PUBLIC**FIRST**

The Cost of Water Scarcity

Research Report

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INTRODUCTION

In January 2025, the Chancellor referenced the importance of addressing water scarcity as part of a flagship growth speech[1], stressing the role of water as an enabler of development and growth. The long-expected approval of major water supply projects is a welcome step and will increase water capacity across England, including in regions of water scarcity. Importantly though, the major supply interventions referenced by the Chancellor are long-term projects - in some cases they will not come online until 2039.
The earliest of England's new reservoirs will be Havant Thicket in Hampshire[2], although it is not due to open in 2031. The 150bn litre reservoir near Abingdon in Oxfordshire won't come online until 2039 at the earliest[3]. In contrast, the Government's growth strategy is firmly rooted within this parliament and the next. Crucial targets such as clean power 2030, the construction of 1.5 million homes, Invest 2035 (Modern Industrial Strategy), and the AI Opportunities Action plan are near-term strategies. There is an urgent window through which the Labour Government needs to deliver as much new infrastructure, housing and commercial growth as possible, rightly focussing on this as a means to kickstart growth.

These plans and others - which boost ambition for development in many areas - have serious implications for water use across England. This is particularly true because much of the ambition is focused in London and the South East, where productivity is highest, but where water scarcity is a serious issue already, for example in some parts of the Oxford-Cambridge growth corridor (OxCam). Company Water Resource Management Plans (WRMPs) accounted for commercial and housing growth over the five year period from 2024 based on the best available data at that time. But, as our analysis shows, in many areas of the country water supply is insufficient to meet the demand implied by the Labour Government's plans for growth. The Government therefore urgently needs to address the water scarcity issue if it is to avoid the prospect of stalled housing, commercial development and broader supply interruptions.

Understandably, it is difficult to predict where growth will happen and in what sectors. This can mean water scarcity puts the breaks on growth, as in the case of Hartismere[4] water resource zone, where there is a prohibition on new non-household supplies. Hartismere offers a warning of the potential for significant limits on growth in some sectors that, for economic reasons, need to establish themselves in certain areas of England and the UK.

Similarly, across the East of England there is a limit on new businesses with a daily water usage of more than 20 cubic metres per day from establishing themselves. This

[1] Chancellor vows to go further and faster to kickstart economic growth - GOV.UK
[2] Reservoir construction timeline | Havant Thicket Reservoir project
[3] New reservoir in Abingdon | Water resources | Thames Water
[4] Hartismere Water Resource Zone

places a de facto ban on water intensive businesses of above that level establishing themselves in this area of the country (unless a case-by-case approach is taken). For some industries location is critical, meaning this ban will not just displace economic activity but will block it from happening at all.

Taken together, these factors suggest that there is simply not enough headroom in current plans to meet the Government's ambitions for growth. This paper aims to quantify the economic cost of this fact over the coming parliament. The paper follows on from Public First's recent work, conducted for Enabling Water Smart Communities[5], which estimated that **building homes to a higher standard of water efficiency could unlock £20 billion worth of economic growth over this parliament** by boosting available headroom, and facilitating the construction of more household development than would otherwise be possible. The report concludes that, without intervention to improve water efficiency of new housing, the cost to the economy over this parliament would reach **£25 billion in lost GVA, which translates to £7 billion in lost tax receipts.**[6]

Research Findings

In areas of the country, we are already seeing the limiting impacts of water scarcity on development; and with the commercial growth in water intensive industries, rising temperatures and population increase mean the problem is only growing. Insufficient headroom will generate a cost by putting breaks on the development that is so desperately needed for growth. This points to the need for more immediate regulatory and policy change to come alongside longer-term strategies to boost capacity at the major projects level.

Specifically, this research models the economic impact of water scarcity on non-household (business and industrial) growth across England and with reference to some key sectors for growth. This will help policymakers and industry to understand the scale of the challenge, to understand how additional growth can be achieved, and the impact of this growth on wider supply. In quantifying the scale of the problem, the research will clarify how much policy change is needed to accommodate growth in line with Government ambition.

- Our analysis focussed on three broad areas. Firstly, we looked at how local non-household growth could be impacted in locations where a Government commitment to higher housebuilding targets intersects with a lack of spare supply above the headroom. We combined water supply and demand modelling with new growth plans for household development released by the OBR[7] to identify where supply runs out and by how much, and estimate what this means

[5] The case for water smart housing — EWSC
[6] This estimate was based on the assumption that the Government meets its ambition to build 1.5 million homes over the course of parliament.
[7] OBR concludes planning reforms will bring housebuilding to its highest level in 40 years - GOV.UK

for commercial growth assuming the forecast is met. We estimate that as much as **£6.4 billion of economic growth** could be lost due to the housing effect in areas where there is limited or little available supply above the headroom. This is driven by an additional demand of **9 million litres of water per day that cannot be met by planned-for water supply, approximately equal to the total water use of a medium-sized town, such as Dudley.**

