

Tapping into growth
Economic impact of the water
and sewerage sector in the UK



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Foreword

Pamela Taylor, Chief Executive, Water UK



Pamela Taylor
Chief Executive
Water UK

Water is critical for our own personal health and well-being and for a growing economy; it is an essential resource required to ensure a prosperous society.

Our industrial and service sectors depend, and can rely, on a continuous supply. We receive the very best quality water every time we open our taps in our homes. This is because the UK's water industry has continued to invest billions each year and will continue to do so in the future.

But as well as enabling the success of others, the UK's water and sewerage sector also makes its own extremely important contributions to the UK's economy and society. The benefits of this investment also go well beyond the stable return to investors. Water companies provide a wide range of services and benefits to their customers and support their regions in many other ways that you may not have realised.

This report, written for Water UK by Deloitte LLP, sets out the overall picture of the value that water companies provide as an industry.

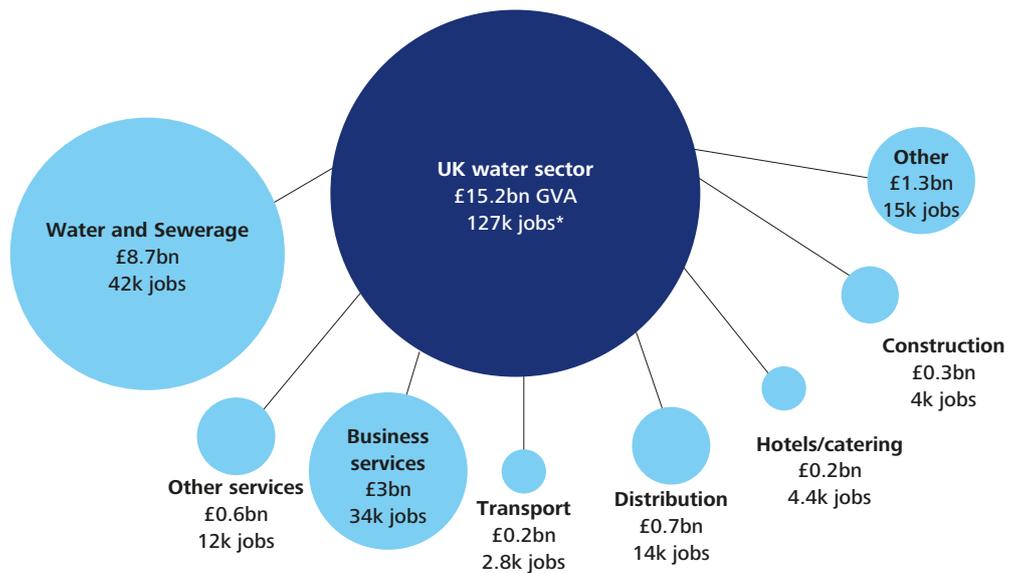
We receive the very best quality water every time we open our taps in our homes. This is because the UK's water industry has continued to invest billions each year and will continue to do so in the future.

Executive Summary

The water and sewerage companies create significant economic benefits for the UK

The total economic impact¹ of the UK water and sewerage sector in 2012/13 is estimated to be £15.2 billion, of which £8 billion was created directly within the sector, with the remainder flowing to other sectors of the economy. This activity supported 127,000 jobs, equivalent to around half the population of Southampton.

Figure 1. UK water and sewerage sector economic impact: GVA and employment

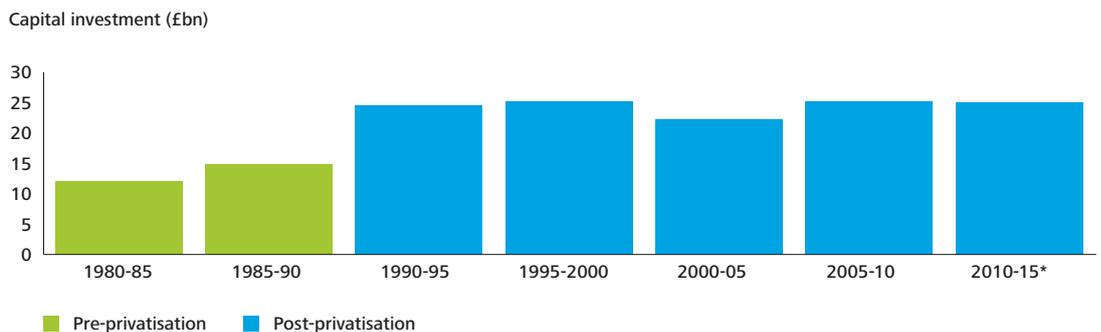


Source: Deloitte analysis
 * Jobs figure is measured as full-time equivalents

Delivery of water and sewerage services is supported by an extensive network and infrastructure requiring substantial ongoing investment

The water and sewerage asset infrastructure is maintained, upgraded and expanded through continuous and extensive investment by companies. Since privatisation, the water industry has been investing over £4 billion per annum, almost double the levels seen in the 1980s. Over the past 15 years, this investment has increased by over 12% in real terms and is expected to continue at over £25 billion (2012/13 prices) in the current 2010 to 2015 price control period.

Figure 2. Water sector capital investment, England & Wales



¹ Defined as Gross Economic Value ("GVA") – a measure of the contribution of individual producers or industries to the economy and broadly corresponding to the Gross Domestic Product ("GDP") measure.

Source: Ofwat and Water UK. Values are in 2012-13 prices
 *Allowed capex for 2010-15 as per Ofwat's Final Determinations (around £2 billion lower than companies' business plans)

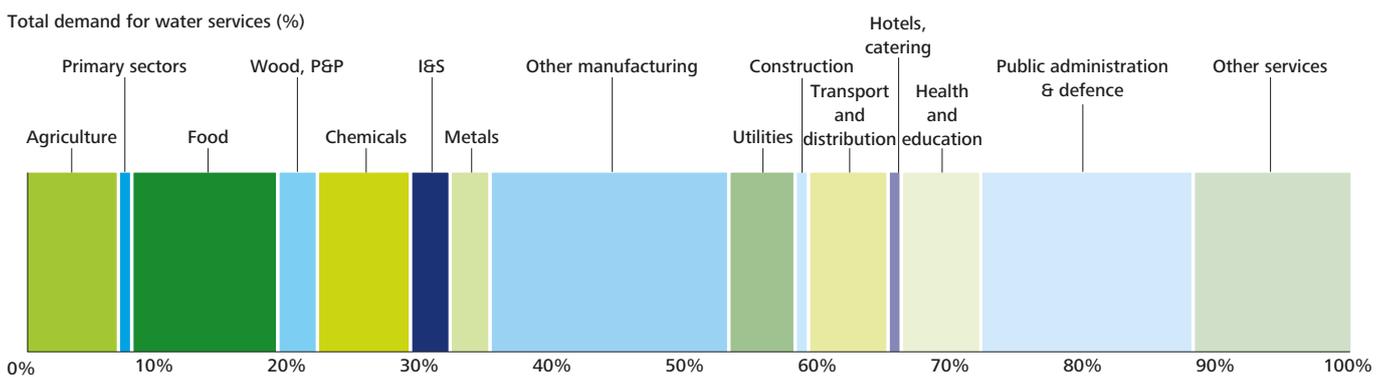
Businesses and domestic customers benefit from high-quality water and sewerage services

Drinking water quality has continued to improve and standards are among the very highest in the world. Over 99.8% of drinking water tested complies with the relevant EU regulations. This compares well with other EU countries; a report published in December 2011² stated that the UK was one of only 10 EU member states that complied with the EU water quality directives in the three groups of parameters tested.

A litre of tap water costs only 0.24 pence to supply to and take away from customers. In July 2012, Deloitte and Ipsos MORI undertook a survey of 1,000 customers on their perceptions of water services, with over 80% of respondents stating that their water and sewerage services provided reasonable or good value for money.

Non-domestic customers across all economic sectors benefit from the supply of clean and safe water. Total spending on water supply services by sector is shown in Figure 3, with the largest spending in sectors including public administration and defence, food and various manufacturing.

