

# **Our Contribution to Yorkshire 2020/21 Methodology Report**

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**YorkshireWater**

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# Acronyms

Acronym	Description
ARFS	Annual Report and Financial Statements
APR	Annual Performance Report
BAS	Biosolids Assurance Scheme
BAME	Black, Asian, and Minority Ethnic
BBS	Breeding Bird Survey
CEH	Centre for Ecology and Hydrology
CFR	Corporate Family Rating
CHP	Combined Heat and Power
CMex	Customer experience Measure
CO2e	Carbon Dioxide equivalent
Defra	Department for Environment, Food and Rural Affairs
DMex	Developer services experience Measure
EA	Environment Agency
ENCA	Enabling a Natural Capital Approach
FTE	Full Time Equivalent
GHG	Greenhouse Gas
ha	Hectare
hh	Household
IEMA	Institute of Environmental Management and Assessment
INNS	Invasive Non-Native Species
KPI	Key Performance Indicator
kWh	kilowatt hour
l/hd/d	Litres per head (i.e. per person) per day
LGBTQ	Lesbian, Gay, Bisexual, Transgender, and Questioning
LTIR	Lost Time Injury Rate
MEAV	Modern Equivalent Asset Value
MI	Megalitre
MWh	Megawatt hour
NEA	National Environmental Assessment
NIC	National Insurance Contributions
ONS	Office for National Statistics

ORVal	Outdoor Recreation Valuation tool
PAYE	Pay as You Earn
PSR	Priority Services Register
QALY	Quality Adjusted Life Year
RCV	Regulatory Capital Value
R&D	Research & Development
ROI	Return on Investment
SIM	Service Incentive Mechanism
SME	Small or Medium-sized Enterprise
SROI	Social Return on Investment
SSSI	Site of Special Scientific Interest
t	Tonnes
T&D	Transmission & Distribution
TIVA	Total Impact and Value Assessment
UKWIR	UK Water Industry Research
VAT	Value Added Tax
WINEP	Water Industry National Environment Programme
WTP	Willingness-To-Pay
YW	Yorkshire Water

# Introduction

## Context

Yorkshire Water is a water and wastewater company in the UK that delivers water, sewerage, and environmental services to over 5 million people and 130,000 businesses. This document is part of a suite of publications sharing the findings and methodology of our latest work to understand the impact and value, both good and bad, we make and manage as an organisation. The main 'Our Contribution to Yorkshire' report summarises the findings of this work and is available at [yorkshirewater.com/capitals](https://yorkshirewater.com/capitals).

This document provides the methodology and data sources used in our most recent assessment. It builds on Yorkshire Water's previous work and incorporates the latest national best practice. Aspects of the work have been reviewed by an independent third party, DNV, to verify and assure the approaches used.

## What is 'Our Contribution to Yorkshire'?

'Our Contribution to Yorkshire' is the name for our work to enhance the understanding of the impacts we have on the environment, society, and the economy, both positive and negative. This approach goes beyond traditional reporting by applying a mix of accounting, economic valuation, and sustainability techniques to quantify impacts across the six capitals, and where sensible, to put a monetary value on those impacts.

The typical approach to 'capital' focuses on financial and manufactured assets. These assets, such as, a water treatment plant for example, can deliver a flow of services – in this case a steady supply of clean water – if they are maintained in good condition. The services they provide have value both to organisations and to wider society, and this value is recorded in a typical financial account.

The six capitals approach extends this type of thinking beyond financial and manufactured capital assets to also consider natural, social, human, and intellectual capital, as defined in Figure 1. By looking at all of these assets, rather than just focusing on the traditional assets recorded in a balance sheet, a six capitals approach can provide a much more detailed understanding of a company's performance than is captured in standard financial or operational performance reports.



*Figure 1: The Six Capitals – these are the resources we rely on and which we impact, both positively and negatively, through our business activities.*

The aim of this approach is to examine the impacts of Yorkshire Water across the six capitals, assessing the full range of economic, environmental, and social attributes associated with our activities. This work aims to provide a broader view of the risks to Yorkshire Water's services and the value we contribute. It also aims to highlight opportunities where we can enhance our impact and value, and the inherent trade-offs that need to be considered when making decisions.

This approach has prioritised the impacts which are understood to be the most significant; and the figures do not yet represent the entire 'value' of nature, people, or society. For example, while the approach covers the value to the company of employees' wellbeing in terms of reduced sickness rates, this does not reflect the entirety of its importance to individuals, nor does it reflect the total scope of Yorkshire Water's business interests or responsibilities.

This is the third Our Contribution to Yorkshire report, which covers the 2020/21 financial year. Previous reports are available at [yorkshirewater.com/capitals](https://yorkshirewater.com/capitals). We aim to publish an annual report to allow ongoing and comprehensive monitoring of Yorkshire Water's net contribution and how it is changing over time.

## Capitals accounting approach

Our capitals accounting approach is built around a framework of assets, flows and values, following the latest guidance from Defra and the Natural Capital Committee. This considers the extent and condition of Yorkshire Water's assets, the physical flows of services and impacts upon them, as well as the monetary value of those impacts across all six capitals (Figure 2).

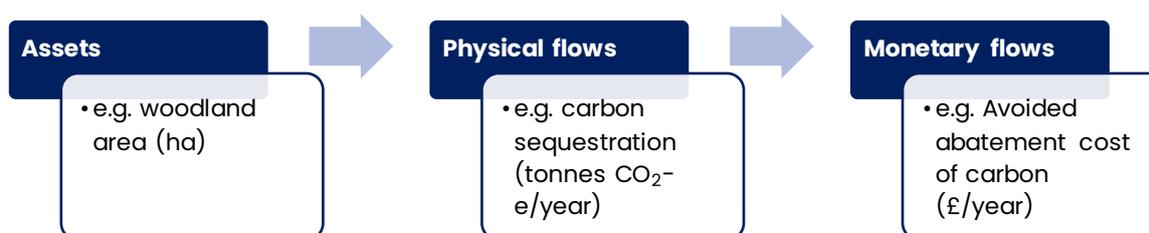


Figure 2: The assets/flows/values accounting framework used in this assessment

## About this methodology report

This report provides the methodology and data sources underpinning the Our Contribution to Yorkshire 2020/21 assessment and report. The full set of results is published in an accompanying spreadsheet. The document is structured around the six capitals: financial, manufactured, natural, human, intellectual, and social capital. Each chapter in the document provides the methodology and data sources used to generate results for each of the six capitals.

## Framework structure

Under each of the six capitals are a series of metrics that provide indicators of Yorkshire Water's assets, impacts, and their values. While some of the metrics may continue to evolve, this structure is expected to remain relatively stable over time. A breakdown of the specific metrics for the physical and monetary flow is set out in Table 1 below. In order to simplify the presentation of this data in the main Our Contribution report, each metric has been assigned to a broad theme within each type of capital as set out below.

<b>Financial capital themes</b>	<b>Financial capital metrics</b>
F1. Taxes	F1.1 Business rates, F1.2 Carbon taxes, F1.3 Fuel duty, F1.4 Abstraction and discharge licenses, F1.5 Employee's PAYE contributions, F1.6 VAT collected from business customers, F1.7 Corporation tax
F2. Salaries	F2.1 Salaries, F2.2 Employer NICs, F2.3 Employee NICs
F3. Pensions	F3.1 Employer pension contributions
F4. Profits	F4.1 Operating profit (inc. exceptionals)
<b>Manufactured capital themes</b>	<b>Manufactured capital metrics</b>
M1. Asset Value	M1.1 Value of change in fixed assets over the year (MEAV)
M2. Waste Use and Reuse	M2.1 Waste going to landfill, M2.2 Amount of waste used productively
M3. Renewable Energy	M3.1 Amount of renewable energy generated and used, M3.2 Amount of renewable energy generated and exported
<b>Natural capital themes</b>	<b>Natural capital metrics</b>
N1. Water Use and Efficiency	N1.1 Total water abstraction, N1.2 Total amount of water returned to the environment to maintain flows for wildlife and other users, N1.3 Total leakage, N1.4 Total water saved through water saving support measures, N1.5 Total water recycled
N2. Water Quality	N2.1 Net change in bathing water status classifications, N2.2 Length of river water improved, N2.3 Number of pollution incidents (N2.3.1 Number of Category 1&2 pollution incidents, N2.3.2 Number of Category 3 pollution incidents), N2.4 Area of wetland habitat providing water quality regulation
N3. Land, Soil, and Biodiversity	N3.1 Number of farm tenancies, N3.2 Amount of timber harvested, N3.3 Atmospheric pollutants emitted from YW operations, N3.4 Atmospheric pollutants filtered on YW land, N3.5 Area of wetland habitat providing flood regulation, N3.6 Area of grassland habitat supporting pollinators, N3.7 Number of visitors to YW sites, N3.8 Number of houses benefitting from proximity to habitats on YW land, N3.9 Net change in biodiversity units
N4. Carbon	N4.1 Scope 1 GHG emissions (burning fuel, process and fugitive emissions, owned transport), N4.2 Scope 2 GHG emissions (grid electricity use), N4.3 Scope 2 reductions in GHG emissions through purchase of green electricity, N4.4 Scope 3 GHG emissions (other business travel, outsourced activities, grid electricity T&D), N4.5 Scope 3 reductions in GHG emissions through purchase of green electricity, N4.6 Scope 3 GHG emissions (embedded in capital spend), N4.7 Other offset GHG emissions from renewable energy export, N4.8 Other net GHG sequestered on YW land

