March 2026

Economic Impact of Water Supply Infrastructure Investment

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About this document

This document sets out the economic growth case for investment in water supply infrastructure generally and specifically looks at the contribution of the Major Projects Programme Ofwat is supporting. The report identifies four key economic roles for water that drive economic growth and provides order of magnitude estimates for the potential value of economic growth that could be unlocked in the long term.

In developing this report Ofwat was supported by KPMG, who undertook research and developed the economic analysis presented in the report and the technical annex. This report was finalised in October 2025.

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Executive summary

Water is a fundamental requirement for the operation of modern economies, intricately woven into the fabric of every sector and underpinning both economic and environmental prosperity. From agriculture and industry to energy generation and the day-to-day sustenance of communities, a reliable water supply is non-negotiable for societal wellbeing and economic prosperity. Water is a necessity for everyday life, without it people can't live, work, go about their daily activities which would impede economic activity across a wide spectrum. In addition, the availability of sustainable water resources is a decisive factor in maintaining natural capital and enabling the wider infrastructure upon which economic ambitions are built. Without adequate water resources, the potential for population and economic growth, urban development and resilience to environmental shocks becomes constrained, directly curbing a nation's capacity for expansion and innovation.

Yet, the United Kingdom faces the growing challenge of water scarcity resulting from climate change, population growth, ageing infrastructure and historical underinvestment in large-scale projects to bolster supply. As demand for water increases, with abstraction drawing largely from vulnerable environmental sources in our precious chalk streams and rivers, the narrowing margin between supply and demand[1] threatens to undermine the foundations of future economic growth.

To address this challenge, Ofwat established RAPID (Regulator's Alliance for Progressing Infrastructure Development) in 2019 to stimulate a programme of water supply infrastructure investments of an unprecedented scale to improve the sustainability of water supply and support economic growth. This programme aims to identify best value options and then to accelerate the development and delivery of Strategic Resource Options, major investment projects, progressed by individual or multiple water companies, that provide solutions to regional water supply constraints. The programme of major infrastructure which is then identified as best value is then competed to ensure the most efficient outcomes for bill payers. This represents not just an investment in protecting access to a basic necessity, but an investment in the future sustainable economic growth in England and Wales.

This circa £50bn major projects pipeline is a significant investment in future economic growth through securing the UK's future water supply. This report sets out the direct impact of the investment in major capital projects and how investing in the water supply drives economic growth. Understanding these links and the scale of impacts are important in avoiding future underinvestment in water supply infrastructure.

[1] Committee on Climate Change, quoted in National Audit Office (2020). Water supply and demand management: "demand for water in England will exceed supply by between 1.1 billion and 3.1 billion litres per day by the 2050s" (p.5).

Economic growth is the number one mission of the government[2] and in May 2024 the growth duty on regulators was extended to include Ofwat, Ofgem and Ofcom[3]. The growth duty states that regulators must "give appropriate consideration to the potential impact of their activities and their decisions on economic growth"[4], both for the regulated industry and for the wider economy. The growth duty highlights infrastructure and investment as a specific driver of economic growth.

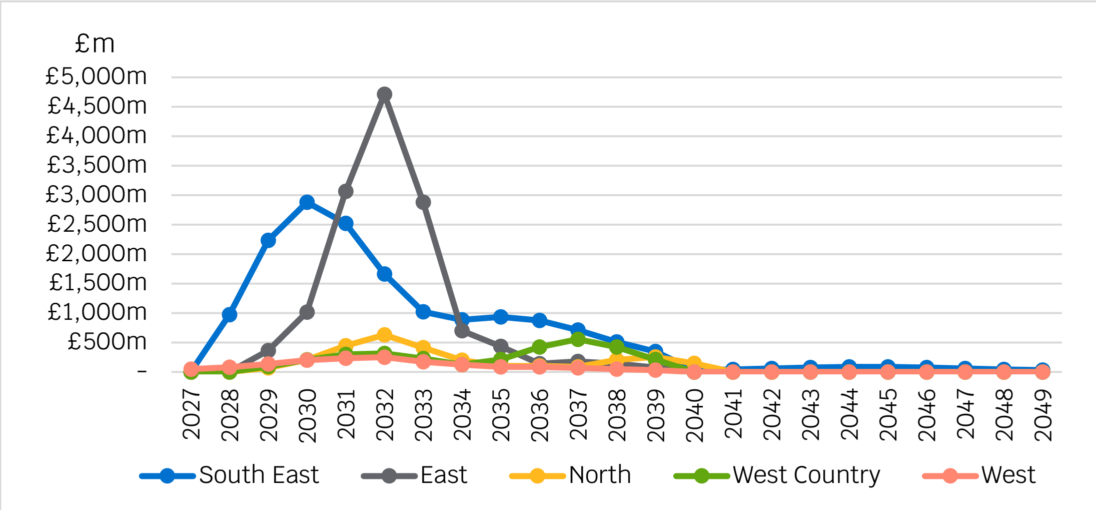
Direct capital spend impacts of the Major Projects Programme

The Major Projects Programme confirmed a significant increase in water sector investment to address resilience, supply, and environmental challenges. Large-scale construction programmes of this nature create a temporary one-off boost to economic output and employment, both locally and nationally, during peak construction years. While these effects are temporary, they leave residual, lasting benefits by upskilling and strengthening the UK's capacity to deliver future infrastructure projects.

The temporary one-off increases in output associated with this major projects programme have been estimated using ONS multipliers for job and Gross Value Added (GVA) impacts. GVA analysis provides an assessment of the economic contribution of individual sectors to domestic outputs and reflects how changes in one sector's output would affect the economy (through supply chain multipliers, job creation and consumption). The total temporary one-off GVA impact is estimated at a range of £28bn to £41.1bn (driven by the £25bn increase in capital expenditure) and the peak temporary one-off job creation is estimated at a range of 31,988 to 46,916. These impacts are temporary, however a longer-lasting outcome, such as the development of a skilled and adaptive workforce, emerges from this effort. These projects leave behind a more skilled and resilient workforce through boosting labour demand, stimulating training, and encouraging localised skills development. In turn, this workforce forms a flexible foundation for future infrastructure programmes. Transferable resources and skills such as construction, project management skills and expertise acquired through this programme will be transferred onto future projects (possibly outside of the water industry) and help support the productivity of the construction sector.

[2] Kickstarting Economic Growth - GOV.UK
[3] final_growth_duty_statutory_guidance_2024.pdf
[4] final_growth_duty_statutory_guidance_2024.pdf

Figure 1 Annual Spread of temporary one-off GVA by Region from Direct Capital Spend



Water Supply and Economic Growth

Four key economic roles of water in driving economic growth have been identified:

- Growing the Labour Supply by meeting household demand
- Increasing National Resilience
- Unlocking Potential in Emerging Sectors
- Supporting Growth in Existing Industries

In addition, RAPID's focus on identifying the best value option is, in itself, important for growth, as it allows customers to spend money on other goods and services. [5]

Economic Role 1: Growing the Labour Supply by meeting household demand

The population require access to reliable water supply, this is necessary to support population growth in different areas which in turn grows the labour supply which is key component of economic output. Without water infrastructure homes cannot be built, limiting where populations can grow and where people can work. The potential for this effect is strongest in the currently water constrained high-productivity regions of the South East and East of England. The projected increase in UK population (to exceed 71m by 2055[6]) and the new housing targets set by Government will place additional pressures on already limited resources which could result in a heightened risk of droughts or localised preventable restrictions on new developments, to protect local water supplies.

[5] How Ofwat's Regulation Impacts on Economic Growth A report commissioned by Ofwat April 2025
[6] The National Framework For Water Resources 2025, page 9

Regions already experiencing serious water stress are facing constraints on housing development, with some local authorities potentially unable to deliver up to 51% of planned new homes annually. This limits local population growth and restricts the expansion of the labour force essential for thriving sectors to grow.

Overcoming water supply constraints will unlock housing developments in the most productive areas and allow businesses to draw on a larger, more developed labour market, driving national economic efficiency and growth potential. The UK Property Forums report on 'Addressing Water Stress: The Key to Unlocking Growth in Cambridge', defines water scarcity as the situation where available water resources cannot sustainably meet existing and planned demand without harming the environment. The experience in Cambridge, where thousands of homes and major developments are stalled for lack of secure water supply, highlights how investing in water infrastructure is essential to unlock economic growth and prevent similar shortages in the future[7].

Economic Role 2: Increasing National Resilience

The resilience of the UK's water infrastructure is critical to sustaining long-term economic growth and productivity by limiting the impacts of drought and other acute risks. Robust infrastructure, including reservoirs, inter-regional transfer schemes, leakage reduction and greater consumption efficiency, play a significant role in preventing water shortages from escalating into systemic crises. Without adequate capacity to store and transfer water, even moderate dry periods can lead to supply disruptions, which in turn generate economic losses, and environmental degradation, for example through effects on agriculture. England has faced notable recent droughts, including 2016 to 2019 and 2022 to 2023, which placed significant pressure on water resources and led to temporary restrictions, for example, temporary use bans. Whiles these were managed without the most severe impacts, they highlight how close parts of the UK have come to a failure to provide the water necessary. Historically the economic impacts of drought and insufficient infrastructure have proven severe; the 1995-97 Yorkshire and North West drought had an estimated economic cost of over £1.28 billion(£650 million - 1997 prices)[8], and the 1976 drought resulted in losses exceeding £4.59 billion (£560 million – 1976 prices)[9][10]. This demonstrates that regional disparities in water storage and transfer capacity left less resilient areas vulnerable to harsh emergency measures, including stand pipe use, rota cuts, and severe restrictions, emphasising the importance of robust, interconnected systems.

The risk of future droughts are rising, with climate projections indicating hotter, drier summers and more frequent droughts by 2050. Beyond existing mitigation plans and measures (drought orders, business resilience plans), droughts can incur significant costs on the environment and economic activity. Investing in new reservoir capacity, alternative

[7] Addressing water stress: the key to unlocking growth in Cambridge? - UK Property Forums
[8] Major droughts in England from 1800 and evidence of impact
[9] ibid
[10] All historical cost estimates (£650 million, 1995-97; £560 million, 1976) have been expressed in 2025 prices using the HM Treasury GDP deflator.

sources (i.e. recycling, desalination, etc.) and flexible, connected water networks will protect economic growth benefits and deliver further benefits by buffering regions against future shocks, protecting the economy from escalating costs and disruptions.

In addition, strengthening the UK's water supply resilience also supports sustainable energy . As water and energy systems grow increasingly interconnected, insufficient water resources threaten power generation, with electricity demand projected to rise by 40-60%[11] by 2050. Robust water management is also critical to an environmentally sustainable growth from natural ecosystems protection, which underpins agriculture, food production, and tourism.

Economic Role 3: Unlocking Potential in Emerging Sectors

Increased investment in the UK's water supply is essential to unlocking the full potential of emerging sectors identified in the Modern Industrial Strategy[12], particularly in AI and clean energy. As the UK seeks to expand its digital infrastructure and transition to net zero, new technologies such as AI data centres, hydrogen production, carbon capture, and small modular reactors (SMRs) will require significant volumes of water.

For AI data centres the location and competitiveness will be directly affected by the availability and cost of water resources, with potential risks of higher operating costs and lost investment if water constraints are not addressed. Businesses will also be indirectly impacted from lack of water in homes. Forecasts from the US show that by 2028 direct water consumption by data centres is expected to reach 150-275 billion litres a year, between 2.5 and 4.5 times 2023 levels[13].

The identified clean energy technologies: hydrogen, carbon capture, utilisation and storage (CCUS), and SMRs, are required for the UK to achieve its net zero aims, but their success is contingent on a reliable water supply. Forecasts by the Joint Environmental Programme[14] indicate that water consumption for energy production may increase up to tenfold by 2050, driven by the shift toward these new technologies. Strategic investment in water infrastructure will be critical not only to secure inward investment and economic growth but also to improve energy independence and support the UK's net zero commitments. Failure to address these water needs , risks slowing industrial development, prolonging reliance on fossil fuels, and reducing the country's long-term competitiveness.

Economic Role 4: Supporting Growth in Existing Industries

Water supply is a foundational utility which other sectors in the wider economy rely on to operate. Increasing water supply and building resilience will feed into the wider economy, drive growth and improve UK international competitiveness in the future. Sectors where

[11] The National Framework For Water Resources 2025
[12] The UK's Modern Industrial Strategy 2025 - GOV.UK
[13] Shehabi, A. et al, 2024 United States Data Centre Energy Usage Report (2024), source - lbnl-2024-united-states-data-center-energy-usage-report.pdf
[14] Moores, A. Scenarios for the project to 2050 of water use by power producers.

water costs make up the largest proportion of their output will benefit greatly from investment in water supply infrastructure, and these are not necessarily the largest water consumers. Reliable water access lowers operational costs (against a counterfactual where access to water is constrained) and supports expansion, making businesses in these sectors more competitive and resilient. In addition, it attracts investment, stimulates job creation, and strengthens supply chains, particularly in regions where economic growth is closely tied to these industries. Where water is a critical input but not a major proportion of costs, investment in water supply infrastructure can further support growth by protecting against the harm caused by a lack of water availability.

