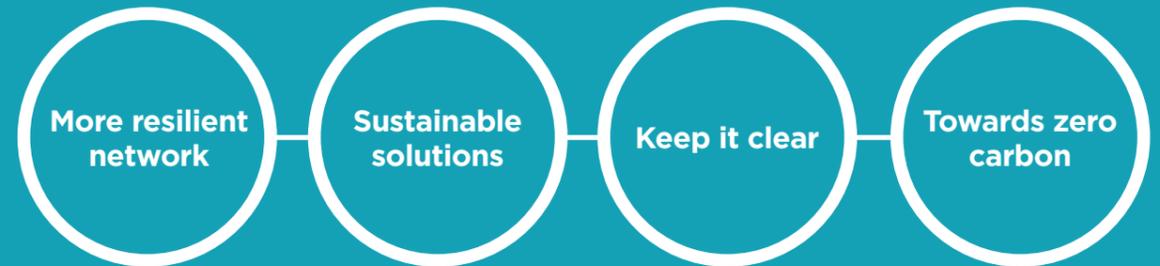


Nature

Protecting and enhancing the natural environment

Sustainable wastewater treatment using a wetland at Castle Archdale, County Fermanagh

Strategic areas of focus



Sustainable development goals



Strategic threats/opportunities

ST1 ST2 ST3 ST4 ST6 ST8 SO3 SO4

Page 59 Read more about strategic threats and opportunities.

Strategic performance indicators

Nature	Unit of measurement	Target 2019/20	Actual 2019/20	Pass/Fail	Target 2020/21
Reduction in pollution incidents (high and medium)*	Number	24	13	Pass	23
Wastewater compliance % population equivalent served*	%	99.16	99.51	Pass**	99.16
Reduction in number of properties at risk of out of sewer flooding (cumulative over 2015-21 period)	Number	54	41	Fail	62
Reduction in carbon footprint. Relates to reduction in net operational carbon emissions measured in tonnes of carbon dioxide equivalent (tCO ₂ e)	%	***	12.21	***	***

*Calendar year target.

**Based on pre-announced rather than un-announced regulatory sampling at the treatment works and the reported wastewater compliance doesn't incorporate flow compliance for the wastewater treatment works or the sewer network.

***New indicator - target to be set in 2020/21.

Strategic areas of focus

More resilient network

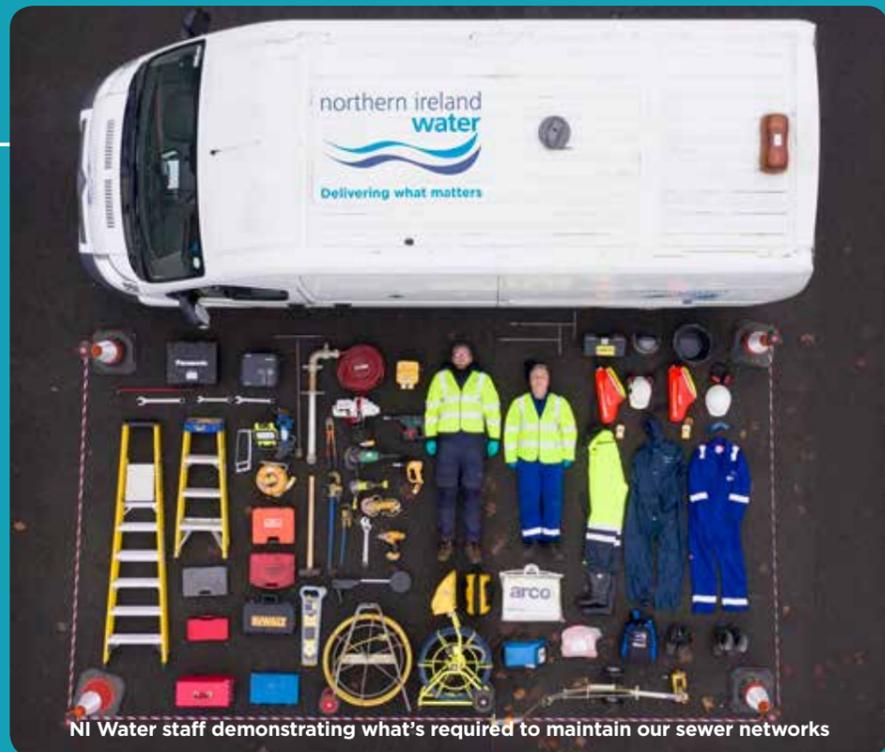
Flooding and the risk of flooding can constrain economic development, increase the cost of insurance and pollute our natural environment. Most of the urban areas of Northern Ireland, including road surfaces, are served by combined sewers that carry both wastewater and surface water - such a system would never be built today.