<b>Human capital themes</b>	<b>Human capital metrics</b>
H1. Performance and Development	H1.1 Number of employees undergoing performance reviews, H1.2 Number employees recruited through internal promotions to management positions, H1.3 Average length of time commuting, H1.4 Wage inflation / deflation (magnitude of pay above / below inflation), H1.5 Staff turnover (voluntary leavers), H1.6 Number of new apprenticeships each year
H2. Health, Safety, and Wellbeing	H2.1 Lost days avoided through employee engagement, H2.2 Spend on health / wellbeing benefit programmes, H2.3 Number of injuries, H2.4 Workforce extent of unpaid / underpaid overtime, H2.5 Number of sick days
H3. Diversity and Inclusion	H3.1 Gender pay gap (mean hourly rate), H3.2 BAME pay gap (mean hourly rate), H3.3 LGBTQ pay gap (mean hourly rate), H3.4 Disability pay gap (mean hourly rate)
<b>Intellectual capital themes</b>	<b>Intellectual capital metrics</b>
I1. Research and Development	I1.1 Total spend on R&D
I2. Knowledge and Learning	I2.1 Total employee hours spent on training, I2.2 Number of computers, I2.3 Knowledge decay rate, I2.4 Number participants in educational programmes
I3. Processes and Efficiency	I3.1 Total spend on software, I3.2 Total spend on hardware, I3.3 Total spend on remote sensors, I3.4 Total spend on process management, I3.5 Total spend on transformation
<b>Social capital themes</b>	<b>Social capital metrics</b>
S1. Trust	S1.1 Late payments to suppliers, S1.2 Early payments to suppliers, S1.3 Customer trust in YW
S2. Health and Wellbeing	S2.1 Health benefits of providing a public water supply compared to a private supply, S2.2 Health benefits of recreational exercise on YW sites, S2.3 Volunteering time provided, S2.4 Amount raised for WaterAid
S3. Quality of Service	S3.1 Total amount of water delivered to customers, S3.2 Drinking water contacts, S3.3 Internal flooding incidents, S3.4 External flooding incidents, S3.5 Significant water supply events (>12 hours), S3.6 Number of properties below the low pressure threshold
S4. Vulnerability	S4.1 Number of customers YW provide financial support to, S4.2 Number of customers at risk that YW provide specialist support to

## Timescale

This assessment covers the period 1 April 2020 to 31 March 2021. To allow for comparisons over time, results for this period along with previous results for the five-year period from 1 April 2015 to 31 March 2020 are presented together in the accompanying spreadsheet. Note that results for some metrics are not available across all reporting periods.

All values are presented in terms of their respective price years i.e. value estimates for 2017/18 are presented in 2017 prices while for 2019/20 2019 prices are used. This is so that the results presented in this version of Our Contribution are consistent with the figures presented in the APR and ARFS, and with future versions. In light of this there is potential for some changes in value to be caused by inflation rather than real change but, in practice, the effects of inflation are considered to be minimal over the assessment period.

## Robustness ratings

It is important to note that some of the approaches used are less well developed than others. In light of this, each metric is assigned a confidence score of low, medium, or high to reflect limitations around the accuracy of the underlying methodologies and/or data sources. This is defined below and follows the approach used in previous reports.

<b>Confidence ratings used to indicate the robustness of results</b>		
<b>High</b>	<b>Medium</b>	<b>Low</b>
Uses robust data and widely respected techniques that have matured to become commonly used by respected organisations.	Uses data with estimations and assumptions and using techniques that have been used by early adopters, but which are still maturing.	Uses data with substantial extrapolation, estimation, and assumptions, and using techniques that are at the early stages of development.

## Independent assurance

Yorkshire Water's standard business processes include independent assurance of many of the metrics used in this assessment. These metrics are marked throughout this report. DNV provided further assurance of five metrics that are not already assured elsewhere, which are described in detail at the end of this report. DNV's independent assurance report can be found at [yorkshirewater.com/capitals](http://yorkshirewater.com/capitals).

# Financial capital

## **F1. Taxes**

All data for this metric and the corresponding sub metrics (F1.1 Business rates, F1.2 Carbon taxes, F1.3 Fuel duty, F1.4 Abstraction and discharge licenses, F1.5 Employee's PAYE contributions, F1.6 VAT collected from business customers, and F1.7 Corporation tax) taken directly from the Yorkshire Water Annual Report and Financial Statements (ARFS) – no additional calculations undertaken.

## **F2. Salaries**

All data for this metric and the corresponding sub metrics (F2.1 Salaries, F2.2 Employer NICs, F2.3 Employee NICs) taken directly from the Yorkshire Water ARFS – no additional calculations undertaken.

## **F3. Pensions**

Data for this metric and the corresponding sub metrics (F3.1 Employer pension contributions) was taken from the Kelda Group Pension Plan (as reported in the Yorkshire Water ARFS and the Kelda Stakeholder scheme arrangement).

## **F4. Profits**

All data for this metric and the corresponding sub metrics (F4.1 Operating profit (inc. exceptionals)) taken directly from the Yorkshire Water ARFS – no additional calculations undertaken.

# Manufactured capital

## M1. Asset Value

### M1.1 Change in the value of fixed assets over the year (MEAV)

Calculation of the Modern Equivalent Asset Value (MEAV) was based on figures from the Annual Performance Report (APR) rather than the AFRS. This calculation therefore excludes non-appointed assets (not a material value) and capitalised interest which is required by Ofwat to be excluded from regulatory reporting.

## M2. Waste Use and Reuse

### M2.1 Waste going to landfill

Input	Data	Unit	Source
A.	Waste going to landfill	t/yr	Data collected within Yorkshire Water and its suppliers on waste production and disposal, collated in a central spreadsheet
B.	Private cost of waste disposal	£/yr	As above
C.	Private benefit of waste disposal	£/yr	As above
<b>Physical flows</b>	<b>Calculations</b>		
1	Total waste = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Net cost of waste = B + C*		
* Note that in this formula 'B' is a negative impact i.e. the private cost of waste disposal.			

