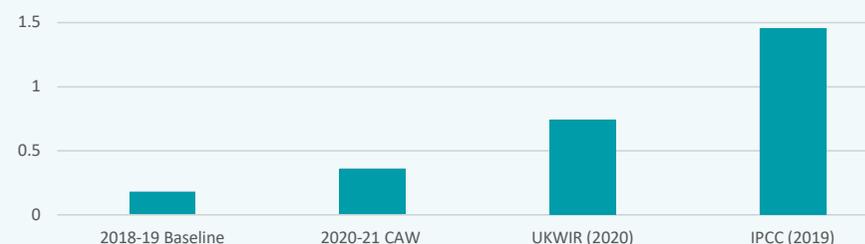
To illustrate the uncertainty in this area, the following graph shows the impact on reported process emissions for the 2021 reporting year based on estimated emissions factors from different sources. These are:

- **WRc** – 0.002 kg CO₂e per tonne of effluent – used to calculate the 2018-19 'emissions baseline year'
- **WRc updated by UKWIR 2020** – 0.004 kg CO₂e per tonne of effluent – used for the Carbon Accounting Workbook reporting 2020-21
- **UKWIR best estimate 2020** – 0.0082 kg CO₂e per tonne of effluent – an estimate based on desk research
- **IPCC Updated to 2006 Reporting Guidelines 2019** – 0.016 kg CO₂e per tonne of effluent – an estimate for generic global use

2. UKWIR (2020), Quantifying and Reducing Direct Greenhouse Gas Emissions from Waste and Water Treatment Processes (Phase 1): <https://ukwir.org/quantifying-and-reducing-direct-greenhouse-gas-emissions-from-waste-and-water-treatment-processes-1>

The UKWIR phase 2 project is focused largely on producing guidance on how to do monitoring and control, as well as reviewing some of the data from trials; individual company monitoring trials are doing the bulk of the data gathering.

Graph 3: Emissions from processing wastewater for 2020-21 according to different emissions factors for Nitrous Oxide (N₂O), MtCO₂e





Emissions in the 2020-21 year

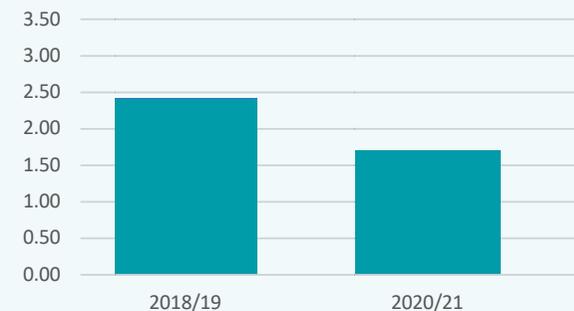
Gross greenhouse gas emissions for the sector have fallen by 0.44 MtCO₂e or 15% from the 2018/19 baseline year (graph 1). The gross emissions are reported using the location-based methodology – the average carbon intensity of the electricity grid – which enables a consistent view of emissions over time as it discounts the significant emissions reduction which can occur from switching to green tariff electricity. This methodology helps to show how the sector has reduced its emissions across all areas of its activities in comparison to the baseline year.

The net greenhouse gas emissions figure (graph 2) shows the emissions that result from all the activities of the sector and incorporates reductions in emissions from the export of fuels and energy from onsite renewables. The net figure presented here is calculated using the market-based methodology, which incorporates the actual emissions from the energy procured by water companies which can be different to the average carbon intensity of the grid. The graph shows net emissions calculated using the market-based methodology have fallen by 0.71 MtCO₂e, or by 29% compared to the ‘emissions baseline year’.

Graph 1: Change in the sector’s gross greenhouse gas emissions (MtCO₂e) — Location Based



Graph 2: Change in the sector’s net greenhouse gas emissions (MtCO₂e) — Market Based



Note: The Carbon Accounting Workbook is updated each year to reflect the latest science, therefore figures are not directly comparable to the base line in every respect, but they do serve as a useful illustration of the major trends.



Annex

1. Greenhouse gas emissions intensities for water and wastewater 2020/21

Each year, companies publish data regarding the greenhouse gas emissions intensity of their activities.

The following tables illustrate the greenhouse gas emissions produced per megalitre of water supplied and wastewater processed.

In reviewing the following tables, it is important to note that the UK has a varied climate, land geography and spread of population. These factors all impact the greenhouse gas emissions for each company. For example, a company based in a hilly region may be able to use gravity rather than distribute water using a pump as may be the case in a flatter region, or a company based in a drier region may need to move more water around to more arid spots, which is energy intensive. No company is directly comparable with another, each is unique and has its own challenges to reduce emissions.

