

Directors' report

Energy and carbon

Carbon emissions

167,856

tonnes CO₂ equivalent (tCO₂e)
71 per cent below our 2005/06 baseline

Operational energy use

976GWh

underlying energy use that is used to calculate GHG emissions

Renewable energy generation

173GWh

equivalent to 21 per cent of our electricity consumption

Greenhouse gas emissions reporting

We measure and report our greenhouse gas (GHG) emissions of the six Kyoto Protocol gases that result from all United Utilities' operational activities in the UK. There are no material omissions.

We report as required under the Companies Act 2006 (Strategic Report and Directors' Reports) Regulations. We follow the 2019 UK Government Environmental Reporting Guidelines: Including streamlined energy and carbon reporting guidance and the GHG Protocol Corporate Accounting and Reporting Standard (2015).

In line with the recommendations of the Taskforce on Climate-related Financial Disclosure (TCFD), we are reporting scope 1, 2 and 3 emissions, our methodology and targets.

Our reporting is compliant with the international carbon reporting standard (ISO 14064, Part 1) and assured by the Certified Emissions Measurement and Reduction Scheme (CEMARS).

How we measure our greenhouse gas emissions

A carbon footprint is calculated by converting all emissions of Kyoto Protocol gases into a carbon dioxide equivalent (CO₂e). Emissions are categorised as direct, indirect or avoided emissions.

Direct emissions (scope 1 emissions) are those from activities we own or control including those from our treatment processes, company vehicles, burning of fossil fuels for heating and incineration of sewage sludge.

Indirect emissions, known as scope 2 and 3 emissions, result from operational activities we do not own or control. These include emissions produced as a consequence of electricity we purchase to power our treatment plants (scope 2) and other indirect emissions such as travel on company business (scope 3).

Avoided emissions are reductions from the purchase, or export, of renewable energy.

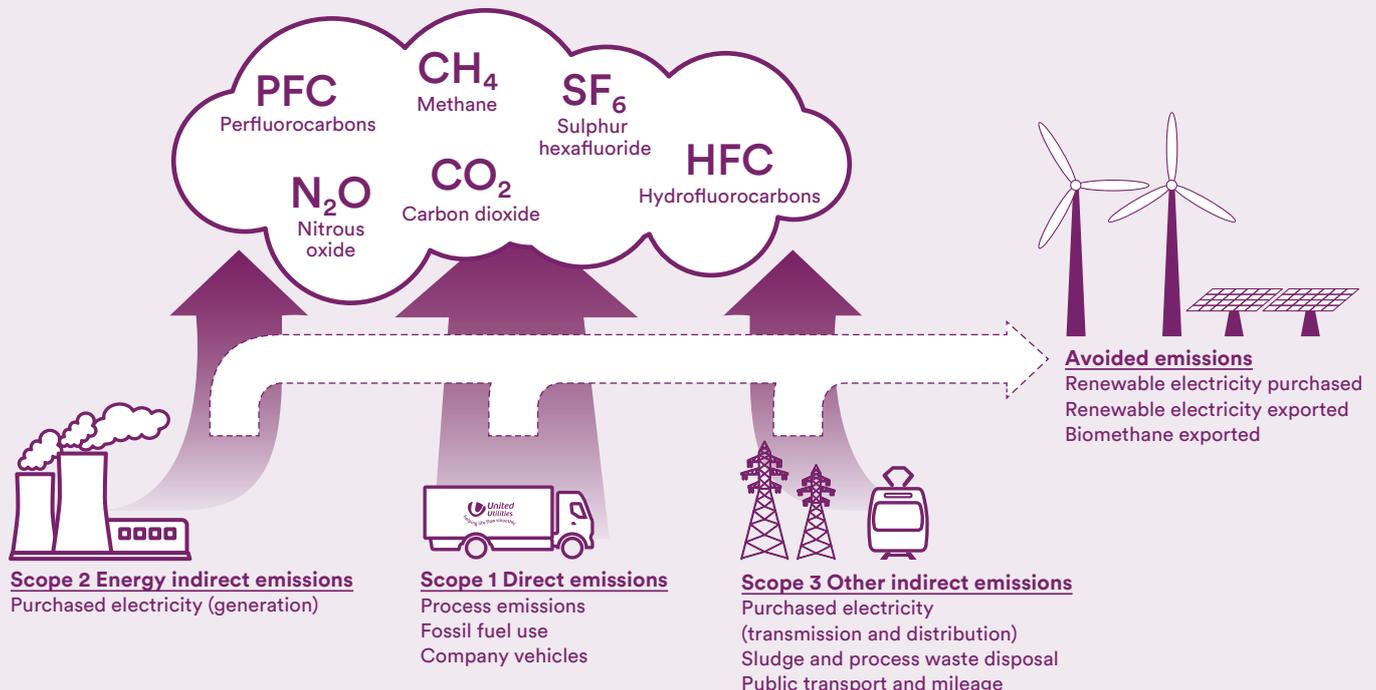
Gross emissions are the sum of all three scopes. Net emissions are the gross emissions minus reductions from avoided emissions.

