

Water today, water tomorrow

Valuing water

How upstream markets could deliver for consumers and the environment



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This is one of a series of occasional focus reports. It highlights the work we are doing on a particular policy area, with the aim of encouraging wider debate and discussion.

Contents

1. Recognising the value of water	3
2. England and Wales – why regulated markets?	5
3. Why trade water resources?	9
4. What might a water market look like?	15
5. The benefits of upstream markets	33
6. Next steps	37
7. Further information	38

1. Recognising the value of water

Water is a precious resource. Its importance is universally recognised. Over recent decades, it has become an increasingly prominent issue. When we read headlines with the word 'water' in them, the word 'crisis' is rarely far away.

Here in the UK, water seems to be plentiful. We are fortunate to have very successful water and sewerage sectors in England and Wales that deliver clean water and take away our waste reliably and safely every day.

But we now face a number of very different challenges. These include:

- a changing and unpredictable climate;
- population growth, particularly in south-east England where water is already scarce;
- rising consumer expectations;
- economic uncertainty;
- affordability issues; and
- the costs of implementing EU legislation, such as the Water Framework Directive.

If we do not adapt to them, these challenges have the potential to put the future security of our water and sewerage services at risk. And as pressures on supplies grow globally, the water intensive products that we import – such as tomatoes from southern Europe – may no longer be available at prices that are acceptable to consumers. In turn, this may place more pressures on our own water use.

Overcoming these challenges successfully will require the sectors to respond in different ways than in the past. It will also require them to respond quickly and efficiently to changing circumstances as the future we face is more uncertain.

All of this means we have to look carefully at how we use water. We need to value it and manage it responsibly. This is so that we have the water we need today, and that the environment and future

Water is a precious resource – we need to value it and manage it with care

generations have what they need as well. We need to manage our water sustainably.

The problem is that we do not actually have a value for water. The price that customers pay reflects what has been done to get the water to the tap (for example, collection, treatment, transportation and billing), but not the value of the resource itself.

So, we must start valuing water, using a range of tools to reveal that value, including regulation and water trading. We are already working with colleagues at the Environment Agency, the Department for Environment, Food and Rural Affairs (Defra) and the Welsh Assembly Government to advise on the development of regulatory tools that reveal scarcity

values for water and increase abstraction trading.

This document explores how a different set of tools might help us to value water better, and use it more wisely now and over the long term.

It develops some of the ideas we discussed in ‘Harnessing upstream markets – what’s to play for?’, which we published in March 2010. It also describes one hypothetical model for how upstream markets could work in the water sector. We will be

publishing a more detailed technical report to accompany this document later in the summer.

Building on the work of a wide range of stakeholders, we describe one hypothetical model – regulated upstream water markets – that could help the appointed companies, policy makers, consumers and investors to discover the crucial missing piece of information they need to make sustainable choices. We want to reveal the true value of water and provide ways of encouraging its efficient use.

The ideas we have developed are intended to encourage wider debate and discussion. They are not firm proposals. We welcome challenge to and comment on the model. We recognise that we will need to work with other organisations if we are to develop any firm proposals. We note and welcome other stakeholders’ contributions and we encourage collaboration and innovative thinking to meet the goal that we can all aim for – sustainable water.

Are the challenges facing England and Wales the same?

Many of the challenges that we face now and over the long term apply to both England and Wales.

However, we recognise that there are differences. For example, some parts of England and Wales have more available water resources and lower population density than others.

We have taken this into account, and consider that the ideas in this document are sustainable over the long term and could be implemented in all parts of England and Wales. It will be important when we discuss the ideas in this document with stakeholders that we learn in more detail about their potential to be effective in different parts of the country.

We also recognise that some of our ideas require legislation. It would be for the UK Coalition Government to decide if it will implement them in England and for Welsh Ministers to decide in Wales.

2. England and Wales – why regulated markets?

Most people across England and Wales currently receive their water and sewerage services from one of 22 licensed regional monopoly suppliers and their sewerage service from one of 10 suppliers (the ‘appointed companies’).

It is a multi-billion pound industry – with annual turnover of more than £10 billion. The companies we regulate are responsible for providing water and sewerage services to 24.5 million properties and maintaining a total pipe network of 668,000 km. They are responsible for a range of activities, including:

- storing, treating and distributing water, and collecting and disposing of sewage (the **upstream** activities); and
- providing billing services, reading meters, handling customer complaints and dealing with enquiries (the **retail** activities).

Since privatisation in 1989, the sectors have invested more than £85 billion (in today’s prices). They will invest another £22 billion over the next five years. That is double the rate of investment compared

with that before privatisation, and it has addressed the problem of crumbling infrastructure and a reputation as the “dirty man of Europe”. It has also delivered:

- better standards of service;
- increased environmental and drinking water compliance; and
- a stable infrastructure.

At the same time, we have kept customers’ bills down by challenging the appointed companies to become more efficient and meet tough targets on issues like leakage. As a result, bills are 30% lower than they would have been without our regulation. On top of this, a litre of tap water delivered to customers and taken away costs less than a penny.

It is little wonder, then, that we take this valuable resource for granted. It is also why we must consider carefully why change is needed if the regulatory framework has been so successful and delivered such demonstrable benefits.

The simple reason is that the challenges of the past – that the sectors and our regulation have

tackled so successfully – are different from those we face in the future. They introduce a much wider range of uncertainty and volatility – about the climate and weather patterns and their effects on supplies and services. There is uncertainty too about future levels of demand, which will be influenced by changes in lifestyles, demographics, climate and environmental standards.

To tackle these challenges, we have to understand better the value of water to our economy and society. This will enable us to make sustainable choices about how we will manage our water over the long term. So that this can happen, future regulatory arrangements must be able to:

- cope with these uncertainties;
- reveal the information we need; and
- incentivise better solutions.

This means that we cannot rely on continuing to do things in the same way as before.

We need to consider whether there are better, more sustainable ways

of doing things, and we have to do this now, because new solutions may take a long time to deliver. We must also think about different ways of working to meet these challenges and ensure that consumers' interests remain at the heart of what we do.

So that we could start addressing these issues, we set out our own long-term approach to regulating the sectors in 'Delivering sustainable water – Ofwat's strategy', which we published in March 2010. This includes our vision for a "sustainable water cycle in which we are able to meet our needs for water and sewerage services while enabling future generations to meet their own needs."

As a result, we are reviewing the tools that we use to regulate the sectors, and considering new approaches where necessary.

This document focuses on one of the options that could be

considered – regulated upstream water markets – as a means of addressing some of the challenges we face. We have set out a hypothetical model for an upstream water market that is evolutionary and would represent a first step towards more effective markets. It also represents a collection of ideas rather than a firm proposal, and it is intended to provide the basis for further discussion and debate.

This model, set out in detail in chapter 4, would allow us to build on the successes we have achieved to date. It would also allow us to capture the crucial benefits we can gain from better information and understanding of the value of water.

We are considering options for developing upstream markets alongside a number of other projects in a 'future regulation' programme

We want to make sure consumers continue to receive safe, reliable and affordable water and sewerage services now and over the long term

that will set the direction for how we will regulate over the long term. These include projects on:

- future price limits, which will draw on the lessons from the 2009 price review and consider how we set prices to customers;
- future water charging, which aims to consider the best way to charge for water and sewerage services;
- regulatory compliance, which aims to develop an effective framework for monitoring the appointed companies;
- accounting separation, which will enable the appointed companies to report their accounts on a consistent, vertically-disaggregated basis; and
- retail market reform, which is looking at how customers can be offered more choice.

We know that we are only one part of the solution. We also recognise that major water policy decisions are for UK Ministers in England and Welsh Ministers in Wales. We are conscious of, and grateful for, the contributions of others into this debate. This includes the:

- Cave review;
- Walker review;
- previous UK Government and Welsh Assembly Government's consultation on the Cave review; and
- recent work that Severn Trent Water and Water UK have published.

We have considered these recent contributions when developing many of the ideas outlined in this document. We have also considered the part that other stakeholders have played, particularly in discussing the merits of water trading and some of the barriers to it.