The analysis in this report highlights that the key beneficiary sectors from water supply investment include Waste & Recycling, Accommodation, Leisure and Agriculture. Benefits include more efficient recycling processes, higher standards in tourism and accommodation, vibrant leisure industries, and sustainable domestic agriculture.

The order of magnitude of economic growth benefits

Investing in water supply infrastructure can unlock future economic growth. However, such investment alone is not sufficient to drive growth. It must be part of a broader, coordinated investment strategy across the economy and remains influenced by external factors such as geopolitical developments and technological advancements. This interdependency between water infrastructure and other infrastructure is recognised in NISTA's 10-year pipeline[15], which acknowledges the requirement to consider water usage in rail (related to housing construction), data or energy projects.

It can be useful to estimate the scale of growth potential unlocked associated with each of the economic roles water plays to drive growth at an order of magnitude level. To support this the analysis provides some very broad, early-stage order of magnitude estimates of the scale of benefits. These estimates are intended for contextual understanding of the scale of benefits only and are not appropriate to use in detailed cost-benefit analysis. These estimates are made in the context of significant unknown information around the future development of the UK economy. The analysis was scoped around the following question: "Assuming appropriate investments in water supply related major capital projects were made, what is the order of magnitude of economic growth unlocked in the year 2050". The estimates are therefore a single year value. The results are presented below.

[15] UK Infrastructure Pipeline - GOV.UK

Economic Role	Growth Unlocked Order of Magnitude in year 2050 (single year value only, 2025 prices, rounded to nearest £0.25bn)[16]
Growing the Labour Supply by meeting household demand	£1.5bn - £3bn
Increasing National Resilience	£0bn -£0.25bn
Unlocking Potential in Emerging Sectors	£2.75bn - £8bn
Supporting Growth in Existing Industries	£0.5bn - £0.75bn
Total	**£4.75bn - £12bn**

Conclusion

Investing now to secure future water supply, alongside other planned investments in demand management, will create the environment to drive long term economic growth. The Major Projects Programme supported by Ofwat is a major step forward towards achieving this. In addition to the contribution to long term economic growth the programme will also create a significant temporary boost to local economies through the construction of major projects. The significant investment programme will also generate a legacy of improved skills and productivity across these regions.

[16] *In developing this report OFWAT was supported by KPMG, who undertook research and developed the economic analysis presented in the report and the technical annex.*

1. Scope of report

Water is a key input into modern economies, used in all sectors with many heavily reliant on a sustainable supply to function. Further to this, water is a key input to the wider economy as it sustains people (labour) and the environment (natural capital). Ensuring a consistent water supply to meet demand is therefore key to economic growth.

Pressures on the UK's water supply-demand balance in recent years have been driven by a combination of factors. These included reductions in permitted abstraction, higher than anticipated growth in demand, and additional regulatory requirements such as increased resilience standards (e.g. resilience reflecting 1-in-500-year drought events) and abstraction caps.

To address this challenge Ofwat is supporting and regulating the delivery of a major projects programme by water companies to increase water supply. A major project is defined as a project exceeding £200m in TOTEX and the majority also meet the criteria to be a Regulators' Alliance for Progressing Infrastructure Development (RAPID) project. The current major projects pipeline includes 30 projects with a combined TOTEX in excess of £50bn. These are long term projects to be delivered over the next 30 years.

This report is divided into two sections:

Major projects Programme: An assessment of the direct economic impacts of the current major capital projects programme in terms of growth, jobs and skills.

Water supply and economic growth: An economic narrative on how investing in the water supply drives economic growth, split into four roles that water plays in the economy:

1 Growing the Labour Supply by meeting household demand
2 Increasing National Resilience
3 Unlocking Potential in Emerging Sectors
4 Supporting Growth in Existing Industries

2. Major projects programme

2.1 Major Projects Programme summary

The PR24 (price review) confirmed a significant increase in water sector investment to address resilience, supply, and environmental challenges. Alongside the regulated five-year price review period, a £50bn investment programme (of which £25bn is CAPEX) has been established outside the standard PR cycle. This allows for longer-term delivery timelines, as its 30 major infrastructure projects including reservoirs, transfer pipelines, desalination and treatment plants, and water recycling and reuse facilities, cannot be confined to the 5-year regulatory review period.[17]

This programme represents a strategic response to the need for sustained investment in water infrastructure. While the sector has maintained existing networks, little new storage or large-scale supply infrastructure has been built to accommodate rising demand, population and climate pressures, and industrial growth.[18] Addressing these challenges through investment in major water infrastructure will help close that gap by delivering new sources, networks, and resilience systems required for the UK's long-term water security.

The delivery of the majority of these projects is being coordinated through RAPID (Regulators' Alliance for Progressing Infrastructure Development) which is responsible for overseeing and progressing new infrastructure critical to future water resilience.[19] The development of these projects is accelerated through collaboration with regulators, water companies, and other stakeholders.[20]

Major infrastructure projects usually involve significant whole life totex and capex commitments. While project costs provide a clear picture of the scale of investment required, the focus of this report is on the benefits these projects will deliver in supporting economic growth. Table 1 shows the latest list of approved projects, their water resource zone locations and respective capital costs as originally published.

Table 1 List of Major Water Infrastructure Projects (£m, as of PR24 determinations)

Project Name	Type	Delivery Mode	Region	Whole Life TOTEX	Capex
Thames to Affinity Transfer (T2AT)	Transfer	DPC	South East	387	402
Grand Union Canal (GUC)	Transfer	DPC	South East	1,540	467
Minworth	Water recycling	In-House	South East	640	640

[17] PR24 final determinations: Major projects development and delivery - Ofwat
[18] ibid
[19] RAPID action on major water infrastructure is securing supply for future generations - Ofwat
[20] Major Projects - Ofwat

Project Name	Type	Delivery Mode	Region	Whole Life TOTEX	Capex
Fens Reservoir	Reservoir	SIPR	East	4,071	3,271
Lincolnshire Reservoir	Reservoir	SIPR	East	4,158	3,766
Peterborough to Grafham (P2G)	Transfer	DPC	East	389	174
Bacton Desalination	Desalination	DPC	East	2,337	727
Severn Trent Sources (STS)	Treatment and Transfer	In-House	West	124	124
West Midlands Raw Water Storage	Reservoir	DPC	West	491	316
Hampshire Water Transfer and Water Recycling (HWTWR)	Transfer and Water Recycling	DPC	South East	3,031	1,236
Aylesford re-use (Medway) and Ford re-use (Littlehampton) bundle	Water Recycling	DPC	South East	1,295	314
Thames to Southern Transfer (T2ST)	Transfer	DPC	South East	2,188	1,006
Broad Oak Reservoir	Reservoir	DPC	East	1,092	305
Beckton Water Recycling	Water Recycling	DPC	South East	3,511	994
South East Strategic Resource Option (SESRO)	Reservoir	SIPR	South East	7,523	2,662
Teddington Direct River Abstraction (DRA)	Water Recycling	In-House	South East	989	989
Lower Thames West London Reservoir (LTWLR)	Transfer	DPC	South East	1,729	635
North West Transfer	Transfer	DPC	West	353	323
Cheddar 2 Source and Transfer	Reservoir and Transfer	DPC	West Country	839	680
Poole Water Recycling and Transfer	Transfer and Water Recycling	DPC	West Country	306	163
Mendips Quarry	Reservoir	DPC	West Country	1,728	1,218
Kielder Transfer SRO	Transfer	In-House / DPC	North	1,146	384
Severn to Thames Transfer (STT)	Transfer	DPC	South East	4,310	1,537
Nottinghamshire Mine Water Treatment	Water treatment/ Transfer	DPC	North	755	341
West Yorkshire Water Treatment Works	Water Treatment works	DPC	North	310	220
Rudyard Reservoir Augmentation	Reservoir	DPC	West	738	290
South Yorkshire Sources	Source and Transfer	DPC	North	419	309
Mablethorpe	Desalination	DPC	East	2,205	686
North Suffolk	Reservoir	DPC	North	812	662

Project Name	Type	Delivery Mode	Region	Whole Life TOTEX	Capex
New Arlington	Reservoir	DPC	East	268	225
Total				49,684	25,066

2.2 Direct capital investment impacts

Large-scale construction programmes of this nature create a temporary one-off boost to economic output and employment, both locally and nationally, during peak construction years.[21] While these effects are short-term, they leave residual, lasting benefits by upskilling and expanding the labour force, which strengthens the UK's capacity to deliver future infrastructure projects.[22]

The programme's economic contribution has been assessed through to 2050, capturing both the scale and timing of capital spend and the resulting economic benefits. The analysis focuses exclusively on the economic impacts generated by the design and construction phases of these assets and does not assess the operational benefits or costs associated with the infrastructure once in service, such as reduced drought impacts or ongoing employment in water operations (these impacts are captured in section 2, although not linked specifically to this investment programme).

2.2.1 Methodology

To estimate the programme's Gross Value Added (GVA) and employment impacts, projects were grouped by WRMP[23] regions to reflect the geographic distribution of investment, and calculations were based on capital expenditure (capex). Different asset types were assigned a specific construction cost share of capex to account for their varying capital structures. For example, desalination plants typically involve a higher share of construction activity, while treatment plants and water reuse systems allocate a greater proportion to technology and specialist equipment.[24] This approach ensured the analysis accurately captured the right type of activity to better estimate the economic impact.

Given the inherent uncertainty associated with the economic modelling and the forward-looking nature of the assumptions applied, the results presented should be interpreted as orders of magnitude rather than precise point estimates. To reflect this uncertainty a sensitivity range has been applied to the modelled estimates for both maximum annual employment impacts and cumulative GVA.

[21] Analysis of the National Infrastructure and Construction Pipeline 2023 (HTML) - GOV.UK
[22] National Infrastructure Plan for Skills
[23] A summary of England's revised draft regional and water resources management plans - GOV.UK
[24] World Bank Document

Each central estimate has been assigned a lower-bound adjustment of -25% and an upper-bound adjustment of +10%. This asymmetric range has been adopted to account for the greater likelihood of downside variation relative to upside potential. This reflects a cautious approach intended to minimise the risk of overstating potential impacts, acknowledging that external factors and input assumptions could reasonably reduce impacts below the central case.

2.2.2 Additionality: Leakage and Displacement

Additionality is defined in the HMT Green Book as "real increase in social value that would not have occurred in the absence of the intervention being appraised"[25]. In the context of the Major Projects Programme it means reflecting the actually realised short term increase in GVA and jobs once the components of additionality have been taken into account.

- In additionality **leakage** refers to the proportion of benefits that occur outside the target area (the UK). For this analysis a low leakage assumption of 10% was applied reflecting that the majority of economic value and jobs will be contained within the UK.
- **Displacement** refers to the degree to which any increases from this intervention are offset by reduced activity elsewhere. For the Major Projects Programme a moderate displacement assumption of 25% has been applied to reflect that large scale construction projects can use up limited construction resources and limit other activity in the counterfactual.[26] A moderate assumption has been used rather than a high assumption here because this spending is well telegraphed and communicated to the market in advance, giving time for the market to react to growing resource demands. In addition, the total GVA of the construction sector in 2023 was £154bn[27], meaning that in most years the capital spend programme assessed here represents a less than 1% increase, with a brief peak to 3%. These assumptions were applied to the respective capex for each project across the build period to produce the final GVA and employment estimates by project type, industry allocation, and additionality factor.