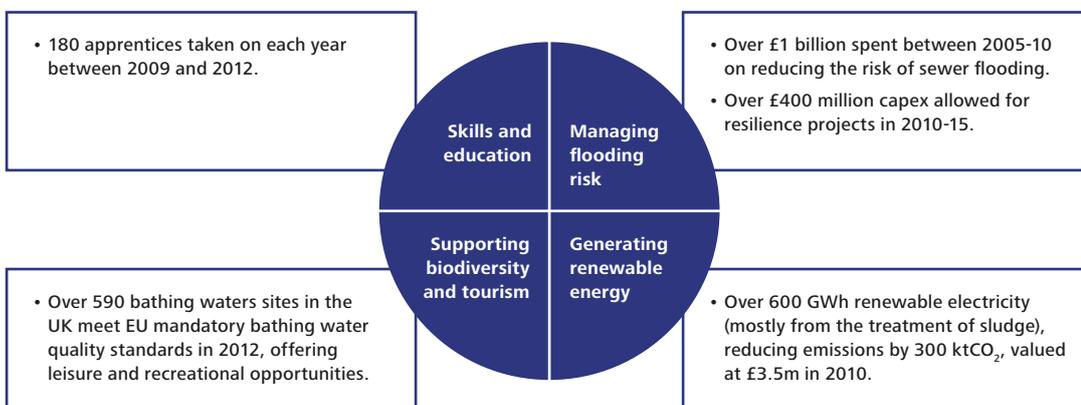
Figure 3. Spending by non-domestic customers on water supply services



Source: UK Input-Output tables, 2005

There are also wider benefits from the sector across the community and UK economy

Companies active in the UK water and sewerage sector benefit the economy beyond the provision of their services, creating extra value to the local communities and the UK economy in addition to the estimates presented above.



² KWR (2011) The quality of drinking water in the European Union 2005-2007, page 9.

1. Introduction

1.1 Context of this report

The water industry in the UK plays a key role in delivering clean and safe drinking water for homes and businesses to over 63 million people.³ In addition, 12 companies in the UK collect, treat and dispose of wastewater, investing to ensure that this is done safely and is compliant with relevant environmental legislation. Together, the water only and the water and sewerage companies (together referred to as ‘the water and sewerage companies’⁴) provide an essential service to the UK as a whole.

The benefits of the water sector to the UK are wider than the direct spending by the water and sewerage companies on its employee wages, on paying taxes and the profits generated in a given year (the ‘direct effects’). The economic impacts are felt beyond the water and sewerage companies through:

- indirect effects which covers the value created in the associated supply chain industries resulting from the supply of inputs to the water and water and sewerage companies (this includes for example water industry suppliers in the manufacturing or construction sectors);
- induced effects from the value created from spending in the overall economy as a result of the direct and indirect effects from the generated economic activity of the water and sewerage companies and associated industries (this includes for example water sector employees spending their wages on food, housing or retail); and
- spillover effects, which capture the broader economic activities and benefits to be generated in the UK economy (this includes for example the industry’s contribution to reducing UK carbon footprint or improvement in skills and employability by offering apprenticeships).

Water UK has commissioned Deloitte to assess the economic impact of the water industry on the UK economy with the aim of developing a better understanding of the industry’s impact on the UK economy as a whole. This report summarises the results of the economic impact analysis of the water industry for financial year 2012/13 by aggregating the economic impact of individual UK water and sewerage companies on the economy.

The focus of the analysis in this report is a detailed examination of the Gross Value Added (“GVA”) and employment arising from the activities involved in the UK based supply chain for the water industry in the UK. An economic impact assessment framework adapted for this specific sector is implemented to determine the direct and indirect effects of spending in the water sector, as well as the wider induced impacts of such spending on the overall economy. In addition, some of the spillover benefits of the UK water industry are considered in a qualitative way through the use of company case studies.

1.2 The water industry in the UK

The various water and sewerage companies operating in the UK provide two main services to domestic and commercial customers.

- Collecting, treating and supplying clean drinking water to customers – around 17 billion litres of water are supplied each day of the year.
- Collecting wastewater and sewage from customers and treating it to a standard that allows it to be safely returned to rivers and the sea – over 16 billion litres of wastewater and sewage are treated every day.

The following subsections provide a more detailed description of the activities undertaken in providing these services to customers, together with a description of the current structure of the water sector.



³ Office for National Statistics mid-2012 estimate for the total UK population is 63.7 million; <http://www.ons.gov.uk/ons/taxonomy/index.html?nscl=Population>

⁴ The water and sewerage sector in the UK includes water only companies and water and sewerage companies. Throughout this report, references to ‘water and sewerage companies’ cover both water only and water and sewerage companies.

1.2.1 Water industry activities

There are a number of steps companies undertake to deliver water and sewerage services to their customers, as set out in Table 1 (water) and Table 2 (sewerage).

Table 1. Key stages of delivering clean drinking water to customers



Key steps	Description
Collecting and storing water	<ul style="list-style-type: none"> Water is collected by pumping it from rivers and ground water sources. This raw water is then pumped to water treatment plants. In some cases, water may be stored in large reservoirs before being treated – this also helps with the treatment process as heavier particles sink to the bottom of the reservoir. The amount of water that can be pumped out of rivers and underground sources by each company is limited.
Initial treatment: screening and removing particles	<ul style="list-style-type: none"> The initial phase of treatment involves passing water through a screen to capture any debris (such as leaves). The water then goes through additional filters (for example, using coarse and fine sand, or other additional treatments) to remove invisible particles.
Final water treatment	<ul style="list-style-type: none"> The final treatment for water involves killing any remaining bacteria or organisms by adding a small amount of chlorine to the water – this keeps the water safe as it is distributed to customers. Water is tested at each stage of the process, with millions of tests being carried out by water companies each year.
Water distribution to customers	<ul style="list-style-type: none"> Using a water distribution network of pumping stations and over 415,000km of pipes, clean drinking water is supplied to customers.



Table 2. Key stages of treating wastewater and sewage from customers



Key steps	Description
Collecting wastewater and sewage	<ul style="list-style-type: none"> Wastewater from households and commercial customers is collected through an extensive network of sewers (over 390,000km in length) to one of over 9,000 sewage treatment works in the UK.
Screening	<ul style="list-style-type: none"> The wastewater cleaning process starts by removing large objects before further stages of treatment; this includes large amounts of grit that is washed into the sewers but also items that should not have been put down the drain (e.g. face wipes).
Treatment processes	<ul style="list-style-type: none"> Before safely disposing of the wastewater into rivers, a number of stages of treatment need to be completed: <ul style="list-style-type: none"> – Primary treatment: this separates organic solid matter from water by using large settlement tanks, with the settled solids referred to as 'sludge'. – Secondary treatment: this involves processing the water taken from the primary treatment to remove smaller particles and harmful organisms using bacteria to breakdown these elements. – Final treatment: the water from the secondary treatment is then put into another settlement tank to separate the remaining particles and bacteria, with the settled sludge being treated further. – Filtering: the treated water from the final treatment is then filtered through a bed of sand to capture any remaining particles.
Sludge treatment	<ul style="list-style-type: none"> The sludge pumped out of the tank in the primary treatment process is recycled and used as a fertiliser by farmers or can be used to generate energy.
Treated wastewater returned to the river	<ul style="list-style-type: none"> The cleaned wastewater from the treatment process is returned to local rivers, streams or the sea. The Environment Agency regulates the quality of the treated wastewater that is returned to rivers, which is monitored through testing to ensure it meets the required quality standards.



To conduct these activities, water and sewerage companies employ trained and skilled staff and incur costs at each step of the process to ensure that the services are available 24 hours a day, seven days a week. This includes maintaining and continuously investing in the equipment at treatment works, pumping stations, repairing pipes and sewer networks to meet increasing demand for services as the population grows.

In addition, water and sewerage companies also undertake retail related activities such as answering customer queries, managing vulnerable customer schemes, billing, handling payments, meter reading and managing the process for new connections.

Case Study 1 – Helping vulnerable customers – Yorkshire Water

A Helping Hand for Yorkshire's customers

Water and sewerage companies are committed to providing the very best service to their customers and overall complaints have been continuously falling over the past 5 years.

Yorkshire Water provides a range of special services for vulnerable customers, such as the elderly, the less-able, or those with sight or hearing difficulties.

There are now more than 6,500 customers on the company's Helping Hands Register, which provides assistance with reading bills, meter-reading and the provision of emergency alternative water supplies in the event of a major incident.

Like all the water and sewerage companies, Yorkshire Water operates a range of schemes to help customers facing genuine financial hardship.

Through its Resolve Scheme, for example, qualifying customers who commit to make regular monthly payments over a 12-month period are rewarded by the company clearing some of their arrears – the intention is to help people clear their debts and become full, bill-paying customers in the future.

The company also operates a charitable trust which hard-up customers can apply to for financial help.



Taken from: Infrastructure North, <http://infrastructurenorth.co.uk/>, Consumer Council for Water

In England and Wales the Water Services Regulatory Authority (Ofwat) has the duty to protect customers' interests while ensuring that the water companies finance and carry out their functions properly.



1.2.2 Water sector structure

The water sector in the UK is made up of 12 water and sewerage companies ('WaSCs') and 10 water only companies ('WoCs').⁵ There are also other appointed businesses and companies with water supply licences which are not included in these totals. However, the ownership structure and regulatory framework differs by region.