### M2.2 Amount of waste used productively

Input	Data	Unit	Source
A.	Waste used productively	£m/yr	Data collected within Yorkshire Water and reported in APR table 3E
<b>Physical flows</b>	<b>Calculations</b>		
1	Waste used productively = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Value created from underused resources = 1		

## M3. Renewable Energy

### M3.1 Amount of renewable energy generated and used

Input	Data	Unit	Source
A.	Total renewable electricity generated and used onsite (from sludge processing)	kWh/yr	Data collected within Yorkshire Water and its suppliers, collated in its Carbon Accounting Workbook which is provided and annually updated by UKWIR
B.	Total renewable electricity generated and used onsite (from other sources than sludge)	kWh/yr	As above
C.	Total energy generated from sludge processing (both used onsite and exported) - heat	kWh/yr	As above
D.	Conversion factor for kWh to MWh (i.e. 0.001)	-	-
E.	Energy efficiency conversion factor from heat to gas (i.e. 1.18)	-	Yorkshire Water (2018) TIVA - Methodology Report - based on Yorkshire Water's previous experience
F.	Average unit cost of gas for 'large' nondomestic consumer (i.e. £0.02244 in 2014 prices)	£/kWh	Yorkshire Water (2018) TIVA - Methodology Report - based on BEIS quarterly gas and electricity prices for non-domestic sector
G.	Average price paid by Yorkshire Water for grid electricity (i.e. £ 0.098 in 2014 prices)	£/kWh	Yorkshire Water (2018) TIVA - Methodology Report - based on total cost of electricity purchased / volume of electricity purchased from Yorkshire Water accounts Physical flows Calculations
<b>Physical flows</b>	<b>Calculations</b>		
1	Total energy generated and used in kWh = A + B + C		
2	Total energy generated and used in MWh = 1 * D Monetary flows Calculations		
<b>Monetary flows</b>	<b>Calculations</b>		
3	Value of heat energy generated and used = C * E * F		

4	Value of electricity generated and used = (A + B) * G
5	Total value = 3+4

### M3.2 Amount of renewable energy generated and exported

Input	Data	Unit	Source
A.	Total renewable electricity generated onsite and exported (from sludge processing)	kWh/yr	Data collected within Yorkshire Water and its suppliers, collated in its Carbon Accounting Workbook which is provided and annually updated by UKWIR
B.	Total renewable electricity generated onsite and exported (from other sources than sludge)	kWh/yr	As above
C.	Conversion factor for kWh to MWh (i.e. 0.001)	-	-
D.	Market value of security of electricity supply (i.e. £1.43 in 2014 prices)	£/kWh	Yorkshire Water (2018) TIVA - Methodology Report - based on research published in 2013 by London Economics for Ofgem and DECC which estimated the Value of Lost Load (VoLL) for consumers in Great Britain
<b>Physical flows</b>	<b>Calculations</b>		
1	Total energy generated and exported in kWh = A + B		
2	Total energy generated and exported in MWh = 1 * C		
<b>Monetary flows</b>	<b>Calculations</b>		
3	Value of grid resilience through renewables exported = 1 * D		

# Natural capital

## N1. Water Use and Efficiency

### N1.1 Total water abstraction

Input	Data	Unit	Source
A.	Total water abstraction	Ml/yr	Internal data provided by Yorkshire Water
B.	Gross value of water abstracted (Total wholesale charge – water)	£/yr	Yorkshire Water APR
C.	Environmental cost per unit abstracted (proxied by value per MI lost through leakage)	£/yr	Yorkshire Water Service Measure Framework
<b>Physical flows</b>	<b>Calculations</b>		
1	Total amount abstracted = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Gross value of water abstracted per MI = B / A		
3	Net value of water abstracted per MI = 2 + C		
4	Net value of water abstracted = 1 * 3		

### N1.2 Total amount of water returned to the environment to maintain flows for wildlife and other users

Input	Data	Unit	Source
A.	Volume of wastewater receiving treatment at sewage treatment works	Ml/yr	Yorkshire Water APR (Table 7C)
<b>Physical flows</b>	<b>Calculations</b>		
1	Total water returned to the environment = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Not included in this version of the accounts		

### N1.3 Total leakage

Input	Data	Unit	Source
A.	Average daily leakage	MI/day	Yorkshire Water ARFS
B.	Number of days per year	no./yr	-
C.	Cost to customers per MI lost through leakage	£/MI	Yorkshire Water Service Measure Framework
<b>Physical flows</b>	<b>Calculations</b>		
1	Total annual leakage = A * B		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Total cost of leakage = C * 1		

### N1.3 Total water saved through water saving support measures

Not included in this version of the accounts.

### N1.4 Total water recycled

Not included in this version of the accounts.

## N2. Water Quality

### N2.1 Net change in bathing water status classifications

Input	Data	Unit	Source
A.	Number of bathing waters increasing in quality relative to the previous year	no./yr	Yorkshire Water ARFS
B.	Number of bathing waters decreasing in quality relative to the previous year	no./yr	Yorkshire Water ARFS
C.	Value to customers of an increase in bathing water quality (i.e. £1,324,017 in 2017 prices)	£/change in status category	Yorkshire Water Service Measure Framework
D.	Cost to customers of a decrease in bathing water quality (i.e. -£1,324,017 in 2017 prices)	£/change in status category	Yorkshire Water Service Measure Framework
<b>Physical flows</b>	<b>Calculations</b>		
1	Net change in bathing water status classifications = A - B		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Net change in value = (A * C) + (B * D)		

## N2.2 Length of river water improved

Input	Data	Unit	Source
A.	Length of river water improved	km	Internal data provided by Yorkshire Water
B.	Value to customers of improvements in river water quality (i.e. £111,643 in 2017 prices)	£/km	Yorkshire Water Service Measure Framework
<b>Physical flows</b>	<b>Calculations</b>		
1	Total length improved = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Value of the change in river water quality = A * B		

## N2.3 Number of pollution incidents

Input	Data	Unit	Source
A.	Number of Category 1&2 pollution events	no./yr	Yorkshire Water ARFS
B.	Number of Category 3 pollution events	no./yr	Yorkshire Water ARFS
C.	Cost to customers per Category 1&2 pollution event (i.e. £937,545 in 2017 prices)	£/km	Yorkshire Water Service Measure Framework
D.	Cost to customers per Category 3 pollution event (i.e. £150,285 in 2017 prices)	£/km	Yorkshire Water Service Measure Framework
<b>Physical flows</b>	<b>Calculations</b>		
1	Total pollution incidents = A + B		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Total cost = (A * C) + (B * D)		

## N2.4 Area of wetland habitat providing water quality regulation

Not included in this version of the accounts.

## N3. Land, Soil, and Biodiversity

### N3.1 Number of farm tenancies

Input	Data	Unit	Source
A.	Number of farm tenancies	no./yr	Internal data provided by Yorkshire Water
B.	Rental income from farm tenancies	£/yr	Internal data provided by Yorkshire Water
<b>Physical flows</b>	<b>Calculations</b>		
1	Number of farm tenancies = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Rental income from farm tenancies = B		

### N3.2 Amount of timber harvested

Input	Data	Unit	Source
A.	Amount of timber harvested	t/yr	Internal data provided by Yorkshire Water
B.	Average conversion factor for different types of woods (i.e. 1.46)	m <sup>3</sup> /t	Forest Research Conversion Factors
C.	Average softwood sawlog price (i.e. £34.03 - £56.84 in 2016 prices)	£/m <sup>3</sup>	Forest Research Timber Price Indices
<b>Physical flows</b>	<b>Calculations</b>		
1	Amount of timber harvested = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Value of timber harvest = A * B * C		

### N3.4 Atmospheric pollutants filtered on YW land

Not included in this version of the accounts.

### N3.5 Area of wetland habitat providing flood regulation

Not included in this version of the accounts.

### N3.6 Area of grassland habitat supporting pollinators

Not included in this version of the accounts.

### N3.7 Number of visitors to YW sites

Input	Data	Unit	Source
A.	Number of visitors per year (i.e. 2.6 million)	no./yr	Internal calculation for YW based on the ORVal tool and data from Forestry England
B.	Average WTP for a recreational trip to a water habitat (i.e. £1.82 in 2010 prices)	£/trip	Defra ENCA workbook
<b>Physical flows</b>		<b>Calculations</b>	
1	Total number of visitors per year = A		
<b>Monetary flows</b>		<b>Calculations</b>	
2	Total value = A * B		

### N3.8 Number of houses benefitting from proximity to habitats on YW land

Not included in this version of the accounts.

### N3.9 Net change in biodiversity units

Not included in this version of the accounts.