The GHG Protocol recommends using two methods to quantify emissions – the 'location-based' method which uses average grid electricity emissions factors and the 'market-based' method which is specific to the actual electricity purchased. From this year we will report results using both methods and will adopt the gross 'market-based' figure to report our headline carbon emissions.

Intensity measurement

As in previous years we state our carbon emissions as tonnes CO₂e per £million revenue. This year we have also reported the metric tonnes CO₂e per megalitre (using the location-based method) broken down by clean water and wastewater, as these are common metrics for our industry.

Greenhouse gas emissions by scope



Directors' report

Energy and carbon

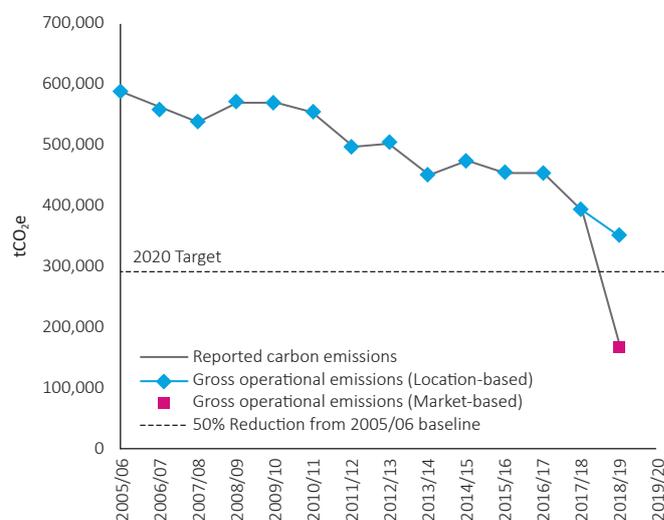
Emissions target

By 2020 we aim to reduce our greenhouse gas emissions by 50 per cent from the 2005/06 baseline and to achieve a 60 per cent reduction by 2035. We are pleased to report that for 2018/19 our carbon emissions were 167,856 tCO₂e, 71 per cent below the 2005/06 baseline.

We have achieved our emission target early as a result of purchasing certified renewable electricity, with over 95 per cent of the electricity we use having zero emissions. We will now focus on our remaining emissions, the majority of which are from processing wastewater and the treatment and disposal of sludge.

In line with our refreshed environmental policy, published in October 2018, we recognise our obligation to mitigate climate change and will continue to explore ways to lower our GHG emissions. We will set a new science based emissions target and evolve our reporting in line with expectations to achieve net zero emissions.

Our carbon footprint since 2005/06



United Utilities' greenhouse gas emissions

	Current year 2018/19 tCO ₂ e	Previous years 2017/18 tCO ₂ e ⁽²⁾	2016/17 tCO ₂ e	Baseline Year 2005/06 tCO ₂ e
Scope 1 Direct emissions				
Direct emissions from burning of fossil fuels	16,809	14,324	20,848	17,638
Process emissions from our treatment plants – including refrigerants	88,136	91,456	96,019	125,032
Transport: company owned or leased vehicles	14,409	11,803	11,783	7,514
Total Scope 1 Direct emissions	119,354	117,583	128,649	150,183
Scope 2 Energy indirect emissions				
Grid electricity purchased – generation	Market-based ⁽¹⁾ 18,503 Location-based 187,171	28,287 230,167	277,726	357,660
Total Scope 2 Energy indirect emissions	18,503	230,167	277,726	357,660
Scope 3 Other indirect emissions				
Business travel (public transport and private vehicles)	2,236	2,504	2,889	2,374
Emissions from sludge and process waste disposal	26,186	23,048	17,915	42,712
Grid electricity purchased – transmission and distribution	Market-based ⁽¹⁾ 1,577 Location-based 15,955	2,644 21,520	25,120	33,088
Total Scope 3 Other indirect emissions	29,999	47,072	45,924	78,174
GROSS CARBON EMISSIONS⁽³⁾	167,856	394,822	452,301	586,017
Avoided emissions from renewable electricity exported	(3,434)	(2,303)	(4,417)	(1,597)
Avoided emissions from biomethane exported	(8,446)	(8,577)	(3,240)	–
Avoided emissions from renewable electricity purchased	Location based (168,667)	(173,876)	–	–
Total avoided emissions	(11,880)	(184,756)	(7,657)	(1,597)
NET CARBON EMISSIONS⁽³⁾	155,976	210,066	444,644	584,420