- England and Wales. Following privatisation of the sector in 1989, the majority of the water sector companies operating in England and Wales are privately owned, with the exception of Dwr Cymru (Welsh Water) which is a not-for-dividend company. Currently, customers in England with a consumption of more than 5 megalitres (50 megalitres in Wales) are free to choose their water supplier.
- Scotland. There is a single publicly owned water and sewerage company in Scotland ('Scottish Water') answerable to the Scottish Parliament. From 1 April 2008, all public sector, non-profit and business customers in Scotland were free to choose the supplier of their water and sewerage services from among the water only and water and sewerage companies. In September 2013, 11 companies held a water and/or sewerage service licence in Scotland.
- Northern Ireland. Water and sewerage services are provided by Northern Ireland Water, which was set-up as a government owned company ('GoCo') in April 2007.

Public water services are monitored and controlled by government-appointed regulators who set legally-binding standards and report each year on progress. Regulation is focused in four main areas: finance and economics; environmental impact; drinking water quality; and health and safety.

In England and Wales the Water Services Regulatory Authority (Ofwat) has the duty to protect customers' interests while ensuring that the water companies finance and carry out their functions properly.

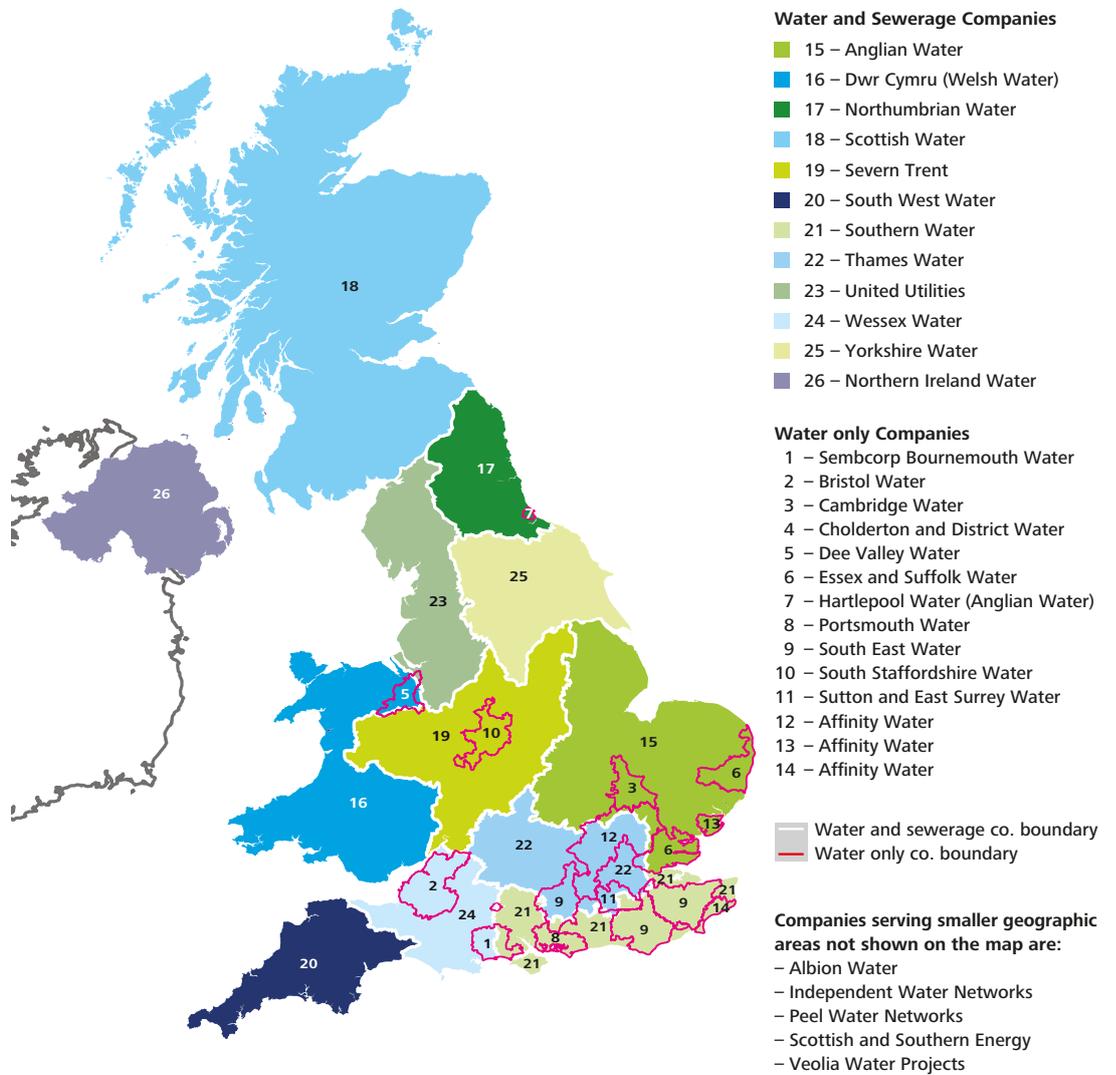
Ofwat also sets water prices for companies in England and Wales. For Scottish Water, this duty lies with the Water Industry Commission for Scotland ("WICS"). In Northern Ireland, the Utility Regulator has this role.

The water industry depends upon the natural environment in order to provide water and recycle wastewater. In Northern Ireland environmental impact is regulated by the Northern Ireland Environment Agency (NIEA), in Scotland via the Scottish Environment Protection Agency (SEPA), in England by the Environment Agency and Natural England and in Wales by Natural Resources Wales.

As well as the many thousands of tests for drinking water quality carried out by water companies themselves, supplies are continually monitored to EU and UK standards – by the Drinking Water Inspectorate within the Northern Ireland Environment Agency, the Drinking Water Quality Regulator in Scotland and the Drinking Water Inspectorate in England and Wales. There are other organisations that represent consumers including Consumer Council for Water (England and Wales), Consumer Futures (Scotland) and the Consumer Council for Northern Ireland.

⁵ There are 14 water only company areas in England and Wales, but Affinity Water includes three of these, Anglian Water owns Hartlepool Water and Essex & Suffolk Water is part of Northumbrian Water Group.

Figure 4. UK Water only and water and sewerage companies



Source: © Water UK, October 2012

1.2.3 Revenues and expenditure

The revenues for the water and sewerage companies in 2012/13 are shown in Figure 5. Of these revenues, over 98% relates to the regulated activities of these companies which are set by the economic regulators (Ofwat, WICS and the Utility Regulator) and are used to fund investment capital expenditure ('capex') and cover the operating costs ('opex') of running and delivering the services to customers.

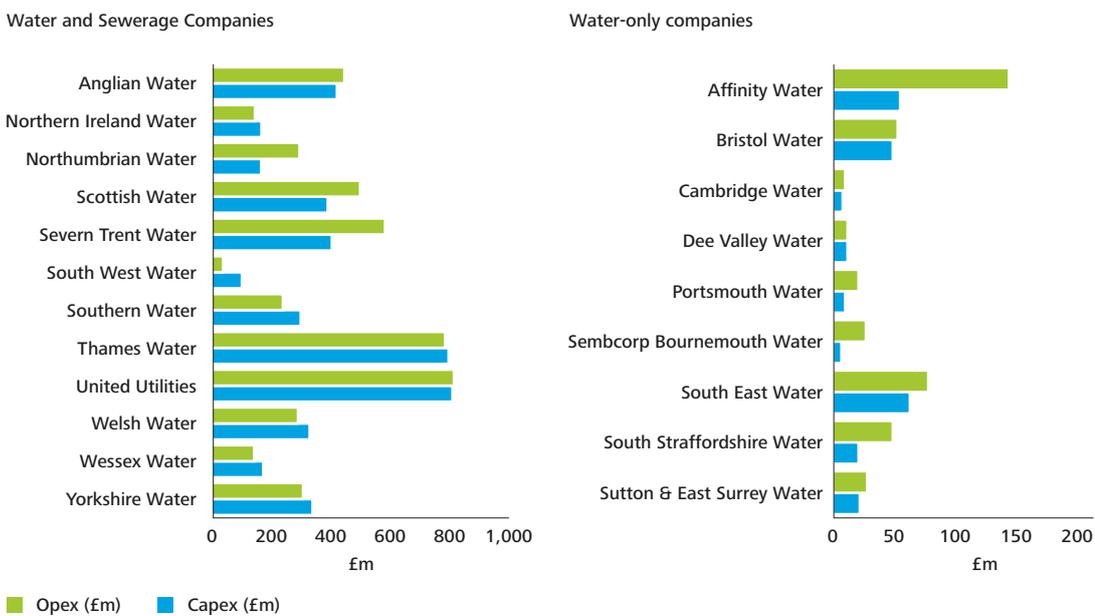
Figure 5. Revenues for UK water and sewerage companies (2012/13)



Source: Company accounts and information provided directly by water and sewerage companies

In 2012/13, the water and sewerage companies in the UK spent over £5bn as operating expenditure, covering costs such as staff, power for pumping stations and treatment works, and consumables such as chemicals. In addition, the companies have continued to invest in assets to further enhance the services being provided to customers and increase the resilience to flooding and drought – capex expenditure in 2012/13 is estimated to be in excess of £4.5bn.