Learning lessons

Each of the key projects within our future regulation programme takes into account the recommendations from the following three significant independent reviews.

- The review of competition and innovation in water markets, chaired by Professor Martin Cave (the 'Cave review'), which examined the role that competition and innovation could play in ensuring the sectors have the solutions and tools necessary to meet the challenges of the future.
- The review of charging for household water and sewerage services, chaired by Anna Walker (the 'Walker review'), which examined fair and sustainable charging for household water and sewerage services.
- The review of the 2007 floods, chaired by Sir Michael Pitt (the 'Pitt review'), which identified lessons from the floods that affected England and Wales during that summer.

Deregulation

On 22 June 2010, the UK Coalition Government announced in its first budget that it would reduce regulatory costs by introducing a 'one in, one out' system for new regulations.

Our ideas to reform the upstream market discussed in this document involve several deregulatory measures, such as:

- creating new upstream-only licences, removing the requirement for upstream water suppliers to also retail water to customers;
- opening access to water storage and water treatment assets to upstream entrants;
- removing the 'costs principle' (the current access pricing rule) from legislation and replacing it with rules set by Ofwat following consultation with stakeholders;
- supporting the Environment Agency, Defra and Welsh Assembly Government in looking at measures to remove the barriers to abstraction trading;
- supporting the Environment Agency, Defra and Welsh Assembly Government in looking at market-based approaches to achieving sustainable abstraction; and
- allowing the appointed companies to sell some of their water at unregulated or less tightly regulated prices.

However, we recognise that some of our ideas involve more regulation to provide upstream market participants with the certainty they need to enter the market. These include:

- possibly requiring appointed companies to sell a proportion of their water to, or buy it from, a third party; and
- requiring appointed companies to set up a business unit for system operation.

The proposed ideas outlined in this document could represent a first step towards potentially more deregulated upstream water markets in the future.

3. Why trade water resources?

Before considering a model for water markets, it is important to ask why it is necessary or desirable. We think that introducing market mechanisms into aspects of service delivery could help secure water and sewerage services for the future.

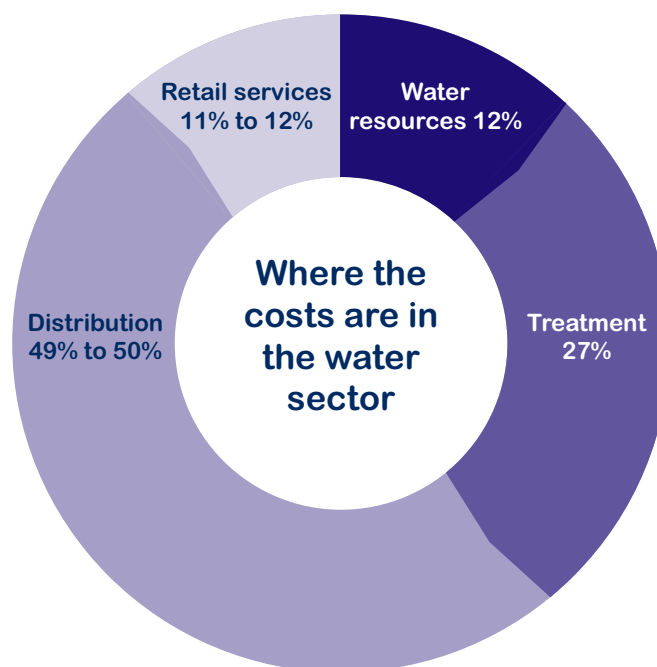
This is because markets give decision-making power to many local buyers and sellers who know their specific water and sewerage needs better than central planners. Local buyers and sellers have more information. As buyers meet sellers in markets, they reveal this information, which should improve decision-making about both water resource use and the investments that are needed. This additional information will become increasingly important to meet the challenges that the sectors face now and over the long term.

Markets can also deliver a number of other benefits, including:

- sharpening the companies' customer and business focus;

- creating new services and management processes;
- making sure new water supplies are located efficiently;
- redistributing water between areas; and
- encouraging innovation – in services, processes and technology.

The area where markets could have the biggest role to play is the upstream processes of water and sewerage service delivery. These account for 90% of investment in the sectors and almost all of their environmental impact.



Introducing upstream water markets would involve changes to the way we regulate the appointed companies. To the extent that these changes will incur costs, we would need to be confident that they are proportionate to the benefits that could be achieved.

We want our work to contribute to the debate on where and how upstream markets should be introduced.

This is because we want to improve the ability and the incentive of those involved in the sectors to use water efficiently, while:

- maintaining the sectors' ability to finance their functions through debt, equity or retained earnings;
- making sure that consumers continue to receive safe, reliable and affordable water and sewerage services that promote positive social, economic and environmental impacts now and over the long term;
- protecting customers from unnecessary price changes and

the impact this has on their ability to pay their bills; and

- tackling the potential for the appointed companies to discriminate against new entrants in the market, which may include existing appointed companies acting outside their own area.

We must also understand the impacts of the choices we make now, both for current and future customers. Upstream markets could be the crucial lynch pin in helping us to achieve our vision if they are properly designed and carefully implemented. This is because they can help reveal a real value for water.

Our hypothetical model would enable water trading to reveal a better understanding of the value of water. It would also provide buyers and sellers with the ability and incentive to use water efficiently. This would allow the appointed companies and their customers to make more sustainable choices about the water they use. It is another tool that we could use to

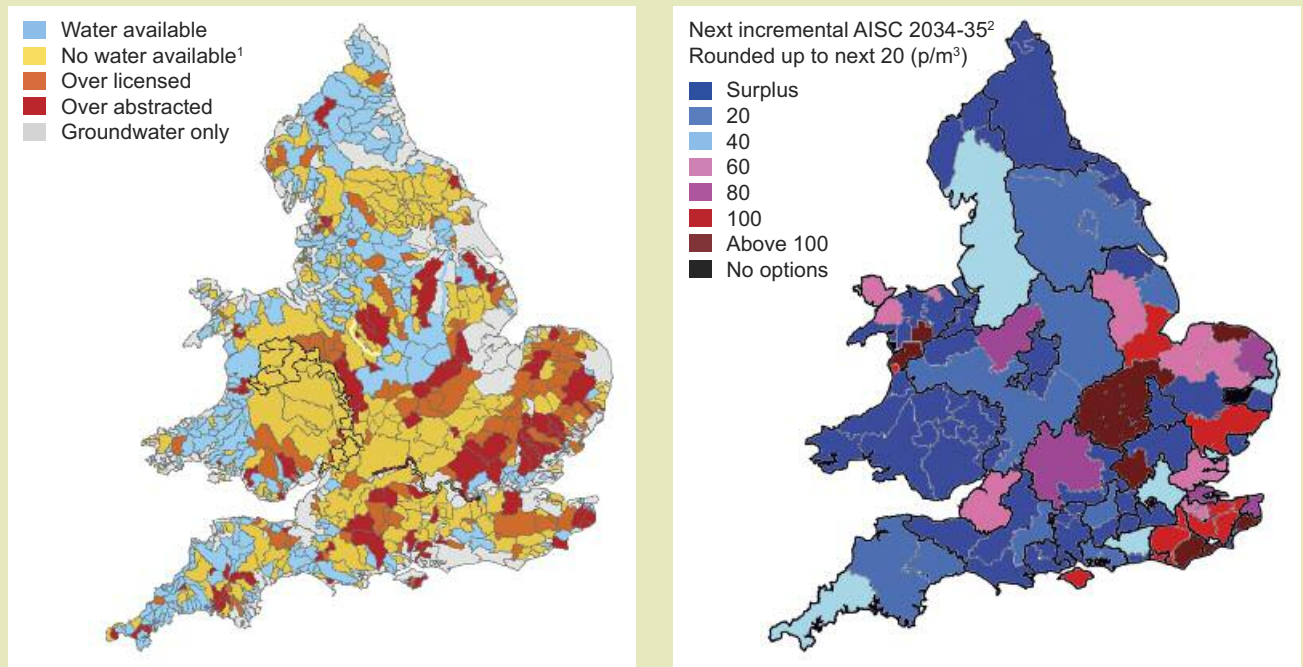
safeguard secure supplies now and over the long term and to protect those customers who cannot choose their water provider.