Note: Under market-based reporting the grid emissions factor is higher than the location-based grid emissions factor if a company does not specifically procure green tariff power. This is because the utility company provides companies with a grid emissions factor for the remaining electricity it sells after the green electricity has been removed, which is often produced from more carbon intensive sources.

Explanation of the charts:		
Location-based methodology	Gross greenhouse gas emissions	Calculates all operational greenhouse gas emissions across a company. For electricity procured the average carbon intensity of the electricity grid is used.
	Net greenhouse gas emissions	Calculates all operational greenhouse gas emissions across a company, and nets off fuel exported and renewable energy exported offsite. For electricity procured the average carbon intensity of the electricity grid is used.
Market-based methodology	Gross greenhouse gas emissions	Calculates all operational greenhouse gas emissions across a company. For electricity procured the emissions associated with its production is used.
	Net Greenhouse gas emissions	Calculates all operational greenhouse gas emissions across a company, and nets off fuel exported and renewable energy exported offsite. For electricity procured the emissions associated with its production is used.



Chart 1: 2020-21 Location-based methodology for Gross and Net greenhouse gas intensity of water supplied (kgCO₂e/MI)

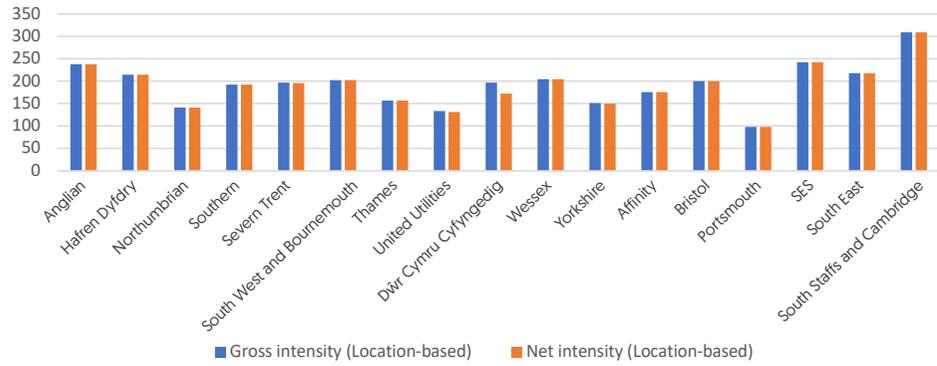


Chart 2: 2020-21 Market-based methodology for Gross and Net greenhouse gas intensity of water supplied (kgCO₂e/MI)

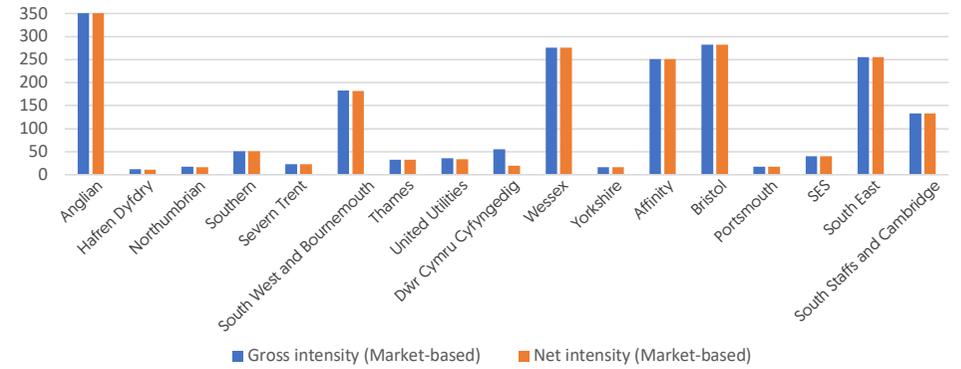


Chart 3: 2020-21 Location-based methodology for Gross and Net greenhouse gas intensity of wastewater treated (kgCO₂e/MI)