Figure 6. UK water companies capex and opex (2012/13)



Source: Company accounts and information provided directly by water and sewerage companies
 Notes: For Northern Ireland Water, data has been sourced from company accounts only.

Case Study 2 – Flood Defences – Severn Trent
Improving flood defences in Gloucestershire

Water companies play a crucial role in protecting their regions against the effects of climate change and extreme weather. Severn Trent has already invested millions of pounds on flood protection measures and is planning to invest more for the future.

Since 2007, the company has invested over £38 million across Gloucestershire to ensure they are better able to cope with heavy rainfall and flooding. To ensure sewers in Gloucester can cope with heavy rainfall the company has laid over 1km of new sewers. It has protected its sewage pumping station at Longlevens with underground storage tanks and storm water pumping and installed flood protection barriers at its Mythe Water Treatment Works. To ensure it always has a back-up supply the company has built pipelines from its other water treatment works.

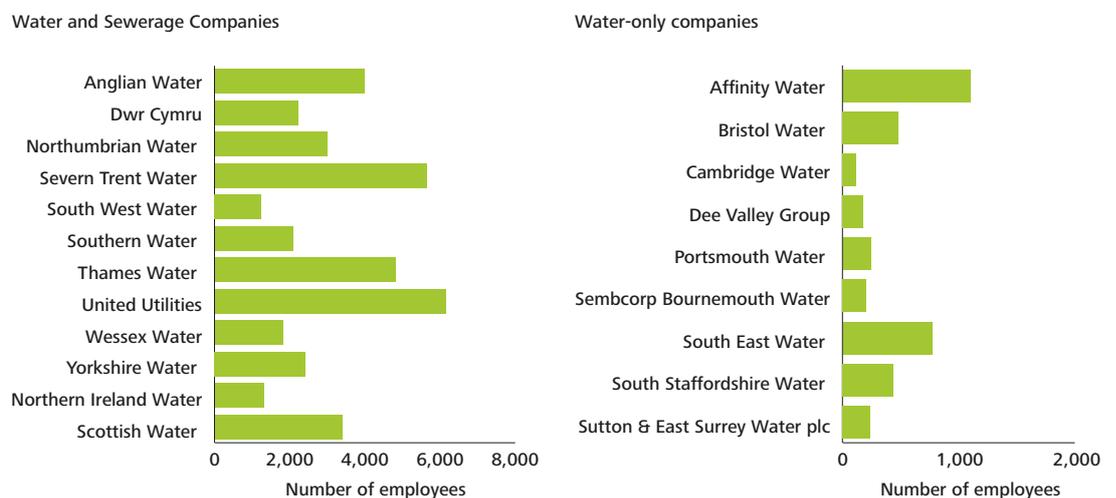
Replacing its largest covered reservoir at Ambergate, Derbyshire and replacing over 7km of sewers in Newark, Nottinghamshire are just two of its major investment schemes over the next five years. Severn Trent will invest over £58 million on these two projects to ensure it continues to provide quality water and prevent sewer flooding.



Taken from: Severn Trent Annual Report and Accounts 2013, page 19
<http://www.severntrent.com/upload/pdf/Severn-Trent-Annual-Report-and-accounts-2013.pdf>

Water and sewerage companies directly employed over 40,000 people in 2012/13. Figure 7 shows how this number is split by company. In addition, companies are also running apprenticeship schemes and recruiting new graduates to develop and build the required skills in the sector.

Figure 7. Number of employees by company (2013)



Source: Water UK, based on industry data; excludes Cholderton and District Water Company, Albion Water, Independent Water Networks, Peel Water Networks, Scottish and Southern Energy and Veolia Water Projects

Case Study 3 – Apprenticeship Scheme – South West Water

South West Water recruits 22 new apprentices

A diverse set of skills and experience is required in the water industry and the water and sewerage companies employ large numbers of people in their regions. Companies offer a range of different apprenticeships that are giving young people opportunities to thrive and take the first steps in building their careers.



South West Water has recruited the next generation of water industry professionals in an expansion of its successful apprenticeship programme. Twenty-two apprentices will join water and sewerage operations across the region and the cohort includes the company's first two female apprentices.

The chosen trainees will work within its Drinking Water and Waste Water Services, along with Operation Support Services. The apprentices will work alongside a nominated mentor whilst studying for a level three qualification from a training provider.

Apprentice Abi Hayward, aged 22, from Lanhydrock, will be working in Waste Water Services in Bodmin. She said: "I wanted a lifelong career and to do something outdoorsy while protecting the environment. It was South West Water's values of sustaining our environment here in the South West that made me want to apply."

Karl Stone, aged 17, from Delabole, will be working in Waste Water Services in Launceston. He said: "I like to be hands-on and I like to know that I'm providing something for the South West and something that is essential to communities."

There are now 46 apprentices at South West Water who make up around 4% of its workforce.

South West Water believes sharing knowledge and expertise with the next generation of water industry professionals is critical for a successful workforce of the future which is ready to meet the challenges of its 25-year vision.

Taken from: South West Water

The economic impact analysis framework used in this report has been developed to assess the impact of the water industry on the UK economy.

1.3 Contents and structure of this report

The economic impact analysis framework used in this report has been developed to assess the impact of the water industry on the UK economy. The analysis builds upon data from individual water and sewerage companies by mapping the supply chain of these companies and determining the value of UK content, in terms of total spend and employment, associated with each of them. These total spend and employment estimates are used in this report to assess the wider economic implications of the UK water industry.

The analysis does not include consideration of a counterfactual, which would require the development of an alternative scenario for the collection, treatment and distribution of water in the absence of the existing water sector in the UK, which is outside the scope of this report. Instead, the analysis focuses on the gross economic impact of UK water industry.

The analysis quantifies the narrow economic benefit derived from UK water industry's investments and operations. First, the more straightforward 'economic impact' is calculated as the GVA and employment that is generated as a result of the expenditure associated with the water and sewerage companies' investment and operation and further rounds of spending that are generated throughout the supply chain and more widely in the economy.

The economic impact estimates of the direct, indirect and induced effects of spending on UK water industry are set out in Section 3. The methodology used to calculate this impact is described in Section 2, with Appendix A providing further detail on the approach, including the data sources used.

Other wider economic benefits outside the supply chain, as well as spillover effects are discussed in Section 4 and illustrated using a number of case studies from specific water and sewerage companies in the UK.

The analysis builds upon data from individual water and sewerage companies by mapping the supply chain of these companies and determining the value of UK content, in terms of total spend and employment, associated with each of them.

2. Economic impact methodology

The regulated revenues received from their customers (as well as any non-appointed business they may own) are used by water companies to finance large-scale infrastructure investments, maintenance of existing assets and development of new and better ways to serve their customers.

The expenditure by water companies in the UK has the potential to generate economic activity and employment opportunities not only through the direct and indirect suppliers of goods and services, but also through the induced spending in the wider economy of employees working in the supply chain for the companies. In addition, the UK water sector creates spillover effects and other economic benefits.

The economic impact methodology estimates the overall scale of direct, indirect and induced economic activity and allows for these secondary impacts to be better understood and quantified.

2.1 Economic impact: GVA and employment

The value that is generated through water companies' investments and other expenditure is known as gross value added ("GVA"). This measure captures three impacts:

- direct value generated by water companies through their own operations, measured as the difference between water companies' revenues and intermediate goods and services expenditures;
- indirect value generated by water companies by stimulating economic activity throughout the supply chain. For example, by subcontracting a construction company to deliver a particular asset, a water company is a direct driver of additional value created by that construction company as a result of delivering its services; and
- induced value driven by the spending that water companies' employees make in sectors outside of the water sector's own supply chain.



Similarly, the employment that is generated as a result of water companies' activity in the UK includes three categories:

- direct employment by water companies;
- indirect employment in companies in the water sector supply chain (but distinct from water companies themselves); and
- induced employment outside of the water sector's own supply chain.

The total economic impact of water companies on the UK economy as a whole can be estimated from their own expenditure and employment, by using a multiplier methodology. This methodology is based on an understanding of economy-wide linkages between different sectors, captured in what is known as Input-Output tables.

The multipliers capture the value and employment that £1 of spending by water companies themselves (or an additional employee in the water sector) generates in the water sector supply chain and UK economy as a whole. Further details on the multiplier methodology can be found in Appendix A.

THE TOTAL ECONOMIC IMPACT OF THE UK WATER AND SEWERAGE SECTOR IN 2012/13 IS ESTIMATED TO BE £15.2 BILLION, SUPPORTING 127,000 JOBS ACROSS THE UK ECONOMY.

BIODIVERSITY

Companies fund research activities that help maintain and protect biodiversity, endangered species' habitats and local environment.