## N4. Carbon

### N4.1 Scope 1 GHG emissions (burning fuel, process and fugitive emissions, owned transport)

Input	Data	Unit	Source
A.	Direct emissions from burning of fossil fuels (including CHP generated onsite)	t/CO <sub>2</sub> e/yr	Yorkshire Water Carbon Accounting Workbook
B.	Process and fugitive emissions	t/CO <sub>2</sub> e/yr	Yorkshire Water Carbon Accounting Workbook
C.	Transport: Company owned or leased vehicles	t/CO <sub>2</sub> e/yr	Yorkshire Water Carbon Accounting Workbook
D.	Social cost of carbon (i.e. £288 in 2019 prices)	£/t CO <sub>2</sub> e	<a href="https://route2.com/news/costing-carbon">https://route2.com/news/costing-carbon</a>
<b>Physical flows</b>		<b>Calculations</b>	
1	Total Scope 1 emissions = A + B + C		

Monetary flows	Calculations
2	Total value each year = 1 * D

#### N4.2 Scope 2 GHG emissions (grid electricity use)

Input	Data	Unit	Source
A.	Total grid electricity used by company (including CHP electricity purchased)	t/CO <sub>2</sub> e/yr	Yorkshire Water Carbon Accounting Workbook
B.	Social cost of carbon (i.e. £288 in 2019 prices)	£/t CO <sub>2</sub> e	<a href="https://route2.com/news/costing-carbon">https://route2.com/news/costing-carbon</a>
Physical flows	Calculations		
1	Total Scope 2 emissions = A		
Monetary flows	Calculations		
2	Total value each year = 1 * B		

#### N4.3 Scope 2 reductions in GHG emissions through purchase of green electricity

Input	Data	Unit	Source
A.	Total grid electricity used by company (including CHP electricity purchased)	t/CO <sub>2</sub> e/yr	Yorkshire Water Carbon Accounting Workbook
B.	% purchase of green electricity	%	Internal data provided by Yorkshire Water
C.	Social cost of carbon (i.e. £288 in 2019 prices)	£/tCO <sub>2</sub> e	<a href="https://route2.com/news/costing-carbon">https://route2.com/news/costing-carbon</a>
Physical flows	Calculations		
1	Total Scope 2 emissions reductions = A * B		
Monetary flows	Calculations		
2	Total value each year = 1 * C		

#### N4.4 Scope 3 GHG emissions (other business travel, outsourced activities, grid electricity T&D)

Input	Data	Unit	Source
A.	Business travel on public transport and private vehicles used for company business	t/CO <sub>2</sub> e/yr	Yorkshire Water Carbon Accounting Workbook

B.	Outsourced activities (if not included in Scope 1 or 2) Energy and other	t/CO <sub>2</sub> e/yr	Yorkshire Water Carbon Accounting Workbook
C.	Total grid electricity used by company (including CHP electricity purchased)	t/CO <sub>2</sub> e/yr	Yorkshire Water Carbon Accounting Workbook
D.	Social cost of carbon (i.e. £288 in 2019 prices)	£/tCO <sub>2</sub> e	<a href="https://route2.com/news/costing-carbon">https://route2.com/news/costing-carbon</a>
<b>Physical flows</b>	<b>Calculations</b>		
1	Total Scope 3 emissions (other) = A + B + C		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Total value each year = 1 * D		

#### N4.5 Scope 3 reductions in GHG emissions through purchase of green electricity

Input	Data	Unit	Source
A.	Total grid electricity used by company (including CHP electricity purchased)	t/CO <sub>2</sub> e/yr	Yorkshire Water Carbon Accounting Workbook
B.	% purchase of green electricity	%	Internal data provided by Yorkshire Water
C.	Social cost of carbon (i.e. £288 in 2019 prices)	£/tCO <sub>2</sub> e	<a href="https://route2.com/news/costing-carbon">https://route2.com/news/costing-carbon</a>
<b>Physical flows</b>	<b>Calculations</b>		
1	Total Scope 3 emissions reductions = A * B		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Total value each year = 1 * C		

#### N4.6 Scope 3 GHG emissions (embedded in capital spend)

Input	Data	Unit	Source
A.	Emissions embedded in capital investment activity	t/CO <sub>2</sub> e/£	Yorkshire Water (2018) TIVA – Methodology Report – based on internal cost and carbon models
B.	Capital investment	£/yr	Yorkshire Water ARFS
C.	Social cost of carbon (i.e. £288 in 2019 prices)	£/tCO <sub>2</sub> e	<a href="https://route2.com/news/costing-carbon">https://route2.com/news/costing-carbon</a>
<b>Physical flows</b>	<b>Calculations</b>		
1	Total Scope 3 emissions (embedded) = A * B		

<b>Monetary flows</b>	<b>Calculations</b>
2	Total value each year = 1 * C

#### N4.7 Other offset GHG emissions from renewable energy export

<b>Input</b>	<b>Data</b>	<b>Unit</b>	<b>Source</b>
A.	Exported renewables (generated onsite and exported)	t/CO2e/£	Yorkshire Water Carbon Accounting Workbook
B.	Social cost of carbon (i.e. £288 in 2019 prices)	£/tCO2e	<a href="https://route2.com/news/costing-carbon">https://route2.com/news/costing-carbon</a>
<b>Physical flows</b>	<b>Calculations</b>		
1	Total offset emissions = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Total value each year = 1 * B		

#### N4.8 Other net GHG sequestered on YW land

<b>Input</b>	<b>Data</b>	<b>Unit</b>	<b>Source</b>
A.	GHG sequestered on YW land	t/CO2e/£	Yorkshire Water Carbon Sequestration Model
B.	Social cost of carbon (i.e. £288 in 2019 prices)	£/tCO2e	<a href="https://route2.com/news/costing-carbon">https://route2.com/news/costing-carbon</a>
<b>Physical flows</b>	<b>Calculations</b>		
1	Total sequestered emissions = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Total value each year = 1 * B		

# Human capital

## H1. Performance and Development

### H1.1 Number of employees undergoing performance reviews

Input	Data	Unit	Source
A.	Turnover costs	£/yr	See H1.5 Staff turnover (voluntary leavers)
B.	Number of employees subject to performance reviews	%	Internal data provided by Yorkshire Water
C.	Number of employees	no./yr	Yorkshire Water ARFS
D.	Average employment cost per individual	£/yr	Internal data provided by Yorkshire Water
E.	Turnover reduction due to performance reviews (i.e. 14.9%)	%	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Asplund & Blacksmith (2011) The Secret of Higher Performance
F.	Increase in productivity due to performance reviews (i.e. 7.467%)	%	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on research gathered from a variety of studies
<b>Physical flows</b>	<b>Calculations</b>		
1	Number of employees subject to performance reviews = B * C		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Avoided turnover costs = A * B * E		
3	Avoided productivity costs = B * D * F		
4	Total cost = 2 + 3		

### H1.2 Number of employees recruited through internal promotions to management positions

Input	Data	Unit	Source
A.	Number of employees recruited through internal promotions	no./yr	Internal data provided by Yorkshire Water
B.	Average salary per employee	£/yr	Internal data provided by Yorkshire Water

C.	Extra recruitment cost of an external hire (compared to an internal hire) (i.e. £4263.29 in 2012 prices)	£/hire	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Saratoga Institute (2012) US Human Capital Effectiveness Report
D.	Salary increase for an external hire (i.e. 18% salary)	%	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Bidwell (2012) The Effects of External Hiring versus Internal Mobility
E.	Cost of an external hire (in case of a 'bad hire') (i.e. £50,000 in 2013 prices)	£/hire	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Career Builder (2013) 'More Than Half of Companies in the Top Ten World Economies Have Been Affected By a Bad Hire, According to CareerBuilder Survey'
F.	Probability of a 'bad hire' (i.e. 3%)	%	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Route2 research
G.	Productivity loss of an external hire (i.e. 20.5% salary)	%	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Bliss et al. (2016) The Business Cost and Impact of Employee Turnover
<b>Physical flows</b>	<b>Calculations</b>		
1	Total employees = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Avoided recruitment costs of external hires = A * C		
3	Avoided increased salary cost of external hire = A * B * D		
4	Avoided costs of bad hires = A * E * F		
5	Avoided productivity cost of an external hire = A * B * G		
6	Total cost = 2 + 3 + 4 + 5		