2.2.3 Estimating output in Gross Value Added (GVA)

Using UK Input-Output tables and sector-specific multipliers for the construction and architectural & engineering services industries, the programme's GVA impact was estimated. These sector specific multipliers estimate the total change in economic output associated with an increase in a specific sector, i.e. an increase in the construction sector output will increase output in other sectors that are part of the supply chain. The economic output generated follows a temporary and peak-centric profile, aligned with construction activity across the various projects between 2027 and 2049. For example, in the East region, the total

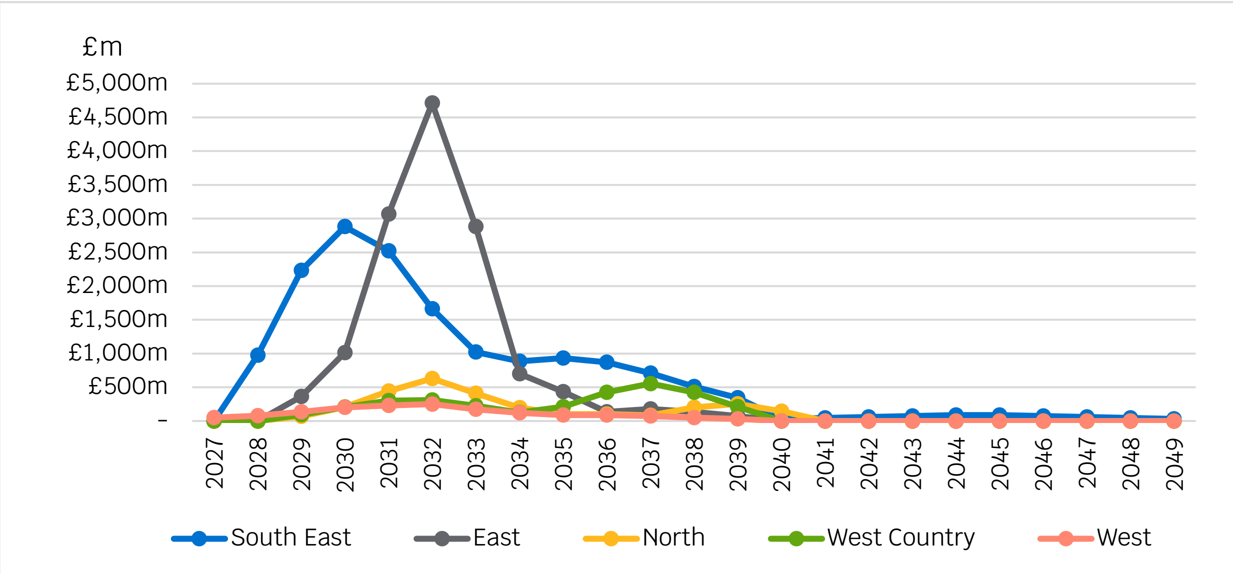
[25] The Green Book (2022) - GOV.UK
[26] Additionality Guide
[27] Regional gross value added (balanced) by industry: all ITL regions - Office for National Statistics

net GVA contribution reaches a peak between£3.5bn to £5.2bn (2025 prices), part of a 3-year surge (2031-2033), accounting for over 75% of the entire regional economic impact of major projects. By 2035, net GVA falls within the range £326m and £477m, and by 2039, it reaches only £54m to £79m, indicating the end of major construction activity and associated economic growth. While the £25bn capital spend generates a significant short-term economic boost this is a temporary stimulus effect and not a long-term economic transformation.

2.2.4 Employment

Employment impacts were estimated using industry-specific Type I employment multipliers, expressed as full-time equivalent (FTE) job-years per £1 million of spend.[28] These figures do not represent direct employment in Construction and engineering. By design, the multipliers reflect the total employment generated across the economy as a result of capital investment in these two industries. This includes direct employment within these sectors and the indirect employment created in their supply chain. The detailed year-by-year job creation projections are presented below.

Figure 2 Annual Spread of temporary one-off GVA by Region



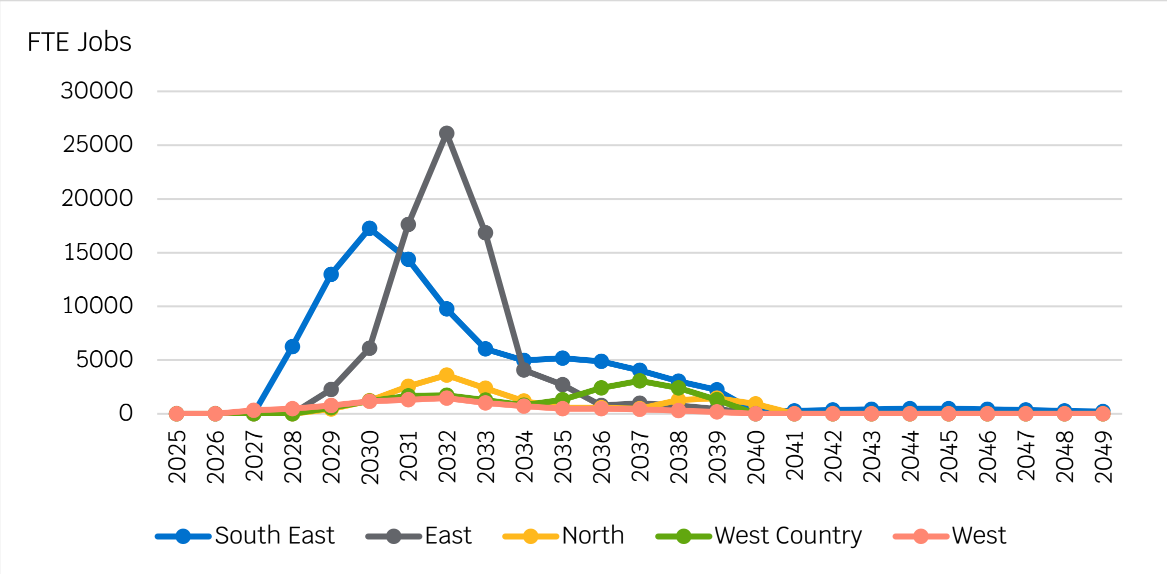
The estimated FTE job creation across all regions is a temporary and cyclical employment pattern tied directly to the construction timeline of the projects, spanning from 2027 to 2049. For example, zooming in on the East region, Figure 3 shows that job creation is not evenly spread, but follows a bell-shaped curve, with a pronounced peak during the core construction years (2031-2033) and a rapid decline post 2033. Peak estimated concurrent employment is reached in 2032 at an estimated range of 19,572 to 28,706 FTEs. These jobs are

[28] National Infrastructure and Construction Pipeline 2023

also temporary, highly concentrated, and should be considered as a time-limited economic and labour market stimulus.

The overall results show that both GVA and employment peak between 2025 and 2035, with a sharp decline as major capital works are completed and the projects transitions into operational phases.

Figure 3 Spread of Total No. of temporary one-off annual employment



2.2.5 Sensitivity Analysis

The total costs for capital delivery of the Major Project Programme may be higher than initially set out in the Final Determinations. Recognising this, the analysis has incorporated a set of sensitivity scenarios (+25%, +50%, and +75%) to capture various potential impacts in the future.

Based on the initial capex profile, the total impact is estimated at 31,988 – 46,916 maximum annual jobs generating a £28.0 – £41.1bn cumulative GVA. Applying the sensitivity tests, the total impacts could range from this base estimate up to 55,980 – 82,103 maximum annual jobs and £49.0 – £71.9bn cumulative GVA, representing a 75% increase compared to the base impact.

The total cumulative results in the tables below indicate that the South East and East regions together account for over 80% of the total GVA and jobs created.

Table 2 Cumulative temporary one-off GVA (2025-2050) (£bn)

Region	Major Projects Programme Total CAPEX Assumption			
	Base	+ 25%	+50%	+75%
South East	12.1 - 17.8	15.1 - 22.2	18.2 - 26.6	21.2 - 31.1
East	10.3 - 15.1	12.8 - 18.8	15.4 - 22.6	18.0 - 26.4
North	2.1 - 3.1	2.7 - 3.9	3.2 - 4.7	3.7 - 5.5
West Country	2.3 - 3.4	2.9 - 4.2	3.5 - 5.1	4.1 - 5.9
West	1.2 - 1.7	1.5 - 2.2	1.8 - 2.6	2.1 - 3.0
Total	28.0 - 41.1	35.0 - 51.4	42.0 - 61.6	49.0 - 71.9

Table 3 Temporary Annual Max Job Creation

Region	Major Projects Programme Total CAPEX Assumption			
	Base	+ 25%	+50%	+75%
South East	12,939 - 18,978	16,174 - 23,722	19,409 - 28,467	22,644 - 33,211
East	19,572 - 28,706	24,465 - 35,882	29,358 - 43,058	34,251 - 50,235
North	2,698 - 3,957	3,373 - 4,947	4,047 - 5,936	4,722 - 6,925
West Country	2,299 - 3,372	2,874 - 4,215	3,449 - 5,058	4,023 - 5,901
West	1,096 - 1,608	1,370 - 2,010	1,644 - 2,412	1,918 - 2,813
Total	31,988 - 46,916	39,985 - 58,645	47,982 - 70,374	55,980 - 82,103

2.2.6 Skills

Large-scale infrastructure acts as a catalyst for skills development. Investment in major water infrastructure across England will generate substantial temporary benefits such as employment growth, construction activity, and local economic uplift. However, a longer-lasting outcome, such as the development of a skilled and adaptive workforce, emerges from this effort. By signalling labour demand, stimulating training, and encouraging localised skills development, these projects leave behind a more skilled and resilient workforce. In turn, this workforce forms a flexible foundation for future infrastructure programmes.

Figure 4 Infrastructure Investment as a Catalyst for Skills Development

Creates Scale and Demand

Delivering this scale of infrastructure will naturally create immediate demand for labour, requiring tens of thousands of skilled and semi-skilled workers, such as engineers, surveyors, project managers, environmental specialists, and construction workers.

In 2024, Water UK projected over 30,000 new workers and 5,000+ apprenticeships were needed to deliver the UK water sector's future investment pipeline (this includes all water investment, not just the Major Projects Programme), estimated at £96bn (2025-2030).[29] The Infrastructure and Projects Authority (IPA) estimates that an annual average of 543,000-600,000 workers will be required to deliver the £164bn of total infrastructure investment (not

[29] Water UK, 2024

just water) in the next two years. These jobs are forecasted to be across different industry groups including construction and engineering construction. Of this, approximately 60% are construction jobs.[30]

Signals Local Stakeholders

The increase in demand for construction and technical roles in regions receiving infrastructure investment, acts as a clear signal to:

- Local authorities to adjust economic development and employment strategies
- Further Education (FE) colleges to modify course offerings and increase capacity
- Training providers and employers to form partnerships and invest in upskilling

These responses create a regionally tailored skills pipeline that not only serves the current infrastructure programme but also builds lasting capacity in civil engineering and project delivery.[31] [32]

Residual Benefit

The construction phase delivers temporary employment and economic uplift (GVA) and leaves behind valuable residual benefits such as a skilled workforce. Workers trained or retrained during the build phase leave with certifications, advanced technical experience, and transferable skills that are applicable to other industries. These workers become more mobile, employable, and productive in future roles, creating a positive multiplier effect on the regional and national economy.[33]

Figure 5 The Residual Benefit

Addresses Skills Shortages and Builds Resilience

Furthermore, the UK faces notable shortages in construction and infrastructure skills. By driving local training provision, these projects help reduce national skills gaps, especially in areas underserved by previous industrial or economic policy.[34]

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[30] National Infrastructure and Construction Pipeline 2023
[31] UK Infrastructure: A 10 Year Strategy
[32] The UK's Modern Industrial Strategy
[33] National Infrastructure Plan for Skills
[34] CECA, 2022

"Civils contractors today warned that the UK's infrastructure sector is being hampered by a lack of skilled workers and said that the number of firms reporting difficulties in labour supply has reached record highs." CECA, 2022

Incentivises Skills Investment Through Procurement

Lastly, public procurement rules can require bidders to deliver social value outcomes, including skills training, apprenticeships, and local labour. This creates accountability mechanisms that ensure the spillover effects are not incidental, but intentional and measurable. This ensures that the skilled workforce developed during infrastructure projects becomes part of a strategic, long-term human capital plan.[35]

"Procurement Policy Note 14/15 set out a mandatory requirement on publicly funded projects. It requires procurers of major construction and infrastructure projects with a capital value over £10 million, and lasting 12 months or longer, to support skills development and the apprenticeship commitment." (HM Treasury, 2015 p.8)

The following case study[36] demonstrates how large-scale capital investment can deliver not only physical infrastructure but also a lasting workforce legacy.[37]

Skills Outcome from Large-Scale Capital Programmes - HS2

HS2, one of the UK's largest infrastructure programmes, has embedded a strategic focus on skills throughout its design and delivery. Beyond its core transport objectives, HS2 has acted as a platform for addressing national skills shortages and creating a more inclusive and resilient workforce for the infrastructure and engineering sectors.

- Over **2,000 apprenticeships** created across its supply chain, spanning engineering, transport and technical services.
- A **workforce of over 30,000 individuals**, with sustained demand expected across the programme's construction timeline.
- The **upskilling of hundreds of formerly unemployed individuals**, many entering construction and infrastructure for the first time.
- Structured **STEM outreach and education initiatives**, reaching more than **11,000 students**, contributing to future skills pipeline development.

[35] National Infrastructure Plan for Skills
[36] HS2 Skills Education Employment Strategy
[37] Creating a legacy through social value - HS2 Learning Legacy

- Active **engagement with FE providers and the National College for High-Speed Rail**, ensuring alignment between labour demand and skills training.
- A dedicated **Skills, Education and Employment (SEE) strategy** integrated across all tiers of the supply chain.