COMMUNITY/WIDER ENVIRONMENT AND EDUCATION

Companies offer recreational and educational facilities to the public and encourage conservation of landholdings and reservoirs.

HELPING VULNERABLE CUSTOMERS

Companies tailor their services to support vulnerable customers, such as the elderly, the less-able, or those with sight or hearing difficulties.



RENEWABLE ENERGY

Companies help to reduce the UK's carbon footprint by generating renewable energy.

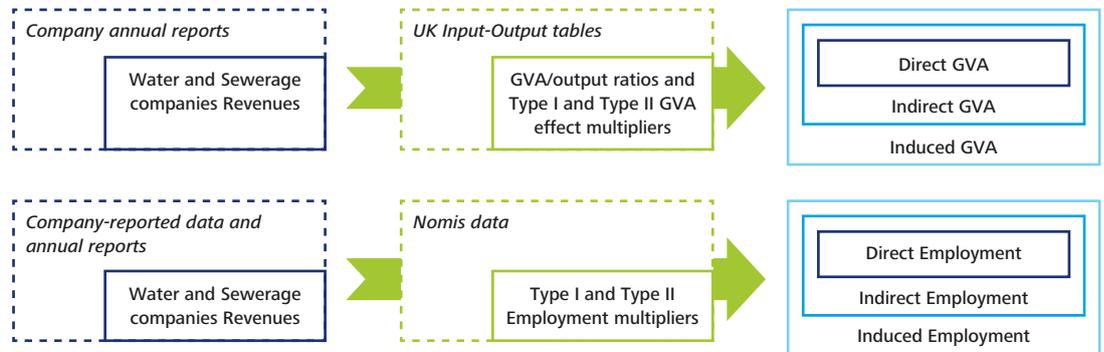
TREATING WATER AND WASTEWATER

Companies help building skills by investing in workforce training.

FLOOD DEFENCES

Companies invest to upgrade local infrastructure to cope with extreme weather.

Figure 8. Economic impact: methodology overview



Source: Deloitte analysis

2.2 Spillover effects

The UK water industry gives rise to certain additional economic benefits that are distinct from the GVA and employment effects quantified previously, but which are nevertheless the result of expenditure on the construction and operation of the water industry. These include some wider economic benefits in terms of reduction of CO₂ emissions and biodiversity improvements as well as some “spillover effects”, where expenditure in one activity, in this case a water company’s expenditure in specific projects, can give rise to benefits that are not the primary purpose of such expenditure.

By its nature, the estimation of spillover effects tends to be less robust than the GVA impact analysis, because the link between the initial investment and the associated benefits is less direct. Accordingly, the spillover effects have not been quantified and included in the narrow economic impact analysis. Nevertheless, these effects are important for the understanding of the full impact on the local and national economy of UK water industry investment and are illustrated through a number of case studies from specific companies operating in the industry.

The UK water industry gives rise to certain additional economic benefits that are distinct from the GVA and employment effects quantified previously, but which are nevertheless the result of expenditure on the construction and operation of the water industry.

Case Study 4 – Biodiversity Action Plan – Anglian Water

Funding vital research for local birds under threat

The nightingale is one of the UK's fastest disappearing birds, but the reasons for this are currently unknown. Conservationists suspect that changes to the birds' favoured habitats – either in or along the route to their African wintering grounds – could be the cause. Many of Anglian Water's sites are home to the species, and the company has a long history of supporting nightingale conservation work.

To help find answers, Anglian Water has been working with the British Trust for Ornithology (BTO) as part of a three-year tracking project to establish if the birds are experiencing any problems during the course of their annual migration. In 2012/13, Anglian funded the fitting of geolocators – positioning identification tags – as part of a programme designed to provide scientists with valuable information about annual migration patterns.

The size of a shirt button and weighing just half a gram, the geolocators consist of an electronic clock, a calendar and a light meter, powered by a small solar battery. They record valuable positioning and flight tracking data, which is collected when the birds return to the UK.

In 2012/13, in addition to paying for the geolocators, Anglian funded a repeat of the 2,000 hotspot survey in the Fens, and many of its employees got out of bed early to listen for the birds on its sites as part of a larger, national BTO nightingale survey. With the Anglian region so important to nightingales, the company believes it is vital that it does what it can to help their conservation.



Taken from: Anglian Water Annual Report and Accounts 2013, p89 http://www.anglianwater.co.uk/_assets/media/Anglian_Water_Annual_Report_and_Accounts_2013.pdf

3. Economic impact of UK water industry

The water industry is a large and economically important sector for the UK economy. Through its spending on infrastructure and delivery of effective water and sewerage services to households and businesses, it generates significant value – to its employees, shareholders, customers as well as a wide group of other stakeholders.

The economic impact of the UK water industry is measured by its role in generating value added (to the economy) and by its role in creating jobs (to individuals). In this section, the impact of the UK water industry in 2012/13 is presented, with GVA and employment impacts presented in section 3.1. For comparison, the impact on total UK output is presented in section 3.2, although this does not form part of the economic impact of UK water industry.

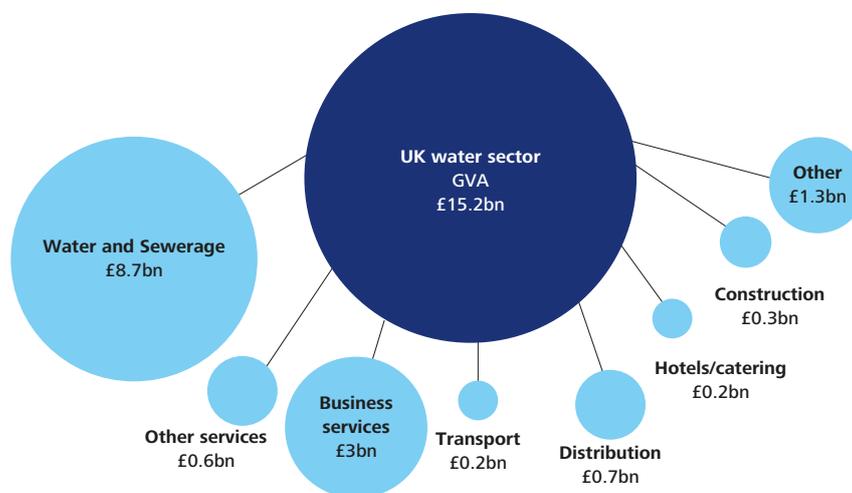
3.1 GVA and employment impacts

3.1.1 Total GVA and employment impacts

The total economic impact of the UK water sector is shown in Figure 9 and Figure 10. The total direct GVA generated by the sector in 2012/13 is £8.5 billion. Indirect GVA in the water sector supply chain amounted to £3.9 billion and induced GVA outside of the water sector supply chain amounted to £2.7 billion. The total GVA impact of the UK water and sewerage companies, including direct, indirect and induced impacts amounted to £15.2 billion.

The majority of the GVA was generated in the water and sewerage sector itself (58%) and in business services⁶ (20%). An additional 5% of the GVA was created in distribution and 2% in construction.

Figure 9. Economic impact of water sector in 2012/13: GVA



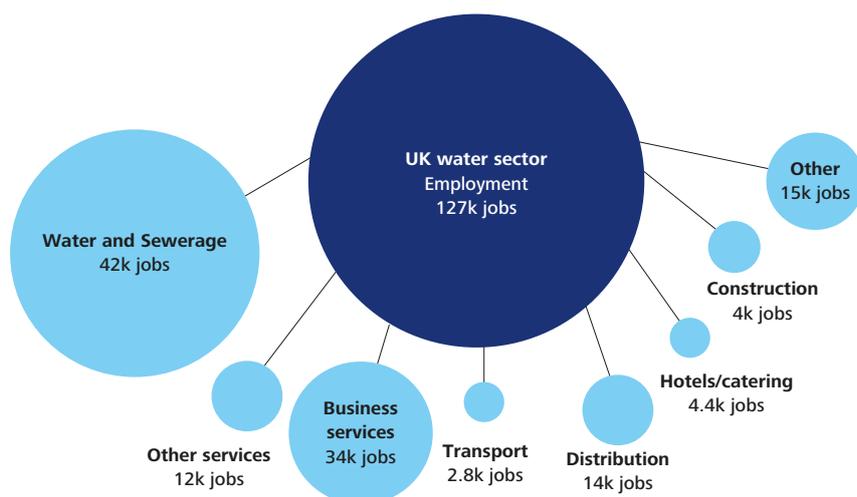
Source: Deloitte analysis

Notes: 'Other services' includes services such as public sector services and private sector services not covered separately in the figure above. 'Other' includes mostly primary and manufacturing sectors. The water and sewerage total GVA impact of £8.7 billion includes both direct GVA of £8.5 billion and the indirect and induced impacts on the sector of £0.2 billion.

⁶ Business services include a range of services provided to the water sector including banking and finance, real estate and computer services.

