25 May 2016

Trust in water

Water 2020: our regulatory approach for water and wastewater services in England and Wales Appendix 3 Tackling water scarcity - further evidence and analysis

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Contents

1 Introduction

In Chapter 5 of our decision document we set out the challenges, opportunities and our objectives for changing the way we regulate water resources. The document describes our approach to facilitating markets in water resources and the high-level decisions for our regulatory framework for the 2019 price review (PR19).

This appendix sets out additional background and supporting analysis for our policy decisions on water resources. Specifically:

- **Section 3** provides additional supporting detail regarding our decisions in relation to overall market design, improving market information, a separate price control for water resources, further options to support market development, and the impacts of our decisions;
- **Section 4** sets out the methodology and detailed results from our analysis to support our impact assessment; and
- **Section 5** sets out further detail on risk allocation for water resource utilisation for consultation.

2 Further detail to support our decisions

In this section we provide additional detail and supporting information regarding our decisions on:

- our market design for water resources;
- improving market information;
- a separate price control for water resources;
- further options to support market development; and
- the impacts of our decisions.

2.1 Our market design for water resources

In Chapter 5 we set out at a high level our market design for water resources, below we provide further information on:

- water resources in the public water supply;
- our market models for water resources; and
- our proposals in the December consultation.

2.1.1 Water resources in the public water supply

In the public water supply water resources are the sources of raw (untreated) water that are used to provide water supplies to households and businesses. Providing and managing water resources is a key element in this value chain and, in England and Wales, it is mostly carried out by the regulated incumbent water companies.

The table below summarises the key features of water resources for the public water supply.

Table 1: The key features of water resources for the public water supply

Feature	Summary
Finance[1]	Across the water and wastewater value chain, water resources account for about: • 17.8% of operating expenditure; • 3.4% of the modern equivalent asset value (MEAV); and • 7% of industry total expenditure.
Main sources of water[2]	**Boreholes:** holes drilled into the ground to abstract water from underground aquifers account for about 32% of supply in England and Wales. **Bulk supplies:** supply of water from one appointed company to another, often referred to as 'water trades' (about 4%). **Reservoirs:** basins constructed in stream or river valleys to hold back flow, so that water can be stored (about 24%). **Rivers:** taking water from a river (about 40%).
Major assets[3]	615 dams and impounding reservoirs. 2,543 intake and source pumping stations. 1,750 km of water mains or conveyors to transfer raw water between sites.
Operational structure	Companies' water resources are organised around water resource zones (WRZs). A WRZ describes an area within which the management of supply and demand is largely self-contained (apart from agreed bulk transfers of water). Within the WRZ, supply infrastructure and demand centres are generally integrated to the extent that customers in the WRZ should experience the same risk of supply failure. Consequently all customers share the same level of service. It is defined in the water resource management plan (WRMP) process. As WRZs reflect geographical and hydrological factors, there are often a number of WRZs across companies' appointed areas.
Regulatory accounting definition[4]	Identify sources of raw water, obtain permission for its extraction or collection, and input it to the raw water distribution system.

[1] Source: 2013-14 Regulated Accounts and Ofwat analysis.
[2] Source: PR14 August 2013 data request.
[3] Source: Table W5, companies' PR14 business plans.
[4] Source: Ofwat regulatory accounting guidelines.

Ownership of water resources extends beyond water companies to include canal operators, farmers, landowners, non-governmental organisations, private water supplies and industrial users, such as brewers and the electricity supply industry. The public water supply accounts for about 25-30% of all abstraction by volume

(both consumptive and non-consumptive), and it is the second largest abstractor after the electricity supply industry. Although the electricity sector typically relies on tidal water (brackish water), it does use freshwater sources for thermal generation (cooling) and hydropower.

Water resources do not have the characteristics of a natural monopoly and there are opportunities for a greater diversity of suppliers for new capacity for the public water supply.

2.1.2 Market models for water resources

We envisage two distinct types of water resources markets for new resources developing:

- A **bidding market model** under which third parties submit bids to an incumbent water company to provide ways to help it meet the future needs for water identified in the incumbent's water resources zones (WRZs). There is a variety of third-party options. Transfer of water between water companies is one example. Other examples include: a water trade with a non-water company; a water efficiency scheme provided by a third party; or provision by a third party of reclaimed water. This market model will be implemented in England and Wales and is an immediate priority because companies will be submitting draft Water Resource Management Plans (WRMPs) in December 2017.
- A **bilateral market model** in line with the Water Act 2014, in which third party providers of water resources (who could be out-of-area water companies or other third parties) contract directly with independent retailers in the non-household market, and pay an access price to incumbent companies to use their distribution system and, if needed, treatment facilities. The bilateral market we envisage requires Defra to bring forward the market-enabling provisions of the Water Act 2014. As the Welsh Government has decided not to expand business retail competition at this time, the bilateral market model will not apply to incumbent companies whose areas are mainly in Wales. We note that in principle, a form of bilateral market model already exists under the legislative and regulatory arrangements for the England and Wales water industry. There are legislative provisions to enable, in some circumstances, a licensed water supplier to introduce water to an incumbent's distribution system for the purposes of supplying its own customers. However, this has not been effective; new water resource entry has not taken place under the existing regime.

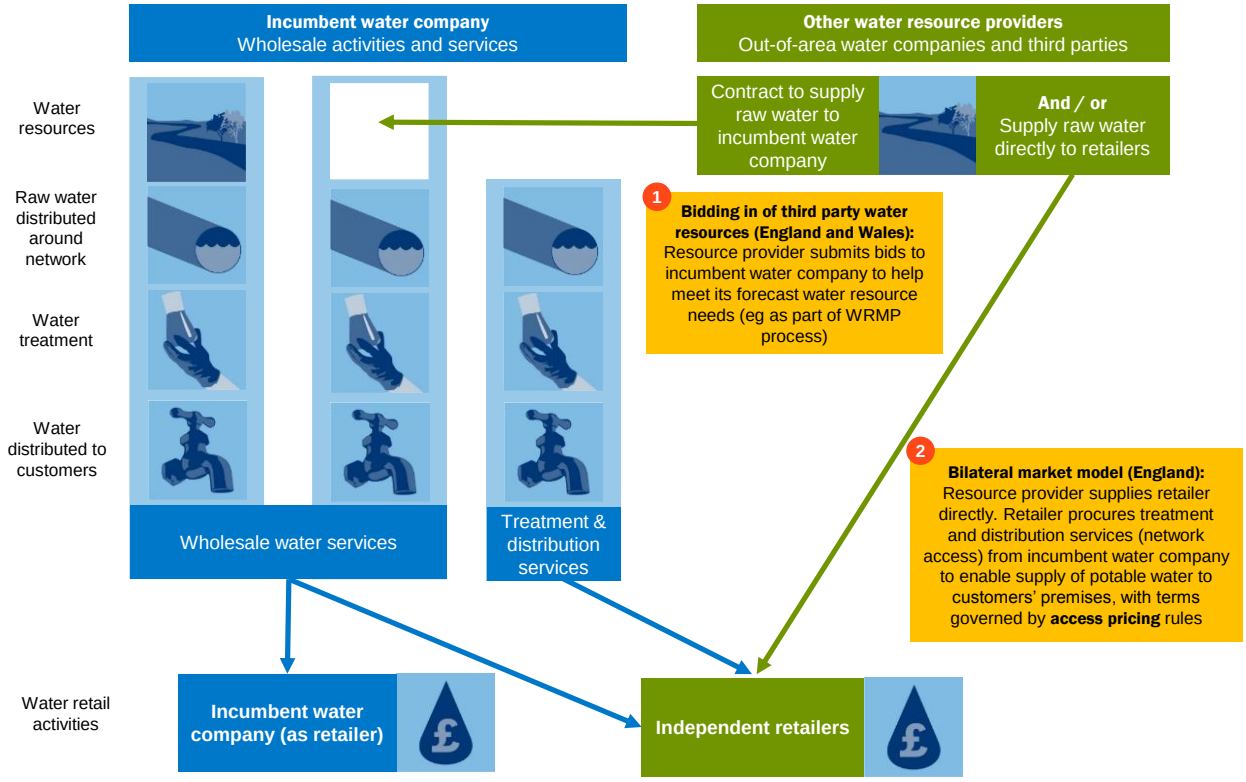
The Water Act 2014 enables a number of legislative changes to help realise bilateral market opportunities. Three of these are particularly relevant to highlight:

1. The new water supply licensing regime will allow water supply licensees to introduce water into the systems of water undertakers whose areas are wholly or mainly in England, in order to supply the customers of other water supply licensees. (We note that the Water Act 2014 also gives the Welsh Government powers to extend this regime to undertakers whose areas are mainly in Wales at any point in the future, but we understand that it currently has no intention of doing so.)
2. The regime will extend the ways in which third party providers of water resources might draw on the facilities and systems of incumbent water companies to operate in the water value chain and provide supplies to customers. In particular, third parties that have raw or untreated water will be able to draw on the treatment facilities of incumbent water companies, whereas under the current legislative regime bilateral market entry is mainly limited to companies that can treat water themselves.
3. The Act includes amendments to revise the current legislative provision governing charges for use of incumbent water companies' facilities. The existing costs principle, which has been identified as a barrier to market participation by efficient third parties, will be replaced for companies whose areas are wholly or mainly in England by charging rules developed by us. We understand the Welsh Government proposes to maintain the cost principal for companies operating mainly in Wales. In developing new charging rules we will have regard to any guidance issued by Defra and the Welsh Government.

The reformed water supply licensing regime allows for arrangements under which licensees with the ability to abstract (and potentially treat) raw water could use their resources and facilities to supply non-household customers, relying on the local or regional water undertaker to carry out any treatment, transportation and distribution required to deliver that water (or equivalent volumes) to the premises of the licensee's non-household customers (or the customers of another licensed retailer).

The figure below provides a simplified illustration and comparison of what these two market models involve. Under the bidding market model, the resource provider sells water to the incumbent wholesale water company for onward supply to retailers. Under the bilateral market model there are a number of different ways the market could work. In the figure below the resource provider sells water directly to retailers and uses the incumbent wholesale water company's treatment and distribution system in order to achieve the physical supply to the retailer's customers. Another option (not shown in the diagram) would be for the water resources provider to undertake treatment itself and use only the distribution services of the incumbent company.

Figure 1: Illustration of the bidding market (England and Wales) and bilateral market (England only) models



Where applicable, these two routes to market reinforce each other. The potential ability for third party providers of water resources to use the bilateral market model should help encourage incumbent water companies to thoroughly explore offers made to them through bidding markets, while resource providers that have not been successful in bidding markets may find subsequent opportunities in bilateral markets.

2.1.3 Our December consultation proposals

Our preferred option for each policy area in the December consultation is summarised in the table below, alongside the other options we considered, including the do nothing option.

Table 2: Our December consultation proposals and options considered

Policy area	Do nothing option	Preferred option	Other options considered
Improving market information	No additional information or bid assessment requirements	Market information database and ongoing assessment of third party resource options	Companies publish more accessible WRMP data based on Ofwat stipulations

Policy area	Do nothing option	Preferred option	Other options considered
Access pricing for bilateral markets	Not possible in England: new access pricing regime required under Water Act 2014	New framework designed to enable entry by companies that can provide new water resource capacity as efficiently as incumbent, implemented through combination of cost-based charges for network plus services plus a compensation payment reflecting incumbent's forward-looking incremental water resource costs	Approach based only on historical RCV-based average costs of network plus activities
Separate price controls	Continuation of PR14 approach	Separate binding price controls for water resources and network plus	Non-binding network plus and water resources sub caps Separate binding price controls for each element of the wholesale water value chain
Approach to historical RCV and new investments	RCV protection on efficient expenditure up to 31 March 2015 Uncertainty about RCV protection after that date	RCV protection on efficient expenditure up to 31 March 2020 Expenditure from 1 April 2020 at risk	None
RCV allocation	No RCV allocation between network plus and water resources	Unfocused RCV allocation to water resources based on split of MEAV between water resources and network plus	Focused RCV allocation to water resources based on MEAV of water resource assets
System operation	System operator functions undertaken by incumbent companies and other market participants	System operator functions undertaken by incumbent and other market participants, with broader role played by markets	Independent system operator (ISO)

2.2 Improving market information

In Chapter 5 we set out our decisions on improving market information, below we provide further information on the:

- market information platform;

- bid assessment framework; and
- implementation timetable.

We look forward to working with stakeholders in refining the details of these measures and implementing the package in line with our timetable.

2.2.1 Market information platform

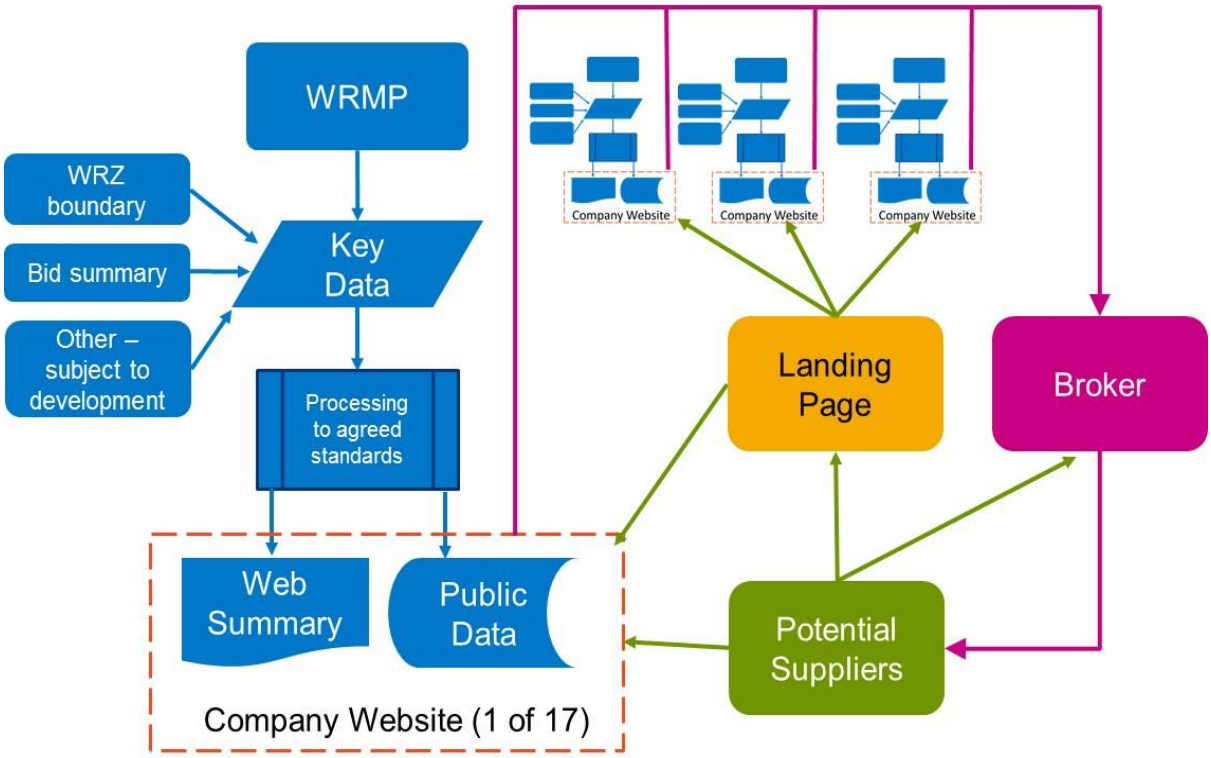
We have reconsidered our proposal for a market information database run by a third party in light of the responses received and our further analysis. The revised information platform model will require companies to post summaries of relevant information on their websites and provide open access to underlying data. Potential suppliers would access a company's market information platform either directly from a water company's website or via a signposting page hosted by Ofwat. The data requirements are discussed below.

Third parties will not be required to post or submit information to the market information platform. Rather, bids would be made directly to companies with consideration of issues such as resilience, drinking water quality and environmental impacts addressed by negotiation and regulatory approval. Companies will be required to periodically publish summaries of bids received, their outcomes and reasoning for decisions.