Climate change has contributed to an increase in the intensity and frequency of rainfall. Heavy rainfall can cause the sewers to become full of water and the sewage to back up in the system. Many of our traditional systems are 'combined sewer overflows', which were designed to prevent out of sewer flooding/damage to properties by discharging this excess water directly into the rivers or streams bypassing the treatment works. Whilst we adhere to NIEA's approved level of discharge, we are keen to go further to protect and enhance our natural environment by avoiding these overflows being released to water courses. As we update our networks, we are taking the opportunity to disconnect the rainwater from the sewerage system.

In 2019/20 we completed a £5m investment to upgrade the sewers at Ormeau Avenue in Belfast, some of which dated back to the

late 1800's and were in very poor condition. This investment has reduced the risk of out of sewer flooding by separating the rainwater from the sewer system, and minimising the amount of 'fats, oils and greases' by using a non-stick solution on the new wastewater pumping station walls. This improves the quality of the water in the River Lagan and facilitates further development within the area. Unforeseen complexities for another of our sewer rehabilitation schemes in Belfast has resulted in the removal of a lower number of properties at risk of out of sewer flooding than targeted.

In 2020/21 we will continue our work with developers to ensure new developments are sustainable and do not increase the flood risk to the site or surrounding area by looking at more sustainable ways of taking storm water out of the combined sewer system. Where this is not achievable we will work with developers to design the storm sewers to reduce the storm flow within the development and release back into our network at a reduced rate over a longer period. This will reduce shock loading to the existing sewer network during extreme rainfall events and reduce the pressures on our combined sewer overflows.



NI Water staff demonstrating what's required to maintain our sewer networks

Ormeau Avenue sewer upgrade:
<https://www.youtube.com/watch?v=AounkKc4Q4g>

Sustainable solutions

Everyday we recycle wastewater from 720,000 homes and businesses before safely returning it to the rivers and sea. Traditional treatment works require a lot of energy, carbon, concrete and chemicals to ensure wastewater can be safely released back to the environment. However, due to continued growth in population and industry, many of our wastewater treatment works are no longer capable of meeting this demand.

In keeping with our ambition to put back more than we take out, we identified a green solution, which uses constructed natural wetlands to treat wastewater instead of traditional wastewater treatment processes. Wetlands do more than you think - they filter our fresh water, absorb and retain carbon, support biodiversity and protect us from flooding.

In 2019/20 we constructed a wetland in Clabby, County Fermanagh to replace the traditional wastewater treatment works, which had struggled to meet new discharge standards and was restricting growth in the village. The wetland based Phragmafiltre wastewater treatment works is more efficient to construct and maintain than traditional systems and requires less energy, carbon, concrete and chemicals.

We plan to upgrade the existing wastewater treatment works in Ballykelly, County Derry/Londonderry in 2020/21 by constructing a sustainable integrated constructed wetland to enhance the traditional treatment works.



The new wetland at Clabby, County Fermanagh



Strategic areas of focus

Keep it clear

We deal with around 15,000 blockages of our sewers each year, over 11,000 of which could have been prevented. The most common causes of these blockages is the flushing of items which do not dissolve down the toilet such as wet wipes and the disposal of fats, oils and grease (FOG) down the sink. These combine to form a solid mass in the pipes underground, meaning less waste can pass through the pipe. If enough waste cannot pass through, it leads to flooding in homes, business or our natural environment.

In 2019/20, we introduced Wipezilla the wet wipe monster to towns across Northern Ireland in a bid to raise awareness of the damage caused by wet wipes in sewers and our natural environment and to reinforce the message of flushing only the Three P's; pee, poo and paper. A further awareness campaign, in partnership with local councils, focussed on towns with the top 20 blockage 'hotspots', which have seen over 20,000 blockages in the last two years, at a cost of around £5m.