Total employment generated directly by the water companies amounted to 41,000 full-time equivalent jobs (“FTEs”) in 2012/13. In addition, indirect employment generated in the water sector supply chain was 51,000 FTEs, and induced employment outside of the water sector supply chain was 35,000 FTEs.

Figure 10. Economic impact of water sector in 2012/13: Employment



Source: Deloitte analysis

Notes: The number of jobs represents the number of full-time equivalent employees per year and excludes self-employment. The water and sewerage total employment impact of 42,000 jobs includes both direct employment of 41,000 jobs and the indirect and induced impacts on the sector of 1,000 jobs.

3.1.2 Detailed economic impact results

The impact of the water sector on the UK economy is summarised in Table 3.

Table 3. Economic impact of water sector in 2012/13: detailed results

Metric	Unit	Economic impact
Total UK water sector revenues	£m	12,800
Total GVA	£m	15,200
Direct GVA	£m	8,500
Indirect GVA	£m	3,900
Induced GVA	£m	2,700
Total employment	FTE 000s	127
Direct employment	FTE 000s	41
Indirect employment	FTE 000s	51
Induced employment	FTE 000s	35

Source: Deloitte analysis

The total output associated with the UK water sector in 2012/13 amounted to £26.5 billion, of which £12.8 billion was generated directly in the UK water sector.

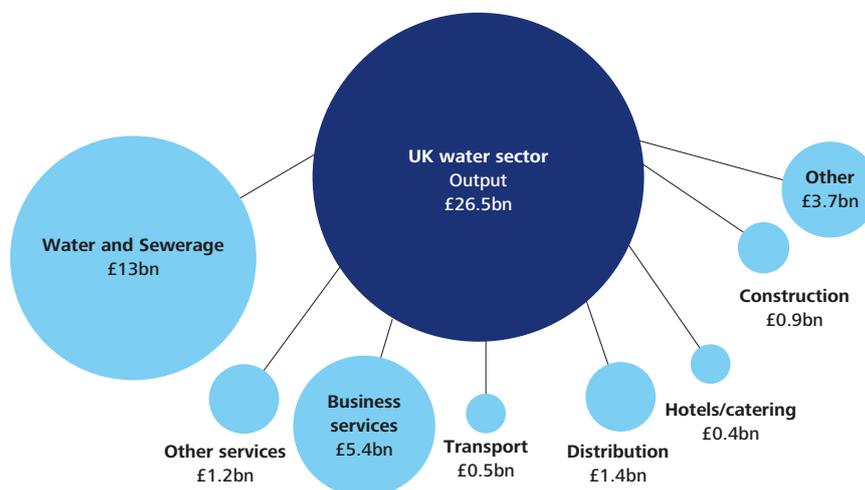
3.2 Output impacts

Another useful measure of the impact that the water industry has on the UK economy is the total output impact. Similarly to the GVA and employment impacts, this captures the benefit of water companies' expenditures on the water sector supply chain and broader effect on the UK economy as a whole. However, the output impacts are necessarily broader than the GVA impacts, as they capture the full output from the UK economy resulting from activity in the water sector, inclusive of any intermediate inputs in these sectors. By contrast, GVA impacts only capture the value added in the sectors.

The output impacts do not form part of the economic impact assessment, and are provided for illustration only.

The total output associated with the UK water sector in 2012/13 amounted to £26.5 billion, of which £12.8 billion was generated directly in the UK water sector (the direct impact), £8.4 billion in the supply chain to the water sector (the indirect impact) and another £5.3 billion in the wider economy (the induced impact). This is shown in Figure 11.

Figure 11. Broader impact of water sector in 2012/13: Output



Source: Deloitte analysis

Notes: The water and sewerage total output impact of £13.1 billion includes both direct output of £12.8 billion and the indirect and induced impacts on the sector of £300 million.

4. How water companies spur growth and support communities

Spending and employment by water and sewerage companies in the UK generates value to the UK economy that is broader than the relatively narrow measure of the economic impact on GVA and employment, as reported in Section 3. Water and sewerage companies play an important role in their local communities. Their activities, which often go beyond their role as prescribed by the regulator, create additional value to the UK economy.

- **Building skills and education.** Water companies invest significantly in training their workforce, in particular by developing apprenticeship schemes in conjunction with local training providers. In 2012/13, over 180 apprentices were taken on by the water and sewerage companies. This investment then benefits the UK economy more broadly, as a better educated workforce is able to transfer and deploy its skills in other sectors. Companies also provide educational services through visitor centres, raising awareness of the water cycle and the need for water conservation.
- **Managing flooding risk.** Periods of heavy rainfall can lead to localised flooding of households and businesses, which can cause significant damage and distress. Water and sewerage companies play an important role in ensuring that infrastructure, such as sewers, can cope with heavy rainfall. In addition, certain assets that may be more exposed to flooding and required additional protection, for example, by installing flood barriers. The water supply network also needs to be resilient to failures due to weather conditions by, for example, having back-up supplies available from another area that can be called upon in the event of a failure occurring in a neighbouring area.
- **Generating renewable energy.** As large consumers of energy, water companies are looking at ways of reducing their energy consumption but also at how they are able to generate renewable energy using their assets. This can involve installing renewable generation at their sites (for example, wind turbines and solar panels) which would serve some of the energy demand and offset part of the energy required by water and wastewater treatment works. In addition, the outputs from the sludge treating process can be used to generate electricity through anaerobic digestion process to produce biogas which can be used on-site for power generation (direct combustion) or injected into the national gas grid for use by domestic and commercial gas customers. These initiatives make a positive contribution to the UK's renewable energy targets and reducing CO₂ emissions.
- **Supporting bio-diversity.** The reservoirs maintained by water companies provide a natural habitat for fish, birds and other wildlife. Companies often work in partnership with wildlife organisations to support the development of habitats and carry out surveys to assess progress and results of these schemes in developing bio-diversity.
- **Supporting tourism.** Wildlife habitats and water reservoirs across the UK attract visitors throughout the year, who enjoy activities ranging from water sports and fishing, to walking and bird watching. In addition, companies have visitor centres which attract people to specific exhibitions, and spend in gift shops and restaurants.

The previous sections of the report have outlined a number of case studies and the following pages provide two further case studies which illustrate the range of additional benefits and spillover effects that the water and sewerage industry creates in the UK economy.

Water and sewerage companies play an important role in their local communities. Their activities, which often go beyond their role as prescribed by the regulator, create additional value to the UK economy.

Case Study 5 – Community, Wider Environment and Education – Dwr Cymru
Education and leisure opportunities for local communities

Water companies own sites of stunning beauty and operate assets that can be enjoyed by everyone. Where possible companies use their facilities to create leisure and education opportunities for local communities and spur economic growth through tourism.

Dwr Cymru's estate of reservoirs and land holdings include some of the most attractive and important landscape in Wales. The sites that it actively manages for public recreation attract close to a million visitors each year and provide a range of activities including cycling, fishing, sailing, canoeing, and windsurfing. Many sites have bird watching hides, picnic areas, walks and nature trails.

This year the company opened a cycling centre at its LlynBrenig visitor centre in North Wales. There are two other visitor centres at Llys y Fran, near Haverfordwest, and the Elan Valley in mid Wales and the company is building a fourth facility at its Llandegfedd Reservoir near Newport.

To enhance the visitor experience Dwr Cymru is developing apps for smart phones as part of the Visit Wales 'digital tourism' initiative. Its team of rangers lead a variety of activities throughout the year – including archaeological expeditions, star-gazing evenings, fly-fishing courses, charity cycling events and sponsored walks, boat trips, and guided nature walks and wildlife tracking – which foster Dwr Cymru's standing with our customers and the communities it serves.

Conservation best practice is encouraged across the company's landholdings and all its main reservoirs have biodiversity management plans. At LlynBrenig it is planning to link two Sites of Special Scientific Interest with a corridor for wildlife, and there is a project to attract nesting ospreys.

In the Brecon Beacons Dwr Cymru is encouraging less intensive grazing regimes and is re-landscaping the margins of water bodies to promote habitats and to improve water quality.

Supporting education continues to be one of its main areas of community support. During the last academic year nearly 27,000 young people passed through one of its four education centres or attended a session led by one of its teachers. The company's education centres are staffed by full time seconded teachers and they use its indoor and outdoor facilities to teach primary school children about the importance of water and the environment.



Taken from: Welsh Water Annual Report and Accounts 2013; <http://asp-gb.secure-zone.net/v2/1963/3110/7537/Glas-Cymru-Cyfyngedig-Report-and-Accounts-2013.pdf>

Case Study 6 – Renewables – Scottish Water

Supporting renewable energy

Water companies are investing to reduce their own energy consumption and support the development of renewable energy.