- Although not forecast to be achieved by the OBR, if the Government's target of 1.5 million homes were to be built successfully, our model estimates that as much as **£10.9 billion of economic growth** could subsequently be lost due to the knock-on impact on available supply.
- Secondly, we conducted analysis at the sectoral level, focussing on the impact of growth in certain key sectors on water supply. Chief among these sectors is the impact of Artificial Intelligence (AI) and the data centres that are needed to support its growth. We found that if computer capacity is prioritised to meet the Government's ambitious AI growth agenda that it will further reduce the commercial growth of other sectors assumed in supply demand modelling. We estimate that **this barrier to commercial growth could cost the economy £1.3 billion.** However, with economists estimating that the productivity gains over the next ten years due to AI could be as much as £400 billion, the economic cost of not providing the infrastructure necessary to drive AI growth would be far higher[8].
- The implication of the above is that increasing supply and managing demand in the short-term would unlock economic growth over the medium and long-term. Failing to address the issue could have serious implications for the ability of the Government to meet its key political objectives.
- Finally, Public First built on its analysis that formed the basis of the Government's growth strategy from January by modelling the extent to which growth in the OxCam Arc could be jeopardised by water scarcity. In the Chancellor's January growth speech, she announced the OxCam growth corridor could bring £78bn to the UK economy by 2035[9]. This growth was based on a projection of 4.4% growth driven by increase in highly skilled employment which would increase GDP by £7 billion by 2030. Our analysis estimates that water scarcity could reduce this growth by more than 10%, **costing the UK economy almost £800 million.**
- Taken together, these novel approaches to estimating the impacts of a notoriously difficult problem demonstrate the urgent need for action. Accounting for the estimate of 1.3 million homes built, water scarcity results in a total of **£8.5 billion** in stifled economic growth; this equates to a reduction in **£2.5 billion** in tax receipts, and over 25% of the £9.9 billion in fiscal headroom announced at Autumn Budget 2024. Over five years, this represents **3.5% of total OBR forecast growth of the UK economy in this time period.**
- In contrast, if the 1.5 million homes ambition is met (as opposed to the OBR's estimate) the cost of water scarcity over the next five years equates to a total of **£13 billion in lost GVA.** This translates to a reduction of **£4 billion in tax**

[8] Google's Impact in the UK – 2023 – Google's Impact in the UK – 2023
[9] Public First research used by Chancellor to drive new OxCam growth strategy - Public First

receipts - over 40% of the fiscal headroom announced at Autumn Budget. Over five years, £13bn represents **5.5% of the total economic growth forecast by the OBR in this time period.**

Without swift and rapid policy intervention ahead of 2029 and of the next round of water resource management planning, water scarcity will become the main blocker to commercial development and subsequently, economic growth. Fortunately, there is still time to make these interventions, if policymakers act quickly.

CHAPTER ONE:

The Cost of Insufficient Water Supply

In this chapter, we present an initial England-wide modelling scenario which investigates the economic impact of water scarcity on commercial development as it intersects with household development. As part of this scenario we build on analysis previously conducted by Public First which estimates water scarcity's impact as a limit on new housing.

Because the supply-demand balance of WRMPs were based on evidence available at the time, there are limits on the capacity of existing resources to meet additional commercial and house building commitments announced by the Government in the period since those resource plans were created. Both of which are necessary for growth. Whilst water companies have a requirement to supply new housing with water, there is no such requirement for non-household development; this limits the degree to which non-household development can take place alongside housing. Our analysis identifies 35 WRZs in England (39%) that could see limitations on non-household growth given the additional strain on supply provided by housing, AI and the OxCam Arc. In these areas, the capacity for commercial growth will be constrained, leading to a significant economic cost.

Our modelling in this chapter aims to understand and quantify **the disaggregated economic cost of a lack of water supply (through its impact on stifling commercial development) in water scarce areas.** To meet both housing and commercial growth ambitions, more must be done in the short term to manage supply and allow for greater water efficiency at a system-wide level. Below we outline the economic cost of not doing so through foregone commercial development.

Water Resource Zones and Commercial Growth

WRMPs demonstrate increasing challenges in balancing water supply and demand across the country, especially in water scarce regions. Namely, these areas are the East and South East of England although there are also increasing challenges with water scarcity elsewhere, for example in some WRZs in the South West of England. WRMPs outline short term supply and demand headroom by WRZ over five years, longer-term projections over 25 years, and plans for demand management in the form of new major projects like pipelines and reservoirs.

As outlined in the paper's introduction, the short term growth targets will not be helped by these longer term upgrades, many of which will not be realised for up to fifteen years.

Where new housing need exceeds targets planned for in WRMPs - true in the case of many WRZs since this Government has boosted the housing ambition to 1.5 million homes in England over the course of parliament - headroom for commercial growth will be limited. In these areas, non-household development will subsequently see greater constraints without policy action. This points to the risk of further examples like Hartismere WRZ with de facto bans on commercial development. Below we outline in more detail how we calculate the cost of this constraint on commercial development.

Modelling the Economic Impact

To model the impact of water scarcity on commercial development, Public First carried out novel economic modelling that combines a variety of data sources that shape water availability in high-growth regions. These sources include.

- **Water Demand and Supply Modelling:** By examining the current and projected water supply and demand across all regions of England, we can model where additional water demand could limit commercial growth without other policy intervention.
- **Housing Targets:** We examine how the updated local authority housing need formula and the OBR's delivery forecasts compare with housing growth assumed in WRMPs; we then estimate the impact of that development on water demand, identifying the extent to which headroom will diminish by WRZ.
- **Commercial Growth:** We estimate the growth in commercial development that would be curtailed by an increase in water demand and the associated loss in gross value added.