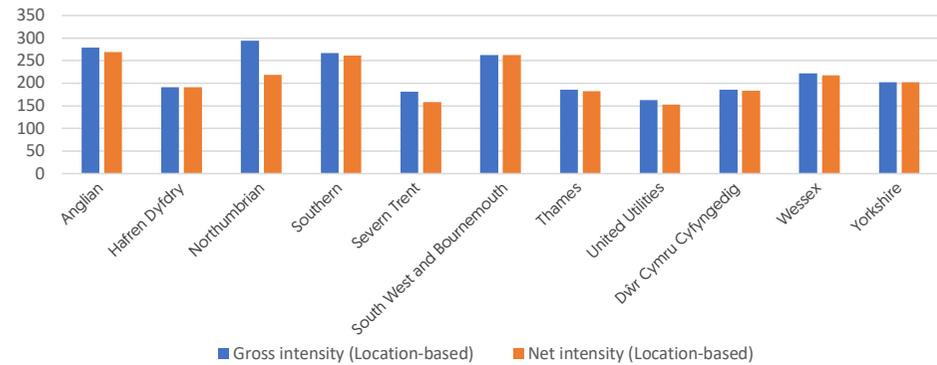
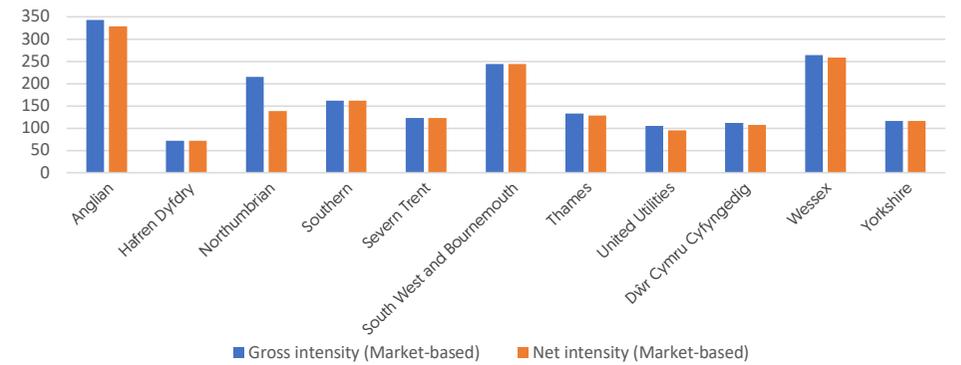


Chart 4: 2020-21 Market-based methodology for Gross and Net greenhouse gas intensity of wastewater treated (kgCO₂e/MI)



2. Company Net Zero plans

At an individual company level, the transition to net zero will reflect the diversity in each company's area, such as differing operational requirements and local decarbonisation opportunities. Detailed planning will need to reflect both the national policy landscape, and more localised factors such as existing electricity grid constraints and earlier moves towards a hydrogen economy in some parts of the UK.

The table below lists each company's individual company plan detailing how each company expects to deliver on its net zero commitment.

Anglian Water

Our net zero strategy to 2030

<https://www.anglianwater.co.uk/siteassets/household/environment/net-zero-2030-strategy-2021.pdf>

NWL Group including Essex and Suffolk

Emission Possible: How Northumbrian Water will reach Net Zero by 2027

<https://www.nwg.co.uk/our-purpose/public-interest-commitment/net-zero/>

Southern Water

Our Net Zero Plan

<https://www.southernwater.co.uk/our-performance/reports/net-zero-plan>

Severn Trent including Hafren Dyfry

Our journey to Net Zero (page 50-67)

<https://www.severntrent.com/content/dam/stw-plc/shareholder-resources/ara-annual-report-2021.pdf>

South West and Bournemouth Water

Our promise to the planet: Carbon busting net zero plan

<https://www.southwestwater.co.uk/siteassets/document-repository/sustainability/ourpromisetotheplanet.pdf>

Thames Water

Our journey to net zero carbon and beyond: Introducing our routemap

<https://www.thameswater.co.uk/media-library/home/about-us/responsibility/net-zero/our-journey-to-net-zero.pdf>

United Utilities Water

Our approach to climate change

<https://unitedutilities.annualreport2021.com/our-approach-to-climate-change/>

Welsh Water / Dwr Cymru

Our journey to Net Zero

<https://corporate.dwrcymru.com/en/journey-to-zero>

Wessex Water

Wessex Water's routemap to net zero carbon emissions

<https://www.wessexwater.co.uk/-/media/files/wessexwater/environment/carbon-and-climate/net-zero-report.pdf>

Yorkshire Water

Our carbon reduction strategy: The journey towards net zero

<https://www.yorkshirewater.com/environment/climate-change-and-carbon/our-carbon-strategy/>

Affinity Water

Our plan for Net Zero

<https://www.affinitywater.co.uk/news/plan-for-net-zero>

Bristol Water

Our routemap to net zero carbon by 2030

<https://f.hubspotusercontent30.net/hubfs/7850638/Our%20Routemap%20to%20Net%20Zero%20Carbon%20by%202030.pdf>

Portsmouth Water

2030 Net Zero Routemap

https://www.portsmouthwater.co.uk/wp-content/uploads/2021/07/2030-NET-ZERO-CARBON-ROADMAP_28-JULY-2021-v1.pdf

SES Water

Our net zero carbon routemap

<https://seswater.co.uk/your-environment/net-zero-carbon/our-net-zero-carbon-routemap>

South East Water

Our route to net zero

<https://corporate.southeastwater.co.uk/routemap>

South Staffordshire and Cambridge Water

Due later in 2021





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