For example, the maps opposite show the areas of England and Wales where water is scarce and highlight water development costs.

The map on the left shows the areas where water is scarce and being used unsustainably. It also shows that some of these are located next to areas where water is relatively plentiful. The map on the right shows that the costs of developing new resources will start to become high in certain parts of England and Wales by 2034-35.

What our regulatory and market tools need to do is reveal the relative value of water in these areas, and encourage everyone – the companies and consumers alike – to use it more efficiently. This can be achieved either by trading water between the areas, or by moving the water demand between areas.

Water scarcity and water development costs vary across England and Wales



© Environment Agency 2008 'Water resources in England and Wales – current state and future pressures'

Notes:

1. This means that the amount of licensed abstractions is close to the environmental limit and the Environment Agency will not issue any more abstraction licences.
2. AISC is the average incremental social cost. This measure includes the social, environmental and economic costs of developing water resources.

There are a number of environmental benefits to this.

- By encouraging or requiring water trading, we would expect the appointed companies to want to buy water where it is cheaper and sell it where it is more expensive to earn a profit. New sources tend to be more expensive in areas where water is scarce. So, trading should discourage these new sources from being developed in locations where taking more water out of the environment through abstraction would damage wildlife and other habitats.
- Water trading would encourage the companies to develop new sources in areas where supplies are relatively plentiful in a way that is sympathetic to the environment.
- Upstream markets would also encourage the appointed companies to move water from areas where it is plentiful to those where it is relatively scarce (interconnection). This would help to reduce over-abstraction.
- Finally, upstream markets would reveal the regional and seasonal value of water, which is likely to vary between locations and at different times. Having access to this information would encourage the appointed companies to use water more efficiently when and where it is most scarce.

We think that upstream markets have the potential to deliver real benefits to consumers and the environment. We also consider that we need to retain some of the very important positive aspects of the existing regulatory framework. This is so that we can manage the impact that upstream markets could have in a number of key areas. We have outlined these below.

Moving ‘water thirsty’ activities to where and when the water is available

Water trading is not just about moving water around. As it can reveal a value for water, it should highlight areas of England and Wales where supplies are scarce and where and when the marginal cost of the resource is high. This would increase the incentives for ‘water thirsty’ industries to consider locating where supplies are more plentiful and cheaper at the margin. Although water is only one of several inputs for most companies, it could be one of the factors that influences decisions on where to locate.

Financing investment

We have a duty to ensure that the sectors can continue to finance investment over the long term. We have regulatory tools in place to do this, particularly through our five-yearly price review process. We are

also considering these issues as part of our future price limits project.

Water resource trading focuses on water as a commodity and not on the asset-intensive parts of the business (although we recognise that there are links between the two). As a result of this and because we can use our regulatory tool kit to deal with any effect, we think that introducing water trading should not raise the risk that there would be assets that are not needed in water and sewerage service delivery and for which the appointed company does not earn a return ('stranded assets').

Security of supply

The appointed companies have a duty to ensure a secure supply of water to consumers. We use our security of supply index to hold them accountable for meeting certain standards of service. We take action against any company that fails to achieve this. We do not envisage that these obligations will

change. And we expect that the way in which we regulate the appointed companies will continue to be important in ensuring secure water supplies over the long term.

But market mechanisms could reinforce these existing arrangements and provide an additional way in which the appointed companies can ensure secure supplies. This is because markets provide a mechanism by which signals about relative scarcity can be sent to buyers and sellers, who can then act on those signals. In this way, markets could provide a basis for dealing with security of supply concerns.

Simply put, in a market, an appointed company with a security of supply problem has an improved



way of tackling this. Along with the mechanisms already available, such as reducing demand, tackling leakage and developing new water resources, the appointed company could buy water from another company to ensure the security of its supplies. Conversely, an appointed company without a security of supply issue could make additional profits by selling water it does not need.

Protecting customers

We need to make sure that customers are appropriately protected against unwarranted price changes. These could occur through windfall gains to the companies as market reform takes place. They could also occur because of pressures on the current system of geographic averaging of prices across the companies' regions.

We would continue to use the regulatory tools that we have in

place to protect customers. We want them to be flexible enough to achieve the right balance between short- and long-term benefits for customers and the appointed companies.

Market mechanisms could provide additional means by which the appointed companies can ensure secure supplies

Market power

If upstream markets are to be effective, then we have to tackle the potential for the existing companies to discriminate against new entrants to the market. We could use our existing regulatory powers to ensure that this does not happen. We may also be able to take action against discrimination under existing competition law.



4. What might a water market look like?

This chapter sets out one possible hypothetical model for effective first step upstream water markets, which is summarised in the table below.

First step element	When proposed	What it could achieve
Existing proposals		
Create upstream water supply licences	Proposed for England in UK Government and Welsh Assembly Government consultation (September 2009)	<ul style="list-style-type: none"> • Makes entry easier for upstream competitors
Create new access pricing rules that enable entry on a fair basis	Proposed for England in UK Government and Welsh Assembly Government consultation (September 2009)	<ul style="list-style-type: none"> • Makes entry more attractive for upstream competitors • Makes efficient water trading easier • Discourages network owner from discriminating against upstream entrants
Make abstraction trading easier	Proposed by Ofwat and the Environment Agency in February 2009; supported by Cave review (April 2009) and Walker review (December 2009)	<ul style="list-style-type: none"> • Makes entry easier for upstream competitors • Helps to reveal the value of water and encourages environmentally-sustainable abstraction
Ideas we have been exploring		
Implement water trading arrangements that encourage or require appointed companies to buy and/or sell a small proportion of their water	New idea, but discussed in Severn Trent Water and Water UK reports	<ul style="list-style-type: none"> • Stimulates competition among appointed companies • Makes entry easier for upstream competitors • Helps to reveal the value of water and encourages efficient use of water • Proportion of water traded can be small to allow the idea to be trialled
Create functionally independent system operators	New idea	<ul style="list-style-type: none"> • Discourages network owner from discriminating against upstream entrants and blocking the benefits of upstream markets

The first three proposals were outlined in the Cave review's final report. The previous UK Government supported the first two proposals for England in its consultation in September 2009. For Wales, the consultation provided an opportunity to comment on the appropriateness of the recommendations but the Welsh Assembly Government did not support them. It is for the UK Coalition Government to decide if it will take forward the proposals in England; the Welsh Assembly Government is responsible for deciding if it will take forward these proposals in Wales.

We have suggested the last two ideas as we think that they would help to ensure that the first three proposals are more effective in practice. We discuss each idea in more detail below.

Creating upstream water supply licences

Under the provisions of the Water Act 2003, since December 2005 it

has been possible for non-household customers that are likely to use at least 50 million litres (Ml) of water a year at each eligible premises to choose their water supplier from a range of new companies known as water supply licensees (or 'licensees'). These licensees can compete with the appointed companies to provide water supply services to such non-household customers.

There are currently two kinds of water supply licence available.

- **Retail licence.** This allows the holder to buy water wholesale from an appointed company and sell it to its customers' premises.
- **Combined licence.** As well as allowing the holder to buy water wholesale and sell it to eligible customers, the combined licence also allows water to be introduced into an appointed water company's supply system.

In its September 2009 consultation, the previous UK Government proposed accepting the Cave review's recommendation to

unbundle the current combined supply licence in England. We support this, and consider it an important step towards effective upstream markets.

Unbundling combined supply licences would create upstream-only licences, allowing new entrants that want to sell (or buy) water from the appointed companies to do so without having to have their own customers to retail the water to. This opens up opportunities for a range of new activities, including:

- selling water directly to an appointed water company under a regulated framework rather than as a private arrangement;
- selling water to new entrant retailers; and
- buying water from an appointed water company and selling it on to another appointed company or retailer.

This would help to drive improvements in efficiency. It would also help to tackle the market power of the existing vertically integrated appointed companies.