We expect the platform to evolve over time if it becomes evident that additional information and functionality is desirable. But evolution is not just limited to the design and specification of systems operated by companies – nor should it necessarily result in higher costs for incumbents. Our approach will enable data aggregators, water trading brokers and information analysis to evolve as it has in other parts of the world, see the WaterLitix tool developed by WestWater Research in the United States for example.

The structure of the market platform is shown in the figure below.

Figure 2: Overview of market platform design



This approach represents a marked change in the **platform design and functionality, data requirements (for buyers and sellers)** and **data format** when compared to the proposal in the December consultation.

Platform design and functionality

Our revised market platform will see each water company publishing specified data on its website in an agreed format alongside their final bid assessment framework. Ofwat will host a central signposting web-page that could also hold background information on the policy and legislative framework for water trading, the type of information incumbents might require from suppliers in order to evaluate bids, and the remedies available if potential suppliers feel their bids were not treated fairly. These remedies include our powers to request more in-depth information to investigate whether potential buyers complied with relevant legal requirements for which we are the enforcement authority. We could also take account of complaints or concerns about discriminatory behaviour or inefficient procurement as part of the risk based review of future business plans.

The platform will also enable third parties, regulators and other stakeholders to understand where companies are facing supply-demand deficits and where

opportunities for beneficial trades or innovation in leakage control and demand management may exist. But it is not our intention to create a database that contains all the information required to assess and complete a trade. Details of issues such as water quality, environmental impact and supply resilience will need to be considered offline through commercial negotiations and regulatory approval.

Data requirements (buyers)

Many of the responses received made the case that much, if not all, of the information a third party needs to understand where a company is facing a supply-demand deficit is already held in WRMPs and updated annually. We agree but more could be done to make the information and underlying assumptions readily and consistently available. This includes presenting outputs and underlying assumptions in summary maps and making the supporting data, including WRZ boundaries, freely available for third-party analysis.

We will also require companies to publish summary information on the cost of its preferred option(s) to close the supply-demand balance or address other needs (for example, enhanced resilience). We understand that WRMP option selection takes place in the context of wider considerations of system operation and social, environmental and resilience impacts. As a result WRMP cost information may not be directly comparable to a third party's understanding of their cost to supply. However, it will be a useful starting point for initial discussions.

Companies will need to publish summary details of bids received from third parties including grounds for any refusals. These summaries would contain enough information to understand the nature of bids and decision without revealing commercially sensitive information.

Data requirements (suppliers)

We have revised our proposal to require registration of third parties and formal bid verification. We consider that our approach of requiring incumbents to post bid summaries will facilitate greater transparency in decision making without the complexity and cost associated with creating third party access rights to an information platform. It also means that potential suppliers will not face any pre-registration requirements or a charge for market participation – features which may act as a disincentive to third parties.

Format

In line with the recommendations from our commissioned report 'Water trading – scope, benefits and options', Deloitte LLP, December 2015, we consider consistency in the definition, structure and format of datasets to be a prerequisite for any system designed to allow comparison between companies and across regional boundaries. It also provides the foundation from which the market platform might evolve as we receive feedback on company/user needs and experience.

A simplified and consistent format should also facilitate entry by third parties offering services in data analysis, aggregation and/or brokering services as discussed above.

2.2.2 The bid assessment framework

We will require each incumbent water company in England and Wales to develop and publish a bid assessment framework for water resources. Our intention is to provide clarity and confidence to third parties that their bids will be assessed on an equal footing with the incumbent's own schemes, and to overcome some of the information barriers that may otherwise impede water trading.

The bid assessment framework will set out each company's policies and processes for the assessment of third party bids, including its approach to ensuring that it does not unduly favour its in-house solutions at the expense of third party solutions that may be more efficient or offer other benefits for example, improving resilience or reducing environmental impact. It should reference the wider policy and legal framework applicable to bid assessment, and set out guidance on the kind of information that a third party needs to provide to enable its bid to be properly evaluated alongside other options.

We want companies to take ownership of developing the Bid Assessment Framework they will apply, taking into account a set of high-level guiding principles that we will issue. Our initial thinking is that those principles will cover:

- stakeholder engagement in developing the framework (including public consultation);
- principals of bid evaluation such as transparency and fairness;
- the relevant legal and policy framework (differentiated for England and Wales as necessary);
- an outline of the tiered appraisal process, mirroring that in the WRMP process;
- service expectations for considering bids, for example timescales for decision/response;
- interaction with the WRMP planning cycle;

- processes for dealing with queries and complaints; and
- the process for review and publication of the final framework.

This company-led approach will provide the flexibility required to ensure that effort expended in submitting and assessing bids is commensurate with potential viability and benefits a bid has to offer – something that is best understood in the context of a company's circumstances. But this should not stop companies from collaborating to develop a common framework where this offers efficiencies of scale or where bid evaluation might take place in the context of regional networks.

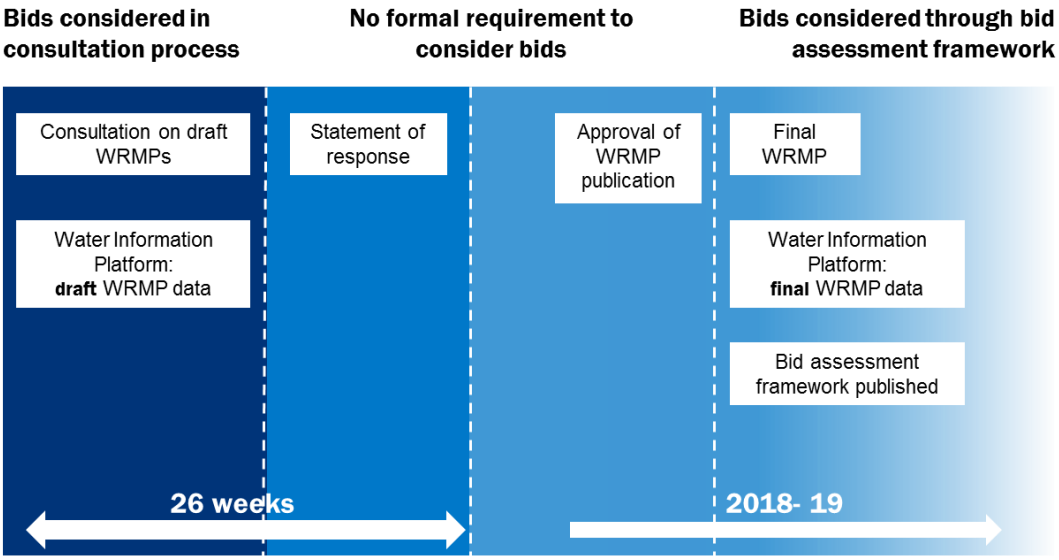
We do not intend to provide formal ratification of companies' final bid assessment frameworks. However, the quality of the development, content and application of a company's framework could be a significant factor in our consideration of the risk based review (especially for water resource enhancement schemes), and in any relevant casework under our general regulatory and competition enforcement obligations.

2.2.3 The implementation timetable

We recognise the interrelationship between our decisions to improve market information and the statutory WRMP process. We also note companies have sought to generate water resource bids from third parties (or are planning to do so) as they develop their latest round of WRMPs. We want our policy decisions on improving market information to compliment these efforts. As a result the first iteration of the market information platform should be functioning with draft WRMP data in time to stimulate third party engagement at the point of public consultation on WRMPs in early 2018.

We intend that bids submitted during the WRMP consultation period should feed into the formal WRMP process rather than be subject to the bid assessment framework. Bids made after the consultation is closed but before the final plans are agreed would not have to be formally assessed This should avoid the risk that companies run parallel processes or duplicate effort.

Figure 3: Interaction between WRMP development and bid assessment



This approach should be communicated clearly with bidders in order to manage expectations over how bids will be handled and the timescales for bid decisions.

We expect companies to update their market information platform when they publish their final WRMPs. This is expected to run from late 2018 onwards. At that point any subsequent bids would be subject to consideration through the bid assessment framework. We expect to use the experience gained and review the role of the information platform in subsequent WRMPs.

2.3 Separate price control for water resources

In Chapter 5 we set out our decisions on the separate price control for water resources, below we provide further information on:

- the alternatives to a separate binding water resources price control we considered;
- our considerations for applying a separate control to companies mainly in Wales;
- the alternative form of the separate control we considered; and
- boundary issues related to the water resources price control.

2.3.1 Alternatives to a separate binding price control

We considered the following alternatives to a separate binding price control for water resources:

- a non-binding price control for water resources;
- a separate binding control covering water resources, raw water distribution and storage and water treatment;
- a single wholesale price control; and
- removal of formal price control regulation from water resources.

Our view is that a non-binding control would bring many of the same administrative costs of a separate binding control, without providing the same degree of benefits. This is supported by evidence from respondents to our February information request on the costs of our policies (described further in Section 3.4.3 below), with six out of nine companies stating that they expected costs be the same or similar under non-binding and binding controls – for example, because data would still need to be allocated between business units and audited for quality assurance. (The remaining three companies stated that costs would be lower under a non-binding control, for example because a binding control would have a higher audit requirement.) On the benefits side, a non-binding control might help to provide more regulatory and commercial focus on water resources than at present. But, being non-binding, it would offer less protection to third party resource providers against cross-subsidy concerns and would not address the risk that a single wholesale control does not work well for customers in a context where new entry occurs.

A separate control covering water treatment, raw water transportation and raw water storage as well as water resource activities was another option. There are some arguments in favour of this approach. Some third party providers will have both water resources and treatment facilities and the scope of potentially competitive activities could include treatment as well as water resources. It might be more straightforward from a practical and consistency perspective to draw the boundary for a separate control in a way that includes all activities up to and including water treatment as this boundary could be defined relatively clearly as the point of entry to the treated water supply systems.

However, we do not consider that it would be proportionate to include raw water transportation, storage and water treatment in a separate control at this stage of market development. By definition, all water resource providers (whether out-of-area incumbents or third parties) will be engaged in water resource activities, but only a subset will also be involved in raw water transportation, storage or treatment. Before we know more about how the market is developing, and any problems that may arise

in practice, it seems premature to include other activities such as water treatment within the separate control. More generally, there are benefits from a more incremental and evolutionary approach to regulatory reform (for example, opportunities for learning-by-doing and future adaptation), which suggests a separate control focused around water resources initially, but with the potential to adapt and extend if necessary in the future.

A single wholesale price control does not fit well with the development of markets in water resources, at least if the price review 2014 (PR14) price control framework were retained. It might be possible to maintain a single wholesale price control, but change key aspects of the design and operation of that control (for example, relating to the financial incentives and risks borne by companies operating under the control) to enable it to work better in the context of a more competitive environment for water resources. However, we consider this approach to be inferior to a separate water resources price control. Making changes to incentives and risk across the entirety of wholesale water activities could lead to a disproportionate increase in risk and financing costs (which might ultimately borne by customers) across the value chain. Without separation of the control, it would be more difficult and costly to tailor the price control arrangements for water resources to realise the benefits from developing the markets in these areas. A single control would also provide less clarity to incumbent water companies and third parties on how water resources are to be treated differently for price control purposes, and would make less of a contribution to the revelation of information on water resource costs.

A single wholesale control would also not offer as much help in overcoming potential barriers to entry. In particular, under a single wholesale control, incumbent water undertakers may be able to cross subsidise their water resources activities from revenues from less competitive parts of the value chain. There are ways to tackle cross subsidy risks without a separate control (for example, via regulatory reporting and competition law enforcement) but the separate resources control would provide an additional contribution, not least because the formal price controls are a high-profile and relatively transparent part of the overall regulatory framework and also because case work can be a relatively time-consuming process.

A more radical alternative would be to remove formal price control regulation from water resources and reduce the scope of the existing wholesale water control accordingly. We might then rely on competition, and competition law, to protect customers. We do not consider this to be a viable option. At least in the near and medium term, we would not expect market entry (or the threat of entry) in water resources to be sufficient to impose competitive constraints on incumbent water companies' water resource activities. We expect that the most likely source of competitive activity in water resources will be to meet the needs for incremental new

water resource capacity, which third parties may be able to do more efficiently than incumbents. We do not expect major displacement of the existing water resource capacity and activities of incumbent water companies. Given the strong existing position of incumbents, the constraint from competitive entry may be insufficient to constrain costs at current levels, which reflect the RCV discount at privatisation.

2.3.2 Applying a separate control to companies mainly in Wales

In Chapter 5 we explained that on balance, even though the benefits of a separate control may be greater in England, we consider that it would still be net beneficial for the separate control to apply to all water companies in England and Wales rather than only companies operating wholly or mainly in England. We expand on our reasoning below:

- The case for separate price controls for water resources is only partly related to the development of bilateral markets in some areas. There are wider benefits, including improved information on the costs of water resources and the potential for better targeted regulatory incentives. This view was supported by some respondents, who cited benefits from the separate control that are unrelated to opportunities for markets. For example, Dee Valley Water said that a separate control will help regulatory institutions to have a better understanding of efficient costs, allowing benefits to be driven through better regulation rather than market-based solutions. The Environment Agency agreed that separate price controls will increase the transparency of costs for all elements of the water resources value chain, and said it would like to see this information used to set targeted regulatory incentives to benefit the environment.
- Where a company has a forecast surplus in its demand-supply position it is a potential exporter of water to other parts of the country (for example, through the bidding model). These opportunities apply to companies based in both England and in Wales. In these circumstances the separate control can bring benefits by improving information about water resource costs, and this improved information should provide a better evidence base for the identification of trades that are beneficial to customers. It will also help ensure that an appropriate level of costs are recovered from trading and that an appointee's customers' interests are protected by transfer prices that reflect all costs.
- The scope for bilateral market entry is wider than the area served by companies operating wholly or mainly in England. For example, potential changes to the devolution settlement to align the boundary for legislative competence for water with the national border (a recommendation in the Part II report of the Commission on Devolution in Wales, also known as the Silk Commission) would mean that the Water Act 2014 reforms to enable bilateral markets for water

resources could in future apply in areas within England that are served by companies operating mainly in Wales. These potential changes limit the case for exempting Welsh companies from the separate controls.

- There are benefits in applying a consistent price control methodology to all companies, for example in relation to the transparency of regulatory processes and the ease of undertaking benchmarking between companies.
- The benefits that could be realised from exempting the Welsh companies from the separate water resources price control seem relatively limited. Exempting some companies would provide some administrative and regulatory cost savings because it would enable these companies to avoid work on issues such as the RCV allocation for water resources, development of separate charges for water resources, compliance with an additional price control and the allocation of revenues between water resources and network plus activities. However, our analysis of the costs of our proposals (discussed further in Section 2.5.2 below) shows these cost savings are likely to be modest. Companies already report water resources costs separately as part of their regulatory accounting requirements, and we consider this to be important irrespective of a separate control (e.g. to provide evidence to inform the development of appropriate wholesale tariff structures). Moreover, the central and common work for Ofwat and the industry to design and implement the separate control would still need to be done.

2.3.3 Alternative forms of price control for water resources

We considered the following alternatives to a total revenue control, combined with an explicit within-period adjustment mechanism that depends on the scale of bilateral market entry:

- a total revenue control without any within-period adjustment;
- an average revenue control; and
- caps on specific prices or tariffs.

A total revenue control without any within-period adjustment might achieve a similar financial effect to our preferred approach, over the longer term, with any adjustments relating to bilateral market entry made through financial adjustments in subsequent price control periods. However, we consider that this is inferior to an explicit within-period adjustment in this case. We are seeking to adapt the price control framework for water resources and the explicit within-period adjustment mechanism is a much more transparent way to do this than reliance on financial adjustments which would be implemented as part of subsequent price control reviews. The within-period adjustment provides an explicit way to signal our adapted approach for water

resources. The development of the adjustment mechanism will be an important part of the price control framework for water resources and warrants attention in the foreground rather than the background. Against these issues, we have not identified a good reason to favour an approach of delaying these adjustments to subsequent price control periods.