### H1.3 Average length of time commuting

Input	Data	Unit	Source
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A.	Average commuting time to work, minutes	mins	<a href="https://www.tuc.org.uk/news/annual-commuting-time-21-hours-compared-decade-ago-finds-tuc">https://www.tuc.org.uk/news/annual-commuting-time-21-hours-compared-decade-ago-finds-tuc</a>
B.	Total working days per employee per year	days/yr	Internal data provided by Yorkshire Water
C.	Number of days lost to commuting for over 20 minutes (i.e. 1.5 days)	days/yr	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Route2 research
D.	Profit for the year	£/yr	Yorkshire Water ARFS
<b>Physical flows</b>	<b>Calculations</b>		
1	Average commuting time to work = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Attracted productivity loss (%) as a result of commuting > 20 minutes = C / B		
3	Total cost = 2 * D		

#### H1.4 Wage inflation / deflation (magnitude of pay above / below inflation)

Input	Data	Unit	Source
A.	Last year's employment cost per FTE	£/yr	Internal data provided by Yorkshire Water
B.	This year's employment cost per FTE	£/yr	Internal data provided by Yorkshire Water
C.	Inflation (+) or deflation (-) of economy	%	<a href="https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?name_desc=false">https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?name_desc=false</a>
D.	Total employment costs	£/yr	Yorkshire Water ARFS
<b>Physical flows</b>	<b>Calculations</b>		
1	Increase or decrease in employment cost = (B - A) / A		
2	Magnitude of pay below inflation = 1 - C		
<b>Monetary flows</b>	<b>Calculations</b>		
3	Total costs = 2 * D		

#### H1.5 Staff turnover (voluntary leavers)

Input	Data	Unit	Source
A.	Number of leavers	no./yr	Internal data provided by Yorkshire Water

B.	Percentage of leavers that were voluntary	%	Internal data provided by Yorkshire Water
C.	Average recruitment time	months	Internal data provided by Yorkshire Water
D.	Direct replacement cost (% of annual salary) (i.e. 20.5%)	%	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Bliss et al. (2016) The Business Cost and Impact of Employee Turnover
E.	Lost productivity cost (% of annual salary) (i.e. 20.5%)	%	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Bliss et al. (2016) The Business Cost and Impact of Employee Turnover
F.	Average annual employment cost per FTE	£/yr	Internal data provided by Yorkshire Water
<b>Physical flows</b>	<b>Calculations</b>		
1	Number of voluntary leavers = A * B		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Lost productivity cost (during recruitment) = (C / 12) * F * 1		
3	Lost productivity cost (new staff getting up to speed) = E * F * 1		
4	Hiring & training cost for replacement staff (direct replacement cost) = D * F * 1		
5	Total cost = 2 + 3 + 4		

## H1.6 Number of new apprenticeships each year

Input	Data	Unit	Source
A.	Number of apprentices	no./yr	Internal data provided by Yorkshire Water
B.	Total employment cost per apprentice	£/pers.	Internal data provided by Yorkshire Water
C.	Social Return on Investment (SROI) on apprenticeship programmes (i.e. 557%)	%	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Route2 research
D.	The total staff hours spend administering the apprenticeship programme	hrs/yr	Internal data provided by Yorkshire Water
E.	Total direct costs required to run the apprenticeship programme	£/yr	Internal data provided by Yorkshire Water

F.	Average hourly employment cost per employee	£/hr	Internal data provided by Yorkshire Water
<b>Physical flows</b>	<b>Calculations</b>		
1	Number of apprentices = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Total company investment in the apprenticeship programme = (D * F) + E		
3	Total investment in apprentice staff = A * B		
4	Net social return on investment = ((2 + 3) * C) - (2 + 3)		

## H2. Health, Safety, and Wellbeing

### H2.1 Lost days avoided through employee engagement

Input	Data	Unit	Source
A.	Proportion of employees classed as engaged	%	Yorkshire Water ARFS
B.	UK Benchmark of employees classified as 'engaged' (i.e. 59%)	%	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Aon Hewitt (2017) Trends in Global Employee Engagement
C.	Avoided days lost to absenteeism and presenteeism due to engagement (i.e. 7.5)	days/yr	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Willis Towers Watson (2012) Global Workforce Study
D.	Number of employees that completed the engagement survey (assumed 100%)	no./yr	Yorkshire Water ARFS
E.	Total cost of sickness absence	£/yr	See H2.5 Number of sick days
F.	Number of days lost to sickness	no./yr	See H2.5 Number of sick days
<b>Physical flows</b>	<b>Calculations</b>		
1	Are benefits provided (i.e. is engagement above average)? = IF (A > B, "Yes", "No")		
2	If benefits are provided then avoided days lost = (C * (1 - (1 - A) / (1 - B))) * D where 1 is an integer, otherwise avoided days lost = 0		

<b>Monetary flows</b>	<b>Calculations</b>
3	Total cost = (E / F) * 2

## H2.2 Spend on health / wellbeing benefit programmes

<b>Input</b>	<b>Data</b>	<b>Unit</b>	<b>Source</b>
A.	Number of staff eligible to benefit from wellbeing programmes (assumed 100%)	no./yr	Yorkshire Water ARFS
B.	Average hourly employment cost	£/hr	Internal data provided by Yorkshire Water
C.	Total direct investment in defined wellbeing programmes	£/yr	Internal data provided by Yorkshire Water
D.	Employee uptake of wellbeing programmes	%	Internal data provided by Yorkshire Water
E.	Paid hours spent per employee in wellbeing programmes	hrs/pers.	Internal data provided by Yorkshire Water
F.	Social Return on Investment (SROI) in wellbeing programmes (i.e. 150%)	%	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Rand Corp. (2014) Do Workplace Wellness Programs Save Employers money?
G.	Individual non-financial gain from a wellbeing programme (i.e. £548 in 2014 prices)	£	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on DCMS (2014) Quantifying and Valuing the Wellbeing Impacts of Culture and Sport
H.	Spending on health care programmes	£	Internal data provided by Yorkshire Water
I.	Return on investment (ROI) for health care programmes (i.e. 141%)	%	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Berry et. al. (2010) What's the hard return on employee wellness programmes?
J.	Individual non-financial gain as a percentage of the total ROI on health care programmes (i.e. 6%)	%	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Kyla (2015) Income Protection and rehabilitation – working together
<b>Physical flows</b>	<b>Calculations</b>		

1	Total hours of employee participation in defined wellbeing programmes = $A * D * E$
2	Employment cost of hours spent in defined wellbeing programmes = $1 * B$
3	Total spend = $2 + C + H$
<b>Monetary flows</b>	<b>Calculations</b>
4	Return on Investment for employee participation in wellbeing programmes = $(C + 2) * F$
5	Non-financial benefit to individual = $A * D * G$
6	Net benefit of wellbeing schemes = $(4 + 5) - (2 + C)$
7	Corporate benefit from health care programme = $(H * I) - (H * I * J)$
8	Non-financial benefit to individual of health care programme = $H * I * J$
9	Net benefit of health programme = $(7 + 8) - H$
10	Total benefits = $6 + 9$

## H2.3 Number of injuries

Input	Data	Unit	Source
A.	Number of Minor Injuries	no./yr	Internal data provided by Yorkshire Water
B.	Number of Major Injuries	no./yr	Internal data provided by Yorkshire Water
C.	Minor injury cost (i.e. £880 in 2015 prices)	£	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on UK Health and Safety Executive (2015/16)
D.	Major injury cost (i.e. £30,390 in 2015 prices)	£	As above
<b>Physical flows</b>	<b>Calculations</b>		
1	Total injuries = $A + B$		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Total costs = $(A * C) + (B * D)$		

## H2.4 Workforce extent of unpaid / underpaid overtime

Not included in this version of the accounts

## H2.5 Number of sick days

Input	Data	Unit	Source
A.	Number of days lost	no./yr	Internal data provided by Yorkshire Water
B.	Average daily employment cost per employee	£/day	Internal data provided by Yorkshire Water
C.	Medical treatment cost per minor illness (minor) (i.e. £29.58 in 2016 prices)	£	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on The Guardian (2016) How much have I cost the NHS?
D.	Medical treatment cost per Musculoskeletal problem (minor) (i.e. £2,332.22 in 2016 prices)	£	As above
E.	Medical treatment cost per 'Other' illness (minor) (i.e. £1,018.68 in 2016 prices)	£	As above
F.	Medical treatment cost per episode of Stress, depression, or anxiety (minor) (i.e. £714.95 in 2016 prices)	£	As above
G.	Medical treatment cost per episode of Gastrointestinal problem (minor) (i.e. £217.94 in 2016 prices)	£	As above
H.	Medical treatment cost per eye/ear/nose/mouth/dental problem (minor) (i.e. £374.73 in 2016 prices)	£	As above
I.	Medical treatment cost per respiratory condition (minor) (i.e. £567.03 in 2016 prices)	£	As above
J.	Medical treatment cost per headache or migraine (minor) (i.e. £493.07 in 2016 prices)	£	As above
K.	Medical treatment cost per genito-urinary problem (minor) (i.e. £798.77 in 2016 prices)	£	As above
L.	Medical treatment cost per heart, blood pressure, or circulation problem (major) (i.e. £2,524.51 in 2016 prices)	£	As above
M.	Medical treatment cost per episode of a serious mental health problem (major) (i.e. £2,056.10 in 2016 prices)	£	As above