2.3 Environmental impacts

While this analysis focuses on the economic impacts of capital delivery, environmental considerations are a core driver of the £50bn major projects programme. Alongside the need to increase water supply and resilience for a growing population, a significant share of the new capacity being delivered is intended to replace or offset unsustainable abstraction from sensitive sources, particularly chalk streams and ecologically vulnerable catchments.[38]

The Environment Agency's (EA) National Framework[39] states that over 60% of the new water supply provided by the major projects in regions like the South East and East is will be used prevent further environmental damage from over abstraction . By 2050, England will need up to 5,400Ml/d of new supply or demand savings. A significant portion of this is linked to environmental needs, such as restoring flow levels in protected rivers and groundwater systems. Therefore, strategic resource options such as reservoirs, transfers, desalination, and water recycling are essential to enable these reductions while maintaining supply resilience. While the value of a healthy environment is not directly captured in GDP, these improvements represent a clear benefit to society by supporting ecosystem health, public wellbeing, and long-term economic resilience. This aligns with the Growth Duty's[40] recognition that environmental sustainability is a fundamental driver of economic growth and an integral part of the UK's wider prosperity.

[38] A summary of England's revised draft regional and water resources management plans - GOV.UK
[39] The National Framework For Water Resources 2025
[40] Growth duty statutory guidance 2024.pdf

3. Water supply and economic growth

3.1 Introduction

Investment in the future water supply, through major water supply projects, underpins economic growth by providing the required resources to grow. This report does not make specific assumptions on the scale of water resources needed to be supplied beyond that it is sufficient to meet future water growth demands. The report does not assume that water supply drops below current levels.

Four primary economic roles of water have been identified as the drivers of this growth:

1. Growing the Labour Supply by meeting household demand
2. Increasing National Resilience
3. Unlocking Potential in Emerging Sectors
4. Supporting Growth in Existing Industries

This report focuses on presenting an economic narrative that explains the importance of new water supply in supporting sustainable growth across England. It provides an economy-wide perspective that complements the assessment of the Major Projects Programme direct capital spend set out in Section 2. Order of magnitude estimates are included in this section, only to illustrate the potential scale of impacts and to frame the wider economic context.

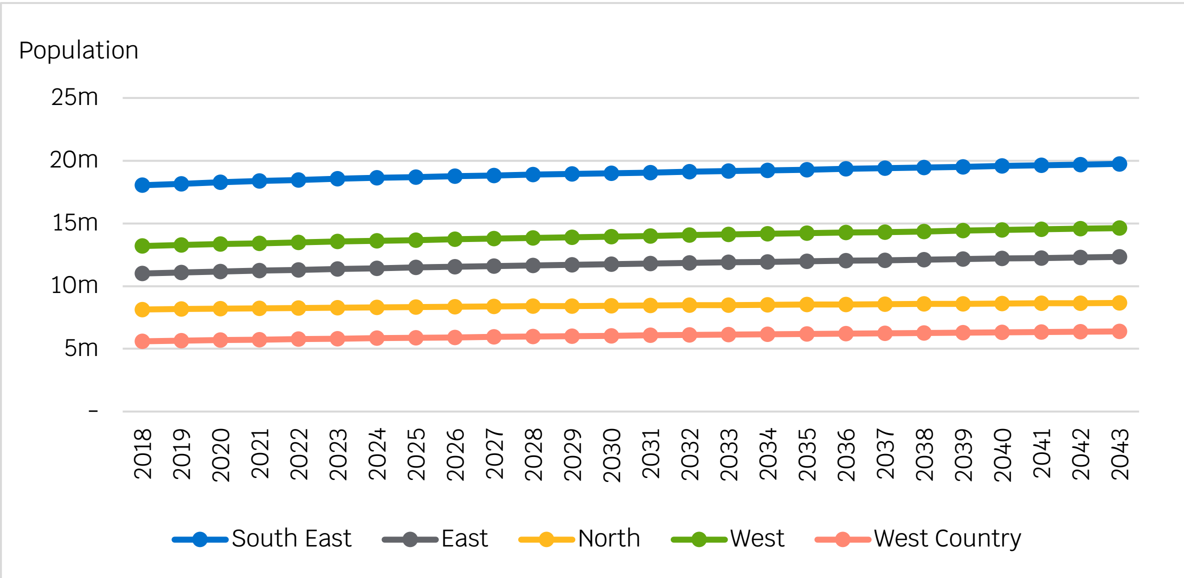
3.2 Economic Role 1: Growing the Labour Supply by meeting household demand

Reliable access to water is essential to sustaining communities and economic activity. In order for a population to grow, it has to have access to enough water to support that growth. Adequate water resources are a prerequisite for sustainable population growth. In the UK context, constraints on local water availability can limit new housing development in specific areas, as homes cannot be approved without assurance that water supplies are sufficient to support them. Population growth drives economic growth through an increase in the labour supply. Access to water is therefore fundamental to drive economic growth.

Figure 6 Water Supply and its Impact on Housing, Labour, and Economic Growth

England's population is set to increase to over 71 million people by 2055, an increase of over 8 million people from now.[41] According to ONS estimates, the South East region is projected to maintain the largest share of England's population over the long-term, consistently accounting for at least 30%.

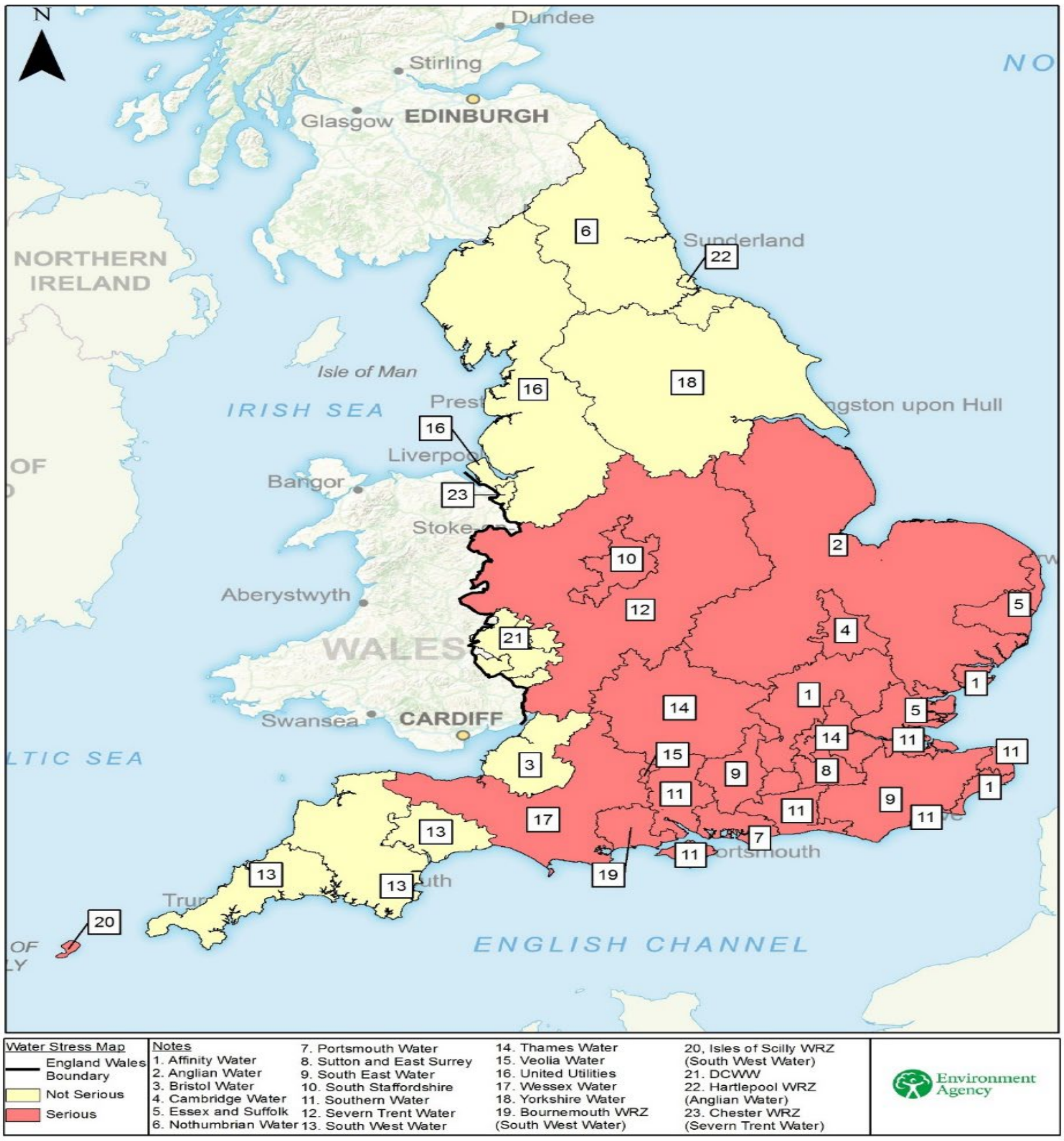
Figure 7 ONS Population Projections by Region



Several regions in England, most notably the South East and East, are currently classified as seriously water-stressed[42] under the Environment Agency's 2021 assessment.[43] The Water Resources Management Plan (WRMP) identifies the South East as having the highest projected water need by 2050, driven by environmental pressures and population growth with household demand alone expected to reach 549 Ml/d.[44] The National Framework target to reduce per capita consumption to 110 litres per head per day, alongside the measures set out in the WRMP, will be essential to achieving a sustainable balance that requires both new supply infrastructure and robust demand management. This will help alleviate population pressures on regional development.

[41] The National Framework For Water Resources 2025
[42] In this context, water stress reflects the balance between available water resources and demand, which is strongly influenced by factors such as high population density and relatively low rainfall.
[43] Water stressed areas – 2021 classification - GOV.UK
[44] A summary of England's revised draft regional and water resources management plans - GOV.UK

Figure 8 Water Stress Classification Map



Source: Environment Agency (2021) [Water stressed areas – 2021 classification - GOV.UK]

Housing Development is Linked to Water Supply and Economic Growth

In areas with limited water capacity, housing development becomes increasingly constrained. Planning permission for new housing developments may be restricted where forecasts to 2050 show that supply will not meet demand under the tougher drought resilience target, which moves from a 1-in-200 to a 1-in-500-year drought. While the government has set an ambition to deliver 1.5 million new homes over five years, many of the areas expected to accommodate this growth are already operating under serious water stress.[45] As a result, regions such as the South East and East, which typically attract the

[45] EWSC: Public First Report

highest levels of demand due to economic opportunity, face limits on their ability to accommodate population growth.

This leads to persistent housing shortages, rising affordability pressures, and a diversion of development activity toward less constrained regions, even where economic fundamentals are weaker. For instance, recent assessments by Public First[46] have identified seven of the most productive local authorities which risk experiencing the highest percentage of lost housing due to water scarcity between 2025 and 2030.

Table 4 Annual % of Planned Housing Lost to Water Scarcity

Local Authority	% of Planned Housing Lost to Water Scarcity (p.a)
Worthing	51
Cambridge	36
Woking	45
King's Lynn and West Norfolk	44
North Norfolk	38
Isle of Wight	35
West Suffolk	28

Labour Supply Drives Growth in Productive Regions

To meet growing demand from employers for labour, regions need sufficient water to continue expanding their populations. Without it, employers in these regions may face tightening labour markets, higher wage pressures, and recruitment challenges, as the supply of jobs outpaces the available workforce and potential workers and companies are priced out of relocating to these areas. While GVA per worker may continue to improve incrementally, the cap on labour supply prevents these regions from contributing fully to national economic growth. Investing to increase the water supply will directly address this challenge and drive economic growth.

"The economic impact of housing constraint in this part of the country (the South East and East of England) is exacerbated by the fact that these geographies contain some of the areas with the highest productivity in the UK. A lack of housing delivery in areas such as these will act as a drag on economic growth by constraining access to the labour that is vital to the health of high productivity sectors." Public First Report (2025)[47] p.12.

Constrained Water Supply shifts Labour Growth to Lower-Productivity Regions

[47] ibid
[47] ibid

In the absence of accessible housing in high-demand areas, workers are more likely to remain in their existing regions or relocate to areas with greater housing availability. While the North, West, and West Country regions can absorb population growth, they have lower GVA per worker and a higher proportion of employment in less productive sectors. As labour growth shifts geographically, the distribution of economic activity becomes less aligned with productivity potential. This reduces the overall efficiency of the labour market and subsequently long-term GVA growth. Water supply constraints create a form of market failure, where external factors outside the control of employers and workers (such as limited infrastructure capacity) distort the efficient matching of labour supply and demand. These outcomes underscore the wider economic cost of water infrastructure constraints.

The following case study[48] illustrates how failing to invest in water infrastructure is a direct constraint on housing delivery and labour supply, even in regions central to national productivity. Without urgent response to water scarcity challenges Cambridge's growth and its contribution to national economic output will remain restricted.