It was suggested in the responses that a total revenue control approach should be retained to avoid a situation where water companies have a profit incentive to increase the volume of water delivered to customers, which might lead to undue water abstraction. We note that under our proposed form of control, the adjustment mechanism is limited to bilateral market entry and does not expose the incumbent to wider volume risk, and therefore the incentives in regard to water volumes will be similar.

We also note that incentives to increase demand will be impacted by marginal costs as well as revenues, and that with rising marginal costs an incumbent will face incentives to reduce demand even under a price cap or average revenue control. A revenue control also implies perverse incentives for customers, in that if all customers save water, unit prices will increase, which may disincentivise demand management.

Further, a range of measures are available and used to address environmental risks relating to levels of water consumption, including the price control review process, the WRMP process, the abstraction licencing regime and the duties on companies to promote the efficient use of water. One of the benefits from a greater use of markets in water resources is that new opportunities for meeting water demand will be revealed, some of which will bring environmental improvements compared to the options that would otherwise be identified.

Under an average revenue control for water resources, the price control would be based on volume measures such as average revenue per cubic metre of water supplied. This approach would help to address the concern that a total revenue control might mean that customers pay more following bilateral market entry as the incumbent water companies revenues are not adjusted after a third party enters the market. However, an average revenue control could also expose incumbent water companies to considerably greater financial risk, such as full exposure to variations in the aggregate level of demand for water within each WRZ. This would involve a major change to the price control framework for water resources, which seems out of proportion with the likely scale of bilateral market entry in the near term. It would also reduce transparency around implementing our policy to provide regulatory protection for the pre-2020 RCV.

Finally, we considered the possibility of formal caps on specific prices or tariffs rather than controls on revenues. Given that companies do not currently set, calculate or publish separate prices for the outputs from their water resources activities this approach would present relatively large implementation challenges. Further, it seems difficult to combine the price cap approach with our policy on the regulatory protection for the pre-2020 RCV and it may impose a degree of financial risk on incumbent water companies, which in turn could raise costs for customers.

2.3.4 Boundary for the water resources price control

In light of stakeholder responses and the findings of the 'Targeted Review of Sludge and Water Resources report', CEPA, March 2016, we have looked again at the boundary for the water resources price control.

A key theme of responses was the importance of consistency in cost reporting. Portsmouth Water noted that care is needed to differentiate water resource costs from water treatment costs, especially where these are co-located. The CEPA report noted a number of questions and inconsistencies on the part of the incumbent water and sewerage companies. Our starting point is the definition of water resources in the regulatory accounts. We recognise that in a number of cases, boreholes with on-site treatment for example, establishing the allocation of operating costs for water resources is not straightforward and there may be a need for further guidance in the regulatory accounting guidelines (RAGs).

Our current view is that the point at which a company demonstrates abstraction licence compliance to the Environment Agency or to Natural Resources Wales, should provide the foundation for the boundary. Typically this will be at a flow meter, with raw water resources upstream and raw water transportation downstream. In common with the meters used in wholesale/retail separation the flow metering asset(s) will be owned and maintained by the upstream party.

There has been discussion as to whether the assets upstream of the flow meter (and hence the associated costs) should be classed as water resources or raw water distribution, these could include weirs or flumes, screens, and fish passes, for example. There is also debate as to where the boundary should be located for raw water that is abstracted and then stored prior to treatment, such as pumped bank side storage. In such cases our initial view is that where water is abstracted solely for public water supply and no other use for that water is licenced, then the boundary should be set at the furthest downstream point in the licence.

For some sources the split of costs in these cases is much more complex. Where borehole pumping process supports downstream operations by providing pressure, for example. Multiple borehole sources may also controlled by the same abstraction licence, possibly with hands-off conditions on one or more boreholes, or cases where the distribution main downstream of the borehole (and hence outside the borehole compound) acts as a contact tank for disinfection.

We are keen to explore with stakeholders the following approach, which would provide more detailed guidance than the current RAGs.

In the case of **river abstraction assets**:

- weirs, screens, and fish passes to fall within the water resources price control; and
- assets downstream of the abstraction meter to fall within raw water distribution (and hence the network plus price control).

In the case of **bank side storage or bulk transfer schemes**:

- the economic boundary for water resources to be determined by the furthest point downstream controlled by the abstraction licence; and
- all assets and costs downstream of this point to fall within raw water distribution (and hence the network plus price control), unless the bank side storage cannot be used for public water supply purposes in which case it will be classed as water resources.

In the case of **co-located borehole sources:**

- all operating costs to be apportioned to either water resources or water treatment, with rule for apportionment between these categories to be confirmed as part of the RAGs.

We recognise that the level of granularity in accounting data varies widely, some companies aggregate costs against cost centres for similar or regional assets, a specific site, or water supply in a region for example, while others have systems that capture costs for individual assets. In developing the boundary we will take into account these practicalities to avoid any undue regulatory burden.

We propose to consult and develop this further in collaboration with the industry and intend to develop a set of amendments to section 2 of RAG 4 to be published for the 2016-17 RAGs.

2.4 Further options to support market development

Chapter 5 of our main document sets out our thinking on further options to support market development. We are in the early stages of policy development in these areas and below we capture key stakeholder responses and our further thinking on the options we set out in December. In turn we address:

- water trading incentives;
- interconnection funding mechanisms;
- model contracts;
- rules for supply curtailment; and
- case studies.

We received extensive comments in response to the December consultation on options broader than the proposals above. For example many respondents commented on what they considered to be the key barriers to water trading at present, and/or put forward further policy suggestions to help overcome barriers. We welcome these stakeholders' contributions. While we have not reproduced these comments, we will look to build on them in the future policy development.

2.4.1 Water trading incentives

Water trading incentives for both new water exports and new water imports were introduced at PR14. For all new qualifying exports in 2015-20, we allow exporters to retain 50% of the lifetime economic profits (that is, the profits over and above the normal return on capital invested). Importers benefit from an import incentive of 5% of the costs of water imported under new agreements, for the duration of the price control period. To protect customers, there is a cap on total annual import incentive rewards of 0.1% of water activity turnover in any year of the control period. We note that already two companies, Dŵr Cymru and Thames Water, have approved trading and procurement codes, a necessary step for a water company to be rewarded through the PR14 water trading incentives.

The findings of Deloitte's report to us and 'Water 2020 – Water resource planning and third party options', South East Water and Frontier Economics, July 2015, (submitted by South East Water as part of the Water 2020 'Marketplace of Ideas') both suggest that the PR14 water trading incentives may have had limited impact on encouraging trading. However, this issue was not raised by any respondents to our December consultation.

We will review the impact of the incentives on water trading as part of our considerations in developing our PR19 methodology. The options to be considered as part of this assessment will include:

- no incentives for water trading;
- rolling over the PR14 incentives to PR19;
- whether caps are needed and their appropriate levels; and
- strengthening of the PR14 incentives.

Our current view is that it is too early in the regulatory cycle to reach conclusions on the impact of the current incentives and whether or not they may need to be developed further. However, if strengthening of incentives is found to be necessary and appropriate this could be achieved through:

- longer periods during which companies can retain benefits from trading, for example to align with the lifetime of the schemes (this only applies to imports as the export incentive already applies to the lifetime of the scheme);
- a higher percentage of benefits that can be retained by companies; or
- a combination of the above.

In addition, we will need to ensure that the financial incentives and profit opportunities from selling or exporting water, which are available under the regulatory framework, do not create biases or distortions in appointees' choices between the two main routes to market that we have identified: bidding markets to supply other wholesale companies and bilateral markets to supply retailers. For this reason, our review of water trading incentives will need to consider more widely the treatment of non-appointed revenues in the context of bilateral markets.

Any changes to water trading incentives would be implemented in the PR19 and we intend to engage further with stakeholders on these issues ahead of our PR19 methodology consultation.

2.4.2 Interconnection funding mechanisms

Interconnection investment enables supply of raw water or potable water from a WRZ within one incumbent company's area of appointment to a WRZ within another company's area of appointment. The question of how value created by such trades is allocated is discussed under the water trading incentive section above. But there is also a question of how the costs of the interconnection capacity are treated for regulatory purposes.

Two respondents provided specific comments on interconnection funding mechanisms. Southern Water questioned whether the regulatory framework places sufficient value on interconnector investments, especially in relation to their role in facilitating market development and resilience. The Environment Agency was more cautious, noting that more detail needs to be provided and that implementation must be carefully managed to avoid adverse outcomes, for example deterioration in Water Framework Directive (WFD) status or the spread of invasive non-native species.

The costs of interconnection may include the costs to establish or expand a physical connection between two systems in separate WRZs as well as any reinforcement work in the importing or exporting WRZs to enable full use to be made of the interconnection. In light of proposed changes to the price control regulation of water resources we have identified several options for the future regulatory approach:

- Investment in interconnection capacity could be incorporated within the network plus RCV of an incumbent water company carrying out the investment (or potentially allocated across the importing and exporting company if the interconnector is jointly financed between them).
- Investment in interconnection capacity could be treated as part of the water resources costs of the importing water company, on the basis that interconnection investment is one of several ways that a water company might increase its available water resources. Under this approach, new investment in interconnection from 1 April 2020 onwards would be ‘at risk’ in the same way as other types of investment in water resources.
- Bespoke regulatory arrangements (for example on funding allowance, exposure to utilisation risk and exposure to outturn costs) could be applied for specific interconnection projects.
- Investment in interconnection capacity could be done on a commercial basis, outside of the network plus and water resources price controls.

The choice of approach would have implications for a number of relevant considerations, including:

- providing incentives for companies to identify and exploit interconnection opportunities that enable a more efficient use of resources;
- the financing costs for the interconnection investment;
- the environmental impacts of the interconnector;
- the risks borne by customers in the event that the interconnection capacity turns out to be utilised less than expected;
- the consistency of regulatory treatment across different categories of expenditure and the links to water trading incentives;

- the practicalities of applying a specific approach to a defined set of interconnection costs; and
- the complexity of the overall price control framework.

Any changes to the treatment of interconnection investment would be implemented in the PR19 and we intend to engage further with stakeholders on these issues ahead of our PR19 methodology consultation. In regard to potential environmental concerns, we note that similar issues apply to interconnections within company areas and that transfers between company areas are likely to raise similar environmental issues as those within company areas. Any changes we propose to the interconnection regime would be designed to put transfers between company areas and within company on the same footing for the purpose of economic regulation.

2.4.3 Model contract

We have given further consideration to the idea of a model or standard contract for water trading. A model contract would provide a basis for parties to base their contractual negotiations and would cover key contractual terms.

In the responses this idea had mixed support. For example Southern Water favoured developing a standardised set of contract clauses and conditions for the procurement of water from third parties. It suggested that this could be co-ordinated through Water UK. Other stakeholders suggested that model contracts might not be appropriate, for example Thames Water noted that as resource development is non-standard its experience is that each case needs to be treated on its merits.

We have reviewed our previous work on a model contract which was developed in 2012 with input from stakeholders. This model contract was not published as at the time we decided that publishing this would be too directive, could stifle innovation and would be inconsistent with companies taking more responsibility for their decisions. We therefore developed and consulted on draft guidance. Respondents to this draft guidance preferred this approach, agreeing with the reasons we gave of the need for flexibility and not wanting to stifle innovation.

Relevant guidance documents which companies can use if they want to include:

- ‘Bulk supply pricing – a statement of our policy principles’, Ofwat, February 2011;
- ‘Negotiating bulk supplies – a framework’, Ofwat, August 2013; and
- ‘Our framework for resolving pricing disputes related to bulk supplies’, Ofwat, January 2014.

We recognise that there may be some value in developing model contracts that go beyond this guidance, for example a contract for third party supplies from non-incumbent companies. However, we would need to be certain that there is a clear demand for this from market participants and would contribute to better outcomes for customers. A model contract is not a priority area at this stage in the Water 2020 work programme but we intend to keep this under review. If the industry decides to progress work in this area, via the Water UK forum suggested by Southern Water, we would expect the work to have regard to the interests of all potential market participants and benefits to customers.

2.4.4 Rules for supply curtailment

Security of supply, and the rules that might apply around curtailment stimulated a wide range of comments.

South East Water stated that bulk supplies should adequately reflect any outcome delivery incentives (ODIs) and service incentive mechanism (SIM) targets a company has, such that if an ODI penalty is triggered due to a failure to deliver the required water under the terms of a bulk supply, this reputational and financial penalty should be shared with the provider of the bulk supply.

Affinity Water and United Utilities felt that concerns around security of supply could be addressed predominantly through contractual negotiations between parties. Affinity Water noted that a contractual obligation to ensure that physical supplies are maintained under prescribed circumstances (instead of on a ‘best endeavours’ basis) could assist with achieving objectives around increased trading, but suggested that this could have significant cost implications, which may ultimately flow through to customers.

We consider that regulatory interventions which obscure an incumbent’s responsibility for service provision and ODIs could act to undermine trust and confidence amongst customers. The prospect of the regulatory framework offloading penalties to suppliers when services fail might also have perverse consequences for the due diligence applied during contract negotiation. Our preference is for companies to establish rules for curtailment and penalties for failure through their negotiated commercial contracts. However we recognise that the actual or perceived difficulty of mitigating risk through contractual negotiations may hinder market participation and that any contractual negotiations will be conditioned by the regulatory and legislative framework.

Northumbrian Water and South East Water both suggested that a duty could be introduced on incumbents (potentially through a licence condition) to show no undue preference between meeting their own in-area requirements and meeting bulk supplies to others under a contractual arrangement. These suggestions highlight the role that licence conditions on undue preference and non-discrimination could play in addressing the concern that supply curtailment considerations unduly prevent bulk supply agreements. We would expect that such licence conditions would primarily affect the terms of the agreement that is negotiated between the trading parties, with the subsequent rights and obligations of these parties determined by the contract itself.

We are not proposing any specific licence modifications relating to undue preference in water resources or in relation to bulk supplies. However, there are links with wider issues relating to undue preference and non-discrimination in the water industry. Section 23 of the Water Act 2014 introduced a general duty on Ofwat regarding potential undue preference and undue discrimination in the provision of services. The fulfilment of this general duty could help address some of the specific issues on supply curtailment in the context of bulk supplies. As set out in Chapter 8, we plan to take forward work to develop licence modifications in consequence of Section 23 of the Water Act 2014.

2.4.5 Case studies

We received limited comment on the idea of publishing case studies, with Thames Water offering support provided commercial confidentiality was respected. However we recognise that case studies of success could play a role in addressing more general issues respondents raised about improving confidence in trading. They could also be useful in customer engagement – taking on board points raised by CC Water and CIWEM about engaging customers.

Our decision to improve market information should help to improve the visibility of trades as the market develops – providing a ready source of material for companies and others to draw on.

However, given the lack of clear demand from respondents, and our other priorities, we do not propose to develop case studies at this stage in the Water 2020 work programme. We may revisit this decision as the market information platform, and supporting material, develops.

2.5 The impacts of our decisions

As set out in Chapter 5, the overall conclusion of our impact assessment is that our final preferred policy package will generate the greatest net benefits taking account of the risks and uncertainties involved. We came to this conclusion by considering in further detail our final policy package against the alternative 'do nothing scenario' across the following areas:

- benefits (both quantified and non-quantified);
- costs (both quantified and non-quantified);
- risks and uncertainties;
- distributional impacts; and
- a qualitative assessment against our Water 2020 objectives.

For each area in turn we provide an overview of our analysis and main results below, while further detail on the underlying methodology for our quantitative analysis of costs and benefits can be found in Section 4 of this appendix.