N.	Number of sickness episodes per minor illness (minor)	no.	Internal data provided by Yorkshire Water
O.	Number of sickness episodes per Musculoskeletal problem (minor)	no.	Internal data provided by Yorkshire Water
P.	Number of sickness episodes per 'Other' illness (minor)	no.	Internal data provided by Yorkshire Water
Q.	Number of sickness episodes per episode of Stress, depression, or anxiety (minor)	no.	Internal data provided by Yorkshire Water
R.	Number of sickness episodes per episode of Gastrointestinal problem (minor)	no.	Internal data provided by Yorkshire Water
S.	Number of sickness episodes per eye/ear/nose/mouth/dental problem (minor)	no.	Internal data provided by Yorkshire Water
T.	Number of sickness episodes per respiratory condition (minor)	no.	Internal data provided by Yorkshire Water
U.	Number of sickness episodes per headache or migraine (minor)	no.	Internal data provided by Yorkshire Water
V.	Number of sickness episodes per genito-urinary problem (minor)	no.	Internal data provided by Yorkshire Water
W.	Number of sickness episodes per heart, blood pressure, or circulation problem (major)	no.	Internal data provided by Yorkshire Water
X.	Number of sickness episodes per episode of a serious mental health problem (major)	no.	Internal data provided by Yorkshire Water
Y.	Individual Non-Financial Cost (minor illness) (i.e. £320.00 in 2015 prices)	£	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on UK Health and Safety Executive (2015/16)
Z.	Individual Non-Financial Cost (major illness) (i.e. £19,400.00 in 2015 prices)	£	As above
AA.	Individual Financial Cost (minor illness) (i.e. £90.00 in 2015 prices)	£	As above
AB.	Individual Financial Cost (major illness) (i.e. £710.00 in 2015 prices)	£	As above
<b>Physical flows</b>	<b>Calculations</b>		
1	Total sickness days = A		
<b>Monetary flows</b>	<b>Calculations</b>		

2	Number of minor sickness episodes = $SUM(N:V)$
3	Number of major sickness episodes = $SUM(W:X)$
4	Cost of lost days productivity = $1 * B$
5	Individual non-financial costs of a minor illness = $2 * Y$
6	Individual non-financial costs of a major illness = $3 * Z$
7	Individual financial costs of a minor illness = $2 * AA$
8	Individual financial costs of a major illness = $3 * AB$
9	Government cost of treatment = $SUMPRODUCT(C:M, N:X)$
10	Total cost = $4 + 5 + 6 + 7 + 8 + 9$

### H3. Diversity and Inclusion

#### H3.1 Gender pay gap (mean hourly rate)

Input	Data	Unit	Source
A.	Average salary per employee	no./yr	Internal data provided by Yorkshire Water
B.	Gender pay gap (mean hourly rate)	%	Yorkshire Water ARFS
C.	Number of female employees	no./yr	Yorkshire Water ARFS
<b>Physical flows</b>	<b>Calculations</b>		
1	Pay gap = B		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Total cost = $IF((A * B * C) > 0, 0, A * B * C)$		

#### H3.2 BAME pay gap (mean hourly rate)

Input	Data	Unit	Source
A.	Average salary per employee	no./yr	Internal data provided by Yorkshire Water
B.	BAME pay gap (mean hourly rate)	%	Yorkshire Water ARFS
C.	Number of BAME employees	no./yr	Yorkshire Water ARFS
<b>Physical flows</b>	<b>Calculations</b>		
1	Pay gap = B		
<b>Monetary flows</b>	<b>Calculations</b>		

2	Total cost = IF((A * B * C) > 0, 0, A * B * C))
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### **H3.3 LGBTQ pay gap (mean hourly rate)**

Not included in this version of the accounts.

### **H3.4 Disability pay gap (mean hourly rate)**

Not included in this version of the accounts.

# Intellectual capital

## II. Research and Development

### II.1 Total spend on R&D

Input	Data	Unit	Source
A.	Direct spend on research & development (R&D) activities	£/yr	Internal data provided by Yorkshire Water
B.	ROI for R&D	%	Internal data provided by Yorkshire Water
<b>Physical flows</b>	<b>Calculations</b>		
1	Total spend = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Net ROI = (A * B) - A		

## II.2 Knowledge and Learning

### II.2.1 Total employee hours spent on training

Input	Data	Unit	Source
A.	Diversity programmes - direct spend	£/yr	Internal data provided by Yorkshire Water
B.	Efficiency skills - direct spend	£/yr	Internal data provided by Yorkshire Water
C.	Health and safety - direct spend	£/yr	Internal data provided by Yorkshire Water
D.	New employee - direct spend	£/yr	Internal data provided by Yorkshire Water
E.	Professional skills - direct spend	£/yr	Internal data provided by Yorkshire Water
F.	Soft skills - direct spend	£/yr	Internal data provided by Yorkshire Water
G.	Leadership skills - direct spend	£/yr	Internal data provided by Yorkshire Water
H.	Diversity programmes - total hours	hr/yr	Internal data provided by Yorkshire Water
I.	Efficiency skills - total hours	hr/yr	Internal data provided by Yorkshire Water
J.	Health and safety - total hours	hr/yr	Internal data provided by Yorkshire Water

K.	New employee - total hours	hr/yr	Internal data provided by Yorkshire Water
L.	Professional skills - total hours	hr/yr	Internal data provided by Yorkshire Water
M.	Soft skills - total hours	hr/yr	Internal data provided by Yorkshire Water
N.	Leadership skills - total hours	hr/yr	Internal data provided by Yorkshire Water
O.	Average hourly employment cost per member of staff	£/hr	Internal data provided by Yorkshire Water
P.	Diversity programmes - ROI (i.e. 283%)	%	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations - based on Route2 research
Q.	Efficiency skills - ROI (i.e. 314%)	%	As above
R.	Health and safety - ROI (i.e. 396%)	%	As above
S.	New employee - ROI (i.e. 324%)	%	As above
T.	Professional skills - ROI (i.e. 375%)	%	As above
U.	Soft skills - ROI (i.e.128%)	%	As above
V.	Leadership skills - ROI (i.e. 397%)	%	As above
<b>Physical flows</b>	<b>Calculations</b>		
1	Total hours spent in training programmes = SUM(H:N)		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Employment costs = O * SUM(H:N)		
3	Total investment = 2 + SUM(A:G)		
4	Net ROI = (3 * SUM(P:V)) - 3		

## I2.2 Number of computers

Not included in this version of the accounts.

## I2.3 Knowledge decay rate

Not included in this version of the accounts.

## 12.4 Number of participants in educational programmes

Input	Data	Unit	Source
A.	Number of educational visits	no./yr	Internal data provided by Yorkshire Water
B.	Value per visit (i.e. £21.03 in 2010 prices)	£	Defra ENCA workbook
<b>Physical flows</b>	<b>Calculations</b>		
1	Total visits = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Total value = A * B		

## 13. Processes and Efficiency

### 13.1 Total spend on software

Data on total spend provided by Yorkshire Water, impact of this spend not included in this version of the accounts.

### 13.2 Total spend on hardware

Data on total spend provided by Yorkshire Water, impact of this spend not included in this version of the accounts.

### 13.3 Total spend on remote sensors

Data on total spend provided by Yorkshire Water, impact of this spend not included in this version of the accounts.