Creating fair and equitable access pricing rules

Although the water supply licensing framework has been in place for five years, to date only one customer has switched supplier. This is because of a number of barriers within the existing framework. One of the main barriers is that upstream entrants have found it difficult to get regulated access to the appointed companies' assets on reasonable terms. This has resulted in part from the 'costs principle', which is the rule (set out in law) that governs the price that water supply licensees pay appointed companies for:

- taking water out of their distribution network of pipes (the 'wholesale price'); and
- obtaining access to the distribution network in order to introduce their own supply of water (the 'access price').

In its consultation on the Cave review, the previous UK

Government proposed accepting Professor Cave's recommendation that the costs principle should be removed from legislation in England. It also recommended that we should determine a new pricing principle, in consultation with key stakeholders – and that it should:

- support efficient competition;
- be non-discriminatory;
- enable the sustained efficient financing of the network; and
- be based on full economic costs.

We agree strongly with this. It is important for effective first step upstream market arrangements that entrants wishing to buy or sell water can obtain access on fair, reasonable and non-discriminatory terms. It is important that this covers not only price but also non-price terms and allocation of capacity.

The current legislation only allows entrants access to water mains and other pipes. If the UK Government



were minded to pass legislation to remove the costs principle, it would make sense for it to increase the assets to which upstream entrants could obtain access to include storage reservoirs and water treatment works.

We also consider that it is important for those wishing to buy or sell water to know the price of access in advance and not have to negotiate on a case-by-case basis with the existing service provider. Access regulated in this way would open up the opportunity for those wishing to



buy or sell water to buy access to the assets they need to deliver their water to customers.

For example, an upstream entrant with raw water, that may or may not have its own assets, would be able to buy access to:

- storage reservoirs;
- water treatment works; and
- the transport network.

Similarly, an upstream entrant with its own reservoir might only need to buy access to water treatment works and the transport network,

but would be able to do so on fair and non-discriminatory terms. So, it is important for both access to capacity at an appointed water company's assets and the price paid for that access to be agreed in a fair and non-discriminatory manner.

Making abstraction trading easier

Water is currently taken out of the environment ('abstracted') by various different industries, including farming, energy and water supply. Users wanting to take more than 20 cubic metres of water a day must have an abstraction licence from the Environment Agency. These licences govern the way in which users exercise their right to abstract water ('abstraction rights'); in many cases, the holder owns these abstraction rights forever. However, they must pay a charge to hold the abstraction licence.

This charge is currently based mainly on the administrative cost to the Environment Agency of managing the water abstractions framework. Therefore, charges do not reflect either the true economic or the scarcity value of water.

For example, the average charge of each cubic metre of water

abstracted in Northumbrian Water's region is more than 50% higher than in Thames Water's area. In part, this reflects the cost of managing the Kielder reservoir. But it clearly does not reflect the fact that water is considerably scarcer on average in the Thames region.

A lack of knowledge about the economic value of raw water at different locations, and the fact that the current charging system does not reflect relative scarcity, distorts the operational and investment decisions of the appointed companies and other stakeholders. Thus, it is not currently possible to know if it would be more efficient to move water between regions or to invest in new resources. Choosing the wrong option could have potentially large cost and environmental consequences.

Having a better understanding of the value of water, and its relative value between different locations and at different times, would enable

more efficient decisions about where and how to develop the water supply system.

In February 2009, we and the Environment Agency concluded that reforming the abstraction licence framework would be highly desirable to promote economic efficiency and environmental benefits. In particular, we recommended:

- reviewing guidance on trading to give clarity on the conditions applied to licences as a result of trades;
- providing more public information on trading rules and historic traded prices; and
- investigating options to ensure charges better reflect the value of water.

In reaching these conclusions, we and the Environment Agency recognised that changes to the law would be required. The UK Coalition Government and Welsh Assembly

Government would need to decide if they wanted to pursue these options.

These reforms would have a number of clear advantages.

- Trading abstraction licences makes it easier for competitors to enter the market.
- Promoting sustainable abstraction should help to reveal the relative value of water. This in turn would lead to the more efficient use of our limited water resources.
- Taking forward these reforms would reinforce the other upstream reforms, such as those that the previous UK Government proposed for England.

Both the Cave and Walker reviews supported this approach and recommended implementing these reforms. However, it is for the UK Coalition Government and the Welsh Assembly Government to decide if they will take these

recommendations forward in England and Wales, respectively.

We recognise that reforming the abstraction framework would require the involvement of many stakeholders. We also recognise that the responsibility for implementing any reformed framework, approved by the UK Coalition Government for England or the Welsh Assembly Government for Wales, would rest with the Environment Agency.

We think that abstraction reform would be beneficial. Revealing the value of water would provide a good basis for water trading – we consider that abstraction trading and water trading are strongly complementary. We recognise that there would be costs in reforming the abstraction framework, although the current problems with over-abstraction mean that some change is inevitable.

Encouraging water trading

A key component of our hypothetical model is the encouragement of water trading. While we consider that changes to the abstraction framework would help to create upstream water markets, on their own such reforms would not be sufficient to encourage significant new entrants to the market or to reveal the value of raw water.

This is because, across England and Wales, the appointed companies:

- currently own nearly 40% of all abstraction rights by volume;
- account for almost half of all the water abstracted by volume; and
- without further reform, would have little incentive to trade their water.

The result is that there are few opportunities for new market

entrants to source their own water and compete against the appointed companies. The way that abstraction rights are currently distributed suggests that the greatest scope for water trading is likely to be between appointed companies.

So, as well as reforming the abstraction framework to enable trading, we think that it would be necessary to encourage the appointed companies to trade their water with competing third parties and each other where it is efficient for them to do so.

In our view, if water trading were properly designed and implemented, it would bring benefits for consumers and for the environment even without abstraction reform.



Why trade water?

- It would encourage the appointed companies to move water from areas where it is plentiful to those where it is scarce to reduce the impact abstractions have on the environment.
- It would encourage large users to consider the value of water and their environmental impact in their decisions on where to locate their business.
- It would reveal the relative value of water in different areas and at different times, leading to more efficient use of resources and investment.
- By offering choice and increasing the incentives for efficiency savings, it would benefit consumers and be more sustainable over the long term.

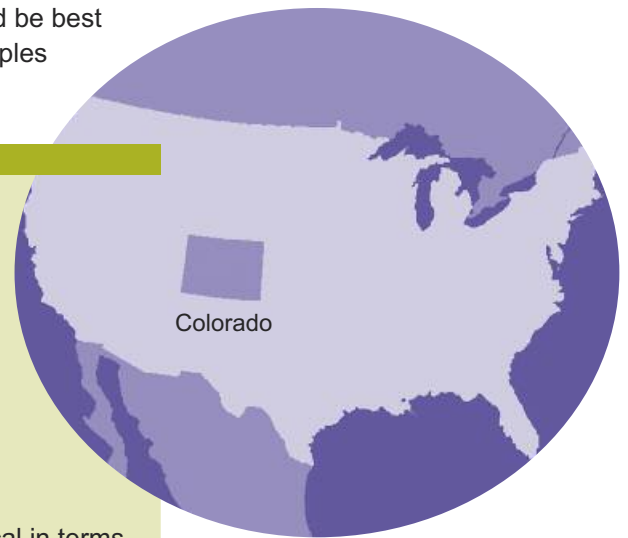
We have considered a variety of approaches of how this could be best achieved, including those suggested by academics and examples from other industries.

Water trading in Colorado – the ‘Big Thomson Project’

The most vibrant water market in the United States is the Colorado–Big Thomson project, which transfers water east across the Rocky mountains to supply 30 towns and cities. The main features of the scheme are that:

- shares are allocated to users, with each share containing 1/310,000th of the water available. The shares are identical in terms of allocation and quantity used;
- annual allocations are made and updated periodically – users take the weather risk as each share will increase or decrease in volume depending on the water available in the project;
- users with shares can rent or sell water on a seasonal basis, or sell shares permanently, to any location or town in the project area. Rural use has declined to less than 50% (compared with more than 80% in the 1960s). Most trades are rural to urban; and
- the administrative procedures for transfers are straightforward.