2.5.1 The benefits of our decisions

As discussed in Chapter 5 (and Section 4 of this appendix) we have modelled the following quantitative estimates of benefits from our decisions:

- **Increased water trading between incumbents**, yielding savings via deferred or avoided investment. Our updated base case analysis finds benefits of £810 million NPV over the lifetime of the assets compared with the cost of the schemes proposed in water companies' 2014 WRMPs. Over the 30 year time horizon of our impact assessment this is equal to £532 million of cost savings. All of the trades identified by our analysis as cost-beneficial are in England. This reflects the fact that the majority of WRZs in Wales are currently in water surplus and that our simplified modelling approach is not able to capture long distance trades or displacement trades (where water flows from Company A – which has a surplus – to Company B, and then from Company B to Company C, so that C obtains more water via trading even though it is not physically the same surplus water exported by A). If these were included in our analysis we consider it is likely that it would identify companies whose area is mainly in Wales that might benefit from participating in trades.
- **Efficiency gains in new incremental investment in water resources**, arising from increased use of markets in resource provision. Our analysis finds potential savings ranging from £127 million to £255 million NPV over 30 years. Most of these benefits (£125 million to £250 million) are expected to accrue in England,

while benefits in Wales are estimated at £3 million to £5 million. This reflects the fact that the majority of WRZs in Wales are in water surplus, and hence only limited investment in new resources is currently forecast in companies' WRMPs.

- **Efficiency gains in the maintenance and operation of existing capacity**, which could be driven from markets in incremental capacity (for example, as a result of knowledge and innovation transfer) as well as more transparent information, management focus and better targeted incentives arising from price control separation. Our analysis finds potential wider efficiency savings of between £81 million to £242 million NPV over 30 years. Reflecting the relative size of England and Wales the majority of these benefits are expected to be generated in England (£75 million to £226 million) with benefits for Wales estimated at £6 million to £17 million. However, on a normalised per customer basis, the benefits are higher in Wales than in England as Wales has a relatively larger existing water resources asset base than England by comparison with its population.

We note that these modelled benefits may not be fully additive – in particular, to the extent that increased water trading leads to deferred or avoided investment in new resources, this will reduce somewhat the scope for efficiency gains in new investment. To account for this, we made an adjustment to our estimate of efficiency gains in new investment when adding our benefit figures together for our overall impact assessment summary and conclusion (as set out in Section 5.12.4 of the main document). Specifically, we reduced the cost base for the analysis of efficiency gains in new investment in proportion to the cost savings from the water trading analysis in the base case. This gave adjusted figures for potential efficiency gains in new investment in water resources of £100 million to £202 million in England and Wales.

As a sense check to our modelling results above, we have also reviewed the Impact Assessment published for the Water Act 2014 proposals on upstream competition. Updated to 2015-16 prices, the estimated benefits of the proposals in the Act for the entire wholesale segment of the value chain (covering both water and wastewater) were £2.65 billion NPV over 30 years in the central scenario. As an approximation, 50% of these benefits could be allocated to water based on the current split in total expenditure, giving a figure of £1.33 billion. Although there is not an exact overlap between our policies and those in the Water Act, we note that our central estimate of benefits of £802 million is similar to (but somewhat below) this figure, which suggests that we may have been conservative in our analysis.

In addition to the quantified benefits, non-quantified benefits from our proposals include greater network resilience through increased interconnection, and potential reductions in the level of unsustainable abstraction due to increased use of alternative resources, particularly in water scarce regions.

2.5.2 The costs of our decisions

Further to Chapter 5, our impact assessment for water resources includes the following quantitative estimates of the costs of our policy decisions:

- **Costs to companies** – based on analysis of information received from incumbent companies (discussed further in Section 3.4 below), we estimated the set-up and ongoing costs associated with information provision to support the market information platform and price control separation (including ensuring accurate accounting separation and RCV allocation).
- **Regulatory costs** – we have assessed the potential regulatory costs associated with the entire package of Water 2020 policies set out in this decision document. Full details of the methodology and results can be found in Appendix 6. A proportion of these costs have been allocated to our water resources policies as follows:
  - 50% of the price control-related regulatory costs have been allocated to the separate water resources control (with the remaining 50% allocated to the sludge control). These costs fall in both England and Wales.
  - 15% of the total market-related costs have been allocated to our water resources bidding market policies (the market information platform and bidding framework). These costs fall in both England and Wales.

The central estimates for these cost elements are summarised in the table below. For England and Wales combined, the total company costs range from £18 million to £28 million NPV. Regulatory costs of the separate price control and policies to support the bidding market range from £4.4 million to £14.2 million.

We have also quantified the regulatory costs of our policies to support the water resources bilateral market (the design and implementation of the access pricing regime and the offset mechanism). To do this, we assumed an allocation of 70% of the market-related regulatory costs in Appendix 6, giving a cost range between £34 million and £40 million NPV over 30 years. These costs fall only in England, given the Welsh Government's decision not to implement bilateral markets. We have not included these costs in our final impact assessment however, given that our assessment has been carried out relative to a 'do nothing' scenario – and as discussed in Chapter 5 of the main document, we consider that 'do nothing' is not a viable option for access pricing given the Water Act 2014 requirement to develop a new methodology in England to replace the cost principle.

Table 3: NPV of company and regulatory costs associated with our water resources decisions, £ million

Cost Category	England	Wales	Total*
Company costs – Information Platform	10.1	1.3	11.5
Company costs – Price control	10.2	1.4	11.6
Total company costs *	**20.3**	**2.7**	**23**
Regulatory costs – Price control	1.2	0.2	1.4
Regulatory costs – Bidding market	7	0.9	7.9
Total regulatory costs *	**8.2**	**1.1**	**9.3**

* Numbers may not add due to rounding

We have also given further consideration to the impact of our decisions on the **cost of capital**. Our assessment is that the introduction of a separate price control for water resources does not, of itself, introduce any additional financing risk. Nor do our policies to promote increased participation by third parties in the WRMP process under the bidding market model (the market information platform and bidding framework), since these do not change the water resources utilisation risk profile for incumbents. However, as set out in Section 4.1 below we are consulting on the introduction of utilisation risk for new assets arising from bilateral market entry in England, which will expose companies to both risks and opportunities associated with the development of the bilateral market. We are also considering whether to introduce some level of risk-sharing for market-wide demand risk (also discussed in Section 4.1). Either of these could in theory lead to cost of capital impacts.

To inform our December proposals we commissioned a report from PwC on the Balance of risk and reward across the water and sewerage value chain, to better understand how risk varies across the value chain at present and how the balance of risk may change as a consequence of our Water 2020 reforms. PwC found that competition risks are diversifiable and do not in themselves necessarily lead to a higher cost of capital. However, PwC noted that market reforms could introduce asymmetric risks for investors in cases where existing investment is exposed to risk and expected cashflows are altered as a result of the reform – which could alter the value of the business. Asymmetric risks could lead to downside risks, not captured through the Capital Asset Pricing Mechanism (CAPM), which could require investors to be compensated through a higher return, or alternatively to a lower return in cases where there is greater potential for upside..

PwC also explained that any premium to adjust for asymmetric risks would be transitional in nature as, over time, new investments are made to replace existing assets and would only apply where existing investment is exposed to market risk. Over time the central estimate for expected cash flows will be calibrated to post-reform expectations regarding market share and asset utilisation and expected cash-flows once more become symmetric. PwC concluded in regard to water resource markets that:

> "Where there are markets for new investment, existing investors are not exposed to new cashflow uncertainties. Market design also restricts cost recovery risk on new investment once sunk. No premium required."

Overall therefore, we conclude that there will be no impact on financing costs from bilateral markets in our base case, because:

- the design of the price control and our commitment to protection of the pre-2020 RCV means that existing investment is not exposed to risk;
- in line with PwC's view, competition risks are diversifiable and hence an asymmetric risk premium is unlikely to be required for new investment; and
- the pace of bilateral market development is likely to be gradual, given that these markets do not exist at the moment and also rely on the development of business retail competition.

We accept however that there could be downside risk to this view, given uncertainty over the trajectory for development of bilateral markets in England. As the Welsh Government is not proposing to introduce bilateral markets, this does not apply in Wales.

We have not carried out an assessment of the potential impacts of allocating a share of market-wide demand risk for new investment to incumbent companies as part of this document, because it is not part of our agreed policy package at this stage. We are putting the issue forward for initial consultation as set out in Section 4.1 below, and we expect that any policy decisions in this area would form part of our PR19 final determinations with an assessment of costs and benefits undertaken at the relevant stage of the price review process. Based on the outcome of this process (and any other relevant issues that emerge as part of PR19), we will set the cost of capital for the separate water resources price control.

2.5.3 The risks and uncertainties associated with our decisions

As with any reform that involves opening a new market to competition, it is difficult to predict the likely speed of market development, the scale of efficiencies and innovations generated or how they will flow through to customers in terms of price and non-price outputs. We have endeavoured to reflect this in our impact assessment by modelling a range of potential outcomes for the benefits of our policies.

Some stakeholders perceive risks to the environment, water quality, and resilience from our proposals but we consider that these can be mitigated as follows:

- Regarding environmental risks, as previously noted our proposals will work within the existing regulatory protections in this area (including any future changes that may be introduced, for example as part of the abstraction reform process) and hence should not lead to any increased risk to ecosystems or the environment. Further, the changes are about aligning activity across company areas on same footing for purpose of economic regulation as activity within company areas, both types of activity need to take place within environmental framework.
- With respect to water quality, in cases where companies source raw water but treat it via existing treatment facilities (either under the wholesale market model or the bilateral market model), there should not be any increase in risk relative to the current arrangements. In cases where treated water is introduced into the system, the DWI will need to inspect and regulate water quality as it does at present for incumbents. We note that the legal framework for this to occur is already in place under the previous access pricing arrangements, although in practice it has not been required due to the lack of new entry.
- Finally, in terms of resilience, increased participation by third parties in water resources could lead to risks of a third party provider going into administration, potentially leading to short-term capacity issues. We consider that this would only be a significant risk should any third party provider become a major player in the market, and this impact can also be mitigated through applying special administration arrangements to licensed third party providers of water resources services.

2.5.4 The distributional impacts of our decisions

We would expect the introduction of markets for water resources to lead to some incumbent companies losing market share in new resource development (either to out-of-area incumbents or third parties), while other companies will gain from expanding their out-of-area water exports. In areas where competition develops, we

would expect customers to gain the most in the long term from the efficiencies introduced.

We do not expect any customer groups to be adversely affected by our policies, although customers in some regions (specifically, those with the most scope for increased trading and/or greater water scarcity) are likely to benefit more than others. Domestic retail customers will continue to receive their water from their in-area incumbent at average prices, with any efficiency savings from water resources markets being shared between the incumbent and its customers. Business customers who take advantage of opportunities provided by the bilateral market by switching are likely to benefit more than other non-domestic customers, but this does not imply that other non-domestic customers would face adverse impacts.

Distributional issues associated with the relative impacts of our policies on companies and customers in England versus Wales has been discussed in an integrated way throughout this impact assessment, and in the analysis of individual policy areas both in the main document and in this appendix.

2.5.5 How our decisions relate to our Water 2020 objectives

We have undertaken a high level assessment of our water resources decisions (as well as the 'do nothing' alternative) against our wider Water 2020 objectives which are set out in detail in Appendix 6. This is summarised in the table below.

Table 4: Assessment of our decisions against our Water 2020 objectives

Water 2020 objective	Do Nothing	Preferred Package
Achieves objectives	Not consistent with our pro-market objectives as it relies mainly on existing regulatory mechanisms, although introduction of revised access pricing framework in England will help to support development of bilateral markets in future Does not expand existing regulatory tool set or sharpen incentives on outcomes and delivery.	Promotes markets in a proportionate and targeted way by focusing on a part of the value chain where potential gains from markets have been identified as high and tailoring market measures primarily towards new investment Incentivises focus on outcomes and delivery at lower cost, by revealing additional information and providing opportunities for potential upside for

Water 2020 objective	Do Nothing	Preferred Package
	Delivers predictability by maintaining existing regulatory framework but does not provide the framework to meet future challenges and opportunities	efficient service providers and their customers Uses a broad range of tools including price controls, information remedies and reforms to access pricing Delivers predictability to companies and investors in the transition to market-based arrangements by protecting historic RCV investment up to 2020
Addresses known problems	Does not address identified problems within the current arrangements, which have not been successful in promoting water trading and entry by new resource providers	Proposals tailored to address identified barriers and problems with respect to greater use of markets in water resources, including: incentives to favour within-company solutions over third parties; lack of information transparency; the design of the existing access pricing regime; and the fact that market entry may not work in customers' interests given the current structure of price controls and RCV Helps to address environmental challenges (particularly water scarcity) through a more efficient development and use of resources Improves system resilience by encouraging greater connectivity between regions and increased participation by third parties Increased use of markets should deliver savings from more efficient investment decisions and better utilisation of assets and resources, which will flow through to lower customer bills relative to the counterfactual. Price control separation should also allow better targeted

Water 2020 objective	Do Nothing	Preferred Package
		incentives and more effective regulation, potentially generating further savings
Is practical to implement	Low cost approach which avoids creating additional regulatory burden on incumbents, but third party suppliers will continue to face barriers to market entry. Revised access pricing regime required even under 'do nothing' scenario in light of Water Act 2014 changes	Increased regulatory burden due to separate price controls and associated RCV allocation. Approach to RCV allocation avoids need to undertake full asset valuation exercise. Licence changes will be required. Some additional costs associated with market information platform but these have been minimised through a revised design

Overall, our assessment is that the alternative policy options we considered do not meet our objectives as effectively as our final policy package. Some key points to note in this regard include:

- With respect to our decisions to **improve market information**, our decision that incumbent companies would make key data on supply-demand deficits and water resource costs available in a consistent format, but more technical details such as water quality and environmental impact would be left to commercial negotiations, represents the best balance between achieving our objectives, addressing known problems, and practicality. The more complex alternative of a full market information database hosted by a third party provider that we put forward in December would be more resource-intensive, which may not be proportionate given the early stage of market development and the information already available via the WRMP process. On the other hand, the 'do nothing' option would not address identified problems in relation to information transparency and barriers to entry for third party resource providers.
- On **access pricing**, as noted previously a 'do nothing' approach to reform is not viable, give the Water Act 2014 requirement to develop a new methodology in England to replace the previous costs principle. Our proposed approach provides strong incentives for entry in places where it is needed most and puts third parties on a level playing field with incumbent suppliers. It will require the development of a better understanding of costs associated with new supplies, but this is likely to beneficial to wider stakeholders.
- On **price control separation**, the alternative of a non-binding control on water resources would still incur many of the same practicality issues (in terms of the

costs of implementation and monitoring, for example), but would not address our other objectives as effectively. For example, it would offer less protection to third party providers against cross-subsidy concerns (and hence is less pro-market than a binding control) and would not promote the same degree of cost transparency or accountability. Conversely, although the 'do nothing' option of retaining the existing integrated wholesale price control would be low-cost to implement (and hence practical), it does not provide an appropriate regulatory framework in the context of developing water resources markets.

- Our approach to **RCV protection**, under which historic RCV investment up to 2020 will be protected while investment beyond that point is incurred 'at risk', represents a practical approach that delivers predictability to companies and investors in the near term while ensuring that the benefits of markets flow through to efficient companies and customers in the longer term. The alternative of introducing an explicit RCV protection true-up mechanism would add significant complexity (and hence is less practical) as well as creating risks of distortions and unintended consequences, while a 'do nothing' approach could increase financing costs and risks which would impact adversely on customer bills.
- On the issue of **RCV allocation**, we note that some form of allocation is necessary in order to set a separate binding price control for water resources, which we consider is in line with our objectives for the reasons discussed previously. Therefore a 'do nothing' approach to this issue is not appropriate. We consider that our preferred approach of an explicit allocation based on an unfocused methodology is proportionate and better meets the objectives of transparency and practicality than the alternatives we considered. An implicit or 'shadow' RCV allocation would lack transparency, while a focused methodology would not be practical given the scale of the RCV discount. Further, our decision to ask companies to develop and justify their proposals for the RCV allocation (rather than mandating a full MEAV exercise to be used for the valuation) involves a lower regulatory burden than the proposal we set out in our December consultation, and also strengthens company ownership and accountability over this issue.
- Finally, leaving responsibilities for **system operation** within incumbent companies of other market participants with a greater role played by markets, as we proposed in December, is a practical approach which we consider to be proportionate and targeted given the current stage of market development. The alternative of an independent system operator would add significant complexity and uncertainty to the arrangements as well as requiring considerable time and resources to implement. Our policy decision provides a greater role for markets in revealing and using information and so will contribute to system co-ordination in a broader sense over the longer term.