(1) Market-based figures for electricity purchased on a standard tariff have been calculated using specific emissions factors from published generator fuel mix disclosures.

(2) 2017/18 figures are restated recognising the purchase of renewable electricity during that year and calculated using the market-based method.

(3) Operational emissions for baseline and previous years use the location-based method and current year uses the market-based method.

United Utilities' greenhouse gas emissions intensity

	Current year 2018/19	Previous year 2017/18	Baseline year 2005/06
Carbon emissions per £m revenue	tCO ₂ e 92.3	225.6	280.9
Operational emissions per megalitre of treated water	Kg CO ₂ e/MI 38.22	60.43	
Operational emissions per megalitre of sewage treated	Kg CO ₂ e/MI 102.43	116.75	

Energy use

The underlying energy data used to calculate our carbon emissions includes electricity, gas and other fuels purchased for use on-site and for transport.

This year we used 976GWh of energy. The prolonged dry and warm conditions from January 2018 increased customer demand for water and required more pumping to move water around our integrated network. As a result, we estimate that we used up to 30GWh more electricity.

We generated the equivalent of 173GWh of renewable electricity, an increase of 6GWh on last year. We achieved this with a mix of generation from wind, hydro, solar photovoltaics and energy recovery from bioresources (using sewage sludge to power combined heat and power generators).

We continued to invest in our generation capability with nine new solar installations coming on line during the year. Most of the energy we generate is used to power our operations, but where there is excess or it makes commercial sense to do so we export to the grid. We are exploring emerging technologies such as batteries and electric vehicles and investigating how systems thinking and artificial intelligence might optimise our energy use and generation.

Energy use and generation

	GWh
Energy use	
Electricity	807.8
Gas	33.0
Other fuels (e.g. for transport) ⁽¹⁾	135.0
Total energy use⁽²⁾	975.8
Electricity purchased	
Renewable 0 CO ₂ g/kWh	601.5
Supplier Standard Tariff 310 CO ₂ g/kWh	59.7
Total electricity purchased	661.2
Renewable energy generated	
CHP	115.7
Solar	34.6
Wind	4.8
Hydro	4.6
Biomethane ⁽³⁾	13.2
Total renewable energy generated	172.9
Renewable energy exported	
Electricity	13.0
Biomethane ⁽³⁾	13.2
Total renewable energy exported	26.2

(1) Energy use for other fuels includes fuel used in processing and transport plus business mileage in private vehicles converted to GWh using UK Government GHG Conversion Factors for Company Reporting.

(2) Underlying energy use that is used to calculate GHG emissions.

(3) Biomethane generated and exported to grid is expressed as an electricity equivalent.

Energy efficiency action taken

Our energy management strategy aims to achieve an appropriate balance between managing our energy consumption, use of renewables and self-generation and being smart about how we operate our assets to get best value while maintaining security of supply.

A key activity in the last year has been assessing and improving energy management planning at both local and regional levels. For instance, at a local level, the United Utilities energy standard has been developed and roll-out is well under way. This is a simple assessment that enables sites to understand current energy management practices and identify where improvements can be made. Supporting this are energy engineers who identify energy efficiency opportunities and share their knowledge of best practice with our teams across the region.

At a regional level, we have increased the weighting that energy consumption has in investment and operational decision-making. This began with raising awareness of actual energy consumption and generation by using the now well-established energy management information portal. With timely, accurate and consistent data, supplemented by trials using energy monitoring and control tools, it has been possible to better understand the local and broader energy impacts of our business decisions and improve how we balance business needs and energy use.

Renewable energy generation by technology

