Sustainability *first*

Water Consumers – Today and Tomorrow

Aligning the short and long-term interests of water and sewerage consumers

A discussion paper by
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About Sustainability first

Sustainability First is small environment think-tank with a focus on practical policy development in the areas of sustainable energy, waste and water.

Our aim is to improve knowledge and understanding of complex multi-disciplinary issues such as demand side response in the electricity market. We develop implementable ideas in key policy areas – such as energy, water and the roles of economic and other regulators in sustainability policy – where it can make a difference. We undertake research, publish papers and organise policy seminars. Our primary focus is on policy and solutions within the UK, but we draw on experiences and initiatives both within and outside the UK.

Our work currently focusses on the demand side response in the electricity market, through the project '**GB Electricity demand –realising the resource'**. Since 2006, Sustainability First has produced a series of major multi-sponsor studies on GB household smart energy meters and brings significant knowledge and insight in the fields of energy efficiency, smart metering, smart energy tariffs and demand response.

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Responsibility for the findings and the recommendations rest with Sustainability First.

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1. Introduction

This discussion paper explores the potential of bringing the short and long-term consumer interests in the water and sewerage sectors closer together. In so-doing, it touches on post-privatisation industry arrangements and structures in England and Wales and the relevant policy and regulatory frameworks. Approaches to incorporating the interests of future consumers in decision making and the issue of inter-generational equity are explored.

The core question which the paper seeks to address is how to achieve a sustainable balance between short and longer-term investment considerations, affordability and the expected need to change the way that sewerage and water-supply services are delivered in the context of the future management of uncertainty from, for example, potential flooding and drought risks and population growth. This is not a 'business-as-usual' world.

The current structures and arrangements in the water and sewerage sectors were designed before the impacts of climate and demographic change were recognized and before the current recession bought the issue of affordability into sharp relief. It is therefore timely to review them from a long-term perspective. Navigating through these complex and difficult questions, which clearly have no easy answers, requires a perspective which brings together economic, environmental, social and political analysis. A number of recent papers (including the 2011 Defra White Paper *Water for Life*, the 2013 *Water Bill* and the 2012 Committee on Climate Change Adaptation Sub-Committee report *Is the UK Preparing for Flooding and Water Scarcity?*) have considered these issues, but there remains much that is unresolved.

The *Water Bill's* proposed new Resilience Duty for Ofwat has the potential to significantly improve the focus on long-term thinking which should be in the interests of current and future consumers. However, much recent public discussion has been about the sectors' accountability and legitimacy to consumers, including questions about company dividends and returns, governance and reputation. This debate has focused on the 2014 price control. These two debates, which straddle two time frames - longer-term policy development versus a five-year price review period - could pull in different directions.

Put simply, if consumers do not have confidence in the way that companies are currently regulated and investors rewarded, they are less likely to support the need for significant change in longer-term investment for resilience - both in its quantum and the way it is delivered. Unless addressed, this tension could grow as consumers are asked to finance investment and change their behavior in an environment of increasing uncertainty.

Although the water and sewerage sectors clearly are not currently in crisis, background discussion for this paper - with government, sector regulators, water companies, academics and consumer representatives - lead us to the view that as a priority we need to consider how best to achieve:

- A clearer, more streamlined and strategic policy approach and simpler regulation to enable and empower local and regional innovative solutions and investments;
- An appropriate balance between stability and change so that key service levels are protected and investments funded whilst ensuring that the longer term challenges are addressed in a publicly acceptable way whilst there are still options available; and
- A better alignment of the interests of *current* and *future* consumers in the decision making process - in terms of security of supply, affordability and wider environmental interests - so

that the need for public accountability and legitimacy is recognized and the sectors are sustainable.

As the *Water Bill* goes through Parliament and the 2014 price control comes to a conclusion, some of these issues should become clearer. It is hoped that this paper can contribute to this process and the debate about the pace of transition as the water and sewerage sectors prepare to meet the challenges of climate and demographic change and affordability.

The paper addresses issues in England and Wales. However, some of the issues covered will also be relevant to Scotland and the 2015 Strategic Review of Scottish Water Charges.

2. Executive Summary

The water sector is going through a period of considerable activity. The 2013 *Water Bill* and the 2014 Price Review are taking up a lot of the attention of industry insiders. At the same time, the public is starting to ask questions about the returns that some companies have been making and how they act as corporate citizens. This paper attempts to stand back and take a longer-term look at the fundamental issues facing the water and sewerage sectors that could be in danger of being lost in the current debate.