Cambridge – Unlocking Growth Potential Through Investing in Water Supply

The Cambridge sub-region stands as one of the UK's most economically promising areas, positioned to become "Europe's Silicon Valley", with plans to deliver up to **150,000 new homes by 2050**, under the Government's Cambridge 2040 vision. Despite high demand for housing and a thriving economic base centred around the University and tech sectors, insufficient water supply now poses a hard cap on future growth.

The city relies heavily on groundwater sources, which are under increasing environmental stress. In response, the EA has objected to multiple strategic planning applications, including sites already allocated in adopted local plans, citing unacceptable risks to water bodies from increased abstraction.

This has led to:

- **9,000 homes** (as well as **300,000 m2 of commercial development**) being currently stalled.
- **The Greater Cambridge Local Plan** has been delayed due to unresolved water issues.[49]
- **Two major housing schemes**, including Darwin Green (1,000 homes) and Cambridge North (450 homes), are under appeal with decisions pending from the Secretary of State.

[48] Addressing water stress: the key to unlocking growth in Cambridge? - UK Property Forums
[49] Greater Cambridge Local Plan - timetable update - Cambridge City Council

3.3 Economic Role 2: Increasing National Resilience

Drought is a recognised national risk in the UK, driven by prolonged periods of below-average rainfall that reduce water availability in rivers, aquifers, and reservoirs.[50] Its impacts are shaped not just by rainfall deficits but by the resilience of the water infrastructure systems that secure and manage water. Robust infrastructure, including reservoirs, inter-regional transfer schemes, and leakage control, plays a significant role in preventing water shortages from escalating into systemic crises. Without adequate capacity to store and transfer water, even moderate dry periods can lead to supply disruptions, economic losses, and environmental degradation.[51] Future investment in water supply infrastructure would therefore make the UK more resilient and boost economic growth.

There are two impact pathways through which increased drought resilience can drive economic growth:

- **Primary Impacts:** Reducing the direct economic costs of periods of low water supply
- **Secondary impacts**: Reducing the knock-on costs to other sectors when they cannot access the water they need.

3.3.1 Primary Impact: Reducing the direct economic costs of periods of low water supply

Investing in water supply infrastructure reduces the size of economic shocks from droughts when they happen. This enables long term economic growth to continue.

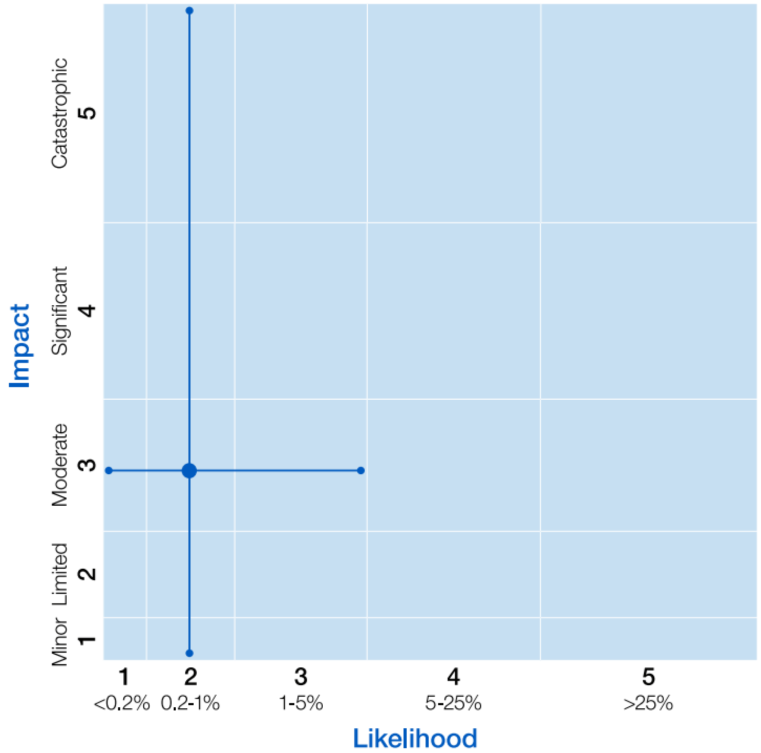
The most immediate effects of droughts arise from reduced rainfall and river flows, which deplete reservoirs and aquifers. In the UK, resilience varies widely across regions. Regions with limited connectivity between catchments or heavy reliance on a single water source are often more exposed to drought impacts. The type of water source also influences resilience. For example, groundwater-dominated catchments can in some cases provide greater stability during dry periods, while surface-water-dependent systems may be more immediately affected.[52]

Consequently, demand management, reservoirs and water transfers are central to buffering the effects of droughts. They allow for the strategic redistribution of water from areas of surplus to areas of need, helping to stabilise supply and reduce over-abstraction from vulnerable water sources. Their role is critical not just in avoiding immediate disruption, but also in safeguarding long-term water security.[53]

[50] Drought: how it is managed in England - GOV.UK
[51] ibid
[52] ibid
[53] Water supply resilience and climate change - UK Parliament.pdf

The National Risk Register (NRR) 2025,[54] recognises drought as an acute risk. It assigns a likelihood score of 2 (annual probability between 0.2% and 1%) and an impact score of 3 (moderate) under a reasonable worst-case scenario. However, these ratings reflect a short-term horizon (1-2 years) and do not reflect the long-term hazard trajectory projected under climate change.

Figure 9 Drought Impact and Likelihood NRR Rating



According to the UK Climate Change Risk Assessment (CCRA3)[55] and the Climate Change Committee's (CCC) 2025 Progress Report,[56] drought risk is increasing and will become significantly more acute by 2050. Under a medium emissions scenario (RCP4.5), by 2050:

- UK summers are projected to be 1.6◦C warmer and 13% drier than the 1981-2000 baseline.
- Summers as hot and dry as 2018 are expected to become typical.

These changes will increase the frequency and intensity of drought events, with direct consequences for water supply, agriculture, and natural ecosystems.[57] These projections suggest that current NRR scores may underestimate the medium and long-term risk.

While major investment is planned the CCC warns that current measures are not progressing fast enough.

[54] National Risk Register - 2025 edition
[55] UK Climate Change Risk Assessment 2022
[56] Progress in adapting to climate change – 2025 report to Parliament
[57] ibid

“Water companies remain off track to deliver the water demand and leakage reduction targets needed to prepare for a drier future despite new plans. The lack of new actions to meet the targets… means that we no longer judge there to be fully credible plans in these areas.” (The CCC, 2025; p.23)[58]

It is important to note, however, that PR24 has enabled a record level of investment to maintain resilience to droughts, including the development of new supply schemes and demand management programmes designed to meet the 1-in-500-year resilience standard by 2039 and sustain it through to 2050.

In recent years, England has faced prolonged dry periods that placed significant pressure on water resources. The 2016 to 2019 drought led to drought permits and orders in the North West and Yorkshire, reduced agricultural productivity and left groundwater levels slow to recover. More recently, the 2022 to 2023 drought brought record summer temperatures, reservoir storage dropping to just 49% nationally, temporary use bans affecting 19 million people, and widespread environmental stress including algal blooms and fish kills.[59] These events were managed without the most severe restrictions, but they underline the economic and ecological vulnerabilities of the system under modern conditions.

The following case study[60] demonstrates how poor resilience due to limited storage and transfer capacity forced costly emergency responses and prompted long-term infrastructure investments.

The 1995-1997 Drought in Yorkshire and the North West

The **1995-1997 drought** was particularly severe in Yorkshire and the North West, regions heavily dependent on upland reservoirs. A hot, dry summer in 1995 rapidly **depleted reservoir levels** and exposed the weaknesses of local infrastructure. By late summer 1995, some communities faced **standpipe use** and **emergency restrictions**, triggering public backlash and national attention:

> “The public resentment and publicity given to the introduction of standpipes in parts of Yorkshire and the north-west in the hot dry summer of 1995... led to Yorkshire Water Services announcing, in April 1996, plans for a £50 million water transfer scheme from the Tees to the River Ouse to increase the resilience of the region against future droughts.” p.21

[58] Progress in adapting to climate change – 2025 report to Parliament
[59] Drought: how it is managed in England - GOV.UK
[60] Major droughts in England from 1800 and evidence of impact

The drought economic impacts were significant. **Agriculture suffered losses of £350m**, while **the retail sector lost £739m**. **Emergency water supply operations** added **another £187m** in costs. In total, the **drought cost the economy over £1.28bn.**[61]

The case study[62] below is another example of the severe impacts of droughts on water supply and the economy. This example illustrates that having interlinked reservoir networks and flexible water movement mechanisms significantly reduces the severity of drought impacts on water supply.

The 1976 Drought

The **1976 drought** was one of the UK's most extreme, with record heat and rainfall deficits across nearly every region of the country. Regions with limited interconnections or single-source reliance were far more likely to face **rota cuts, standpipes, and severe restrictions**.

Drastic rationing led to approximately **one million people experiencing rota cuts**, with water supplies restricted for up to 17 hours a day. Additionally, **over 2,200 standpipes were installed in streets to serve 160,000 people.**

Consequently, this prompted the **UK's first Drought Act** and the **appointment of a Minister for Drought**. One lesson from 1976 was that the flexibility of water networks made a critical difference in local outcomes. The report cites examples where interconnected reservoirs allowed some areas to avoid the worst shortages:

> *"Flexibility in supplies was crucial for determining regional impact of drought (e.g., water shortages in Northampton avoided by transferring supplies between reservoirs; also, in Yorkshire all reservoirs were drawn down equally)."* p.36

The economic impact was substantial as agriculture suffered **a loss of over £4.1bn**(present value) and **subsidence claims added another £491m**[63] (present value). With total losses exceeding £4.59bn, the 1976 drought exposed the vulnerability of the UK's water system.

[61] Prices were converted to 2025 prices from 1997 prices.
[62] ibid
[63] Prices were converted to 2025 prices from 1976 prices.

3.3.2 Secondary Impacts: Reducing the knock-on costs to other sectors when they cannot access the water they need.

The benefits of increased resilience extend far beyond water supply. These include significant consequences for the energy sector and ecosystem.

Energy Supply

Water supply and energy supply are increasingly interconnected, and both are fundamental drivers of economic growth. Investing in securing our water supply means also securing a key input into our energy supply.

The National Framework for Water Resources acknowledges the growing interdependency between the energy sector and water availability, especially in the face of climate change and population growth. Projections from the Department for Energy Security and Net Zero (DESNZ) indicate a significant increase of 40-60% in electricity demand by 2035 driven by the UK's electrification and net zero commitments.[64]

This anticipated rise in electricity demand has direct implications for water resources, as water is essential for cooling in thermal power generation, hydrogen production, and carbon capture technologies.[65] The EA estimates that water needed solely for hydrogen production and Carbon Capture and Storage could reach to 767Ml/d[66] by 2050. While some UK facilities draw on seawater, many depend on freshwater abstraction from rivers – a source vulnerable to reduced flows during droughts, limiting cooling capacity when it is needed most.

Failing to secure sufficient water supply risks severe electricity supply interruptions and major economic costs. Research by Byers et al. (2020) found that on extreme days, almost 50% (7GWe) of freshwater thermal capacity could be unavailable, with annualised electricity price impacts exceeding £100m.[67] Given that energy supply failure is rated among the highest impact risks (impact score of 5 – catastrophic) in the NRR,[68] the potential for drought to disrupt power generation represents a critical threat to the economy.

Ecological Resilience

Investing in our water supply strengthens our ecological resilience and protects our natural capital, which feeds through into economic growth.

Ecological resilience is the ability of natural ecosystems to withstand and recover from drought and water stress. In response to rising pressures on England's freshwater ecosystems – including the increasing frequency of drought, unsustainable abstraction

[64] The National Framework For Water Resources 2025
[65] Drought: how it is managed in England - GOV.UK
[66] The National Framework For Water Resources 2025
[67] Drought and climate change impacts on cooling water shortages and electricity prices in Great Britain
[68] National Risk Register - 2025 edition

levels, and the degradation of environmental flows – ecological resilience is identified as a central objective in the National Framework for Water Resources 2025.[69]

The Framework estimates that without intervention, drought conditions will result in further ecological degradation and reduced resilience. This ecological decline has direct consequences as healthy water systems underpin agriculture, food production, tourism, and energy generation – sectors that contribute significantly to the UK economy.[70] For example, poor ecological resilience can severely disrupt agricultural output, reducing crop yields and increasing the cost of livestock feed. Such impacts reduce farm incomes, limit the availability of produce for food processing, and create supply pressures that drive up market prices, ultimately affecting consumers.

Importantly, these pressures are not solely as a result of limited supply infrastructure but of rising demand from economic and population growth. The environment itself also bears direct costs, with loss of biodiversity, degraded habitats, and reduced ecosystems services. Addressing these challenges requires not only new infrastructure but also significant improvements in water efficiency and demand management across industries.