### 13.4 Total spend on process management

Data on total spend provided by Yorkshire Water, impact of this spend not included in this version of the accounts.

### **13.5 Total spend on transformation**

Data on total spend provided by Yorkshire Water, impact of this spend not included in this version of the accounts.

# Social capital

## S1. Trust

### S1.1 Late payments to suppliers

Input	Data	Unit	Source
A.	Number of late payments to suppliers	no./yr	Internal data provided by Yorkshire Water
B.	Amount of payment per individual invoice	£	Internal data provided by Yorkshire Water
C.	Interest rate on late commercial payments (i.e. 8% + Bank of England base rate)	%	Yorkshire Water (2018) TIVA - Methodology Report - based on Gov.uk: Interest on late commercial payments and Bank of England Statistical Interactive Database - official Bank Rate history
D.	Number of days per year	no.	-
E.	Number of days late per individual invoice	no.	Internal data provided by Yorkshire Water
<b>Physical flows</b>	<b>Calculations</b>		
1	Total late payments = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Cost per day each payment is late = $(B * C) / D$		
3	Total cost = $2 * E$ (summed across all invoices)		

### S1.2 Early payments to suppliers

Input	Data	Unit	Source
A.	Number of early payments to suppliers	no./yr	Internal data provided by Yorkshire Water
B.	Amount of payment per individual invoice	£	Internal data provided by Yorkshire Water
C.	Interest rate on late commercial payments (i.e. 8% + Bank of England base rate)	%	Yorkshire Water (2018) TIVA - Methodology Report - based on Gov.uk: Interest on late commercial payments and Bank of England Statistical Interactive Database - official Bank Rate history
D.	Number of days per year	no.	-

E.	Number of days late per individual invoice	no.	Internal data provided by Yorkshire Water
<b>Physical flows</b>	<b>Calculations</b>		
1	Total early payments = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Avoided cost per day each payment is early = $(B * C) / D$		
3	Total avoided cost = $2 * E$ (summed across all invoices)		

### S1.3 Customer trust in YW

Not included in this version of the accounts.

## S2. Health and Wellbeing

### S2.1 Health benefits of providing a public water supply compared to a private supply

Input	Data	Unit	Source
A.	Total number of households provided with water by YW	hh/yr	Yorkshire Water APR
B.	Average household size Yorkshire (i.e. 2.3)	no./hh	<a href="http://www.statista.com/statistics/295548/households-in-england-uk-average-size-by-region/">www.statista.com/statistics/295548/households-in-england-uk-average-size-by-region/</a>
C.	Likelihood of waterborne illness per person using a private water supply (i.e. 0.18%)	%	Smith et al. (2006) 'Outbreaks of waterborne infectious intestinal disease'
D.	Likelihood of waterborne illness per person using a public water supply (i.e. 0.0053%)	%	Smith et al. (2006) 'Outbreaks of waterborne infectious intestinal disease'
E.	QALYs lost per case of Cryptosporidium	QALYs	eftec (2017) 'Estimating Quality Adjusted Life Years and Willingness to Pay Values for Microbiological Foodborne Disease (Phase 2)'
F.	Monetary value of QALY (i.e. £25,000 assumed constant across price years)	£	NICE (2013) 'How NICE measures value for money in relation to public health interventions'
<b>Physical flows</b>	<b>Calculations</b>		
1	Total number of people provided with water by Yorkshire Water = $A * B$		
2	Total number of illnesses avoided by Yorkshire Water supply = $(1 * C) - (1 * D)$		
3	Total number of lost QALYs avoided by Yorkshire Water supply = $2 * E$		

Monetary flows	Calculations
4	Total value = 3 * F

## S2.2 Health benefits of recreational exercise on YW sites

Input	Data	Unit	Source
A.	Health benefits of recreational exercise on YW sites	QALYs	Yorkshire Water Little Don Capitals Valuation Tool drawing on data on visitor numbers from ORVal tool, internal data from Yorkshire Water on visitor profiles, White et al. (2016) Recreational Physical Activity in Natural Environments and Implications for Health: A Population Based Cross-Sectional Study in England, and Natural England (2017) Monitor of Engagement with the Natural Environment, and Forestry Commission Key Performance Indicators (2021).
B.	Monetary value of QALY (i.e. £25,000 assumed constant across price years)	£	NICE (2013) 'How NICE measures value for money in relation to public health interventions'
Physical flows	Calculations		
1	Total benefits = A		
Monetary flows	Calculations		
2	Total value = A * B		

## S2.3 Volunteering time provided

Input	Data	Unit	Source
A.	Number of employee Volunteer Programme hours undertaken	hrs/yr	Internal data provided by Yorkshire Water
B.	Number of employee participants	no./yr	Internal data provided by Yorkshire Water
C.	Employee Volunteer Benefit hours threshold (i.e. 100)	hrs/yr	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Corporation for National & Community Service (2007) The Health Benefits of Volunteering
D.	Health benefits for employees that volunteer (i.e. £3,313 in 2014 prices)	£	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Bank of England (2014) In giving, how much do we receive? The social value of volunteering
E.	Average employment cost per hour per employee	£/hr	Internal data provided by Yorkshire Water
F.	Monetary investment in volunteering programmes	£/yr	Internal data provided by Yorkshire Water

G.	Employee volunteer programme Return On Investment (ROI) (i.e. 412%)	%	Yorkshire Water (2017) Human & Intellectual Capital Flow Indicator Descriptions & Calculations – based on Octavia Foundation (2011) Placing a value on work. A social return on investment report
<b>Physical flows</b>		<b>Calculations</b>	
1	Total volunteering time = A		
<b>Monetary flows</b>		<b>Calculations</b>	
2	Volunteering time per employee = A / B		
3	Volunteering benefit factor = 2 / C		
4	Benefit to individual volunteers = B * 3 * D		
5	Employment cost of employee volunteer programme hours undertaken = E * 1		
6	Total cost of volunteering employment = 5 + F		
7	Total net value to wider society of volunteering = (6 * G) - 6		
8	Total value of volunteering = 4 + 7		

## S2.4 Amount raised for WaterAid

Input	Data	Unit	Source
A.	Amount raised for WaterAid	£/yr	Internal data provided by Yorkshire Water
B.	Amount leveraged per £ invested	£/£	Internal data provided by WaterAid
<b>Physical flows</b>		<b>Calculations</b>	
1	Total amount raised = A		
<b>Monetary flows</b>		<b>Calculations</b>	
2	Total value of amount raised = A * B		

## S3. Quality of Service

### S3.1 Total amount of water delivered to customers

Input	Data	Unit	Source
A.	Total potable water delivered	Ml/yr	Yorkshire Water APR
<b>Physical flows</b>		<b>Calculations</b>	
1	Total water delivered = A		
<b>Monetary flows</b>		<b>Calculations</b>	

2	Not included in this version of the accounts
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### S3.2 Drinking water contacts

Input	Data	Unit	Source
A.	Total water contacts	no/yr	Yorkshire Water APR
<b>Physical flows</b>	<b>Calculations</b>		
1	Total contacts = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Not included in this version of the accounts		

### S3.3 Internal flooding incidents

Input	Data	Unit	Source
A.	Total internal flooding incidents	no/yr	Yorkshire Water APR
<b>Physical flows</b>	<b>Calculations</b>		
1	Total incidents = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Not included in this version of the accounts		

### S3.4 External flooding incidents

Input	Data	Unit	Source
A.	Total external flooding incidents	no/yr	Yorkshire Water APR
<b>Physical flows</b>	<b>Calculations</b>		
1	Total incidents = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Not included in this version of the accounts		

### S3.5 Significant water supply events (>12 hours)

Not included in this version of the accounts.

### S3.6 Number of properties below the low-pressure threshold

Not included in this version of the accounts.