3 Our analysis to support our decisions

In Appendix 6 of the December Consultation, we set out an initial assessment of the benefits and costs of our proposals for water resources. Our overall view was that the net impact of our proposals would be positive and that the benefits could be significant. Our analysis was largely qualitative, given the early stage of the policy development process.

Since December, we have sought to quantify more of the costs and benefits where appropriate by:

- assessing the scope for efficiencies from the introduction of markets for incremental water resources;
- assessing the scope for wider efficiencies from our decisions in relation to existing capacity;
- updating our assessment of the potential benefits from interconnection; and
- analysing information provided by companies on the costs of the market information platform and separate price control.

The results of this analysis have been integrated into the policy discussion in our decision document so our assessment of impacts and policy analysis are fully aligned. We want stakeholders to understand the underlying analysis we carried out to generate these results and in this section, for each piece of analysis, we:

- set out our methodology;
- provide an overview of the analysis; and
- discuss our base case result and sensitivities (where appropriate).

In line with our general approach, unless otherwise stated all numbers in this section are expressed in 2015-16 prices, and Net Present Values (NPVs) are calculated on a 30 year basis using the Social Time Preference Discount Rate of 3.5%, consistent with the HM Treasury Green Book.

3.1 Assessing the scope for efficiencies in incremental water resources

3.1.1 Our methodology

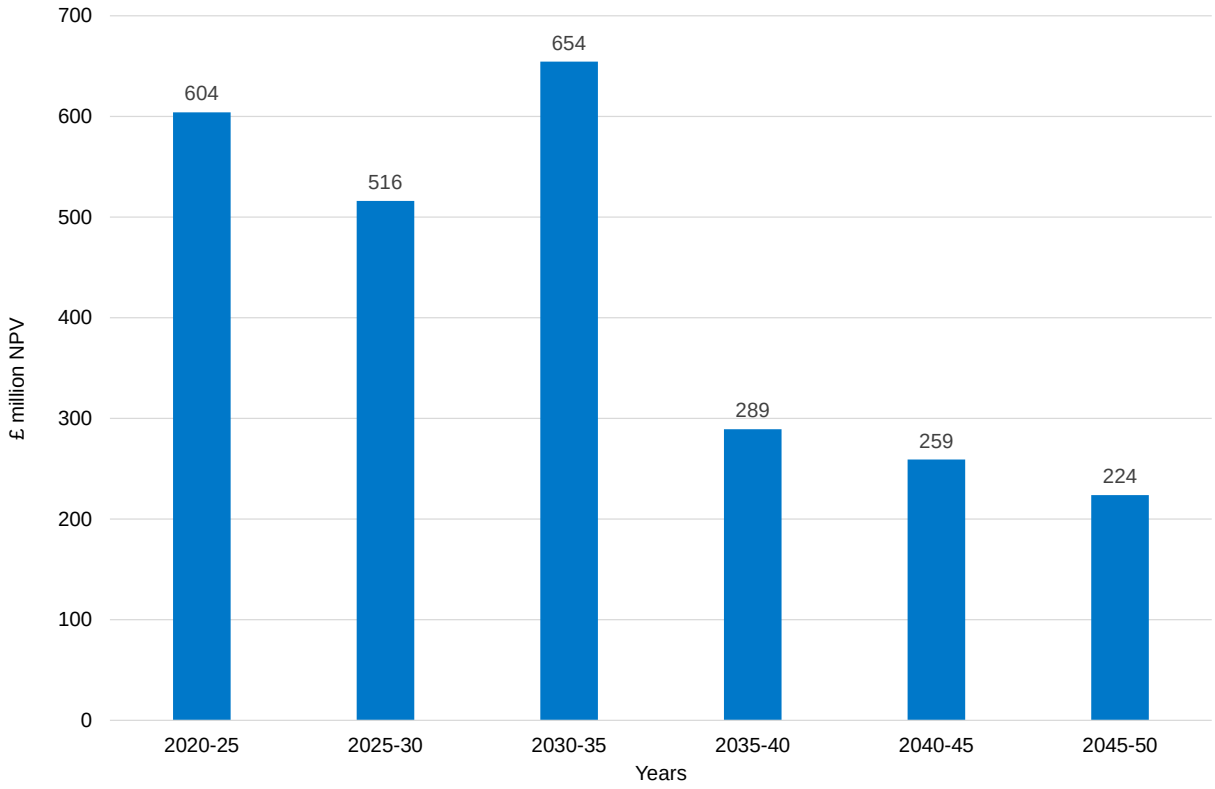
Future investment in incremental water resources is defined through the WRMP process and water company business plans. WRMPs provide a long-term forward look on future investment needs to ensure supply and demand balance, while business plans are focused on five-year periods. The most recent WRMP and price review process was completed in 2014 and reflects the current regulatory framework which has a limited role for market mechanisms.

In the future we envisage that two types of markets will operate in water resources – an extension of current third party provision through a bidding market in England and Wales and the bilateral market model in England. These models are discussed more fully in section 3.1.2 of this appendix. We expect these markets, and the corresponding greater rivalry and information discovery, will create opportunities for significant savings to be made in planned investment in new water resources.

This expectation is supported by three observations:

- **Observation 1**: There is significant expenditure required in incremental water resources to meet future challenges such as population growth, sustainability reductions in abstraction licenses to provide environmental improvements and climate change. Our analysis of 2014 WRMPs has shown that, in England and Wales from 2020-21 to 2049-50, the NPV of planned expenditure in resource-side schemes is £2.5 billion. Resource-side schemes include assets like new reservoirs, bulk supply, direct river abstraction and groundwater wells. Given the large scale of planned expenditure, even small savings will result in significant cost savings. Further, as we discuss below, this is just the current view – a collaborative project led by the incumbent water companies of England and Wales is currently examining long-term water needs under a range of scenarios, which will inform future plans.

Figure 4: NPV of planned expenditure on companies' preferred resource-side schemes in England and Wales, 2020-21 to 2049-50, £ million



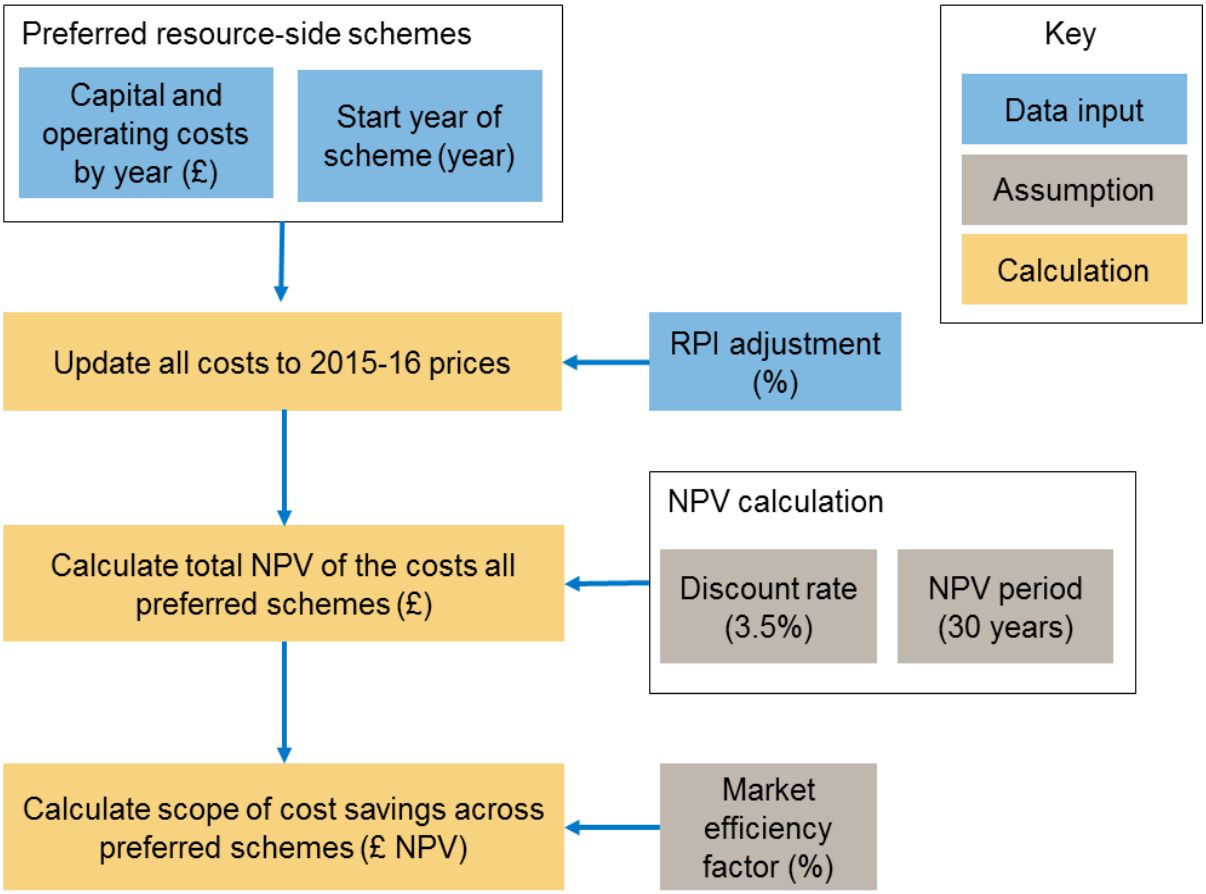
Source: Ofwat analysis of 2014 WRMPs.

- **Observation 2**: In Appendix 2 of the December consultation we looked at cost differences between incumbent companies in providing water resources. We found there was significant variation across the companies, with the lowest-cost company having unit costs that are around one-third those of the highest cost company. There were also significant cost differences between neighbouring companies. Significant differences in the prevailing level of costs between and within companies may provide an indication of potential unrealised gains from markets, although we acknowledge that differences in scheme costs can be driven by a wide range of factors, not necessarily linked to economic efficiency, such as hydrology and geography.
-
- **Observation 3**: There is a large body of evidence of substantial efficiency gains from the introduction and/or expansion of markets. This is discussed further below in our explanation of our assumptions.

3.1.2 Overview of analysis

In this section we explain how we estimate the scope of the benefits of introducing markets for incremental water resources. We explain how this is done with reference to the inputs, assumptions and calculations. The structure is illustrated in the figure below.

Figure 5: Overview of analysis to assess the scope of efficiencies for incremental water resources



Inputs

In the WRMPs, there are four types of schemes that can be used to meet the supply and demand balance:

- **customer-side schemes** such as water use audits, water conservation information to customers and smart metering;

- **distribution management options** such as leak detection and leakage reduction;
- **production management options** such as reduction of treatment work losses; and
- **resource-side schemes** such as new reservoirs, bulk supply, direct river abstraction and groundwater wells.

Of these four types, our analysis is focused on preferred resource-side schemes, as these schemes are most directly (though not exclusively) linked to our water resources proposals. The other options typically relate to investment in either raw water distribution, water treatment and/or treated water distribution, which would be captured under our network plus proposals. We have only analysed 'preferred' options to capture companies' chosen schemes.

This data was extracted from companies' 2014 WRMP data tables and the analysis captures expenditure over 30 years (2020-21 to 2049-50). In general, we used the dry year annual average data table, although where companies also provide a critical period data table, we used the table that corresponded to the largest deficit (as companies need to be able to meet this to ensure supply and demand balance).

The data included the starting year of each scheme and expenditure by year. We restricted our analysis to capital and operating expenditure as we have more confidence around these costs (it is difficult to quantify environmental costs, for example) and as we expect that these costs will be most directly impacted by the introduction of markets. For simplicity, we have not updated our analysis to reflect any updates to the 2014 WRMPs or other regulatory decisions. As the 2014 WRMPs were prepared on the basis of 2012-13 prices, we used the Office of National Statistics (ONS) RPI index to update the costs to 2015-16 prices.

Assumptions

The key assumption is the 'market efficiency factor'. This captures the potential cost savings available from the increased use of markets in water resources and is applied to the NPV of total expenditure. We apply this as there is a large body of evidence of substantial efficiency gains from the introduction and/or expansion of markets. For example:

- In 'A study on potential benefits of upstream markets in the water sector in England and Wales', Ofwat, March 2010 we surveyed the literature on the link between market reforms and productivity and innovation. We concluded that market reforms are associated with more commercial applications and improvements in productivity and innovation.

- In 'Water 2020 – Water resource planning and third party options', Frontier Economics and South East Water, July 2015 a number of studies were surveyed that had assessed the benefits of improved relationships between companies and suppliers. It noted that although the studies are specific and should be treated as purely illustrative, they show that reform of supply chain management has delivered cost savings of 5% to 10% in some industries.

We note that the extent of future efficiencies will depend on many factors, and as a conservative approach, informed by the findings of the studies above, we have used a range of 5-10% to capture a plausible range of scenarios.

Calculations

We calculate the NPV of the costs (updated to 2015-16 prices) over 30 years at the Social Time Preference Discount Rate of 3.5%. We then apply the 'market efficiency factor' to the total NPV of the costs to estimate the NPV of the potential cost savings.

3.1.3 Overview of results

In England and Wales, from 2020-21 to 2049-50, the NPV of planned investment in resource-side schemes is £2.5 billion. The table below shows the impact of applying a range of market efficiency factors to these investment costs to capture the potential cost savings available from introducing markets for incremental water resources. The estimates are split between England and Wales using the geographic location of planned water resource schemes.

Table 5: NPV of potential cost savings from introducing markets for incremental water resources, £ million

Market efficiency factor	NPV of cost savings		
	England	Wales	Total*
5%	125	3	127
6%	150	3	153
7%	175	4	178
8%	200	4	204
9%	225	5	229
10%	250	5	255

* Numbers may not add due to rounding

Our results suggest that total potential cost savings range from £127 million to £255 million NPV. The benefits accrue predominately to companies (and their customers) whose areas are wholly or mainly in England. This reflects in part the relative size of England and Wales and the number of companies in each (15 versus 2), but also the fact that the majority of WRZs in Wales are in surplus, and hence only limited investment in new resources is currently forecast in the WRMPs of companies whose areas are mainly in Wales.

Our view is that the scope for cost savings could be larger than identified above as:

- **The preferred options in the 2014 WRMPs may not fully capture the scope of future expenditure in water resources**. In the current plans, there are only a few major new schemes to provide significant new water resources, such as large reservoirs. Given future challenges like population growth, it is likely that there will be increased pressure on water resources which may lead to significant new schemes being proposed. A collaborative project led by the incumbent water companies of England and Wales is currently examining long-term water needs under a range of scenarios. It will also develop bundles of options including water transfers, resource development and demand management that might feasibly be taken to meet projected demand. The findings are due later this year and while this strategic overview is not intended to replace the detailed planning undertaken in WRMPS we do expect it to influence the options being considered and provide a clearer overview of future challenges.

- **We only take into account the impact of markets on resource-side schemes**. We made this assumption as these schemes would be most directly impacted by our proposals. However, that is not to say that we do not expect our proposals to have a positive impact on distribution-side, production-side and customer-side schemes. For example, our bidding market proposals will not be limited to resource-side schemes and we would expect there to be efficiency benefits for other types of schemes such as innovation in leakage control, treatment losses and demand management.

Building on this, we consider that our proposals will result in wider efficiencies, albeit at a smaller level than above, for existing water resources. The scope of this is discussed directly below.