Commentators have attributed the success of this project to the ease of trading: rights are clearly and uniformly defined. In addition, trading has now become relatively routine. In the past 20 years, there have been 2,144 water transactions in Colorado, and all participants know how the system works.



In the model we are describing, appointed companies would be allowed to sell a percentage of their water so that they could earn greater returns if they sold that water to any organisation other than one of their own subsidiary companies.

This could involve allowing them to sell water at unregulated prices or at a price that was still regulated in some way, but which was higher than for the rest of its water. Whichever organisation bought this water would then be able to trade it in a secondary market for water resources, alongside any trading of abstraction licences.

This framework would apply only to the appointed companies and the

new entrants that we regulate. We think that this has the potential to reveal the value of raw water, which would encourage upstream markets to develop. As a result, this would:

- highlight opportunities for new entrants and appointed companies in other areas that can provide water more efficiently; and
- enable those entrants to secure water resources, and appointed companies in one area to sell water in a different area.

And, within any given area, it could benefit the environment by allocating water resources to uses with the highest economic value and away from lower value uses. In this way, it could make it easier

and less costly to achieve any given environmental limit to, or reduction in, overall abstraction from a particular local environment.

For example, in areas where water is scarce, or where it is over-abstracted (where the existing abstraction rights will have a high economic value), entrants could:

- switch water resource licences from other uses (with Environment Agency approval); or
- identify where moving water between areas or new water resources (such as recycling water discharged to sewer) would be economic.

Water trading in the Murray–Darling Basin, Australia

The Murray–Darling Basin covers one-seventh of the Australian continent, and includes four States. Each State has developed a system of water trading, which started in the 1980s with the trading of temporary water allocations (not permanent rights). Trading has redirected water to higher value uses such as horticultural and urban use.

So, because the water has a value, farmers can, for example, make trade-offs between growing grass to feed their livestock against the cost of selling water and buying grain for feed instead.

The State water trading systems are currently being integrated into the Murray–Darling Basin trading system. The Australian Competition and Consumer Commission (ACCC) is developing new trading rules.

The features of the current systems include:

- a cap in each State on the level of abstractions at 1993-94 levels of water development;
- unbundling rural water from the land;
- establishing new, transparent State water registers and a system of water accounting; and
- fortnightly updates of allocations with outlook probabilities so that water rights holders (including public water suppliers) bear the weather risk in equal proportion.

Over the past five years, trades of temporary allocations have amounted to about 900,000 MI a year; trades of permanent allocations stand at about 100,000 MI a year.

Estimates from the Australian National Water Commission suggest that water trading in the southern Murray–Darling Basin added \$220 million to the country’s GDP in 2008-09. Recently, the National Water Commissioner said that, “water trading is a major success story”, and that, “without the ability to trade water, the impacts of drought in the region would have been much worse – for both individuals and rural communities.”



In our focus report on harnessing upstream markets, we asked why the appointed companies are not already taking advantage of the potentially profitable trades between company areas (interconnections) that the document pointed to.

We identified two important reasons for this.

- If the appointed companies develop their own water resources, the capital costs associated with this is added to their regulatory capital value. The companies can earn a return on this. However, if they buy water from a neighbouring area, then this is classed as operating expenditure and does not earn a return.
- The appointed companies are required by law to ensure that they can provide enough water to meet demand in their area. Although it is not a legal obligation

to do so, they prefer to rely on water resources that they own and control, rather than relying on supplies from neighbouring companies.

In its document, 'Changing course: Delivering a sustainable future for the water industry in England and Wales', published in April 2010, Severn Trent Water suggested two other barriers to effective water trading between company areas. These are:

- the fact that under the current price review mechanism, the benefits are only kept for five years; and
- a lack of information on supply costs, demand points and future demands, which make profitable cross-border trades difficult to identify.

We consider that there is an additional barrier, which is that,

historically, the appointed companies have not traded much or considered trading. Whereas other solutions are familiar to the companies, trading is not. This means that a change in the culture, at least at some of the companies, would be needed if they were to make the most of the opportunities that trading would afford.

Encouraging or – if necessary – requiring the appointed companies to sell a percentage of their water to competing third parties would help to overcome the cultural resistance to water trading. It could be implemented in a number of ways. For example, the requirement could be phased in over several years, allowing time for any interconnection that needs to be built.

Basing water trading on initial charges that reflect relative water scarcity could deliver even greater



benefits. This would encourage water to be traded from areas or at times where it is relatively abundant into those areas or times where it is relatively scarce.

Our hypothetical model explains how beneficial water trading could happen even without abstraction reform. However, we consider that

it would be more effective in delivering benefits if it were accompanied by abstraction reform. This is because a reformed charging system and abstraction trading would provide the most effective means of making sure that the value of water at the (geographical and temporal) point of abstraction reflected relative

scarcity. We recognise, of course, that the creation of any new fiscal instrument would have to be decided on by the Chancellor.

In its final report, the Cave review supported the use of scarcity charges. The appropriateness of any scarcity charging scheme would need to be assessed to examine feasibility and the impact on end-prices to customers that might result from water costing more to abstract in certain parts of England and Wales. Given that we will continue to regulate prices at different stages of the water and sewerage value chain, especially where customers cannot choose their supplier, we would seek to manage any such effects on end-prices.

As an alternative to scarcity charging, regulatory tools might also be used, using the price setting process to incentivise environmentally beneficial water trading.

Creating system operators

All of the reforms we have highlighted so far, as well as other reforms that the previous UK Government proposed in its consultation for England, would encourage new companies to enter upstream water markets.

This means:

- there would be more upstream companies putting water into the distribution network of pipes;
- the network would need to develop efficiently in response to multiple market participants;
- there would be a greater need for co-ordination of networks across company borders (as a result of more transfers of water); and
- there would be a need to ensure fair access to networks.

In order to meet these challenges effectively, over time some of the

functions that the appointed companies carry out (the 'system operator functions') would need to develop substantially. These functions include:

- managing flows of water within the distribution network on a day-to-day basis to ensure demands are met, while operating the network cost-effectively;
- scheduling maintenance to the network;
- ensuring the efficient development of the water distribution network; and
- overseeing the application of the correct access pricing.

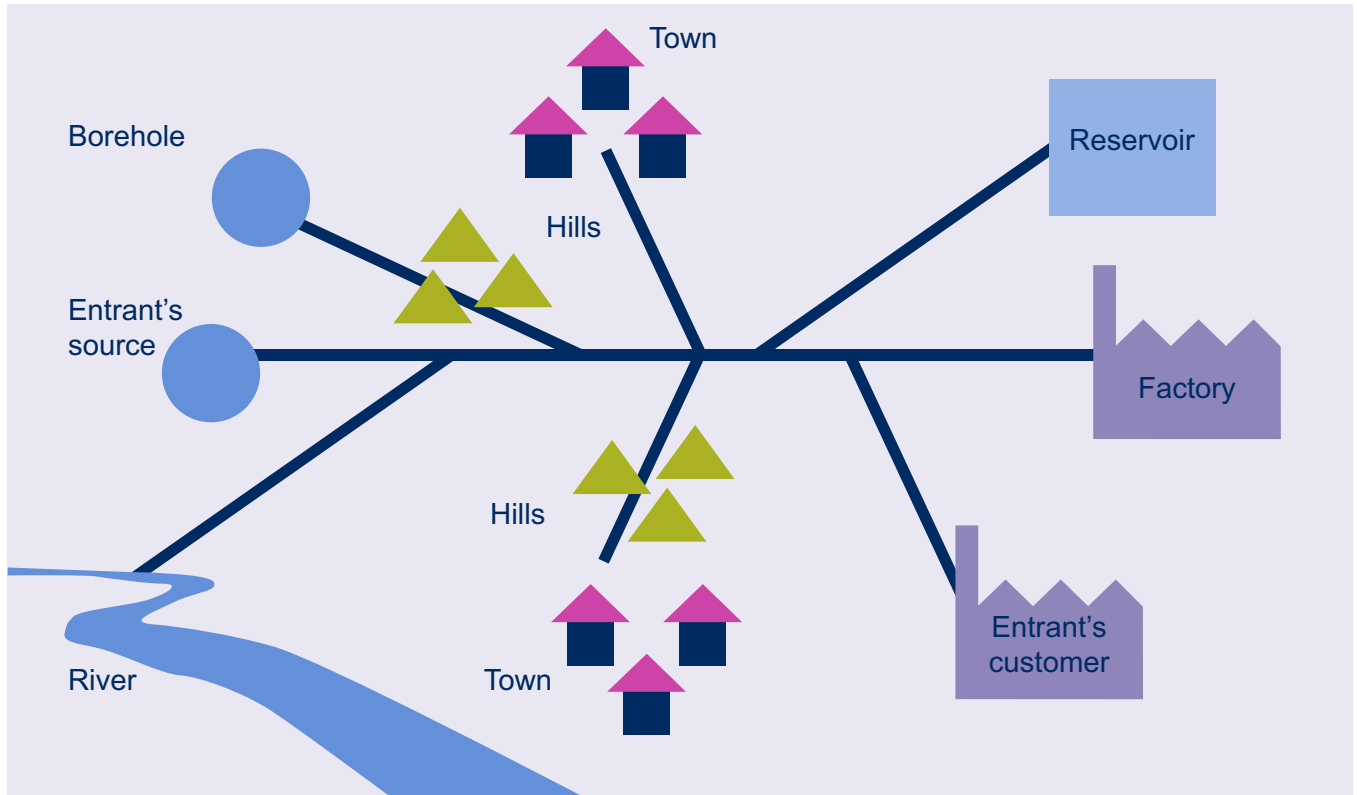
The appointed companies already carry out system operation as part of their business. For example, they control which water sources they use at different times depending on the pressures of demand on the network. They also control the flow of water through their distribution networks.