A more detailed outline of how this calculation was carried out can be found in the **Methodology.**

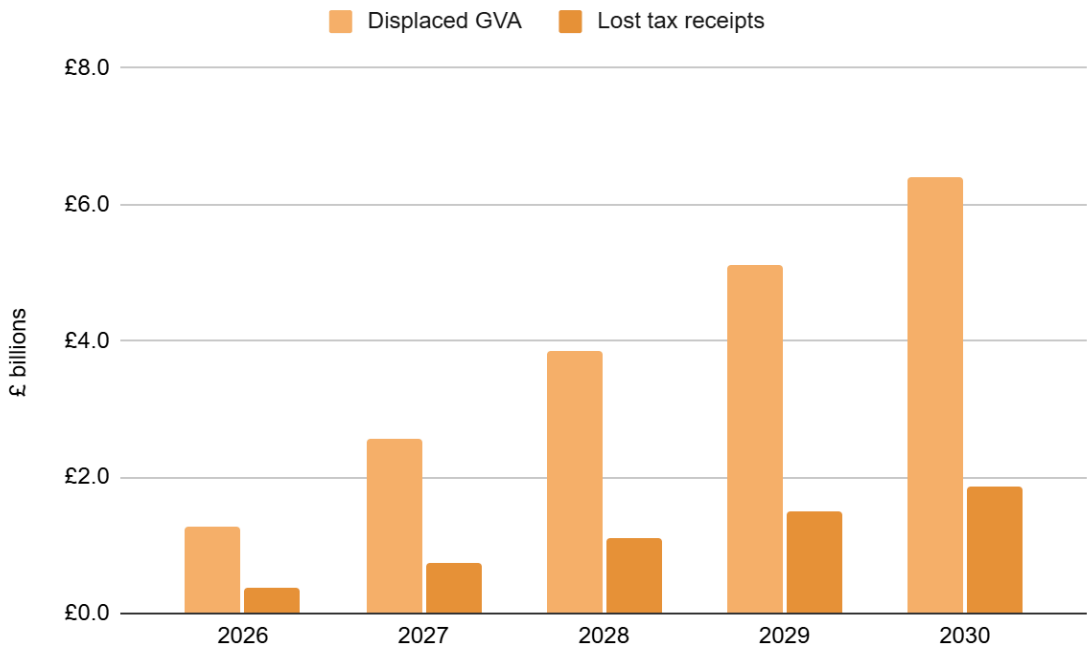
The Economic Impact

Accounting for the OBR's housing forecast from March which estimates the construction of 1.3 million homes over this parliament, alongside WRMP proposed interventions to address the supply-demand balance, our models estimate that, absent further interventions, the limited available supply for additional commercial development will lead to a **reduction in GVA of £6.4 billion by 2030.**

£6.4bn	£1.8bn	9ML
Reduction in GVA by 2030	Lost tax receipts by 2030	Megalitres per day of additional water demand

This, and the subsequent impact on tax receipts, is shown in the Figure 1 below:

Figure 1: Lost GVA and tax receipts associated with increased demand from 1.3m homes



Similarly, although not forecast to be achieved by the OBR, our model estimates that, were the Government's stated ambition of 1.5 million homes to be achieved, there would result in a reduction of as much as **£10.9 billion of GVA by 2030** due to the knock-on impact on available headroom.

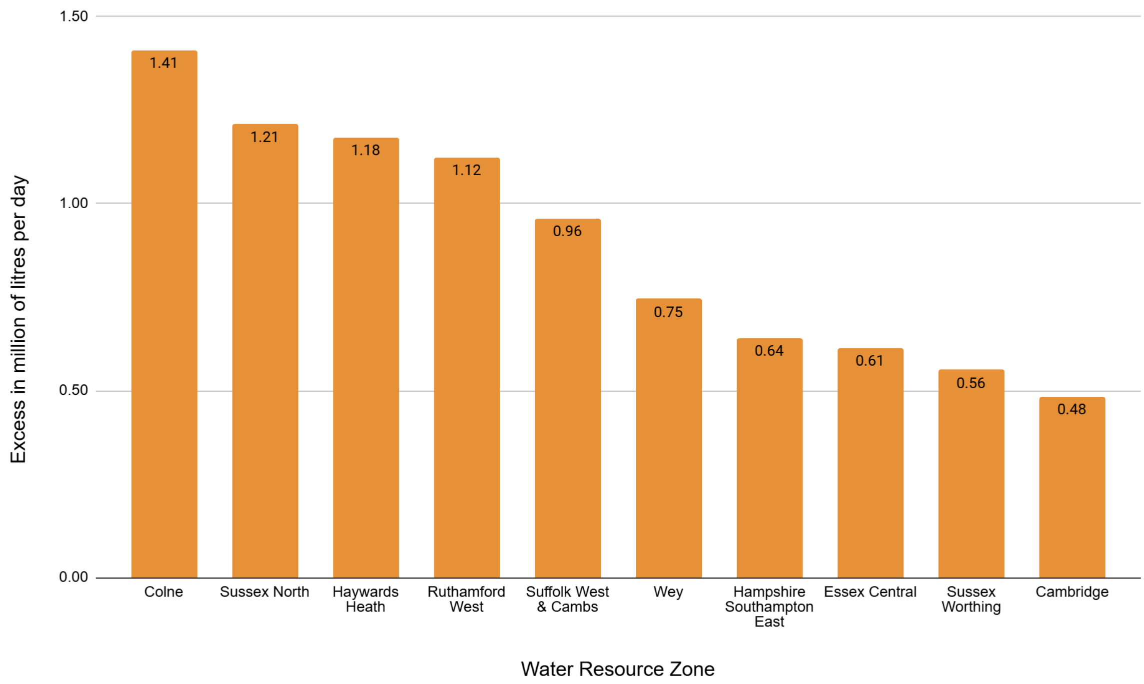
Failing to build additional housing will have an even greater economic cost. However, this analysis demonstrates that achieving growth through additional housing delivery alone, without broader policy intervention to boost water supply and manage water resources, will also generate a substantial economic cost.