3.2 Assessing the scope of wider efficiencies from our decisions

3.2.1 Our methodology

Our decisions will also generate wider efficiencies for existing water resources through:

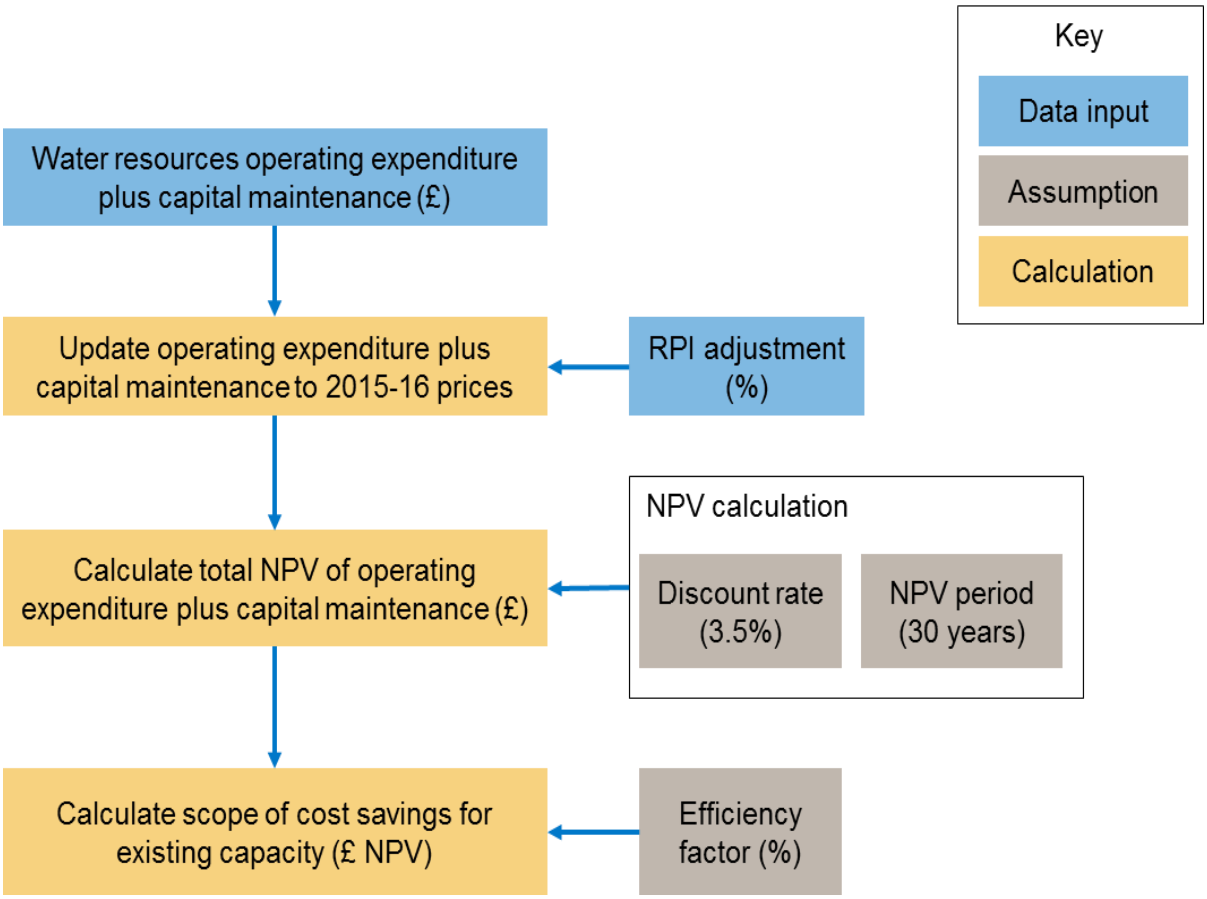
- **Innovation and knowledge transfer** from markets for incremental water resources. This could occur through observing a successful innovation in the operation and maintenance of a new water resource and applying it to existing water resources, for example. 'The Cave Review of Competition and Innovation in Water Markets', which recommended a number of steps to introduce greater upstream competition, considered that a significant proportion of the benefits it estimated arose from improvements in innovation, and that these could accrue both to new and existing capacity.
- **Improved information** on the costs of operation and maintenance, and hence on areas where cost savings could be made. This could be driven by our policies to improve market information and price control separation for water resources.
- **Other gains** arising from our decisions, including stronger management focus on water resources driven by price control separation and better targeted regulatory incentives.

We have not attempted to analyse these separately, but rather have modelled high level scenarios of the potential combined impact on existing water resources.

3.2.2 Overview of analysis

In this section we explain how we estimate the wider efficiencies of our decisions. We explain how this is done with reference to the inputs, assumptions and calculations. The structure is illustrated in the figure below.

Figure 6: Overview of analysis to assess the scope of wider efficiencies from our decisions



Inputs

To capture the scope of potential wider efficiency gains our focus is only on expenditure related to existing capacity in order to avoid double counting efficiency benefits. We have used company reported water resources operating expenditure and capital maintenance expenditure figures from the 2014-15 regulatory accounts. Capital maintenance expenditure consists predominantly of current cost depreciation and infrastructure renewals.

As the 2014-15 accounts were prepared on the basis of 2014-15 prices, we used the ONS RPI index to update the costs to 2015-16 prices.

Assumptions

The key assumption in our analysis is the 'efficiency factor'. This captures the wider efficiencies available for existing water resources, though innovation and knowledge transfer, improved information transparency and other factors described above. It is applied to the NPV of operating and capital maintenance expenditure described above.

As the primary focus of our proposals is for incremental water resources, we expect the potential efficiency savings for existing capacity to be lower in comparison. Therefore we have analysed three different scenarios looking at efficiency factors of 1%, 2% and 3%.

We note this is broadly in line with the assumptions used in 'Water 2020 – Water resource planning and third party options', Frontier Economics and South East Water, July 2015. In this study efficiency improvements in existing resources of between 1% and 4% were modelled, although it should be noted that this report anticipated some potential for displacement of existing resources by new resources, which we have not assumed as a source of efficiency gains in our analysis.

Calculations

We calculate the NPV of current expenditure on water resources (updated to 2015-16 prices) over 30 years at the Social Time Preference Discount Rate of 3.5%. We then apply the 'efficiency factor' to the total NPV of the costs to estimate the NPV of the potential cost savings.

3.2.3 Overview of results

In England and Wales, the NPV of expenditure on existing water resources, as captured by operating cost plus capital maintenance expenditure, is £8.1 billion. The table below shows the impact in terms of NPV cost savings of applying our efficiency factor assumptions to these expenditures. The estimates are split geographically on the basis of companies whose areas are wholly or mainly in England or mainly in Wales.

Table 6: NPV of potential wider efficiency gains from our proposals, £ million

Efficiency factor	NPV of cost savings		
	England	Wales	Total*
1%	75	6	81
2%	150	11	162
3%	226	17	242

* Numbers may not add due to rounding

Our results suggest that the NPV of wider efficiency savings ranges from £81 million to £242 million. Reflecting the relative size of England and Wales and the number of companies in each (15 versus 2), the majority of the benefits accrue to companies and their customers whose areas are wholly or mainly in England. However, when looked at on a normalised basis in terms of customers, the benefits are higher in Wales relative to England. This reflects the relatively larger size of the existing water resources asset base in Wales by comparison with its population. For example, based on 2011 population census figures, we calculate the savings in the 2.0% efficiency scenario at £3.70 per person in Wales and £2.80 per person in England. These figures are likely to be conservative for companies whose areas are mainly in Wales given the area they operate in is smaller than the national boundaries by the census.

3.3 Updating our assessment of the scope for interconnection

3.3.1 Our methodology

In 'Appendix 2: Water resources – supporting evidence and design options' of our December consultation we reported that the potential cost savings available from greater interconnection between and within companies in England and Wales was up to £914 million (2012-13 prices) in NPV terms over the lifetime of the assets. Expressed in 2015-16 prices and over 30 years this equates to £614 million of cost savings. A redacted version of the water resources interconnection: potential cost savings model, with confidential company data removed, is available on our website.

Our modelling was an update of similar analysis reported in 'A study on potential benefits of upstream markets in the water sector in England and Wales' which found

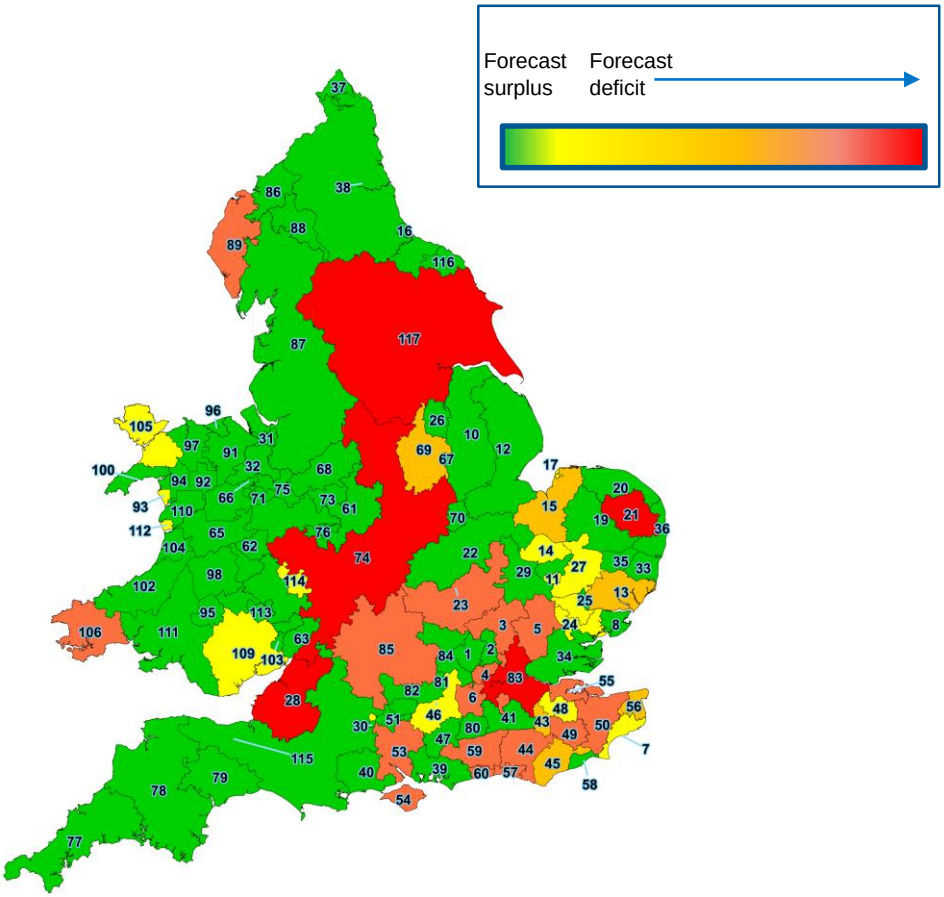
potential cost savings of up to £959 million (2007-08 prices) in NPV terms over the lifetime of the assets.

To estimate the potential scope of cost savings, our approach was to assess, for each WRZ with a forecast deficit in 2039-40, if cost savings could be achieved by meeting its deficit through a new interconnection from a WRZ with a forecast surplus, rather than by the schemes presented in a company's 2014 WRMP. This assessment factored in the estimated cost of developing the interconnection itself.

Our approach was shaped by two observations:

- **Observation 1**: Water scarcity varies significantly across England and Wales. While a number of companies face significant challenges to ensure a supply and demand balance by 2039-40, there are areas of surplus next to areas of deficit (including in the South East of England). This is shown in the map below of the forecast baseline supply and demand balance in 2039-40 for every WRZ in England and Wales based on 2014 WRMPs. The 'baseline' forecast is what would happen without any intervention; that is, it does not take into account schemes to reduce demand or increase supply. The forecast incorporates known sustainability reductions and incorporates companies' level of service commitments.

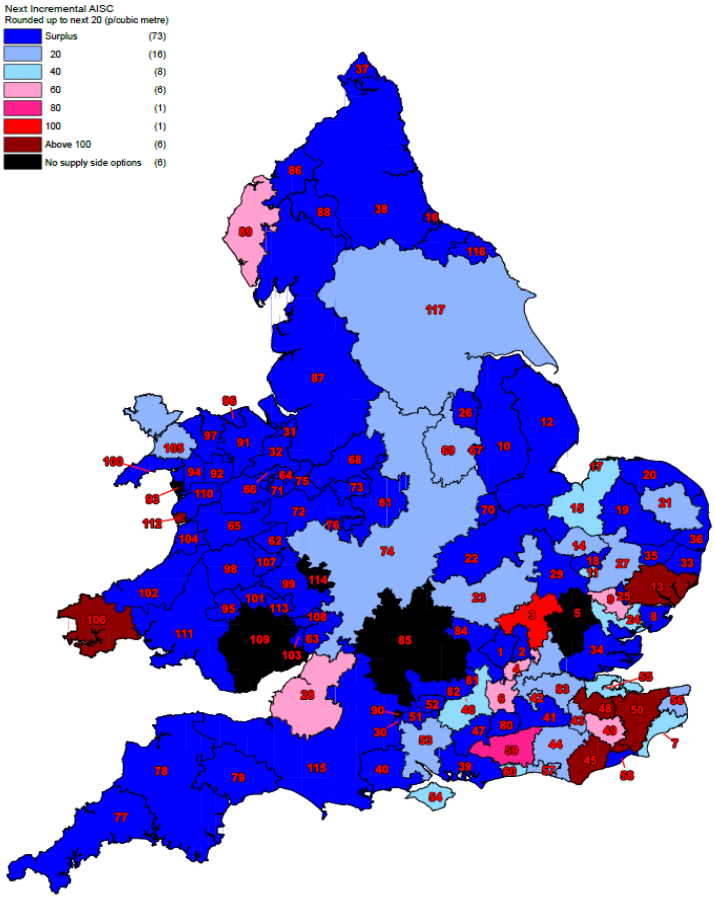
Figure 7: Forecast baseline supply and demand balance under average dry year conditions across England and Wales, 2039-40



Source: Ofwat analysis of 2014 WRMPs.

- **Observation 2**: There are areas with higher water resource development costs near areas with lower costs with the potential to develop water resources for export. The figure below shows the cost of developing the incremental scheme that companies propose to build in each WRZ in their 2014 WRMPs. We defined the incremental scheme as the supply-side option (this includes new resources but excludes proposed imports) that provides a significant volume at lowest unit cost as measured by the average incremental social cost (AISC). Where companies have proposed only demand-side options (for example, leakage reduction), the WRZ is shaded black. Companies do not have to plan solutions for WRZs with a baseline surplus in 2039-40 (shaded dark blue).

Figure 8: Water development costs across England and Wales (AISC)



Source: Ofwat analysis of 2014 WRMPs.

To simplify our analysis for each WRZ in deficit we only compared interconnection with the proposed incremental scheme from the 2014 WRMP. We assumed that the cost identified persists for the whole of the deficit. We also restricted potential interconnections to neighbouring WRZs and non-neighbouring WRZs that were within a 50 km radius.

We recognise that the model, and our static analysis approach, makes a number of simplifying assumptions and only captures to a limited extent the potential scope of further interconnection across England and Wales. Our methodology does not claim that any individual interconnection we identify would be cost-beneficial, as a full assessment would require significant further information and modelling (this same caveat applied to the 2010 results). Instead, the objective of our methodology is to provide an indication of the scale of the potential value that could be generated through increased interconnection both within and between companies.

3.3.2 Overview of analysis

We have updated the analysis to incorporate responses to the December consultation and to make the analysis consistent with our general impact assessment approach.

1.1.2 Responses to our December consultation

Six respondents provided specific comments on our interconnection modelling analysis in the December consultation, including two incumbent water companies (Anglian Water and Thames Water), two regulatory bodies (the Environment Agency and Natural Resources Wales), the Welsh Government, and the Chartered Institution of Water and Environmental Management (CIWEM).