In order to allow an upstream water market to flourish, the efficient performance of these functions would need to be specifically incentivised through regulation.

And once the appointed companies can compete with new entrants and vice versa, the appointed companies would have an incentive to act in ways that will give them an advantage over their rivals. Since the system operator would govern who is permitted to introduce water into the network and take it out, when and where they want, control over the system operator would provide a powerful means for an appointed company to put its rivals at a disadvantage. Overcoming this problem would require regulatory intervention.

So, to allow upstream markets to develop successfully and deliver the maximum benefits, our model would also involve requiring the appointed companies to separate their system

A system operator manages flows from water sources to customers



operation functions from the rest of their business in some way.

In other sectors, the system operator function is usually in the network business, which is a separate legal entity to the companies supplying a product using the network. For example, in the electricity sector the network business provides system balancing independently from the upstream electricity generators. Similarly, in the aviation sector, all airlines have safe and fair access to the air routes network because there is an independent body that

provides air traffic control services. The benefits of this approach include reducing the:

- ability and the incentive of the system operator to discriminate; and
- need to regulate to prevent discriminatory behaviour.

The model would include whichever form of separation was most appropriate. We outline some of the benefits and costs of each of the four types of business separation below.

- **Accounting separation.** The benefit of this approach is transparency of costs. It would help when setting fair and non-discriminatory access prices. However, it would not make visible any discrimination against entrants.
- **Functional separation.** The benefit here is that the system operator functions are located within one business unit. This would be easier to monitor and regulate. The costs of adopting this approach would depend on the precise nature of separation.
- **Legal separation.** This option makes it easier to identify obvious discrimination. Because legally separating the system operator from the rest of the appointed company is more likely to create a different culture and different incentives for employees, it would make discrimination against other entrants into the market less likely. However, there would be costs associated with creating the new company, as well as with meeting legal obligations and governance requirements.

Separating business functions

There are four main types of business separation:

- accounting separation (separate cost reporting);
- functional separation (creating a separate business unit within the water company);
- legal separation (creating a separate legal company within the same water company group); and
- ownership separation (creating a separate company with no ownership link to the water company).

- **Ownership separation.** The advantage of this approach is that there is no ownership link between the separated company and the incumbent. This removes both the opportunity and the motive for discrimination. However, it would be disproportionate for a first step. There could also be a possible loss of co-ordination with the network.

Our hypothetical model favours the functional separation of each appointed company's daily operating and maintenance scheduling functions. We prefer this approach because it would give the system operator a higher degree of visibility in relation to different upstream operators' use of the network. Combined with the appropriate regulatory obligations on the system operator business unit, we consider that functional separation would allow us to police discrimination more easily.

Functional separation has a number of general advantages.

- The separate business unit would have greater management focus on system operation, with benefits regardless of other market reforms.
- The system operator business unit would have greater independence in how it discharged its functions, so that there would be less risk of discrimination in favour of the appointed company. However, as the latter would still own the system operator business unit, we would need to have close regulatory oversight to prevent discrimination.
- A separate business unit does not incur the costs of ownership separation of the appointed company.

There are also two specific advantages of adopting functional separation in water markets.

- Creating a functionally separate system operator would involve very little separation of assets within the appointed companies. These functions involve few large

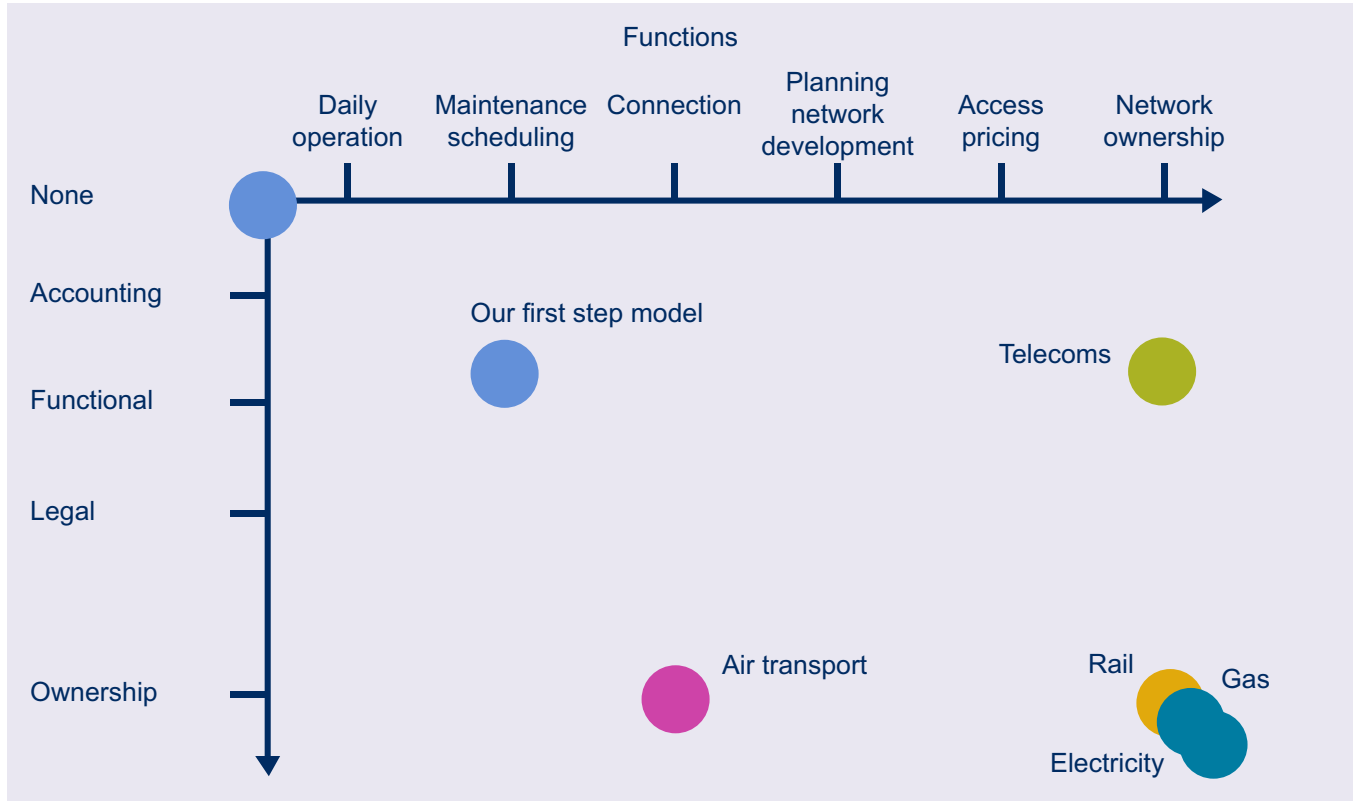
fixed assets and mainly comprise specialised staff, office space and information technology and telemetry systems.