Where the Impact will be felt

The impact of water scarcity is not uniformly distributed across the country. Certain areas, particularly in the East and South East of England, are more severely affected due to their combination of high housing demand, commercial growth projection and low water availability.

Likewise, some areas in the South West see similar challenges. The water resource zones most affected by the impact of additional water demand are illustrated in Figure 2.

Figure 2: Most additional water demanded in Water Resource Zones beyond available WRMP balance



For policymakers, this modelling exercise underscores the urgency of incorporating water efficiency into the broader short-term growth strategy and accelerating new water supply options. This includes improving water efficiency standards for new housing and allowing for non-potable water networks to supply water for non-drinking purposes. The analysis demonstrates that substantive interventions across the board could deliver significant economic benefits, recouping some of the constrained economic growth. Such intervention would prevent the risk of inefficiency being baked into the housing stock for years to come, compounding the problem of scarcity as a blocker on growth.

CHAPTER TWO:

Sectoral Study: AI and Data Centres

Building on the England-wide modelling in the above chapter, this chapter delves into the impact of the growth in AI, a sector that has recently become central to the government's economic growth strategy, on water supply. Certain sectors—due to their water intensiveness—will have a disproportionate impact on available resources. Due to its high barriers to entry and large fixed costs, AI, and the data centres it requires, must also be sited in certain locations across the country to minimise costs, access labour, and realise the benefits from agglomeration. Given its importance to growth, plans for the growth of the industry AI have been subject to change in the updated government strategies and agendas[10], for example in the form of the AI Action Plan[11], meaning WRMPs have not fully accounted for when and where AI will impact available water resources.

This chapter seeks to understand how government ambition in this key, water intensive sector will collide with a lack of available supply - and the subsequent impact of this on growth. Expectations for AI growth and its impact on the economy have grown substantially in the past 12 months, with water companies unable to have accounted for this increase in their WRMPs.

By understanding the unique water requirements of this sector and the projections or possibilities for growth, we can assess its impact on water resources and the subsequent economic costs of undelivered commercial growth. The chapter also suggests policy intervention to minimise the impact of this, and other key, water-intensive sectors.

AI and Data Centres

Data centres are the backbone of the UK's digital economy, supporting cloud computing and the AI that is going to support the high-tech industries that are rapidly growing and on which our future productivity growth depends. However, they are also highly dependent on infrastructure that can (depending on the chosen cooling method) require substantial amounts of water. Their operational demands—particularly for water and power—pose significant challenges.

Our modelling demonstrates that location matters. Proximity to substations to access the power grid and to fibre optic routes - particularly international connectivity via terrestrial and subsea cables - are well known to be significant drivers of siting

[10] [Invest 2035: the UK's modern industrial strategy - GOV.UK]
[11] [AI Opportunities Action Plan - GOV.UK]

decisions[12]. However, our analysis demonstrates that proximity economic mass is important, particularly for highly productive knowledge driven industries. In the case of AI, latency and disaster recovery are also crucial for siting decisions. Ultimately, this puts datacentre capacity within close proximity to Cambridge and London.

Data centres primarily consume water for cooling servers, which generate substantial heat during operation. Cooling methods such as evaporative cooling towers and chilled water systems rely heavily on water to dissipate this heat. While precise UK-specific data is limited due to inconsistent reporting, estimates can be derived from global benchmarks and regional studies. The demand for data centre capacity in the UK is set to soar, driven by digitalisation, AI, and government policies like the AI Action Plan[13]. The UK data centre market, valued at $10.69 billion in 2024, is projected to grow at a compound annual growth rate of 13.33%, reaching $22.65 billion by 2030[14].

This could put significant pressure on water systems depending on the chosen cooling method. The question of why data centres need to be located in particular areas largely comes down to three factors:

- **Latency:** data centres must shorten distances to improve performance and speed of information transfer for financial and other transactions.
- **Agglomeration impacts:** this equates to the impact of commercial development near to other highly productive areas, creating synergies and efficiencies to maximise productivity and growth.
- **Disaster Recovery:** if data centres go down there needs to be a close enough electrical engineer to be able to recover the data centre at pace to limit losses.

It is for these reasons that data centres must primarily be located in and around London and the South East - up to 80% of Data centre capacity is said to be in London[15] - and this is where they are projected to be developed further. One particularly notable example can be found in the Government's AI Growth strategy which announced a new AI Growth Zone in Culham, Oxfordshire[16]. Many more facilities are expected to expand in the coming years, particularly in the OxCam growth corridor and other high-tech hubs.

To estimate the economic impact of water scarcity and AI, we estimate the impact on the wider economy if the water needs of datacentres are met, and existing methods of cooling (i.e. with potable water) remain the industry standard. The implication of these business-as-usual assumptions are a significant drain on water resources and subsequent capacity for commercial development.