NI Water's campaign to inspire people to 'Join the Refillution' has celebrated its first year with some outstanding success stories. The Refillution campaign is aimed

at encouraging everyone to stop buying single use plastic bottles and instead refill a reusable one with tap water. Since its launch in May 2019, our Councils have signed up hundreds of local businesses across their local area who welcome any member of the public on to their premises to refill their reusable bottle with tap water. The Councils have also undertaken several clean-ups across the district, including beach and river cleans, as well as continuing to support community groups to carry out litter clean-ups in their area; others have installed drinking water fountains in public places for their staff and the public to refill from. NI Water has a strong focus on the environment and we are committed to tackling the problems caused by plastic bottles and bottle tops, which block up our drains and rivers, and pollute our seas and shorelines. By refilling a reusable bottle, not only do you reduce plastic waste, you are also helping to drive down your carbon footprint. Over the last year 206 primary and secondary schools have signed up to become Refill schools, pledging to reduce the number of single use plastic water bottles in school and encouraging all pupils to refill a reusable bottle with tap water.



NI Water's Wipezilla the wet wipe monster

▶ Bag it and bin it: <https://www.youtube.com/watch?v=syp45gNoFDg>

Towards zero carbon

Operational emissions from the water industry account for nearly 1% of the UK's total carbon emissions. This is because water treatment is energy and chemical intensive and transporting water requires a great deal of pumping. Grid electricity accounts for the vast majority of our carbon emissions. As Northern Ireland's single largest electricity consumer, our goal is to fully exploit innovative approaches to energy and new technology to reduce our carbon footprint and ultimately become carbon neutral by 2050.

Our initial focus in PC15 on reaching net zero has centred on energy under the following themes:

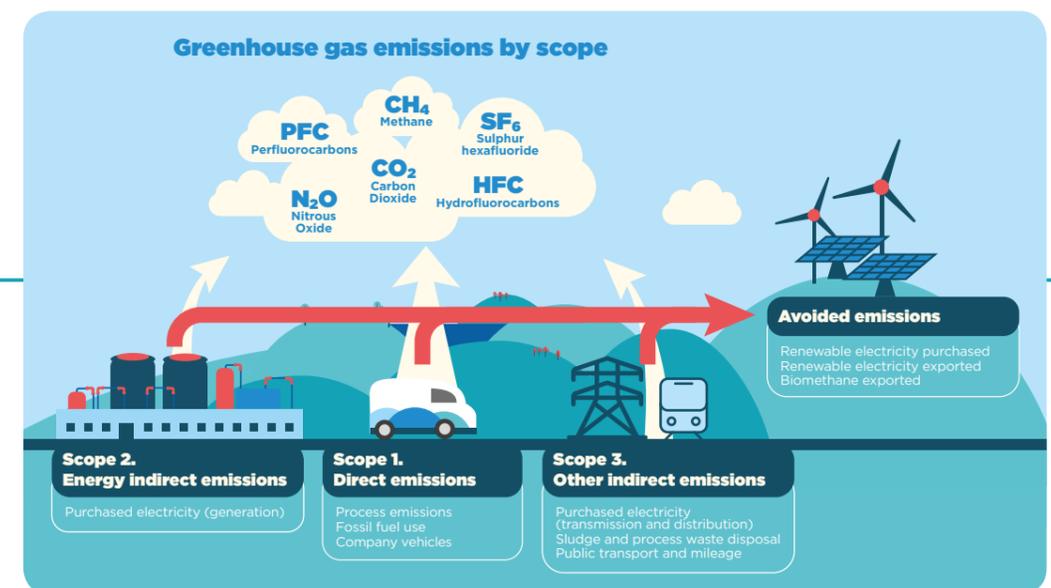
- **using less:** reducing our energy consumption and improving energy efficiency;
- **buying less:** reducing the amount of energy we buy and increasing renewable energy generation;
- **buying better:** reducing the costs of the energy we use; and
- **earning more:** maximising the revenues from the energy sector.

Our focus will widen further as we approach PC21. In 2019/20 we successfully achieved the ISO 50001 certification, the international standard for energy management systems,

which will allow us to achieve continual improvement in energy performance.

In 2020/21, we are aiming to increase our electricity consumption from renewable sources such as solar and hydro power to 40%, rising to 100% by 2027, and plan to improve our storage of carbon by planting around 200,000 trees in partnership with the Woodland Trust. Over 2020/21, we will also liaise with peer water companies to determine how we can capture additional areas in our carbon footprint reporting and embed carbon in our business case decision making. Our carbon footprint doesn't currently capture some emissions from treatment processes, embedded carbon in materials such as concrete used to construct our infrastructure or in the carbon stored in our land - peat bogs, trees and soils.

Initiatives under consideration to reduce carbon emissions over PC21 include transitioning to electric vehicles and energy storage such as batteries, and identifying other locations suitable for renewable energy installation. These initiatives could support Northern Ireland's renewable energy targets and open up opportunities in areas such as green fuel stations, hydrogen heating for homes and businesses and district heating schemes.