- The system operator function is not a competitive one. It would continue to earn a regulatory return, either under the current regulatory system or through a levy on access charges.

A system operator could include many or a few functions. Our model is a system operator that would only be responsible for daily operation of the network and maintenance scheduling. This would include fewer functions than those in other UK utility industries in keeping with the Cave review's step-by-step approach to market reform.

There may be scope in the future to allow system operators to operate across a number of regions or UK-wide. The experience in other sectors has shown there are benefits from this approach, for example by allowing resource and network optimisation across a wider area. For example, the electricity

Separation of system operation functions in other UK network utilities



Regional system operators in the medium term

Our hypothetical model includes a separate business unit for system operation within each appointed company. We consider that this step represents a small change compared with the current position. However, over the medium term, there could be advantages to creating regional system operators.

In certain areas of England and Wales, the appointed companies are large enough already to be considered regional system operators. Northumbrian Water's northern region or South West Water are good examples. However, in south-east England in particular, creating a regional system operator would require the merger of several appointed companies' business units.

We think there is a case for promoting regional system operators. This is because they would focus on the most efficient network and water source development for the whole of their area of responsibility. As a result, they would be more likely to identify opportunities for and to promote inter-company interconnection and more environmentally sustainable outcomes.

Adopting such an approach means that there would be less opportunity or incentive for regional system operators to discriminate in favour of one particular company if several appointed companies owned them. In addition, because new entrants would have to deal with fewer system operators, then entry to the market or expansion once in the market would be easier.

system operator covers separately-owned grids north and south of the Scottish border.

However, setting up functionally separate system operators would incur costs. There may also be some concern, that if system operation functions were no longer part of an integrated water company, there could be a loss of co-ordination benefits between network asset owners and the system operator.

The way in which we regulate the system operator would need to ensure that it was adequately incentivised to maximise co-ordination benefits and to minimise costs. Maximising the co-ordination benefits would offset any costs as a result of loss of economies of scope from separating the system operator function from the distribution business. We do not consider that there should be any costs associated with lack of asset knowledge on the part of the system operator, as it would obtain this knowledge from the asset owner and operation business. We would welcome stakeholders' views on these issues.

5. The benefits of upstream markets

We consider that our model for developing regulated upstream water markets would deliver a number of benefits – for customers, the appointed companies, new entrants and the environment.

Benefits for customers

Water trading could deliver benefits for customers in terms of:

- lower water bills;
- increased choice; and
- increased security of supply.

We would also regulate to protect customers against any unwarranted price changes.

Customers could benefit from lower bills in the future as a result of water trading. We would expect it to promote the development of cheaper water sources in areas where there are surplus supplies. This should help reduce the appointed companies' costs and lead to prices being lower than they might otherwise have been.

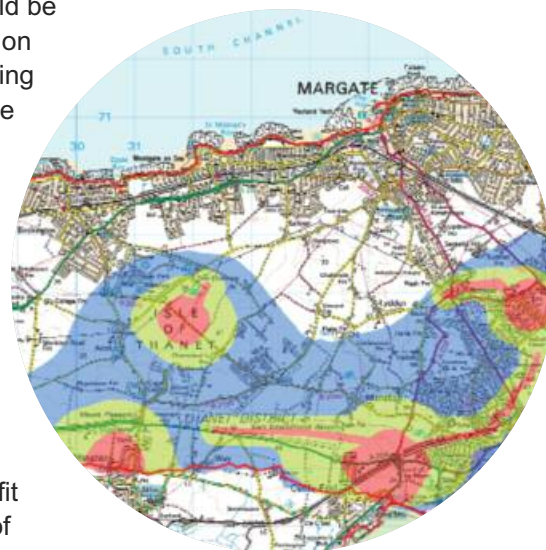
In 'Harnessing upstream markets', we estimated cost savings of £960 million over 30 years from more interconnection. The Water Resources South East (WRSE) group, which used more

sophisticated modelling, identified savings of £501 million by 2035 in south-east England because of more resource sharing. Although a proportion of these benefits might be passed to the appointed companies to encourage trading, a proportion would also be passed on to customers.

If water trading were introduced, customers could also benefit from greater choice. By allowing water retailers a choice of upstream supplier, water retailers would be able to exert more pressure on upstream suppliers, generating better offers and more choice for their customers. Water trading is also likely to lead to more choice for customers in terms of interruptible supplies, seasonal charges or more sophisticated tariffs as an alternative to standard supply contracts.

Customers would also benefit from an increased security of

supply. Our hypothetical model would not change the appointed companies' duty to ensure secure water supplies. Under the current regulatory system, each company has to predict and provide for all water demands in its supply area. We use a security of supply index to compare the actual security of supply with the planned level of service and take action against the appointed companies if they fail to meet these targets. We would



continue to hold the appointed companies to account for achieving the standards of service they have set out.

However, by improving opportunities and incentives for trading, upstream markets would provide an additional means for appointed companies to comply with their duty, more efficiently and therefore at lower cost to customers and the environment.

Similarly, the functional separation of system operators could enhance delivery of security of supply. This is because, although the system operators would still be part of the appointed companies, they would be more focused on system operation and better able to co-ordinate inputs from different upstream suppliers.

A risk to customers is that because water trading would reveal the relative value of water at different times and places, it could put pressure on the current geographic averaging of prices. However, the distribution system would remain a regulated monopoly. So, we could

require the network owner to set network access prices to offset the effects of introducing upstream trading on prices to customers as appropriate.

Another concern is that by increasing the incentives for the appointed companies to trade water we would generate windfall gains for them. If this happened, we would ensure a fair proportion of those windfalls were returned to consumers by calibrating the incentives to trade appropriately. We already have a mechanism for returning a share of water companies' windfall gains from selling protected land to customers. We could use a similar method for windfall profits from water trading.

Benefits for the environment

The main benefit of our proposed approach to upstream markets is likely to result from the more efficient use of water resources. The appointed companies' upstream activities account for almost all of their environmental impact. So, by encouraging water

trading we would expect them to buy water where it is cheaper and sell it where it is more expensive to earn a profit.

This approach would deliver environmental benefits because water trading should discourage new water sources from being developed in areas where further abstractions would damage wildlife and other habitats. And if the value of water also reflected its scarcity, this would encourage the appointed companies to engage in trade to buy water from areas where supplies are plentiful. Upstream markets would also reveal the regional and seasonal value of water. This is likely to vary between locations and at different times. Having access to this information would encourage the appointed companies to use water more efficiently precisely when and where it is most scarce.

Benefits for the existing appointed companies

Our model would benefit the existing appointed companies by giving them more incentives to

trade water and increase the profits they could make as a result. And because their long-term sustainability is tied closely to the environment they abstract water from, these measures could help to tackle over-abstraction.

It also gives the appointed companies alternative ways of ensuring secure supplies, particularly in areas where water is already scarce. The water trading ideas would help the appointed companies to obtain supplies from another company when and where they need them.

Benefits for upstream entrants

Potential upstream entrants, including existing appointed companies acting outside their area, would find it easier to enter and compete under this model than under the current water supply licensing framework. For example, with a reformed abstraction trading framework, entrants would find it easier to:

- gather information about potentially useful abstraction

licences;
 • locate willing sellers; and
 • purchase the licences.

Potential upstream entrants would also be able to obtain water directly from the appointed companies through the water trading arrangements. This would also provide them with a secondary market within which to buy and sell water, and reveal the relative values of water in different areas and at different times. It would give upstream entrants more information about where the best opportunities might be for developing their own water resources.