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[12] Data centres in the UK: challenges and opportunities in development | Russell-Cooke
[13] AI Opportunities Action Plan - GOV.UK
[14] United Kingdom Data Center Market Size & Forecast to 2030
[15] https://www.cbre.co.uk/insights/books/uk-mid-year-market-outlook-update-2022/09-data-centres
[16] Government fires starting gun on AI Growth Zones to turbocharge Plan for Change - GOV.UK

Similarly, non-potable water may not always be available in areas where new abstraction is not possible. We draw on the following analysis:

- **Datacentre demand:** We carry out regression analysis on a model that combines datacentre location and capacity data and various Government datasets that estimate economic indicators such as GVA, productivity and sectoral employment. This analysis estimates the future location of data centres were capacity growth to grow in line with Government policy.
- **Water use of datacentres:** We use industry data to convert datacentre demand into water demand.
- **Spatial analysis:** We use water demand and supply modelling to identify locations in which commercial growth will be limited and estimate the value of lost GVA.

A more detailed outline of how this calculation was carried out can be found in the **Methodology.**

What is the Economic Impact

We estimate **the economic impact of reduced water availability implied by the growth in AI and Datacentres to be £1.3 billion by 2030.** This assumes that the rapidly increasing growth expectations of AI have not been fully accounted for in WRMPs.

This demonstrates the substantial impact of continuing with the status quo. As with the broader England-wide modelling scenario, insufficient headroom in WRMPs has a knock-on effect on growth. T**he scale of the impact suggests that the use of water for cooling data centres should be curtailed as far as possible in order to limit the impact of insufficient supply on commercial growth on the economy more widely.** This will ensure that the UK can meet its ambitious growth targets for AI - essential if the economy is to grow at the required scale over the coming decades - without exhausting the available headroom, limiting both the full growth potential of AI, as well as other household and non-household development in the medium term.

Policy Interventions in Water Intensive Sectors

Other crucial strategic sectors have implications for water resources and availability. Whilst the Labour Government has signalled ambition in these sectors, this ambition is not developed enough to generate reliable estimates of their growth’s impact on water resources by location, and the subsequent impact on commercial growth. Still, sectors are highly water intensive and, as such, require unique policy responses to mitigate their impact on available headroom. Below we outline some possible policy responses in these sectors which would mitigate the impact of their growth on water resources across water scarce areas in England.

Advanced Manufacturing

Advanced manufacturing, which includes gigafactories, relies heavily on water for both industrial processes and cooling. As battery manufacturing becomes more advanced, the water intensity of these operations increases, particularly in precision manufacturing and production lines that require extensive cooling and cleaning. Manufacturing growth is particularly vulnerable in water-scarce regions where new facilities or expansions cannot be built without additional water capacity.

- **Policy Intervention:** In response, government policies could promote investment in water-efficient manufacturing technologies, including closed-loop cooling systems and water recycling practices, which could allow for continued expansion without placing undue pressure on local water supplies.

Food and Drink

The food and drink sector is one of the most water-intensive industries in the UK, requiring large amounts of water in production for certain manufactured goods[17]. Growth forecasts in WRMPs largely put the growth of this sector on a steady course. There is a question about whether or not specific parts of the industry can fit within this growth forecast. Especially water intensive parts of the industry such as breweries, have outsized water needs and require a more in-depth analysis to understand their capacity for growth. Scarcity effectively puts a hard stop on the size and speed at which a water-intensive food and drink company can grow, which has knock-on impacts for growth.

- **Policy Intervention:** The government could incentivise water-saving innovations such as waterless processing technologies and more efficient irrigation systems for agricultural suppliers. Furthermore, encouraging water recycling within manufacturing processes can help reduce overall water consumption and increase resilience against water shortages.

Hydrogen

Hydrogen production is emerging as an important part of the UK's future energy mix as it aims to reach its statutory Net Zero targets. The UK's most recent targets for hydrogen production are for 10GW of operational capacity for 2030[18], with half of this from green hydrogen and the remainder presumed to be from blue hydrogen. Current capacity is thought to be around 5MW. This implies a significant ramp up of production in the short-term, however sites are yet to be chosen.

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[17] Research Gate: Largest global water consuming sectors in the UK (million m 3)
[18] Hydrogen Production Roadmap

All Hydrogen production methods use water as a major input. Recent government updates such as the December 2024 Hydrogen Strategy Update[19] confirm further funding and revised targets for low-carbon hydrogen, underscoring the need to understand how low-carbon hydrogen will pressure existing water resource models.
Early progress on hydrogen is expected within existing industrial clusters such as those on Teesside, Humberside, Southampton, South Wales, Merseyside and Grangemouth in Scotland. Further sites have been identified alongside planned nuclear power stations in Suffolk[20]. Feasibility studies at some industrial clusters have highlighted potential issues with water availability and the need to secure new supplies into the clusters[21].

- **Policy Intervention:** Siting in coastal areas, reuse and recycling, different cooling technologies and process efficiencies can all help reduce the gross amount of water intake and/or consumption. For example, a 'once-through' cooling system for electrolysis could use up to 30x the amount of water as a recirculating tower system, though the water is subsequently returned to the abstraction source after it has been heated. Air cooled systems for electrolysis have also been developed.