Anglian Water considered that the £1 billion of potential benefits we cited in the December consultation is open to debate and that there is a need for more robust cost-benefit analysis on physical water trading. Anglian Water suggested that we should work together with the sector, the Environment Agency and the Drinking Water Inspectorate to come to an agreed view on the likely scale of benefits from physical water trading.

Thames Water considered that our approach may overstate the potential for trading in its area, over and above the bulk supply options already included in its WRMP. It noted that our analysis was based upon dry year annual average conditions, whereas water resource planning in the Thames Valley area is actually undertaken on dry year critical period conditions. This means that the basic inputs used in the model for some of Thames Water's WRZs may overstate the amount of water available. Thames Water also stated that it has been very active in seeking water trading opportunities – it implemented two large water trading imports as part of the WRMP 2014 process, and is currently investigating two further opportunities for significant new third party supplies.

The Environment Agency noted that the cost savings quoted in the consultation were based on analysis first carried out in 2010 and since then there has been significant further work on assessing the risk of deterioration in Water Framework Directive (WFD) water body status. Because of this, the Environment Agency suggested that the potential benefits from trading may now not be as large.

Although it did not directly comment on the results of our modelling, CIWEM made some broad points on interconnection that are relevant to our analysis. In particular, it noted that there is there is the opportunity to trade water across more than one

region via displacement – that is, where water flows from Company A (which has a surplus) to Company B, and then from Company B to Company C, so that C obtains more water via trading even though it is not physically the same surplus water exported by A. CIWEM also stated that the primary market for water trading will be between incumbent water companies, and that trading is needed to remove the spatial variation in water scarcity, hence the general direction of trades is likely to be from the west and/or north of Great Britain to the south east.

Natural Resources Wales stated that it would welcome further clarification on how better sharing of water resources will deliver potential benefits of £1 billion across England and Wales without causing WFD water body status deterioration (or deterioration in any individual element). The Welsh Government noted that there was no split between England and Wales provided for the potential £1 billion savings in the December consultation, and that any Welsh figure should be based on evidence gathered within Wales, not on a proportion of the total England and Wales figure. The Welsh Government also expressed similar views to Natural Resources Wales regarding the importance of avoiding any environmental deterioration as a consequence of increased water trading.

3.3.3 Our review and analysis

We welcome the feedback from respondents on our interconnection modelling. In the December consultation, we acknowledged that our modelling approach is based on a static analysis and makes a number of simplifying assumptions, and hence should not be interpreted as claiming that any individual interconnection we identify would be cost-beneficial. Instead, our objective was to provide an indication of the scale of the potential value that could be generated through increased interconnection both within and between companies.

The evidence suggests physical water trading is likely to be an important part of future solutions. There is a large amount of work already undertaken by both ourselves and others which support this conclusion (the case study below highlights work carried out in the south east, for example), and the lessons learnt from this could be successfully transposed to other regions across England and Wales.

Case Study – water trading in the south east

Water Resources South East ('WRSE') was set up in the 1990s and its aim is "to develop a regional water resources strategy which will contain a range of options

to find the best long term solutions for customers and the environment in the south east of England.”.

In 2013 the group undertook a regional modelling exercise to understand the economically optimum mix of options required to balance supply and demand across the participating companies. The modelling was undertaken for a range of possible future scenarios drawing on detailed information from water companies including their supply and demand forecasts, costs and assumptions about when options would be deployed.

The results indicated that, between 2015 and 2020 the most cost-effective options were fairly evenly split between demand management, supply schemes and intercompany transfers. Looking beyond 2020, the modelling suggested that demand management becomes less economically attractive with new supply and transfers dominating. This modelling built on an earlier study undertaken by WRSE in 2009 which found that sharing water resources could reduce the need for new resource development by 124 Ml/d with a saving of around £500 million.

WRSE continue to refine their modelling. We expect their findings to inform the update of the participating companies’ WRMPs (due for consultation in early 2018) and business plans (due on 3 September 2018).

In response to comments from the Welsh Government and Natural Resources Wales, throughout this document we have reported the results of all of our quantitative analyses of costs and benefit separately for England and Wales. In the specific case of our interconnection modelling, none of the trades we identified involved companies based mainly in Wales, reflecting the fact that the majority of WRZs in Wales are currently in water surplus and that our simplified modelling approach is not able to capture long distance trades or displacement trades noted in CIWEM’s response as being a key opportunity for trading between incumbents. If these were included in our analysis we consider it is likely it would identify that companies whose area is mainly in Wales would benefit from participating in trades. The other analysis that we have carried out since December shows that our decisions will be net beneficial for both Wales and England.

Regarding environmental risks, as previously noted our decisions will work within the existing regulatory protections in this area (including any future changes that may be introduced, for example as part of the abstraction reform process) and hence should not lead to any increased risk to ecosystems or the environment.

We note that the viability of strategic water transfers is one of the questions being directly addressed in a collaborative project led by the water companies of England and Wales. This project is exploring a range of different climate and demand scenarios and identifying cost-effective bundles of measures, including transfers that might be required to close any deficit. This modelling draws on a sophisticated understanding of the companies' infrastructure, catchment hydrology and future drought scenarios. Although the project was not designed to address the same question as our simple model, it should offer a sense-check to our work and provide a more robust insight into the potential role of interconnection and trade for future policy development.

Reflecting the wide scope of this industry-led project our view is that undertaking a further cost-benefit analysis of water trading together with the industry and other regulators is not a priority for us at this stage of the Water 2020 programme.

We have, however made changes to our modelling methodology in order to address comments and to update the analysis in line with our impact assessment approach. We have excluded Thames's WRZs from the analysis in cases where the dry year critical period scenarios showed a deficit and excluded an interconnection that was identified as already being in operation. To align with our general approach to the impact assessment we changed the discount rate to the Social Time Preference Discount Rate of 3.5% and the time period for calculating the NPV of the benefits to 30 years. As the 2014 WRMPs were prepared on the basis of 2012-13 prices, we used the ONS RPI index to update the costs to 2015-16 prices.

3.3.4 Overview of results

In this section, we:

- report our updated base case results;
- compare them to our December results; and
- present key sensitivities.

Our updated base case results

Our updated base case estimate identified 14 interconnections that could save the water sector £532 million over 30 years compared with the cost of the schemes proposed in water companies' 2014 WRMPs. Over the lifetime of the assets this is equal to cost savings of £810 million. As noted above, our methodology does not claim that any individual interconnection we identify would be cost-beneficial as a full assessment would require significant further information and modelling. In addition

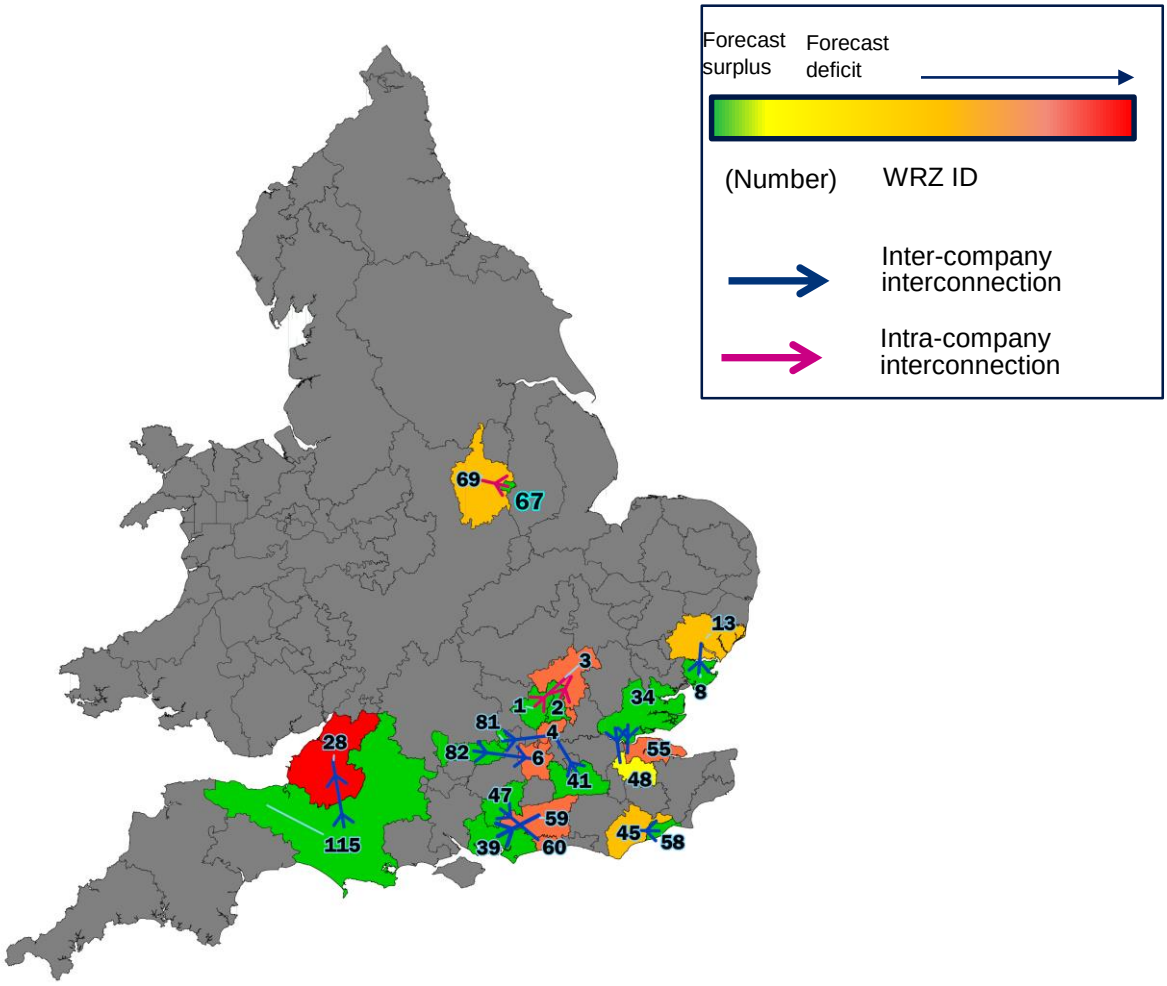
option choice may be constrained by other issues such as drinking water compliance, environmental impact, resilience or landscape and heritage impacts. Instead, the objective of our methodology is to provide an indication of the scale of the potential value that could be generated through increased interconnection both within and between companies.

All identified interconnections are shown in Table 7 and then mapped in Figure 9 below. In Figure 9 the interconnections are shown graphically and arrows have been added to show the direction of the interconnection. The WRZ identification numbers (IDs) which were assigned for the modelling exercise are also shown. The WRZs that are identified as importers or exporters are coloured according to their forecast baseline supply/demand balance in 2039-40 while all other WRZs are coloured grey.

Table 7: Updated interconnection model identified interconnections

WRZ ID	Import WRZ	WRZ ID	Export WRZ	NPV cost savings over 30 years (£ million)
28	BRL – Bristol	115	WSX - Companywide (WW)	120
3	AFW - 3 Lee	2	AFW - 2 Colne	73
3	AFW - 3 Lee	1	AFW - 1 Misbourne	56
59	SRN - Sussex North	39	PRT - Companywide (portsmouth)	49
13	ANH - East Suffolk	8	AFW - 8 Brett	48
6	AFW - 6 Wey	82	TMS - Kennet Valley	42
55	SRN - Kent Medway	34	ESK - Essex	35
45	SEW – 3	58	SRN - Sussex Hastings	33
4	AFW - 4 Pinn	41	SES - East Surrey	25
4	AFW - 4 Pinn	81	TMS - Henley	21
48	SEW – 6	34	ESK - Essex	18
60	SRN - Sussex Worthing	47	SEW – 5	9
69	SVT - Nottinghamshire	67	SVT - Newark	2
4	AFW - 4 Pinn	1	AFW - 1 Misbourne	2
Total				**532**

Figure 9: Updated interconnection model identified interconnections



Source: Ofwat analysis.

Comparison of the results with our December results

In the December consultation we reported that the potential cost savings available from greater interconnection between and within companies in England and Wales were up to £914 million (2012-13 prices) in NPV terms over the lifetime of the assets. Expressed in 2015-16 prices and over 30 years this equates to £614 million of cost savings. As a result of the changes in our analytical approach, the benefits are now estimated to be £532 million NPV over 30 years.

The change in our base case result is due to the changes adopted in response to comments and the change in methodology to align with our general approach for the impact assessment (changing the discount rate to the Social Time Preference Discount Rate rather than the vanilla weighted average cost of capital, for example). This has meant that some of the modelled interconnections have changed, either in

terms of which WRZs are connected or in terms of the size and cost savings of the connection. However, supported by our sensitivity analysis below we do not consider that this changes our conclusion that there are significant potential cost savings from increased water trading, subject to the caveats noted above.

Key sensitivities

Below we present the results of our sensitivity analysis on the value of the cost savings from interconnection. In each scenario, we change one key assumption, while leaving all other inputs the same.

Table 8: Range of cost savings from greater interconnection

Scenario	Description	NPV cost savings over 30 years, £ million (change vs base case)	Interconnections (change vs base case)
Base case	Our base case as set out above	532	
Discount rate sensitivities			
Discount rate increased by 0.1%	A higher discount rate means a higher return on capital and therefore higher costs, which results in lower cost savings.	511 (-21)	14 (0)
Discount rate reduced by 0.1%	A lower discount rate means a lower return on capital and therefore lower costs, which results in higher cost savings.	554 (22)	14 (0)
Distance sensitivities			
Interconnector spans 40% of the centre to centre distance	Shorter interconnectors lower the cost of interconnections, increasing the potential cost savings and making two more interconnections possible.	572 (40)	16 (2)
Interconnector spans 60% of the centre to centre distance	Longer interconnectors increase the cost of interconnections, decreasing the potential cost savings from each interconnector.	498 (-34)	14 (0)
Potential interconnections limited to WRZs 25 km away	Restricting the geographic scope of possible interconnections removes a number of potential interconnections and reduces the potential cost savings.	425 (-107)	10 (-4)

Scenario	Description	NPV cost savings over 30 years, £ million (change vs base case)	Interconnections (change vs base case)
Potential interconnections widened to include WRZs 75 km away	The increased geographic scope gives more opportunities for interconnections, and cost savings.	663 (132)	16 (2)
Interconnector sensitivities			
Indefinite asset life	Increase in cost savings due to longer asset life for discounting.	810 (278)*	14 (0)
Interconnector costs reduced by 10%	Interconnectors are less expensive so cost savings are higher.	549 (17)	14 (0)
Interconnector costs increased by 10%	Interconnectors are more expensive so cost savings are lower.	515 (-17)	14 (0)
Load factor of 65%	Assets are in use for less time so generate fewer cost savings.	494 (-38)	14 (0)
Load factor of 75%	Assets are in use for more time so generate greater cost savings.	570 (38)	14 (0)
No minimum connection size	No change as there are no interconnections less than 1Ml/d	532 (0)	14 (0)
Minimum connection size 2 Ml/d	One small interconnection does not meet this size requirement.	530 (-2)	13 (-1)
Surplus water sensitivities			
AISC of surplus water costs 10 p/m^3	Increasing the cost of surplus water will decrease the cost savings possible, and makes one interconnection unfeasible.	460 (-72)	13 (-1)
WAFU sensitivities			
10% of WAFU for export	Increased WAFU for export means that deficits that can be met through fewer interconnections, which means a slight increase in cost savings but one fewer interconnection in total.	563 (31)	13 (-1)
No WAFU available for export	This means there is less water available for each interconnection. This reduces	416 (-116)	16 (2)

Scenario	Description	NPV cost savings over 30 years, £ million (change vs base case)	Interconnections (change vs base case)
	the potential cost savings and means that two extra interconnections are used to satisfy deficits.		
WAFU for export costs 5 p/m^3	This means that the water available for export has a lower cost and allows for higher cost savings.	550 (18)	14 (0)
WAFU for export costs 15 p/m^3	Fewer cost savings as the cost of water is increased	513 (-18)	14 (0)

*In this sensitivity the NPV was calculated over the lifetime of the asset rather than over 30 years.