To protect both ecosystems and economic stability, the Framework sets a target to return 2,828 Ml/d to the environment by 2050, including 500 Ml/d of immediate abstraction reductions in sensitive catchments such as chalk streams.[71] Meeting these targets is essential not only for biodiversity but also for sustaining the natural capital that underpins long-term economic growth.

3.4 Economic Role 3: Unlocking Potential in Emerging Sectors

The UK's Modern Industrial Strategy, published in June 2025, sets out the UK's 10-year plan to attract inward investments and grow the UK's future industries. The plan identifies eight growth sectors, reflecting the UK's existing and ambitioned competitive position across diverse industrial segments:

- Advanced manufacturing
- Creative industries
- Clean energy
- Digital and technology
- Professional and business services
- Financial services
- Life sciences
- Defence

[69] The National Framework For Water Resources 2025
[70] Drought: how it is managed in England - GOV.UK
[71] A summary of England's revised draft regional and water resources management plans - GOV.UK

While existing UK strongholds in the service industry (creative industries, professional and business services, financial services, life sciences) cannot be considered water-intensive in themselves, other emerging technologies and sectors require significant volumes of freshwater to support their ambitioned growth.[72]

Four emerging technologies, featured in the Modern Industrial Strategy,[73] have been identified as (i) potential key drivers of future economic growth, that are (ii) dependent on high volumes of freshwater resources to deliver their forecast contribution to growth. These include **data centres** (**digital and technology**) **and hydrogen, carbon capture, utilisation and storage (CCUS) and small modular reactors (SMR)** (**clean energy**). Investing in sufficient future water supply and efficient water practices will enable these sectors to lead the way in delivering on the UK's Industrial Strategy.

When considering the scale of opportunity in emerging sectors, an important consideration is that independent forecasts are developed for each sector individually and may include conflicting assumptions. There is a recognition that not all sectors will see the level of growth forecast described in Government policy, in practice it is more likely that only one or two sectors will be scaled to national level industries.

AI and data centres

Artificial intelligence (and increased digital connectivity in general) are transformational technologies that could dramatically improve productivity in the UK, which has remained stagnant since 2008. The growth in AI and digital services needs to be supported by an effective digital infrastructure that matches the scale of the future demand. Critical to this is the development of data centre capacity, digital (and physical) server space that can process the workloads associated with intense compute demands such as AI. Data centres (particularly AI data centres) require two key resources at the sites where they are located to operate; **power and water**. In this paper the focus is on investment to provide water but delivery of the benefits will require access to both resources.

Computers and physical servers generate substantial heat as they process data, which needs to be cooled to maintain performance and prevent systems from overheating. An increased digital capacity therefore translates into a requirement for more efficient cooling. Currently, the most efficient cooling methods require water. Yet, these methods are reliant on high levels of water consumption as around 80% of the water used is lost through evaporation.[74] Therefore, growing data centre capacity to meet the requirements of AI in the UK will be

[72] It is worth noting that the generalisation of AI uses in the creative, financial and professional service industries will contribute, indirectly, to enhanced water consumption from the technology sector, which is considered as a separate industry.
[73] His Majesty's Government. Industrial strategy – advanced manufacturing sector plan (2025).
[74] Data Centre Dynamics in Kenny, R. (2025) Water use in AI and Data Centres. Source - Water_use_in_data_centre_and_AI_report.pdf

partially dependent on sufficient access to cooling water as well as efficiencies regarding the water consumption of cooling processes to reduce upfront demand.

This relationship has been evidenced over the last decade and is likely to accelerate over the next decade driven by growth in water demands from very large data centres. Between 2014 and 2023, direct water consumption from data centres in the USA trebled and is not appearing to slow down - **by 2028 total direct water consumption will increase to c. 150 – c. 275 billion litres a year, that is between 2.5 and 4.5 times the 2023 levels**[75]

Future investment decisions towards AI and data centres will be dependent on co-investment in water supply infrastructure to realise the growth ambitions associated with the digital economy. This could be critical to UK growth as AI is unanimously viewed as a vector of increased productivity for the whole economy, not just the digital and technology sector.

The strength of relationship between AI data centres and water supply needs to be understood in light of the factors informing where data centres are located. The location of data centres, and Government's future AI Growth Zones, is a function of three parameters: proximity to clients, space, and available resources (power & water). Proximity to clients is crucial for inference services, the real-time applications of AI to economic purposes, but is not required for AI training purposes.[76] As a result, place-based water constraints are only likely to affect the location of data centres delivering inference services, which need to be located close to business centres to reduce latency. In water constrained areas, data centre developers are likely to face higher costs associated with sub-optimal locations (increased latency) and/or higher costs related to energy demands associated with a shift to air-cooled systems. These higher costs from using non-water cooling systems could impact the competitiveness of UK data centres compared with other global cities.

In the context of the UK, AI proximity to end-clients is likely to be synonymous with locations in London and the Southeast. If AI rollout accelerates as planned and service industries of the nature of those based in London require substantial inference, a lack of available water resources in the region could not only constrain the UK's AI competitiveness but also undermine the relative performance of the UK's service base and incentivise relocations in other global service hubs.

Culham's AI Growth Zone

The first AI Growth Zone has been designated in the Culham Campus, one of the UK's leading science centres, home to the UK Atomic Energy Authority, the national organisation responsible for research and development in nuclear fusion technologies. The Growth Zone will be delivered alongside the private sector and will benefit from the legacy infrastructure of the fusion campus with prime access to national electricity grid and

[75] Shehabi, A. et al, 2024 United States Data Centre Energy Usage Report (2024), source - lbnl-2024-united-states-data-center-energy-usage-report.pdf
[76] DSIT, AI Opportunities Action Plan (2025), source - AI Opportunities Action Plan - GOV.UK

colocation with a strong scientific research base. The relative proximity to central London (<90 min) also constitutes a significant opportunity.

However, a recent analysis highlighted Abingdon's location in a "serious water stress", highlighting the potential usage conflicts between AI services and other water demands in the region.[77][78]

Clean energy (Hydrogen, CCUS and SMRs)

Hydrogen, CCUS and SMR technologies have been identified because they share two common characteristics: (i) they are some of the key technologies identified to drive the Government's ambition to decarbonise the UK economy and protect energy independence, and (ii) they abstract and/or consume high volumes of water during their operations.

Those technologies use water in the following ways:

- Hydrogen first consumes water for cooling purposes, to control the temperature of technologies. Second, water is used as feedstock in transformation processes for both Steam-Methane Reforming (to produce blue hydrogen) and electrolysis where oxygen is separated from hydrogen (to produce green hydrogen).[79]
- CCUS largely consumes water for cooling purposes in the capture process.
- SMRs require significant volumes of water for cooling power plants. Historically, nuclear power plants in the UK have been located on the coast to benefit from once-through cooling circuits where a lot of seawater was abstracted and released (with limited consumption) to the sea after cooling. Low levels of water are consumed relative to abstraction using this process.[80] However, SMRs have been proposed for inland sites located closer to power demand sites (such as AI data centres). These would then be dependent on freshwater.

The transition towards clean energy will bring a set of challenges to the wider energy system, and these technologies will all play a central role in delivering Government ambitions. In particular, the shift towards clean energy and renewables introduces variability in the supply of energy due to weather changes. This brings a requirement on other net zero power

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[77] [77] Data Centre Dynamics in Kenny, R. (2025) Water use in AI and Data Centres. Source - Water_use_in_data_centre_and_AI_report.pdf

[78] Water shortage fears as Labour's first AI growth zone sited close to new reservoir | Artificial intelligence (AI) | The Guardian

[79] International Renewable Energy Agency. Water for hydrogen production (2023). Source - IRENA_Bluerisk_Water_for_hydrogen_production_2023.pdf

[80] International Energy Agency. Water energy nexus (2016). Source - World Energy Outlook 2016 - Excerpt - Water-Energy Nexus

sources to secure and stabilise the grid as well as to meet flexibility demands associated with unexpected variations in energy supply or demand.[81]

In this future system, SMRs will provide baseload power, the minimum amount of electricity required to meet basic demands on the grid for stability and security purposes. In addition, SMRs can be developed much closer to specific energy-intensive activities (industry, data centres, etc.), minimising transmission issues[82] while safeguarding a constant level of electricity for permanent demands.

Hydrogen will be used in electricity production as a dispatchable source of power, providing flexibility services to meet unexpected changes in supply and demand, or stabilise the grid, thus preventing costs. Yet, the role of hydrogen goes beyond electricity generation. As a gaseous fuel, hydrogen should become a low emissions substitute to natural gas in hard-to-electrify industries such as cement or steel, heavy transport and energy production. CCUS is closely linked to hydrogen production as capture and storage technologies can limit the emissions associated with hydrogen production from the combustion of natural gas.

The relative contribution of hydrogen and SMRs to the future energy mix is set out in the future energy forecasts produced by the National Energy System Operator (NESO). Figure 10 and Figure 11 below summarises the key changes in the energy mix under NESO's holistic transition forecast.[83][84]

[81] International Energy Agency. Managing seasonal and interannual variability of renewables (2023). Source - Managing Seasonal and Interannual Variability of Renewables
[82] Wegrzyn M. & Carlini, S. Small Modular Reactors suitability for data centers (2024). Source - Small Modular Nuclear Reactors Suitability for Data Centers
[83] This scenario assumes that Government meets net zero targets through a mix of electricity and hydrogen, mainly around industrial clusters.
[84] National Energy System Operator. Future Energy Scenarios 2025 workbook (2025) – Tables F13 and F30 – Source - FES Documents | National Energy System Operator

Figure 10 Future electricity supply forecast (NESO)

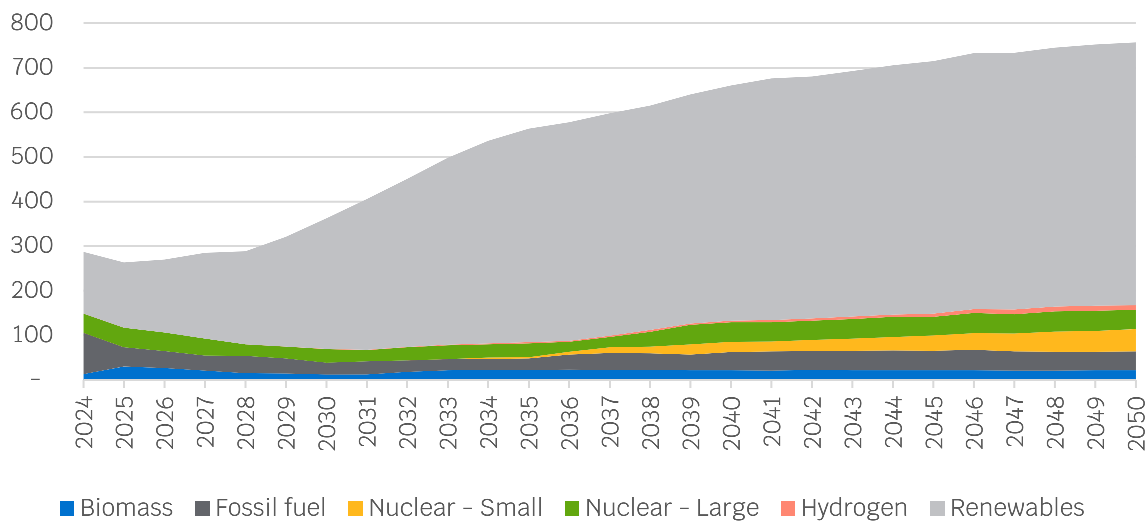
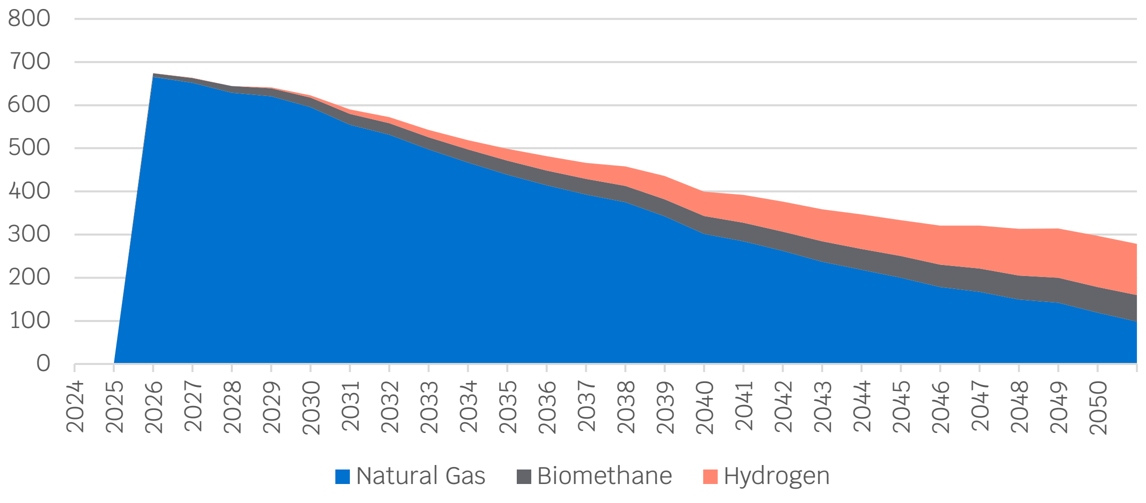


Figure 11 Future gaseous fuel demand forecast (NESO)



To achieve these changes in the energy mix, a significant increase in water demands for electricity production will be required. Based on NESO 2021 forecasts, **total water consumption from energy production could grow between c. 2 and c. 10 times existing volumes, driven in part by the transition to hydrogen and nuclear energy.**[85]

[85] Moores, A. Scenarios for the project to 2050 of water use by power producers.