Agriculture

Agriculture remains one of the most water-intensive sectors in the UK, particularly for irrigation purposes. With climate change exacerbating water shortages, especially in water-scarce regions, agricultural production could face significant limitations. Water shortages could restrict crop yields, impact food prices, and reduce agricultural productivity, particularly in sectors like horticulture and intensive livestock farming. The agriculture sector, particularly in high-water-demand areas, is expected to face limitations on expansion or even contraction due to water constraints.

- **Policy Intervention:** To address this, policy intervention is needed to promote water-efficient irrigation systems, the adoption of drought-resistant crops, and rainwater harvesting. These initiatives could help mitigate the negative impact of water scarcity on agricultural productivity and ensure that the sector continues to thrive.

These sectors are non-exhaustive case studies, but they are also strategic sectors for the Government in its growth plans and some of its key political objectives. Policy interventions are needed in all of these sectors to mitigate their impacts on water supply and the capacity for growth in the economy over the short and medium term.
Without intervention, the impact will be severe and would extend beyond direct losses in revenue. For example, reductions in food and drink production could lead to higher prices, which could have negative ramifications for households and the overall cost of living. These costs are not included in our calculations, implying that the total economic impact is likely to be higher than those outlined in this report.

[19] Hydrogen Strategy Update to the Market: December 2024
[20] https://ukhea.co.uk/uk-hydrogen-project-map/
[21] Industrial Clusters Environmental Capacity Phase 2

The next chapter will explore the specific impact of water scarcity on regional growth, particularly focusing on the OxCam growth corridor.

CHAPTER THREE:

Regional Case Study: OxCam

Public First modelling highlighted the role of the Oxford-Cambridge (OxCam) Arc as one of the most dynamic and innovative economic regions in the UK. It is home to world-leading research, a highly skilled workforce, and significant contributions to national GDP, particularly through high-tech sectors such as AI, life sciences, and advanced manufacturing. It supports a high density of hi-tech knowledge-intensive industries. The region is a major driver of economic growth and this Government has recently announced intentions to supercharge growth by focussing investment in OxCam to unlock its full potential. Given the water scarce nature of the region, it will be critically important to understand how water availability in the OxCam Arc may or may not act as a blocker on growth.

A recent report[22] by Public First made the case for policies to catalyse the growth potential of this region by boosting productivity. Our modelling for this report estimated the region has the potential to contribute £78bn to the UK economy by 2035 - this figure (alongside the strategy) was cited by the Chancellor in her January 2025 growth speech.

Modelling the Economic Cost

As set out in the Government's growth plan, the OxCam growth corridor is projected to experience substantial growth over the next 25 years, including the creation of new jobs, the expansion of startups, and increased R&D activity. The Government's appointment of Lord Patrick Vallance to lead the OxCam growth corridor plans underscores these ambitions.

However, this growth is contingent on the availability of essential infrastructure, including sufficient water supply. The region's infrastructure, particularly its water resources, has not kept pace with the projected demand for housing and commercial use, creating a significant barrier to continued growth.

To model the potential economic cost of water scarcity on the OxCam Arc we estimate what the economic growth scenarios modelled by our economics team imply for commercial growth in specific water resource zones. We then use our core water supply demand model to estimate the extent to which growth will not be possible without policy intervention. We then aggregate this reduction in growth.

[22] Oxford - Cambridge Region | Supercluster Board

What is the Impact

In the high-growth scenario, the OxCam growth corridor estimated 4.4% rate of commercial development over the time period, which would result in £7 billion of additional economic growth on the baseline. This would require an additional 9 million litres of water a day on top of what has been planned for, the equivalent to providing water for a town of 65 thousand people.

We estimate that the total economic cost of water scarcity as a barrier on the high growth scenarios supported by the current Government is £800 million. This cost is primarily felt in and around Milton Keynes and in Cambridge, where water scarcity is greatest.

The role of policy in overcoming supply shortfalls

To ensure that the OxCam growth corridor can meet its growth potential, targeted policy interventions are required. These interventions should focus on addressing water scarcity and boosting infrastructure capacity across the region, namely to ensure headroom is expanded substantially to accommodate the potential for growth in the region. These are distinct from the sector-specific interventions outlined in the chapter above and are purposefully general - able to be applied to other water scarce regions to boost headroom and enable growth. These interventions could include:

- **Investment in water infrastructure** with the acceleration of large-scale strategic water resource options and other major projects to boost water supply in the region.
- **Planning reform** to ensure water resource options are prioritised, for example in the planning of new homes and businesses; and to enable the expansion of water recycling initiatives such as the introduction of dual-pipe networks.
- Regulatory changes to support the increased uptake of **water efficient technologies,** for example through the introduction of a mandatory water efficiency standards for water using products, similar to an energy efficiency scheme.

Without interventions such as those outlined above, the region's capacity to develop and deliver on its potential could be severely limited. Given the scale of the prize available, this points to an urgent and necessary need for a suitable policy response estimated to prevent any losses in economic output and job creation.