Across all the scenarios, the cost savings (in 2015-16 prices) from greater interconnection ranges from £416 million to £810 million and the base case estimate is £532 million. We do not have strong evidence to suggest that a move away from our base assumptions is appropriate, and our results do not suggest that changes in assumptions will result in significantly different results. Therefore, we consider our base case estimate represents our most reasonable estimate of the potential cost savings, subject to the caveats noted above.

As noted above the viability of strategic water transfers is one of the questions being directly addressed in a collaborative project led by the water companies of England and Wales. This project is exploring a range of different climate and demand scenarios and identifying cost-effective bundles of measures, including transfers that might be required to close any deficit. This modelling draws on a sophisticated understanding of the companies' infrastructure, catchment hydrology and future drought scenarios. Although the project was not designed to address the same question as our simple model it should offer a sense-check to our work and provide a more robust insight into the potential role of interconnection and trade for future policy development.

3.4 Analysis of information request on costs of the market information platform and separate price control

3.4.1 Our methodology

In February 2016 we sent an information request to the 10 water and sewerage companies and seven water only companies which included questions about the

expected set-up and ongoing costs of our proposals for a water resources market information platform and a separate water resources price control. Responses were received from the 17 companies on a confidential basis. We have not independently verified the costs they provided.

In line with our approach for the impact assessment, we used the cost estimates that companies provided to estimate the NPV of the costs of our policies over 30 years at the Social Time Preference Discount Rate of 3.5%.

Further information on the inputs, assumptions and results of our analysis is set out below under Section 3.4.2 for the market information platform and Section 3.4.3 for the separate price control.

3.4.2 Market information platform

Inputs

For the market information platform, we asked companies to estimate the system set-up and ongoing costs of providing assured data to industry agreed standards. The request was based on our preferred option as set out in the December consultation, in which the database would be operated by a third party and the information required would include resource cost or price and technical data, together with supply and demand projections for each company and WRZ, in a standardised format. The 17 companies provided a wide range of cost estimates for our market information proposals, as follows:

- set-up costs of the platform – £0 million to £6.1 million, with a mean estimate of £0.6 million; and
- ongoing costs of maintaining the platform – £0 million to £1.2 million per annum, with a mean estimate of £0.1 million per annum.

Key drivers of the differences in cost estimates included internal IT systems set-up costs and the extent to which companies had included estimates of the set-up and operational costs associated with a third-party database manager.

Assumptions

Our revised design for the water resources market information platform differs significantly from that presented in December. Specifically, we have decided on a simpler approach in which:

- data will be held on company websites rather than centrally;
- there will be no central body operating and managing the platform; and
- third parties will not post bids directly on the website.

Companies were not aware of these changes at the time they responded to our information request. In light of this, we made a number of adjustments to the raw data we received from companies prior to calculating our NPV costs. These are summarised in the Table below.

Table 9: Adjustments made to cost estimates for water resources market information platform

Adjustments to set-up cost estimates	Adjustments to ongoing cost estimates
Assumed £30,000 one-off setup costs for three companies who did not provide quantitative estimates but whose qualitative response suggested costs would be minimal, to avoid bias towards higher estimated costs.	Assumed £20,000 per annum costs for five companies who did not provide quantitative estimates but whose qualitative responses suggested costs would be minimal to avoid bias towards higher estimated costs.
Adjusted costs down for two companies where supporting information allowed costs to be attributed to elements of the revised information platform proposal.	Adjusted costs down for one company where supporting information allowed costs to be attributed to elements of the revised information platform proposal.
Excluded five companies because estimates referred to requirements that were significantly different to the revised proposal (for example, setting up an independent operator for the platform), and a lack of detail prevented us from breaking the estimates down.	Excluded two companies because estimates referred to requirements that were significantly different to the revised proposal and a lack of detail prevented us from breaking the estimates down.
Excluded two companies because no cost data or qualitative assessment was provided.	Excluded two companies because no cost data or qualitative assessment was provided.

Calculations

We calculated set up and ongoing costs as an average of the adjusted estimates provided by each of the companies, except for the exclusions mentioned above. The estimates were calculated on an NPV basis over 30 years at the Social Time Preference Discount Rate of 3.5%. We assumed that the cost estimates provided to us by companies were in 2015-16 prices.

We also calculated high and low sensitivities based on a simple plus or minus 20% adjustment to the central estimate, to account for uncertainty over costs given the range of estimates provided by companies, and the fact that the design of the market information platform has changed since we send our information request to companies in February. Cost figures for England and Wales were calculated pro

rata, on the basis that two of the 17 incumbent companies currently operate mainly in Wales and the remaining 15 companies operate wholly or mainly in England.

Overview of results

The table below summarises the results of our analysis for all companies in England and Wales combined. Our central estimate for the total costs of the market information platform for water resources is £11.5 million NPV. On a pro rata basis, our central estimate for the cost in England is £10.1 million, and for the cost in Wales is £1.3 million. Our view is that this is a conservative estimate as we envisage that companies in surplus will only need to update the market information platform in line with their WRMPs.

Table 10: NPV of estimated costs to companies in England and Wales of water resources market information platform, £ million

Cost Category	Central Estimate	Range
Set-up costs	0.7	0.6 to 0.9
Ongoing costs	10.7	8.6 to 12.9
Total*	**11.5**	**9.2 to 13.7**

* Numbers may not add due to rounding

3.4.3 Separate price control

Inputs

For the separate price control, we asked companies to provide estimates of the costs of carrying out an additional price control, along with supporting evidence. We also asked companies to specify the activities that this would include and whether the costs provided were one-off costs or recurring costs at every price control review. Finally, we asked companies whether costs would vary between a binding and non-binding control. Again, companies provided a wide range of cost estimates:

- set-up costs of a separate water resources price control – £0 million to £9.6 million, with a mean estimate of £0.9 million; and
- ongoing costs of a separate water resource price control – £0 million to 1.0 million per five-yearly price review, with a mean estimate of £0.2 million.

Major drivers of differences in the cost estimates were IT systems set-up costs, and to a lesser extent audit and accounting-related costs.

Assumptions

Our revised proposal for the separate water resources price control differs somewhat from that presented in December. In particular, we are not requiring a full MEAV revaluation exercise but instead are allowing companies themselves to decide on the allocation of their RCV to align with the implicit RCV allocation in their tariffs. Accordingly, where companies included estimates of the costs of an MEAV revaluation exercise in their responses, and these were broken out separately, cost estimates were adjusted downwards accordingly.

We also excluded estimates of set-up costs for two companies that were significant outliers, mainly due to very high system costs (one of these estimated set-up costs that were 20 times the mean estimate of the remaining companies, while the other estimated set-up costs that were 95 times the mean estimate of the remaining companies). Similarly, we excluded an estimate of ongoing costs from one company that was a significant outlier, with an estimate that was seven times the mean estimate of the remaining companies (this was the same company whose estimate of set-up costs was 95 times higher than that of the remaining companies). Companies that did not provide any cost figures (or qualitative responses that enabled figures to be derived) were excluded from the analysis. Finally, annual figures for ongoing costs were converted to costs per (five-yearly) price review for one company.

Calculations

We calculated set up and ongoing costs as an average of the adjusted cost estimates provided by each of the companies, except for the exclusions mentioned above. The ongoing costs were calculated on a per price review (five yearly) basis. The estimates were calculated on an NPV basis over 30 years at the Social Time Preference Discount Rate of 3.5%. We assumed that the cost estimates provided to us by companies were in 2015-16 prices.

As for the market information platform costs, we also calculated high and low sensitivities based on a simple plus or minus 20% adjustment to the central estimate, and calculated separate cost figures for England and Wales using a pro rata approach.

Overview of results

The table below summarises the results of our analysis for all companies in England and Wales combined. Our central estimate for the total costs of the separate water

resources price control is £11.6 million NPV. On a pro rata basis, we estimate the costs in England to be £10.2 million and the costs in Wales to be £1.4 million.

Table 11: NPV of estimated costs to companies in England and Wales of separate price control for water resources, £ million

Cost Category	Central Estimate	Range
Set-up costs	1.9	1.5 to 2.2
Ongoing costs	9.7	7.8 to 11.6
Total*	**11.6**	**9.2 to 13.9**

* Numbers may not add due to rounding

4 Further consultation

4.1 Approach to water resources utilisation risk

In our December consultation, and in the stakeholder responses we received, there was discussion of utilisation (volume) risk under the price control framework and the potential risks of asset stranding, both in relation to investments prior to 1 April 2020 and investments from 1 April 2020 onwards. Since December we have given further consideration to the regulatory treatment of new investment in water resources from 1 April 2020 and what it will mean, in practice, for this investment to be made 'at risk'.

In terms of new water resource investment or expenditure, we consider that the relevant risk is not so much that specific assets will be stranded, but rather the possibility that any additional capacity developed within a WRZ will be under-utilised. A perspective of risk based on capacity under-utilisation fits better with the reality that the economic risks are on a gradual scale or a matter of degree rather than being binary (an asset either being stranded or not stranded). In the context of water resources, it also seems problematic in practice to focus on the utilisation of specific assets. If a water company were to invest in too many new water resource assets we would not necessarily expect this to result in its newer assets being unused or under-utilised. Instead, we might see high utilisation of the newer assets, but some older assets being less intensively utilised. Which assets are used to meet water demand at a given point in time will depend on short-term operational and optimisation decisions. The economic risks relating to new investment in water resources are better seen at the system level rather than the asset level.

The capacity that a water company has to meet demand within a WRZ will reflect the following (this list is not exhaustive):

- capacity provided through groundwater abstractions, impounding reservoirs and river intakes operated by the company (taking account of risks of outages);
- capacity to accommodate peaks in demand through raw water storage; and
- long-term agreements to import water from other parties.

The level of demand that the capacity needs to accommodate with also be affected by demand-side measures such as leakage reduction and compulsory metering schemes.

Our view is that the concept of WAFU (water available for use) from WRMPs, which is an estimate of the capacity within a WRZ, will provide a starting point for development of capacity measures for the purposes of the water resources price control.

We can now draw a distinction between two sources of risk affecting decisions about increases in water resource capacity within a WRZ:

- **Utilisation risks from bilateral market entry**. If there is greater bilateral market entry than anticipated this could mean that the level of capacity required from the incumbent water company is less than it expected and there may be lower utilisation of any additional capacity developed by the incumbent. Conversely, a lower level of bilateral market entry than anticipated could mean that the new capacity the incumbent planned to develop is insufficient.
- **Utilisation risks relating to market-wide demand**. There is inherent uncertainty about the level of aggregate demand from the customers connected to an incumbent's system. This reflects uncertainty about a range of factors including: population growth; per capita and per household consumption; changes in industrial demand; and climate and weather patterns.

For market interactions that involve third parties submitting bids as part of incumbent water companies' WRMP processes, this should not lead to any change to utilisation risk on incumbents. Under the bidding model, the incumbent would be choosing whether to agree terms with a third-party supplier before committing to develop the required capacity itself.

The existing price control framework provides protection to water companies against both types of risk above. In considering the regulatory framework for water resources from PR19 onwards, we need to consider what would be an appropriate balance of risk between companies and customers.

Our view is that, subject to our policy on protection of the pre-2020 RCV, the regulatory framework for water resources should not require customers to provide protection to incumbent water companies against the risks from bilateral market entry for post-2020 investment. This is one of the reasons for making changes to the price control framework for water resources. As set out in Chapter 5, we have decided that an explicit adjustment mechanism should be included in the water resources price control to ensure that customers benefit from entry and incumbent water companies face utilisation risk arising from bilateral market entry. This is part of the implementation of our policy that new investment in water resources from 1 April 2020 should not have the same degree of regulatory protection as the RCV at 31 March 2020.

Exposing incumbent water companies to utilisation risk arising from bilateral market entry does not mean that these companies need to be exposed to risks relating to market-wide demand. This depends on the design of the adjustment mechanism and wider approach to price control remuneration of investment to increase water resource capacity.

On market-wide demand risk, we have identified three options on which we are seeking views from stakeholders:

1. Incumbent water companies could be fully exposed to market-wide utilisation risk in relation to post-2020 water resource capacity;
2. Companies could be fully protected by customers (through the price control framework) against market-wide utilisation risk in relation to post-2020 water resource capacity; or
3. Incumbent water companies could be exposed to some degree of market-wide utilisation risk sharing in relation to post-2020 water resource capacity.

While our December consultation generally indicated an approach in which companies would be protected against utilisation risk, we also highlighted the third of these options: specifically, we said that we would keep under review whether it would be appropriate to introduce incentives to ensure that water resource providers forecast demand as accurately as possible, adopt an efficient approach to the management of risk and efficiently develop or procure new capacity.

As noted in Section 5.7.2 of the main document, there was strong agreement with our proposal to protect efficiently-incurred investment included in the RCV up to 31 March 2020, but less support for our view that the risk of stranded assets was very low in the 2020-25 period. Only a few stakeholders made comments that were directly relevant to the issue of utilisation risk post-2020 and how this should be shared between companies and customers. Northumbrian Water said that more certainty regarding the risk to water resources RCV post-2020 was required and that mechanisms to ensure this need to be clearly established and consulted on. South East Water suggested that the lack of an RCV return guarantee beyond 2020 will lead to short-term investment decisions that will impact negatively on resilience, although it also acknowledged that our proposals, if implemented correctly, should result in efficient incentives for new water resources.

Southern Water submitted a discussion paper, as part of their December response, covering, among other things, the challenges it faces in forecasting future supply and demand. Points from this paper that are relevant to the issue of utilisation risk include:

- the south east of England is one of the most challenging regions for water resource planning in the UK, because of population pressures, water scarcity and a range of environmental issues for example. The regional planning framework developed via the WRSE has helped significantly with addressing these issues, and has led to a number of new bulk supply agreements;
- supply forecasts rely heavily on the selection of critical drought events; and
- in the south east, some of the biggest challenges to future supply come from environmental sustainability reductions rather than population growth or climate change. Southern Water forecasts the latter two components but is unable to forecast the former, and it considers that this uncertainty will not be resolved in future plans unless longer-term environmental forecasts are developed.

Having considered the issues involved and responses from stakeholders, our current preference is for the third option above (some degree of market-wide utilisation risk sharing in relation to post-2020 water resources investment) as this shares risk around demand uncertainty for new capacity between incumbent companies and their customers. For example, if a water company's business plan were to include significant enhancement expenditure to address a forecast deficit, the case for a regulatory allowance for this enhancement expenditure would be stronger if the company proposed to bear a degree of demand forecasting risk rather than seeking to pass all risk onto customers. However, we note the potential implications for increased risk to incumbent companies and the potential impact on cost of capital from any increase in non-diversifiable risk. This might suggest a need to constrain the risk borne by companies, albeit that any benefits from a lower cost of capital would also reflect greater risk borne by customers. In line with our general approach of allocating risk to the party best able to manage that risk, there is a case for incumbent water companies to bear at least some of the demand risk around new investment.

The discussion above concerns new investment from 1 April 2020 for additional water resource capacity (including increases in capacity in parts of the system to offset reductions elsewhere due to requirements for lower levels of abstraction). Aside from new capacity, the price control for water resources will include revenue to enable the incumbent water companies to recover the efficient costs of providing the pre-2020 capacity. We are not proposing to expose this investment to any form of explicit utilisation risk for PR19. This approach fits with our view that the opportunities in water resources are greater for additional capacity than existing capacity.

Consultation questions: risk in post-2020 water resource investment

Q1 We consider that demand and utilisation risks relating to bilateral market entry should be allocated to incumbent water companies rather than customers, subject to our policy to protect the pre-2020 RCV. Do you agree that the water resources price control framework should differentiate between utilisation risks relating to market-wide demand and utilisation risk relating to bilateral market entry?

Q2 Do you agree that the price control arrangements for increases in water resources capacity should, at least in some circumstances, expose an incumbent water company to some degree of market-wide demand risk? If so, what circumstances?