If an upstream entrant wished to store its water in an appointed company's reservoir (rather than, say, trade it immediately), under this model, it would have regulated access to the storage capacity in a water company's dam at a fair, reasonable and non-discriminatory price. This would give the upstream

The main benefits of upstream markets are likely to result from the more efficient use of water resources and secure supplies over the long term

entrant flexibility in deciding when to sell its water resources or how to meet its contractual commitments to customers.

If an upstream entrant wished to sell treated water to its own, or another retailer's, customers, it would also have regulated access to the appointed company's treatment works. Full accounting separation based on the upstream water business units may help limit the scope for the appointed companies to move costs around to discourage entry. We would also require the appointed companies to justify the cost allocations underlying their access prices.

If an upstream entrant wished to sell treated water (whether treated by the existing service provider

through the regulated access route or in the upstream entrant's own treatment works), it could obtain regulated access to the existing provider's treated water distribution network.

In general, we consider that upstream entrants would find access easier under our model. There are several reasons for this.

- Upstream entrants would know the price of access in advance and would not have to negotiate with the appointed company.
- They would know the terms under which they could access the capacity of the appointed companies' reservoirs, treatment works and other assets.
- There would be agreed national market access codes, meaning that upstream entrants would not have to deal with different rules when dealing with the 21 different appointed companies.
- The access arrangements, including price and non-price terms and capacity allocation, would be fair to entrants. The functionally separate system operator would also act to ensure

that the appointed company did not discriminate against upstream entrants' water by using non-price mechanisms.

Upstream entrants would also be selling their water to retailers within a partly competitive national retail market. The competing non-household retailers may be more willing to contract for larger volumes than large users are under the current water supply licensing framework. Upstream entrants could also sell to the legally separated monopoly household retailer. As a result, there would be more scope for upstream entrants to find purchasers for their water.

Benefits for retail entrants

From a retail entrant's point of view, the hypothetical model would increase considerably the scope for negotiating with different upstream suppliers to obtain the best deal for their customers.

Without upstream entry, retailers would have to compete on their own service and cost performance with

little or no scope for negotiating a better deal with the incumbent upstream supplier as part of their offer to customers.

By allowing upstream entry in different ways, retailers would be able to negotiate packages between upstream entrants and appointed companies to provide the full service to their customers. The system operator would also ensure that all retailers' supplies are delivered with no discrimination in delivery quality.

We consider that our hypothetical model strikes the right balance between achieving benefits for customers and the environment, and managing the key risks of:

- the cost of investment;
- security of supply; and
- undesirable income effects.

Any transition would take place gradually over a period of up to ten years, although the reforms could be accelerated or slowed depending on their initial levels of success and the difficulties encountered in implementing them.

6. Next steps

In keeping with the purpose of this document, we want to encourage wider debate and discussion on the ideas that we have proposed. This debate will also inform the input we make to the development of the Water White Paper the UK Coalition Government plans to publish in early summer 2011.

We welcome stakeholders' views on any aspect of this document. However, to stimulate the debate, we suggest that stakeholders consider the following questions.

- We have described one possible model for upstream regulated markets. Do you have views on the overall model and do you suggest any adjustments or alternatives? If so, what changes would you make or alternatives would you propose and why?
- Do you agree that the Cave review's proposals of upstream licences, reformed access pricing and abstraction reform would be more effective with the water trading and system operator separation proposed in our hypothetical model?
- Have we identified the right barriers to water trading not occurring already? Have we missed any barriers? Which are the most important barriers?
- Do the Australian and Colorado experiences with water trading have lessons for England and Wales? If so, what are they?
- Could notional scarcity charging cost-effectively incentivise more environmentally sustainable abstraction when taking into consideration the impact on customers' bills? Do you believe notional scarcity charging would cost effectively drive more environmentally beneficial water trades given the potential impact on customers' bills? If not, are there alternatives that you think we should consider?
- Is some reform of system operation required if upstream entry becomes established?
- Our hypothetical model suggests that functional separation of the system operator would be the most appropriate choice. Do you agree? If not, what alternatives should we consider and why?
- Have we suggested the right functions (daily operation and maintenance scheduling) to be separated?

You can help

Please send any comments to Jon Ashley, Market Reform Programme, Ofwat at: jon.ashley@ofwat.gsi.gov.uk by 22 October 2010. We will follow this up with a workshop for stakeholders in autumn 2010.

7. Further information

Ofwat publications

[‘Delivering sustainable water – Ofwat’s strategy’](#), Ofwat, March 2010.

[‘Harnessing upstream water markets – what’s to play for?’](#), Ofwat, March 2010.

[‘A study on the potential benefits of upstream markets in the water sector in England and Wales’](#), Ofwat, March 2010.

[‘Ofwat’s review of competition in the water and sewerage industries: part II’](#), Ofwat, May 2008.

[‘Ofwat’s response to the Cave review’s final report on competition and innovation in water markets’](#), Ofwat, June 2009.

The Cave review

[‘Independent review of competition and innovation in water markets: final report’](#), Defra, April 2009.

[‘Consultation on the Cave review of competition and innovation in water markets’](#), Defra and Welsh Assembly Government, September 2009.

The Pitt review

[‘Learning lessons from the 2007 floods’](#), June 2008.

The Walker review

[‘The independent review of charging for household water and sewerage services’](#), December 2009.

Other sources

'Water resources in the South East Group – progress towards a shared resource strategy in the South East of England', Environment Agency, May 2010.

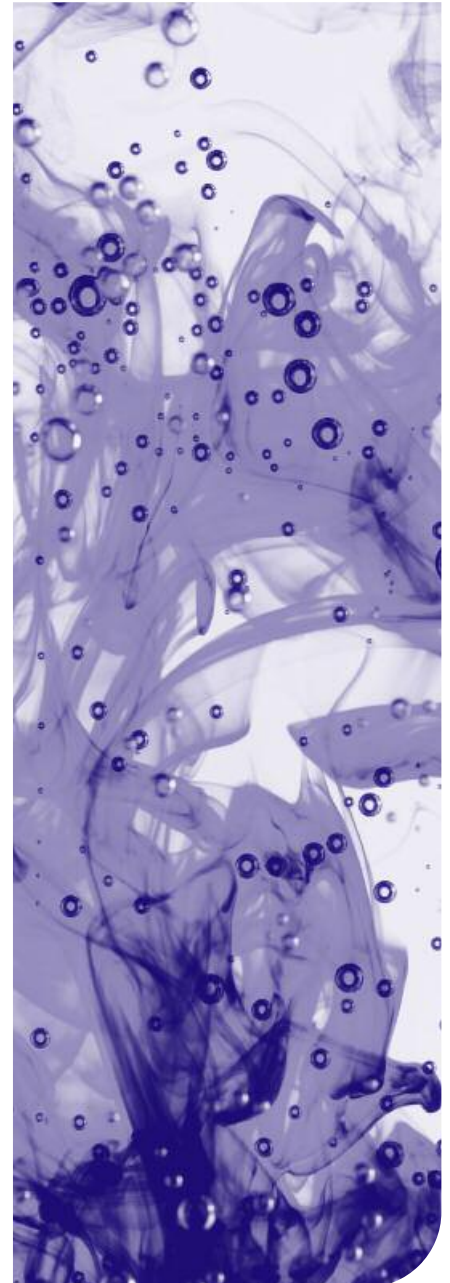
'Changing course – delivering a sustainable future for the water industry in England and Wales', Severn Trent Water, April 2010.

'Severn Trent Water response to Defra's consultation on the Cave review of competition and innovation in water markets', Severn Trent Water, December 2009.

'Meeting future challenges – a blueprint for policy action', Water UK, June 2010.

'Developing upstream competition in the England and Wales water supply industry: a new approach', Jon Stern, City University, March 2010.

'Markets in water: some issues surrounding policy development in a context of potentially increasing resource scarcity', George Yarrow, Regulatory Policy Institute, May 2010.



Ofwat (The Water Services Regulation Authority) is a non-ministerial government department. We are responsible for making sure that the water and sewerage sectors in England and Wales provide consumers with a good quality and efficient service at a fair price.



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