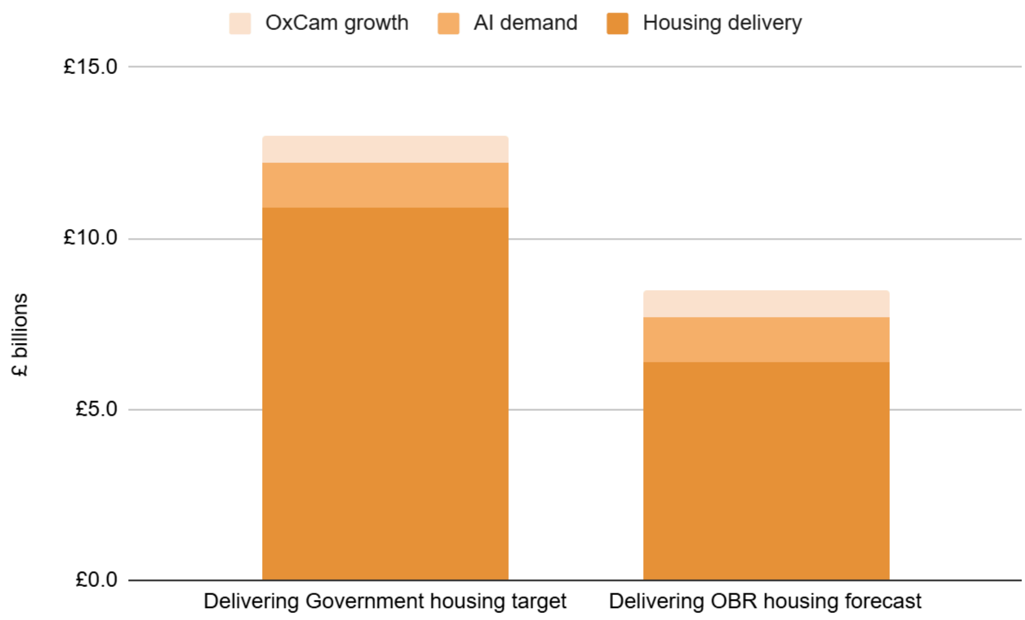
CHAPTER FOUR:

Conclusion: The Total Cost

The combined estimates from the first three chapters are found below. In total, **when accounting for the OBR estimate of 1.3 million homes, water scarcity results in £8.5 billion in stifled economic growth**; this equates to **a reduction in £2.5 billion in tax receipts**, and over 25% of the £9.9 billion in fiscal headroom announced at Autumn Budget 2024. Over five years, this represents **3.5% of total OBR forecast growth of the UK economy in this time period.**

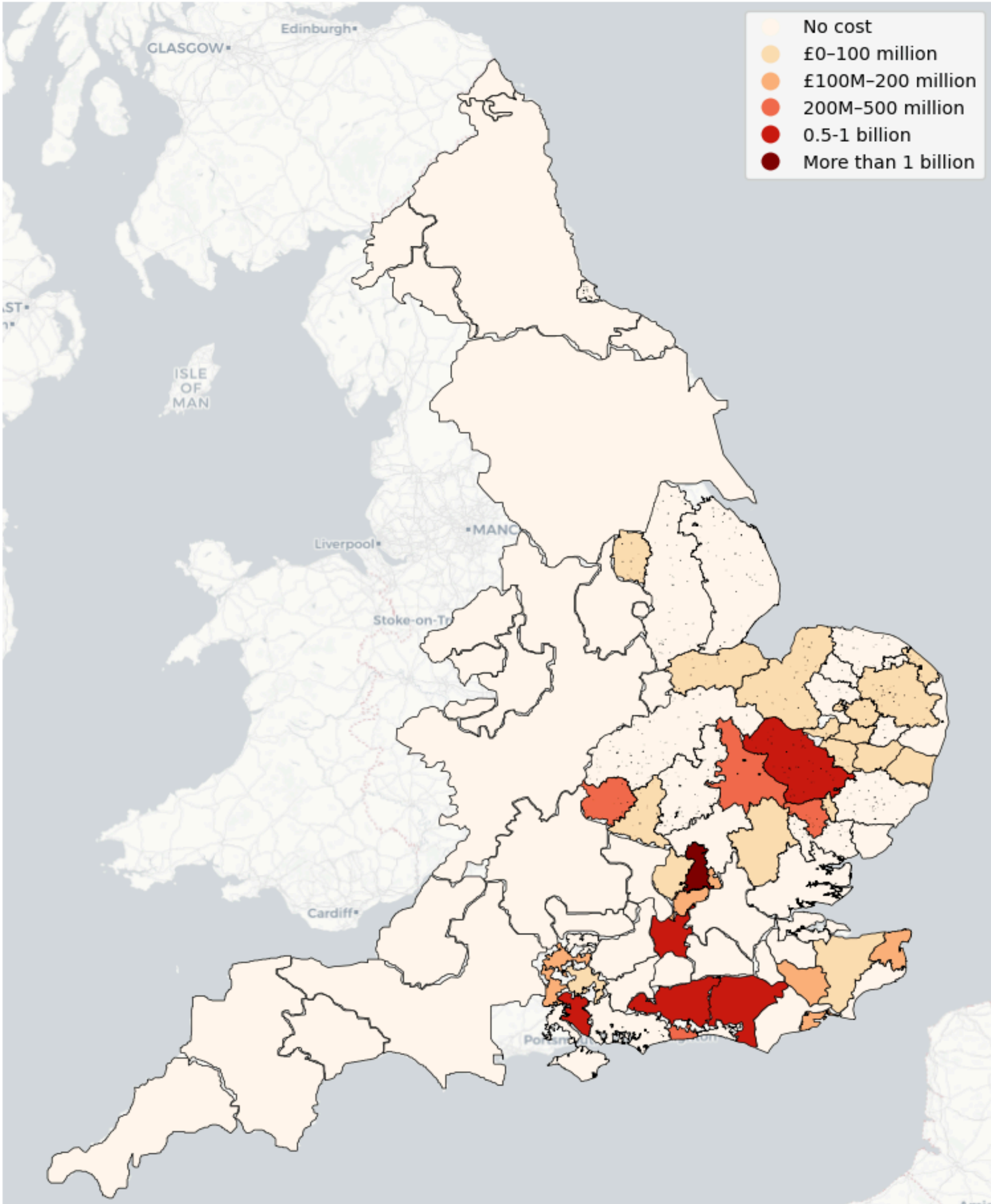
In contrast, in the alternative scenario that the Government's target of 1.5 million homes is met, the cost of water scarcity over the next five years rises to **a total of £13 billion in lost GVA.** This translates to a reduction of **£4 billion in tax receipts** - over 40% of the fiscal headroom announced at Autumn Budget. Over five years, £13bn represents **5.5% of the total economic growth forecast by the OBR in this time period.**