Strategic areas of focus

Towards zero carbon (continued)

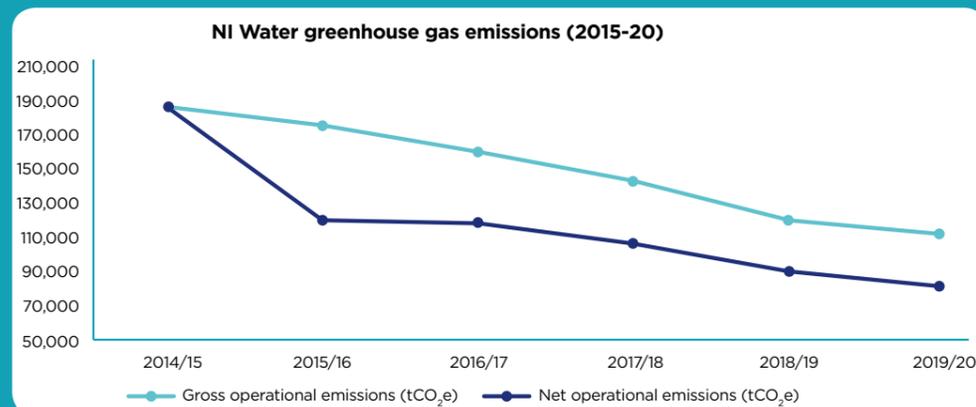
Our greenhouse gas emissions are accounted for and calculated using the UK Water Utilities industry Carbon Accounting Workbook. The workbook is updated each year with the most recent carbon emission factors released by government. We follow the 2019 UK Government Environmental Reporting

Guidelines including the streamlined energy and carbon reporting guidance. We also support the work of the Financial Stability Board's Taskforce for Climate-related Financial Disclosures (TCFD) and in line with their recommendations are reporting scope 1, 2 and 3 emissions, our methodology and targets.

NI Water greenhouse gas emissions	2019/20 tCO ₂ e	2019/20 kWh	2018/19 tCO ₂ e	2018/19 kWh
Scope 1 direct emissions				
Direct emissions from burning of fossil fuels	7,151	27,978,365	6,815	24,076,200
Process emissions from our treatment plants	8,701	34,040,023	10,016	35,382,308
Transport: Company owned or leased vehicles	2,733	10,692,997	2,971	10,497,121
Total scope 1 direct emissions	18,585	72,711,385	19,802	69,955,629
Scope 2 energy indirect emissions				
Grid electricity purchased	75,111	293,862,324	81,876	289,243,544
Total scope 2 energy indirect emissions	75,111	293,862,324	81,876	289,243,544
Scope 3 other indirect emissions				
Business travel on public transport and private vehicles used for Company business	216	845,188	576	2,034,797
Emissions from sludge and process waste disposal	11,841	46,324,844	11,208	39,594,800
Grid electricity purchased - transmission and distribution	6,377	24,948,396	6,979	24,656,269
Total scope 3 other indirect emissions	18,434	72,118,428	18,764	66,285,866
GROSS OPERATIONAL CARBON EMISSIONS	112,130	438,692,137	120,442	425,485,039
Avoided emissions from renewable electricity exported	(927)	(3,627,778)	(426)	(1,505,352)
Avoided emissions from biomethane exported	-	-	-	-
Avoided emissions from renewable electricity purchased	(31,875)	(124,706,182)	(29,652)	(104,750,168)
Total avoided emissions	(32,802)	(128,333,960)	(30,078)	(106,255,520)
NET OPERATIONAL CARBON EMISSIONS	79,328	310,358,177	90,364	319,229,519
NI Water greenhouse gas emissions intensity				
			2019/20	2018/19
Operational emissions per megalitre of treated water (tCO ₂ e/MI)			0.118	0.139
Operational emissions per megalitre of sewage water (tCO ₂ e/MI)			0.386	0.433

During 2019/20 we have made total energy savings of 9,567,896 kWh through energy reduction projects and the use of energy from renewable sources. We are targeting a reduction of around 20% in operational emissions over each of the next five price

controls to reach net zero operational emissions by 2050. Developments in future technologies and the growth of renewables may enable us to reach this goal sooner. Progress in reducing our greenhouse gas emissions is shown below:



Dunore solar farm: <https://www.youtube.com/watch?v=gwxvwrPSiKw>



Solar farm at Dunore water treatment works, County Antrim