## S4. Vulnerability

### S4.1 Number of customers YW provide financial support to

Input	Data	Unit	Source
A.	Number of household customers supported by customer payment schemes	no./yr	Internal data provided by Yorkshire Water
B.	Prop. of general pop. suffering from mental health issues (neurotic disorders) and in debt (i.e. 32.5%)	%	Jenkins et al. (2008) 'Mental disorder in people with debt in the general population'
C.	Prop. of general pop. suffering from mental health issues (neurotic disorders) not in debt (14.2%)	%	Jenkins et al. (2008) 'Mental disorder in people with debt in the general population'
D.	Monetary equivalent of annual costs associated with depression and anxiety per individual (i.e. £44,237 in 2014 prices)	£	UK Council for Psychotherapy (2014) 'Valuing mental health: how a subjective wellbeing approach can show just how much it matters'
E.	Average weekly water bill for YW customers	£/wk	Internal data provided by Yorkshire Water
F.	Average weekly household expenditure for general population	£/wk	ONS (2019) 'Family spending in the UK: April 2017 to March 2018'
<b>Physical flows</b>	<b>Calculations</b>		
1	Total customers supported = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Prop. of general pop. suffering from mental health issues (neurotic disorders) due to debt = B - C		
3	Number of YW customers supported that are suffering from mental health issues due to debt = 1 * 2		
4	Total cost of mental health issues related to debt for YW customers supported by schemes = 3 * D		
5	Contribution of water bills to customers debt = E / F		

6	Reduction in costs of mental health issues related to debt for YW customers supported by schemes = 4 * 5
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#### S4.2 Number of customers at risk that YW provide specialist support to

Input	Data	Unit	Source
A.	Number of customers at risk that YW provide specialist support to	no./yr	Internal data provided by Yorkshire Water
<b>Physical flows</b>	<b>Calculations</b>		
1	Total customers supported = A		
<b>Monetary flows</b>	<b>Calculations</b>		
2	Not included in this version of the accounts		

# Assurance

## Overview

In order to verify and review the data and methodologies used in the development of the Our Contribution model, DNV were asked to assure the approach. The assurance process involved a review and verification of the following five metrics:

- Manufactured capital: Total waste produced (t/yr)
- Natural capital: Number of farm tenancies (no.)
- Social capital: Total number of suppliers (no.)
- Human capital: Number of new apprentices each year (no./yr)
- Intellectual capital: Number of participants in education programmes (no./yr)

Definitions and methodologies for calculating each of these metrics are provided in the following section. DNV's independent assurance report can be found at [www.yorkshirewater.com/capitals](http://www.yorkshirewater.com/capitals).

## Metrics

### Total waste produced (t/yr)

Overall confidence rating: **Low**

This metric is defined as the total amount of waste (tonnes) generated by Yorkshire Water each year. It includes office and administrative waste, grit, screenings and general wastes from wastewater treatment, sludge produced in raw water treatment, construction wastes and excavated materials, and digestates from the wastewater treatment process.

Each of these waste streams has an internal reporting procedure that is maintained by data providers across the business. Full details of the overall reporting methodology and references to waste stream-specific reporting methodologies are provided in the 'Annual Performance Reporting Procedure 2020: Waste Diverted from Landfill' document held by Yorkshire Water's Regulation team.

The following table provides a summary of each waste stream contributing to this metric.

<b>Waste Stream</b>	<b>Definition</b>	<b>Data source</b>	<b>Confidence rating</b>	<b>Methodology</b>
Grits	Grit, sand, and silt removed at the headworks of wastewater treatment plants	Waste management contract partner	High	Monthly email reporting of waste transfer/consignment notes by waste contract partner, checked and collated internally onto master spreadsheet. Total mass (tonnes) calculated at financial year-end.
Screenings	Objects such as rags, paper, plastics, and metals removed by filters at the intakes to wastewater treatment plants	Waste management contract partner	High	Monthly email reporting of waste transfer/consignment notes by waste contract partner, checked and collated internally onto master spreadsheet. Total mass (tonnes) calculated at financial year-end.
Operational site skips	General site waste material, including recyclable material	Waste management contract partner	High	Monthly email reporting of waste transfer/consignment notes by waste contract partner, checked and collated internally onto master spreadsheet. Total mass (tonnes) calculated at financial year-end.
Office waste	General office waste, including recyclable material but excluding IT waste	Waste management contract partner	High	Monthly email reporting of waste transfer/consignment notes by waste contract partner, checked and collated internally onto master spreadsheet. Total mass (tonnes) calculated at financial year-end.
Scrap metal	Scrap metal generated at Yorkshire Water's central logistics centre	Scrap metal recycling contract partner	High	Monthly email reporting of individual skip loads by scrap metal recycling contract partner, checked and collated internally onto master spreadsheet
Digestate	Outputs from the sewage treatment process, including treated conditioned sewage sludge, digestate, and materials to reclamation	Digestate management contract partner	High	Monthly email reporting of waste transfer notes, goods received notes, the weight of the waste, details of the final disposal site, and farmer delivery notifications. Information processed using internal biosolids reporting system and reported onto master spreadsheet. Total

				mass (tonnes) calculated at financial year-end.
Clean water sludges	By-products from the drinking water treatment process, including settled solids and chemicals used for coagulation and flocculation	Internal process data; sludge logistics contract partners	Low	Monthly volumes of sludge to sewer at water treatment works estimated from flowmeter data stored on internal ROD database. Assumptions are made in the case of missing data (e.g., due to malfunctioning flowmeters). For disposals to landfill and tankered sludges, monthly contractor invoices received with details of vehicle load cells. Data collated internally onto master spreadsheet. Total mass (tonnes) calculated at financial year-end.
Asset management	Excavated material, construction and demolition waste generated through previous Tier 1 asset management delivery partners	Asset management delivery partners	Medium	Monthly email reporting of waste by each asset management delivery partners, checked and collated internally onto master spreadsheet. Total mass (tonnes) calculated at financial year-end.
Repair and maintenance	Waste generated by water and wastewater repair and maintenance partners, of which most is excavated material	Repair and maintenance contract partners	Medium	Monthly input of waste data by contract partners to data entry spreadsheet held on Yorkshire Water system. Data checked and collated internally onto master spreadsheet. Total mass (tonnes) calculated at financial year-end.

### Number of farm tenancies (no.)

Overall confidence rating: **High**

This metric is defined as the total number of farm tenancies recorded on land owned by Yorkshire Water for the reporting year. The figure provided for this metric is derived from an internal database within Yorkshire Water that stores details on farm tenancies across Yorkshire Water owned land and is calculated as follows:

1. Run 'RID Extract' report from the Rental Information Database stored on Lotus Notes
2. Filter by Farm Business Tenancies, Agricultural Holdings Act tenancies, horse agreements and seasonal grazing licences
3. Filter by live-only agreements

### **Total number of suppliers (no.)**

Overall confidence rating: **High**

This metric is defined as the total number of suppliers that have invoiced Yorkshire Water and that have been paid within each financial year (not including one-time suppliers). The data is sourced from SAP S/4HANA, Yorkshire Water's enterprise resource planning system, which provides records of all invoices paid out from the organisation. All miscellaneous payments that were not attributable to a particular supplier on the database were excluded from the estimates. The metric is calculated as follows:

1. Run invoice line-item report (FBLIN) on SAP S/4HANA
2. Filter by Yorkshire Water company code to exclude other Kelda Group companies
3. Filter by date: 01/04/2020 – 31/03/2021
4. Remove postings, and only focus on payments out
5. Count unique suppliers

### **Number of new apprentices each year (no./yr)**

Overall confidence rating: **High**

This metric is defined as the number of new apprentices taken on each year by Yorkshire Water that were recruited externally via a formal recruitment process. The figures provided for this metric are derived from an apprentice reporting process within Yorkshire Water that provides a record of the number of new external recruits each year. It is important to note that these figures are different to the numbers of apprentices recorded in the Yorkshire Water ARFS which also include apprenticeships started by internal staff.

## **Number of participants in education programmes (no./yr)**

Overall confidence rating: **High**

This metric is defined as the total number of individuals recorded as participating in educational programmes run by Yorkshire Water each year. The figures provided for this metric are derived from an internal educational reporting process within Yorkshire Water using the Thrive CSR system. This system records the exact numbers of booking enquiries made via an online form located on the Yorkshire Water website [here](#). Each enquiry is reviewed, and the system records all bookings that are subsequently confirmed. Details on participant numbers are estimated at this stage and subsequently updated once each session has been delivered to provide a record of the total participants in educational programmes each year. Note this metric is reported as total participants per year and differs from Yorkshire Water's Education performance commitment, which is measured in hours per year and reported in the Annual Performance Report.

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