Scottish Water has more than 2,000 treatment works and assets and, like many businesses around Scotland, is a significant user of energy. It has a three-pronged approach to:

1. To reduce energy consumption and the cost of consumption;
2. To increase energy self-generation through innovative use of its asset base; and
3. To host private renewable energy investment where there are benefits for customers

At present Scottish Water generates around seven per cent of the energy it consumes. But through innovative use of its assets – such as treatment works, pipes, catchments and pipelines – it is capable of significantly increasing this, maximising its water resources in the spirit of a ‘Hydro Nation’.

Hydro and Difgen

Scottish Water already has 10 hydro-turbine schemes in operation, while about 40 other sites – either hosting hydro or ‘Difgen’ technologies – are in development or construction across Scotland. A minimum of 25GWh additional self-generation is expected to be delivered through these schemes by 2015.

Small and medium-scale wind

Scottish Water is also actively pursuing plans for smaller wind development schemes in appropriate locations to help directly power its own assets. Scottish Water Horizons, its commercial subsidiary, has a programme of investment in a number of such schemes.

For example, 10 small-scale wind turbines have been installed at Scottish Water’s Stornoway waste water treatment works to help reduce energy costs. The energy generated will help to power the treatment works, so the company needs to purchase less energy as a result.

About 20 other similar schemes are in development.

Solar power

Scottish Water Horizons has installed solar panels on a number of Scottish Water assets to help power them all-year round and is actively searching for others.



Taken from: Scottish Water;
<http://www.scottishwater.co.uk/investment-and-communities/investment-programme/energy>

Appendix A. Technical appendix

This appendix presents the overall economic impact methodology and assumptions that have been applied to determine the value that the UK water industry generates in the UK economy.

As discussed in Section 2 of the main body of the report, the economic impact methodology makes use of macroeconomic multipliers that capture the economy-wide effects of incremental spending of the water industry on the rest of the economy.

A.1 Data sources

This section described the data sources used in this report.

UK Input-Output tables

In this report, we have used UK Input-Output tables from 2005 (“IO tables”), which are the most recent ones available for the UK. The IO tables provide information on the output generated by and demand from individual sectors of the UK economy. This includes the spending by the ‘Water supply’ sector and ‘Sewage and sanitary services’ sector on outputs from the remaining sectors of the economy. Conversely, the IO tables also capture the total demand for those two sectors’ services from all other sectors of the UK economy.

The ‘Sewage and Sanitary services’ sector contains not only sewerage services (which water and sewerage companies provide and are therefore included in this report), but also sanitary services, which we have sought to exclude for the purposes of this report. We have made adjustments to the IO tables to reflect this (see further below).

The IO tables also contain information on direct GVA generated by individual sectors, household expenditure and employees’ compensation.

The IO tables are used to identify macroeconomic relationships between different sectors of the economy. Together with the information on direct GVA and household expenditure, this is used to estimate the indirect and induced effects of spending by a given sector – in particular water supply and sewerage services.

In estimating these relationships we have used the standard approach involving the construction of Leontief Type I and Leontief Type II matrices. This approach is used to estimate the full economic impact of the water and water and sewerage sectors on the rest of the UK economy, as well as to understand the impact of those sectors on their respective supply chains.

Information collected from UK water companies

We have requested information from water and sewerage companies on their spending, number of employees, taxes, employee compensation and profits and combined this with other publicly available information on individual companies, in particular their annual reports.

We have also collected a number of case studies from companies’ annual reports.

Employment information from the ONS

We have augmented the data obtained from individual companies with data from the 2005 Business inquiry employee analysis published by Nomis, the provider of official UK labour market statistics (“Nomis dataset”). This data was used to analyse the employment generated by the water and water and sewerage companies in their supply chain as well as in the wider economy.

The Nomis dataset was used to develop a set of employment multipliers (see Section A.3).

Other data used

- We have used Gross Disposable Household Income (“GDHI”)⁷ to estimate the impact that employee compensation (in the water sector as well as in the wider economy) has on actual household spending in other sectors of the economy. This information was used to calculate the Type II multipliers that capture the effects of employees’ spending on the other sectors of the economy.
- We have used Ofwat’s⁸ data on water and sewerage services revenues to estimate direct GVA in these sectors in year 2005.
- We have adjusted the Nomis dataset (which covers England, Wales and Scotland) to apply to the whole of the UK by using broader ONS and NISRA labour market statistics.⁹

A.2 Direct economic impact: GVA and Employment

The direct economic impact of the UK water industry is measured through two main metrics: the water companies’ impact on UK GVA, and their impact on UK employment.

The analysis distinguishes between water only companies and water and sewerage companies.

A.2.1 Gross Value Added

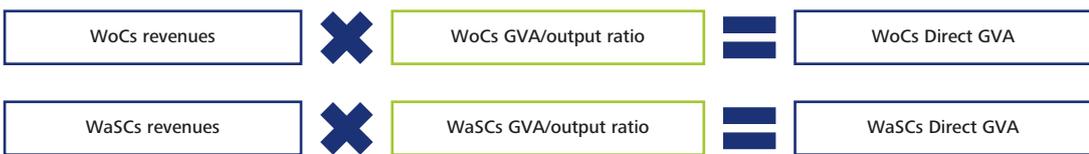
There is no unique way to calculate the Gross Value Added (“GVA”) of a given sector. There are two commonly employed methods for estimating the GVA:

- **Bottom-up approach.** Direct GVA of a sector is defined as the difference between the value of the output of the sector less the value of its intermediate inputs. The GVA can therefore be estimated in a bottom-up way as the sum of wages paid to employees, net tax payments, gross operating profits, depreciation and amortisation.
- **Top-down approach.** Direct GVA generated by the UK water sector can be estimated by considering the economy-wide relationship between the output of the water sector and the GVA of that sector, based on information from IO tables.

Neither of the two methods is inherently superior to the other; however, data limitations typically impose constraints on whether one of the two can be used more successfully.

In this report, we use of water companies’ annual reports to obtain individual companies’ revenues. These are then multiplied by a GVA/output ratio from IO tables, in order to estimate the companies’ direct GVA.¹⁰ While at individual company level, this is likely to be inaccurate, this methodology is appropriate for estimating the aggregate direct GVA of the UK water sector. This is because the macroeconomic relationship of the water sector between the GVA and output reflects the performance of all UK water companies (as covered by the IO tables).

Figure 12. Direct GVA calculation



7 ONS NUTS1.2 dataset

8 Ofwat (2010) “Financial performance and expenditure of the water companies in England and Wales 2009-10”

9 ONS JOBS03 and JOBS04 tables and Northern Ireland Statistics and Research Agency (NISRA)

10 We have followed the methodology as described in ONS (2011) UK Input-Output Analytical Tables 2005 and Scottish Government National Statistics (2011) Input-Output Methodology Guide.

A.2.2 Employment

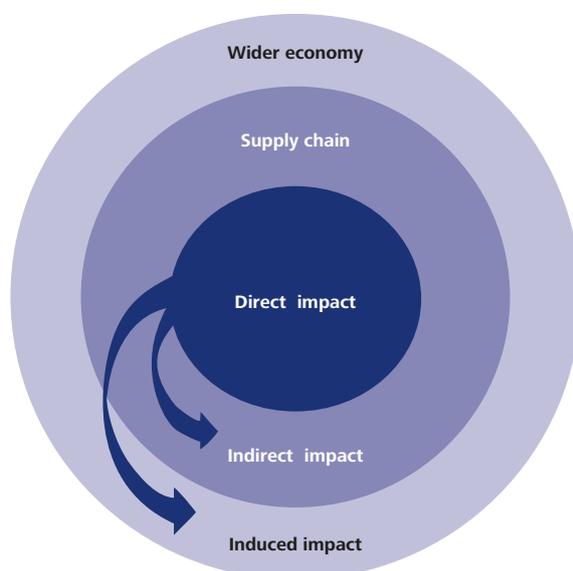
The direct employment created by UK water industry has been estimated using information provided by water companies in response to a data request.

For Welsh Water and Northern Ireland Water, data has not been provided by the companies as at the time of writing this report, so the employment figures were taken from their annual reports.

A.3 Economic multipliers

In addition to the direct GVA and employment generated by the UK water industry expenditure, further rounds of spending occur through inter-linkages in the supply chain and the wider economy.

Figure 13. Economic impact analysis



To assess the full economic impact of the UK water sector expenditure, which includes the indirect and induced impacts, economic multipliers are applied to the direct impact. The following subsections provide an explanation of how these impacts are defined and calculated.

There is a degree of uncertainty associated with estimating the indirect and induced economic impacts associated with the UK water industry expenditure.

- Economic multipliers show the approximate extent to which spending (GVA) changes in a given sector flow through the supply chains into the wider UK economy.
- The mapping of the supply chain and broader economic impact onto individual industry sectors includes a degree of approximation.