The Modern Industrial Strategy sets out a path towards clean energy in the UK that is driven by investments from the private sector, with public investment leveraged to deliver strategic infrastructure and support investor confidence. This strategy places significant importance on maintaining the UK's credibility as an attractive destination for net zero investments. Without sufficient water, it could be harder to attract such investments or more costly to develop clean energies, due to a higher risk profile.

Lower or costlier investments into clean energy technologies could slow down the UK net zero ambition and, to some extent, affect economic growth opportunities. SMRs and hydrogen are due to fulfil a critical stabilising role in the future electricity and energy mix. In the absence of those technologies, it will be difficult to transition away from natural gas and other fossil fuels which provide dispatchable power and support industrial uses.

Maintaining the UK's reliance on fossil fuels, especially natural gas, will extend the UK's vulnerability to international gas prices. Although the UK produces a significant share of its natural gas supplies domestically (>30% of natural gas supply),[86] it remains exposed to supply shocks and global price variability, which could slow down production and affect competitiveness in the long term.

3.5 Economic Role 4: Supporting Growth in Existing Industries

Investing in a reliable water supply infrastructure is a catalyst for economic growth, enabling industries to thrive and expand. When water is readily available and managed efficiently, businesses can scale production and pursue innovation with confidence in the long term sustainability of supply and avoiding cost escalation driven by changing processes due to water scarcity. Sectors that rely heavily on water benefit most as they are most exposed to the impacts of water scarcity. By strengthening water infrastructure and ensuring sustainable use, the foundations are laid for industrial development, increased productivity, and robust long-term growth across the economy.

3.5.1 Identifying water sensitive sectors in the economy

Using data on intermediate consumption of water from the ONS and abstraction data from the Environment Agency the sectors most exposed to a reduction in the supply of water are identified below. Detailed methodology is presented in the technical annex. The sectors have been grouped into three categories:

- **High Use, High Dependency**: The sector uses a lot of water, and the cost associated with that water forms a larger part of the sectors total output. A change in the price and/or scarcity of supply of water will likely have notable impact on growth in the sector.

[86] Department for Energy Security and Net Zero & Department for Business, Energy and Industrial Strategy. Digest of UK Energy Statistics (DUKES) (2025). Source - [Digest of UK Energy Statistics (DUKES) - GOV.UK]

- **High Use, Low Dependency**: The sector uses a lot of water, but the cost associated with that forms a smaller part of the sectors total output. A change in the price of water may have some limited impact on growth in the sector.
- **Low Use**: The sector does not use a lot of water relative to its output and a change in the price of water will not have a material impact on growth in the sector.

Table 5 Classifying sectors based on water dependency

Sector Grouping	Total GVA contribution (2022) (£m)	Consumption of water (% of GVA)	Water dependency categorisation	Notes on sector aggregation
Water Industry	22,409	5.542%	N/A	
Waste & Recycling	32,014	0.587%	High Use, High Dependency	
Accommodation	82,787	0.446%	High Use, High Dependency	Includes all short-term stays (hotels, hostels, private lets, campsites, etc.)
Leisure	185,691	0.277%	High Use, High Dependency	Includes sports activity, theme parks, restaurants and cultural attractions
Agriculture	374,647	0.132%	High Use, High Dependency	High direct abstraction from EA data. Includes both arable and livestock farming.
Public Sector	312,784	0.184%	High Use, Low Dependency	Includes operations of local and central government, defence and education sectors
Health & Social Care	72,229	0.148%	High Use, Low Dependency	
Food and Drink Manufacturing	138,246	0.098%	High Use, Low Dependency	Includes alcohol production
Energy	136,943	0.070%	High Use, Low Dependency	High direct abstraction from EA data. Most water abstracted is not consumed however.
Construction	422,869	0.060%	Low Use	
Manufacturing	1,897,337	0.049%	Low Use	Aggregates all manufacturing sectors except food and drink
Services	1,923,838	0.039%	Low Use	Aggregates all services sectors except leisure, education and public sector administration.
Transport	74,229	0.031%	Low Use	

The High Use, High Dependency sectors will benefit most from investment in water supply. How these benefits are realised in each sector will vary depending on the role of water.

3.5.2 How the High Use, High Dependency sectors depend on water

Waste & Recycling

How water is used: Water is primarily used in the washing and preparation of recyclable materials – particularly plastics, paper, and metals – to ensure they meet quality standards for reuse in manufacturing. Beyond material preparation, water is intensively used in the cleaning and maintenance of waste management infrastructure, including bins, vehicles, and sorting facilities. Water is also central to the treatment of contaminated liquids generated during waste processing, which must be treated to meet environmental discharge standards. The recycled outputs – cleaned and processed materials – are then sold back into the manufacturing sector as secondary raw materials, supporting circular economy goals and reducing reliance on virgin resources.
Impact of water supply investment: With reliable and abundant access to water, processing costs are reduced, enabling more efficient cleaning, sorting, and treatment of materials. This promotes higher rates of recycling within the UK, reduces the need for exporting waste for overseas processing, and strengthens circular economy goals. A steady water supply also supports growth in businesses across related sectors, as the availability of clean recycled materials increases and operational resilience is improved.

Water use in plastic recycling

The UK produced 2.2m tonnes of plastic waste in 2024, of which an estimated 51% was recycled,[87] with over half of that being recycled in the UK.[88] Water is a key input into the recycling process and without a consistent supply recycling plastic would not be possible. The key uses for water are:

- Washing and cleaning: Plastics are washed to remove contaminants like food residue, labels, adhesives, and dirt.
- Separation: Water float-sink tanks separate plastic material based on density
- Pelletizing: Water is used in cooling baths to solidify extruded plastic before cutting into pellets ready to be used in new plastic products
- Wastewater Treatment: Throughout the process water gets contaminated by plastic residue and clean water is used to treat it.

Accommodation

How water is used: The accommodation sector encompasses a wide range of short-term lodging options, including hotels, serviced apartments, short-term rentals, hostels, and campgrounds. Water consumption in the accommodation sector occurs through two primary channels:
- Guest Use: Direct consumption by guests for personal hygiene (showers, baths), drinking, and recreational amenities (e.g., swimming pools, spas).

[87] UK statistics on waste - GOV.UK
[88] Plastic waste - House of Commons Library

- Operational Use: Indirect consumption through business operations such as housekeeping (daily cleaning of rooms and public areas), laundry services and food & beverage (water used in kitchens for cooking, cleaning, and dishwashing).

Impact of water supply investment: Expanding water supply in the accommodation sector would unlock a range of benefits, supporting both domestic and international tourism and bolstering business travel by ensuring reliable infrastructure for overnight stays and extended visits. Enhanced water availability enables hotels, serviced apartments, and other lodging providers to maintain high standards of service, attract guests, and broaden their offerings—such as pools, spas, and landscaping. This, in turn, stimulates regional economic growth by generating employment, strengthening local supply chains in food, laundry, and maintenance, and drawing new investment into infrastructure. By increasing water supply, the sector can expand its capacity, enhance its competitiveness, and contribute positively to the vitality of tourism and business travel, fuelling prosperity across communities.

5-Star Hotel Water Usage

Hotels use dramatically more water per guest than the average daily water use in the UK. A large hotel uses an average of 1,500 litres of water per room per day, over ten times the UK average of 142 litres per person per day[89]. 5-star hotels with more facilities can significantly exceed this. High-end hotels use water across their business, including:

- Swimming pools and Spas: Indoor and outdoor pools, hot-tubs, saunas and steam rooms are highly water intensive features that are key differentiators between entry level and high-end hotels.
- Landscaping: Well-kept green spaces, fountains and specialist gardens require daily watering to meet client expectations, particularly in the summer months when water levels are likely to be lowest.
- Events and conferences: High profile events drawn to high-end hotels are water intensive, with significant catering requirements, restroom usage and cleaning requirements.

While a 5-star hotel may have a smaller number of rooms and guests they are major employers and bring significant spillover benefits from high-spending tourists and businesspeople. This is particularly significant in rural areas where they are often located. Water scarcity can impact these hotels quickly. For example, the water crisis in Cape Town which led to significant water restrictions to curb usage in 2018 led to up to a $65 million shortfall in the region's hospitality industry[90].

[89] Water stewardship - addressing hospitality's impact on water scarcity
[90] ibid

Leisure

How water is used: Leisure sector includes sports activities and swimming pools, amusement parks, cultural sites such as museums and libraries and restaurants. Primary water uses include swimming pools and water attractions, playing field maintenance, food preparation and cleaning as well as operational uses across cultural sites.
Impact of water supply investment: Water-intensive sites such as swimming pools, theme parks, and sports pitches can thrive and expand, even in areas prone to water stress. Reliable access to water ensures these facilities can operate at full capacity, attract visitors year-round, and remain cornerstones of vibrant local economies. Enhanced water infrastructure encourages continued investment in leisure and recreational assets, increases the appeal of a region to both workers and investors, and fosters a positive growth cycle that supports job creation, community wellbeing, and economic prosperity.

Universal Studios Great Britain

Universal Destinations & Experiences has submitted planning permission for a 700-acre theme park in Bedfordshire, the first of its theme parks in Europe[91]. The investment is estimated will generate nearly £50bn of economic benefit, create 20,000 temporary construction jobs and an additional 8,000 permanent jobs by 2050. The site is forecast to attract 8.5 million visitors in its first year and demand a minimum of 460,000 litres of water a day.

Water resource management is already part of Universal Studios messaging in its planning application where it has set an ambitious target of only 20 litres water consumption per guest per day. This would require significant investment from Universal in water re-use and management to achieve.

Investing in water supply infrastructure is key to securing similar investments in the future and ensuring the UK is the preferred destination for large-scale leisure investment instead of Europe.

Agriculture

How water is used: Water for irrigation and livestock rearing is mostly abstracted directly from sources under licence from the Environment Agency. Irrigation is fundamental to growing most crops in the UK and increasing the yield of all crops. Livestock pens require regular washing and water for drinking. Reductions or interruptions to water supplies would reduce UK domestic food production and increase reliance on imported food.
Impact of water supply investment: The UK can empower domestic farmers to remain competitive, foster the production of a diverse range of crops and livestock, and reduce

[91] Universal UK Project |

reliance on imported food. Such investments strengthen the nation's food security and resilience against global disruptions, ensuring that local agriculture can continue to thrive even as external pressures—such as international conflicts—threaten supply chains. Over the long term, enhanced water availability enables the agricultural sector to innovate and expand, safeguarding rural livelihoods and supporting a sustainable, prosperous future for British farming.

Impact of 2018 drought on agriculture

In the summer of 2018, the UK experienced one of its hottest and driest periods since records began. The drought was driven by a prolonged heatwave and below-average rainfall from May through July.

Overall crop yields dropped around 20%, with onions dropping by 50% and Potatoes dropping by 30%. Crops that were harvested were smaller per-unit. Farmers struggled to keep livestock cool in the heat and the wilted grass could not be used to feed them. Farmers were instead forced to use winter food supplies in the summer creating longer-term knock-on effects. The following year milk yields were estimated to be 15%-20% less.

The reduced supply of crops pushed up prices in 2018. **The average wholesale price of lettuce rose by 22%, carrots by 55%, onions by 55% cauliflower by 81% and broccoli by 37%.92**

The Climate Change Committee's (CCC) 2025 Progress Report states that by 2050 summers as hot and dry as 2018 are expected to become typical.

[92] Heatwave pushes up UK fruit and vegetable prices as yields fall | Food & drink industry | The Guardian

3.6 Estimating the scale of potential growth benefit

Investing in water supply infrastructure can unlock future economic growth. However, such investment alone is not sufficient to drive growth. It must be part of a broader, coordinated investment strategy across the economy and remains influenced by external factors such as geopolitical developments and technological advancements.

Conceptualising unlocking growth – Theoretical Example

Imagine a factory is unable to grow because there is no more space on its lot. The owner invests to move the factory to a bigger lot. The factory now has the capacity to grow, but to do so requires other investments (new equipment, new workers, expanded contracts, improved technology, etc.). It cannot be said that moving to the bigger lot caused the growth, but it was necessary to allow it to happen. This is similar to the role investing in water supply plays in the economy.