Figure 3: Total displaced commercial GVA according to two scenarios of housing delivery, AI and OxCam growth



The geographic spread of the costs associated with delivery of the OBR housing forecast alongside AI and OxCam growth are found in Figure 4, below. It demonstrates a concentration of costs in the East and South East of England, including in the OxCam growth corridor.

Figure 4: The Economic Cost of Water Scarcity (OBR scenario) by Water Resource Zone



Taken together, these findings demonstrate the urgent need for action to mitigate impacts of water scarcity on growth. Similarly, they demonstrate that taking such measures is a 'least-regrets' course of action - one that will ultimately enable the development and growth our economy so desperately needs.

CHAPTER FOUR:

Methodology

The cost of unplanned demand increase

This calculation estimates the extent to which the new Government's ambitious housing delivery targets puts additional strain on headroom by Water Resource Zone (WRZ) and its knock-on cost to the economy through lower available headroom.

To model this, we first forecast housing growth by local authority using the Government's updated housing needs formula, adjusting it using the OBR's March housing delivery forecast equating to 1.3 million homes (as well as the Government's original 1.5 million homes target). We integrated this with the available water supply-demand modelling published in 2024 Water Resource Management Plans (WRMPs) in three stages:

- We first mapped local authority boundaries onto the Water Resource Zone boundaries.
- To estimate additional housing delivery we compared this to new builds assumed within the modelling over the period 2025 to 2030.
- We estimated the added water demand of additional housing using household water use assumptions within the WRMP models (which varies by WRZ) and calculated the implied water demand above available headroom by WRZ.

To estimate the impact of less headroom on commercial growth we assume that non-household growth modelled within the WRMP does not take place to account for the additional house growth up to the newly reduced headroom. By converting the available water into commercial water use using WRMP modelling we are able to estimate the lost commercial growth as a percentage of total non-household water use for each WRZ. To convert these estimates of lost commercial growth into GVA we map them onto Middle Layer Super Output Areas (MSOAs) weighted by employment[23]. We then apply these growth estimates to estimates of Gross Value Added (GVA) at an MSOA level[24]. By combining these estimates we are able to estimate the total lost GVA for England.

The cost of unplanned AI growth

This calculation estimates the impact of forecasted AI growth and associated datacentre compute power demand has on water supply and (consequently) commercial growth.

[23] Business Register and Employment Survey - Office for National Statistics
[24] UK small area gross value added (GVA) estimates - Office for National Statistics

We use a Public First AI growth model to estimate both the growth in AI and associated datacentre capacity required over the next five years, a model based on third party datacentre data[25]. To do this we combined employment data, GVA by local area, and sector specific employment at a local level and used various regression techniques to determine the impact of these variables on "compute access", a measure of proximity to compute power, at LSOA level. This enabled the creation of a forecast of where additional compute power is likely to be located. Subsequently, we estimated the water demand of additional datacentre capacity using relevant estimates of datacentre water use[26].

By mapping our AI analysis onto WRZs we fed the additional water demand into the model described above and repeated the same analysis. This allowed us to calculate the additional water required by WRZ and the impact this has on commercial growth. It should be noted that the additional water demand from housing and the OxCam arc is assumed within our calculations.

The cost of unplanned OxCam growth

This calculation estimates the implications of ambitious Government plans for growth in the OxCam Arc based on growth in high-tech sectors. We estimate the additional water demand implied by the growth of these sectors and estimate the subsequent economic cost of this lower headroom through displaced commercial growth where headroom is insufficient to supply water for both.

We applied the assumption used within Public First modelling recently carried out suggesting 4.4% compound annual growth in the region and integrated it into our modelling [27]. By establishing the difference between the non-household growth implied by WRMPs and assumptions on non-household water use, we can estimate (for each WRZ) the total additional water demand from OxCam growth scenarios. We then add this to the housing delivery modelling to estimate demand by WRZ in excess of available supply. We repeat the previous method to estimate the impact on lost commercial output.

This estimate can either be thought of as the economic cost of not being able to deliver on the ambitious OxCam growth, or the lost GVA from other non-high tech commercial growth that the plans replace. It should also be noted that the additional water demand from housing is assumed within our calculations.

[25] Data Center Research Service
[26] ING - Growth in Water Consumption
[27] Oxford - Cambridge Scenario Modelling

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