While the estimates of indirect and induced impacts from a single water or water and sewerage company are likely to be inaccurate when considered in isolation, the *aggregate* estimate of indirect and induced impacts is likely to be more robust. This is because the inaccuracies associated with individual companies will tend to cancel each other out as the aggregate macroeconomic relationships between the water industry and the rest of the economy (i.e. the multipliers) are applied to the full set of UK water and water and sewerage companies covered in this report.

As such, the aggregate indirect and induced economic impact estimates are appropriate estimates of the wider economic impacts that the directly generated GVA has on the wider UK economy, given the information available.

A.3.1 Multiplier methodology

Economic multipliers are calculated from UK IO tables, which map the expenditure inter-linkages between sectors and activities within the UK economy.

- Type I multipliers capture the additional impact of expenditure by water and sewerage companies on the supply chain of the water sector. For example, a replacement of a water pipe by water companies would generate further activity in other industries ranging from steel production to construction services. Type I multipliers include both the direct and indirect economic impact of a given sector.
- Type II multipliers capture the additional impact of expenditure by water and sewerage companies on the economic activity in the wider economy. This activity is stimulated by companies in the water industry supply chain, their employees, spending profits and wages in industries including those outside of the original supply chain. This could include employees spending their salary on housing, entertainment or retail. Type II multipliers thus include the direct, indirect and induced economic impact of a given sector.

The derivation of the multipliers applied in the analysis and their limitations are described below.

A.3.2 Indirect impact

The indirect impact captures the additional economic activity that is stimulated in the UK water industry supply chain arising from the first round of spending by water companies.

Indirect GVA

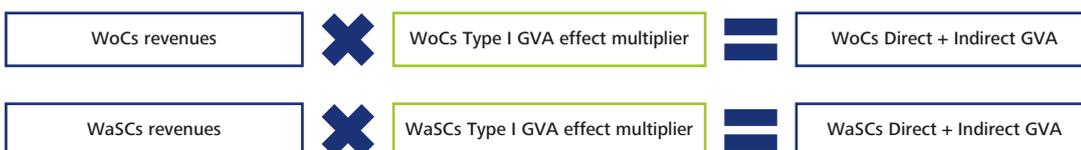
Type I GVA effect multipliers capture the aggregate macroeconomic relationship between the output of a given sector and the direct and indirect GVA that the sector generates in the wider economy. In this report, the GVA multipliers have been calculated following the ONS methodology.¹¹

Since the IO tables distinguish between Water supply and Sewerage and Sanitary and services sectors, this report has estimated the required Type I GVA effect multipliers in two steps:

- for the water only companies, used the IO tables as published by the ONS, by considering the multiplier for the Water Supply sector; and
- for water and sewerage companies, the Water supply and Sewerage and Sanitary sectors were combined into a single 'Water and Sewerage' sector, and the economic multipliers for this newly-created sector were estimated.

The two sets of economic multipliers were then used to estimate the direct and indirect GVA created by the UK water industry. As Figure 14 illustrates, the direct UK contract value of UK water industry is multiplied by the appropriate GVA effect multiplier to derive the sum of the direct and indirect GVA impacts.

Figure 14. Indirect GVA impact calculation



11 ONS (2011) UK Input-Output Analytical Tables 2005 ; and Scottish Government National Statistics (2011) Input-Output Methodology Guide

Indirect Employment

Indirect employment generated in the UK water sector supply chain, as a result of the employment created by water companies themselves is estimated using Type I Employment multipliers.

In this report, the UK-wide relationship between the direct and indirect employment generated by the water and sewerage sector was estimated using the Nomis dataset, obtained from the ONS. The dataset includes full-time and part-time employment across sectors, including water supply and sewerage and sanitation services. We have followed ONS methodology to approximate total full-time equivalent employment in the UK by individual sectors. Similarly to the indirect GVA calculations described above, separate Type I employment multipliers were estimated for the water only and water and sewerage companies.

It is noted that the Nomis dataset provides an estimate of employed workforce across England, Wales and Scotland only. To capture the full employment impact across the UK, the following two factors have been reflected in calculating the Type I employment multipliers:

- The supply chain structure in Northern Ireland has been assumed to be the same as in the other three countries. The Type I employment multipliers used for Northern Ireland Water is therefore the same as for the rest of the UK.
- The employment impact is likely to be even higher than estimated through the multiplier itself, as self-employment is not provided by the ONS in the Nomis dataset, and is therefore not included in calculating the Type I employment multiplier.

Figure 15. Indirect employment impact calculation



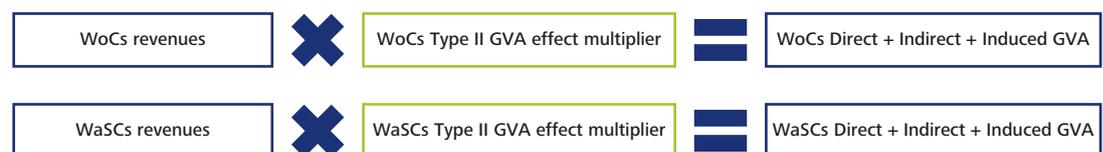
A.3.3 Induced impact

The induced economic impact measures the further rounds of spending in the wider economy generated by earnings by UK water industry being spent on other goods and services across a wider set of industries (e.g. employees spending wages on housing, food or general consumer goods).

Induced GVA

The induced GVA impact is calculated in a similar way to the indirect GVA impact. The Type II GVA effect multipliers are derived from the UK IO tables using the ONS methodology. In a similar way to the Type I GVA effect multipliers, the data is used to distinguish between water only and water and sewerage multipliers, applicable to the two different types of companies. The calculations are shown in Figure 16.

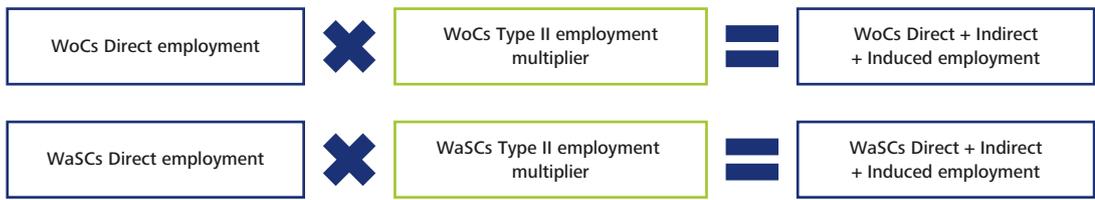
Figure 16. Induced GVA impact calculation



Induced employment

The induced employment impact is calculated in a similar way to the indirect employment impact. The Type II employment multipliers are derived from the Nomis dataset, and are subject to the same caveats (regarding the applicability to Northern Ireland and regarding the self-employment). The Type II Employment multipliers distinguish between water only and water and sewerage sectors, and are applied to the two types of companies respectively. The calculations are shown in Figure 17.

Figure 17. Induced Employment impact calculation



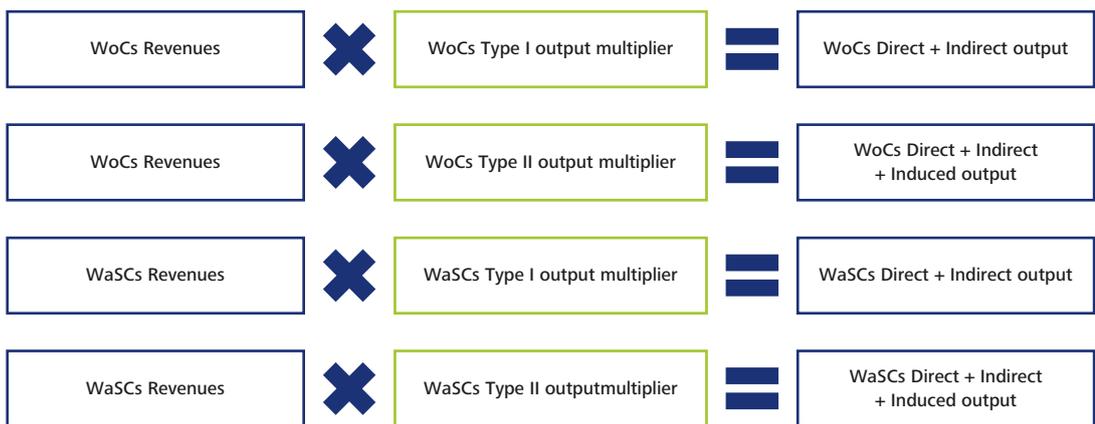
A.4 Output impact

In addition to the economic impact analysis that relies on GVA and employment as the key metrics, it is informative to report the total output impact that the UK water industry has on the broader economy.

The methodology for estimating the output impact is similar to that used for GVA and employment as described above. Type I and Type II output multipliers, based on the IO tables, estimated for the water supply sector and water and sewerage sector, are applied respectively to the output (as measured by companies’ revenues) of individual water companies in the UK.

This is summarised in Figure 18.

Figure 18. Output impact of the UK water industry



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