It is useful to estimate, at a broad order-of-magnitude level, the growth potential linked to each of the economic roles of water identified in this paper. An order of magnitude is a very high-level range of estimates intended to identify the scale and uncertainty within which a value is operating. It is important to note that the quantified impact does not represent a benefit that can be used in cost-benefit analysis. This is because the benefit is not solely driven by investing in the water supply, there are other growth barriers to overcome as well.

To produce any order of magnitude estimates a specific appraisal question has to be asked to base assumptions around. For this analysis the following specification is used:

"Assuming appropriate investments in water supply related major capital projects were made, what is the order of magnitude of economic growth unlocked in the year 2050"

Intrinsic to this question are the following assumptions:

- This is not linked to the Major Projects Pipeline announced as part of PR24. It assumes an unspecified investment in major capital water supply projects such that the demand for water in the future is fully met.
- In the counterfactual (i.e. no investment) no major capital projects are funded. Other water sector investment, including in demand reduction and asset maintenance as laid out in PR24 and beyond, continues.
- No specific assumptions are made on the size of the investment needed to ensure future water demand is met.
- The order of magnitude is a one-year estimate for the impact in 2050. It is not a cumulative 25-year estimate between 2025 and 2050.

- There is no attribution assumed between the investment in water supply projects and the enabling of economic growth. The order of magnitude estimates presented here cannot be assumed to have 'created' this growth. They were one of many factors that enabled it to happen.
- Unless otherwise stated specifically the structure of the economy remains broadly the same in 2050 as it is in 2025. This is a necessary assumption, but it is unlikely to be accurate, as new and unforeseen technology, like the recent emergence of Generative AI, may significantly affect the economy.
- Increasing the water supply will also directly increase the output of the water supply industry, which can be measured in GVA, but this is not the focus of this report. This is because measuring true economic growth in the directly regulated water supply industry is difficult and because the scale of impact is not material at a macroeconomic level (sector "Water Collection, Treatment and Supply" contributed only 0.2% of UK final output GVA in 2022).[93]

As the above assumptions highlight there are many unknown factors that limit the accuracy of any estimates for the scale of benefit. The order of magnitude estimates presented here are based on high level, top-down analysis of publicly available information around each of the economic roles. They are indicative only and are not suitable for use in any cost benefit analysis or similar. As stated above these estimates are for growth unlocked, actually realising this benefit is dependent on additional investment in a wide range of other areas.

Table 6 Summary of Order-of-Magnitude impacts

Economic Role	Growth Unlocked Order of Magnitude in 2050
Growing the Labour Supply by meeting household demand	£1.5bn - £3bn
Increasing National Resilience	£0bn -£0.25bn
Unlocking Potential in Emerging Sectors	£2.75bn - £8bn
Supporting Growth in Existing Industries	£0.5bn - £0.75bn

Order of Magnitude: Total unlocked growth

£4.75bn - £12bn
GVA increase in 2050

[93] United Kingdom Input-Output Analytical Tables, 2022

3.6.1 Growing the Labour Supply by meeting household demand

Investing to meet water supply needs will enable population growth in water stressed areas in the future. Without sufficient water supply it is assumed that the population will not grow in these areas and there will be a corresponding reduction in economic growth as the labour market will become constrained.

However, detailed forecast data on exactly how water stressed currently at-risk areas will be without investment is not available. Environment Agency data currently shows all of the East and South-East of England to be water stressed but does not differentiate between areas where this is currently severe enough to block house building and areas where housebuilding is continuing.

To manage this uncertainty two scenarios are used to estimate a range for the order of magnitude of impact:

- Low scenario: Half of the local authorities in the South East face similar water constraints to the currently water constrained local authorities identified in the report in 2050.
- High scenario: All local authorities in the South East face similar water constraints to the currently water constrained local authorities identified in the report in 2050.

Detailed methodology is provided in the technical annex.

This analysis is designed to be contextual evidence to inform the order of magnitude estimate. There are significant uncertainties around the core assumptions which mean the analysis is not suitable for use in value for money calculations.

Order of Magnitude: Growing the Labour Supply by meeting household demand

£1.5bn – £3bn
GVA increase in 2050 (rounded to nearest 0.25bn)

3.6.2 Increasing National Resilience

Measuring an annual economic impact of drought risk is a challenge as droughts are not annual events. An expected value approach using the size of impact multiplied by the likelihood can be used but this is more suited to estimating risk management benefits than economic growth. Data is available in the National Risk Register on the potential economic cost of droughts that can inform an order of magnitude estimate. Additional detail on methodology is available in the technical annex.

The scale of growth benefit associated with increasing national resilience is estimated as the value of reducing the impact of a potential economic shock at the scale of between £100m and £1bn. This is aligned with the scale of impacts in the case studies presented in section 2.3. The size of reduction in this shock is not modelled but the impact of drought would only need to be around 20% less following investment in water infrastructure for the impact to be over £100m.

The analysis is designed to be contextual evidence to inform the order of magnitude estimate. There are significant uncertainties around the core assumptions which mean the analysis is not suitable for use in value for money calculations.

Order of Magnitude: Increasing National Resilience

£0bn – £0.25bn
GVA increase in 2050 (rounded to nearest 0.25bn)

3.6.3 Unlocking Potential in Emerging Sectors

Emerging sectors will be the drivers of future UK economic growth. In this sense, providing a sufficient level of freshwater is crucial to ensure that the UK economy continues to compete and innovate in high-value economic segments. Across all priority growth sectors, Artificial Intelligence currently dominates public and private agendas, supported by promises of economy-wide productivity gains. The technical annex to this reports sets out the quantitative estimates of the potential contribution of AI to UK productivity which are within the range of hundreds of billions of pounds. In comparison, the economic contribution of other emerging sectors, for example hydrogen is estimated in billions of pounds, a factor difference of a nearly one hundred. As a result, this order of magnitude estimate is limited to AI and data centres.

It would be wrong to assume that an insufficient water supply would prevent any productivity improvements associated with AI in the UK. This is because the size of the prize is simply too large for Government and businesses to accept bypassing it. Air-cooling technologies could be privileged in water scarce areas. This would be associated with higher energy consumption and lower performance but would still enable the implementation of data centres in the UK. Alongside this alternative, businesses could also develop their data centres in more remote locations with sufficient water supply, generating some additional costs linked with transmission.

There are many unknowns that limit the accuracy of any forward looking AI related economic estimates. To produce a high level order of magnitude significant assumptions have been made around the relationships between the cost of operating AI models and adoption of AI, and the reduction in running costs associated with water cooling vs. air cooling. The detailed approach is presented in the technical annex.

The analysis is designed to be contextual evidence to inform the order of magnitude estimate. There are significant uncertainties around the core assumptions which mean the analysis is not suitable for use in value for money calculations.

Order of Magnitude: Unlocking Potential in Emerging Sectors

£2.75bn - £8bn
GVA increase in 2050 (rounded to nearest 0.25bn)

3.6.4 Supporting Growth in Existing Industries

Section 2.5 (and respective technical annex: Identifying water dependency in existing sectors) identified the sectors of the existing economy that will benefit the most from investment in the water supply. This benefit will be most observable in areas of the UK that would otherwise be water-scarce, specifically London and the East and South-East of England. To estimate the scale of potential growth unlocked in the year 2050 will therefore requires the following:

- Forecasts for the value of economic growth in water sensitive sectors in 2050
- The share of this economic growth that occurs in water-scarce regions of the UK

- Assumptions on the degree of this growth unlocked through a consistent water supply

Figure 12 GVA by water dependency 2022

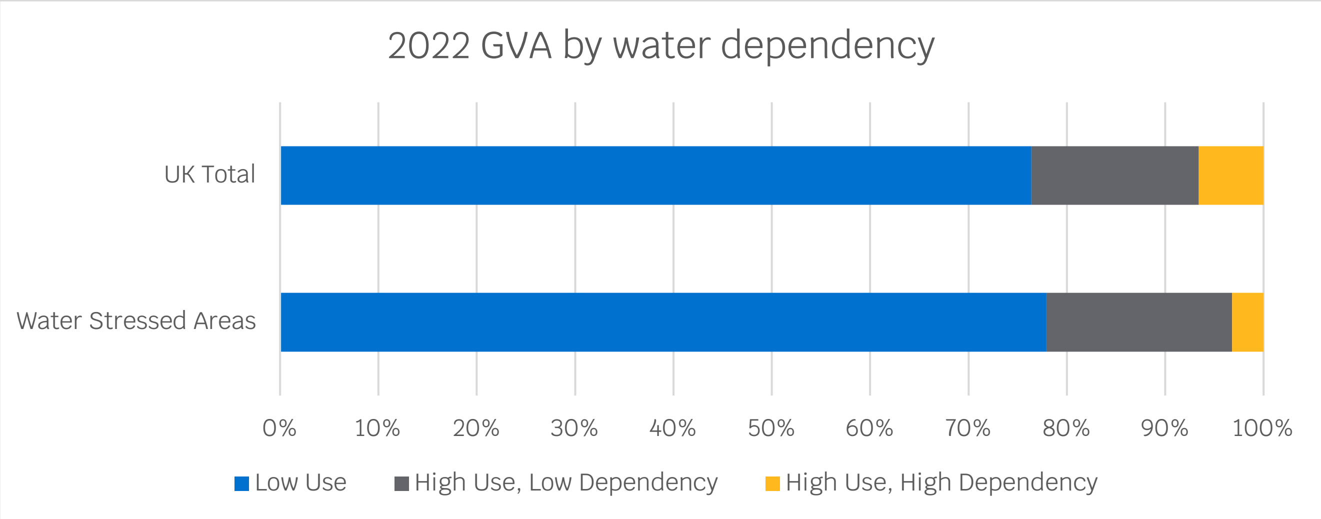


Figure 12 shows the share of GVA generated split by water dependency in 2022 for the UK overall and for water stressed areas only. The share of the most affected High Use, High Dependency sectors is lower in the water stressed areas than for the UK overall.

UK GDP annual growth rate from 2014-2024 was 1.6%.[94] This growth rate can be used to forecast GVA growth in water stressed areas to isolate the GVA growth value in the year 2050.

To estimate an order-of-magnitude for potential unlocked growth requires assumptions on the degree to which this potential growth is otherwise constrained. These assumptions need to reflect the importance of a consistent water source to the operation of businesses in these sectors, but also the ability of these businesses to adapt and reduce water reliance over a 25-year period. The constraint assumptions used have been based on the qualitative economic narrative in section 2.6.

Table 7 Growth unlocked in existing sectors

	2050 potential GVA Growth in water stressed areas (£m)	Growth constraint assumption from water deficit (%)	Estimated unlocked growth in 2050 (£m)
Low Use	£20,788	-0%	£0
High Use, Low Dependency	£5,037	-10%	£504
High Use, High Dependency	£852	-25%	£213

Based on these growth constraint estimates the unlocked growth from overcoming that constraint would be £717m GVA in 2050. This is not an accurate point estimate because of the

[94] which has remained relatively consistent over the long term (2004-2024 average was 1.4%)

significant uncertainties and assumptions required to reach it. It can however inform an Order of Magnitude estimate around this value.

Order of Magnitude: Supporting Growth in Existing Industries

£0.5bn -£0.75bn

GVA increase in 2050(rounded to nearest 0.25bn)

4. Conclusion

Economic growth is the number one mission of the government[95] and in May 2024 the growth duty on regulators was extended to include Ofwat, Ofgem and Ofcom[96]. The growth duty states that regulators must have due regard to promoting economic growth through their actions, both for the regulated industry and for the wider economy. The growth duty highlights infrastructure and investment as a specific driver of economic growth.

Investing in water supply infrastructure materially contributes to the growth mission and the growth duty. Investing in infrastructure now to secure future water supply, alongside other planned investments in demand management, will create the environment to drive long term economic growth.

This report identifies where that growth will come from. It will come from unlocking additional housebuilding in the East and South-East of England, in turn increasing the labour supply in these high productivity areas. It will come from increasing national resilience to drought when climate change is expected to make this a more regular acute risk. It will come from enabling the growth of cutting-edge industries, including directly supporting the rollout of AI and the huge productivity gains associated with it. And it will come from supporting existing industries for which water is a fundamental input in the production of goods and services.

Across these economic roles for water the long-term growth benefits are significant. This report provides an order of magnitude estimate for the boost to economic growth in the year 2050 of £4.75bn - £12bn.

The Major Projects Programme supported by Ofwat is a major step forward towards realising these benefits. In addition to the contribution to long term economic growth the programme will also create a significant temporary boost to local economies through the construction of major projects. These temporary increases in output will also generate a legacy of improved skills and productivity across these regions.

[95] Kickstarting Economic Growth - GOV.UK
[96] final_growth_duty_statutory_guidance_2024.pdf

Ofwat (The Water Services Regulation Authority) is a non-ministerial government department. We regulate the water sector in England and Wales.

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