The paper begins with a brief description of the background to the English and Welsh water and sewerage sectors (referred to as 'the sectors') before exploring the challenges they are likely to face in terms of climate change, demographic change and affordability. Future generations may have very different experiences of these essential services compared to current consumers.

The paper then assesses what is currently being done to address these challenges through the White Paper and *Water Bill* and through changes to Ofwat's methodology and approach. The steps taken by the water companies to change the way they deliver services are also explored.

The gaps in the current measures that have been taken or are being proposed are examined. The Government's vision for the sectors is discussed. The White Paper *Water for Life* is seen as providing a good overview of many of the problems faced. However, importantly, it does not address how benefits are shared between investors and consumers and the impact that the financial structures of the companies may have on customer perceptions of accountability. The 2013 *Water Bill*, which has followed the White Paper, was not considered by many of those interviewed for this paper as a comprehensive response to the areas that were identified in the White Paper as needing action. Some of those we talked to thought that the regulatory changes that have been introduced following the White Paper for the 2014 price review were still unnecessarily complex.

The paper identifies **three key levers** for ensuring that the interests of both current and future consumers are taken into account in decision making.

The first is the proposed new **resilience duty for Ofwat** introduced in the *Water Bill.* This duty could have the potential to make a significant contribution to ensuring that the interests of future generations are protected. Much will of course depend on how it is interpreted and implemented. For example, thought needs to be given as to how to define resilience and the extent to which redundancy in the system is acceptable to achieve this. In thinking through this new duty, it will be important that the social aspects of resilience are taken into account (such as the need to tackle the long-term affordability challenges in the industry).

The second lever for change is how to achieve a **simpler, more strategic and transparent policy framework and regulatory approach**. A more streamlined policy framework, with clearer objectives including resilience, is identified as being a key area for development alongside a clearer public narrative of the policy priorities. Such a framework needs to place a premium on the cultural change and innovation needed to address investment uncertainty through smarter solutions, new partnerships and skills. A more strategic, and less detailed regulatory approach, focused on longer-term plans such as Strategic Direction Statements, rather than reliance primarily on five yearly business plans, could be beneficial in this regard. Such an approach should help to foster initiatives that straddle company boundaries or enable a wider group of stakeholders to be rewarded for their collaboration, such as Payments for Environmental Services. More transparent and 'reputational

regulation' - regulatory comment on company outcomes and performance - could be beneficial in terms of building consumer confidence and encouraging new entrants. Innovation competitions using funds collected from bills and run by the regulator could also help in fostering new, more creative and resilient approaches to change.

The last lever for change **is benefit sharing and company accountability.** Public interest in company returns for this basic utility service is likely to rise if bills increase significantly or service levels change as a result of external climate or demographic pressures. Improving transparency in regulatory reporting on company costs and financial structures could be helpful here. One means of achieving this could be a regulatory requirement for companies to make an annual disclosure statement on each of the onshore and offshore holding companies showing their debt and equity structures, the directors' interests and their governance. Companies that proactively share information in these areas and have a corporate culture which recognizes the importance of long term stewardship, should be better placed to maintain consumer confidence than those that do not.

It will clearly be important to review the valuable innovations in consumer engagement introduced for the 2014 price review after the price control is finished to assess how effective they have been in representing consumer interests and delivering benefits sharing However, periodic intensive consumer engagement restricted to key price control decision points alone is unlikely to ensure that short and long term consumer interests are sufficiently aligned and that consumer trust in the sectors is maintained.

A 'grand bargain' between consumers, policy makers, regulators, investors and companies has been proposed by Alan Sutherland, the Chief Executive of the Water Industry Commission for Scotland. One way of delivering this could be through the 'negotiated settlement' approach. The paper asks whether evolutions in consumer engagement along these lines on their own will be enough to address consumer concerns about benefit sharing (particularly in the privatised context of the English companies). If consumers continue to question whether companies have a 'social license' to operate, innovation may also be needed in company ownership itself. This could range from community initiatives at the local level to mutualisation of existing companies, along the lines of Welsh Water. We propose a series of tests to assess the strengths and weaknesses of different engagement and ownership models and put forward a guide to help facilitate the conversations between consumers, water companies and other key stakeholders that will be needed for benefit sharing to continue to evolve (see Annex A).

The paper concludes by identifying several areas that could be fruitful for future research. These include the links between water and energy use (scope for renewable distributed power generation in the water and sewerage sectors and analysing the costs and benefits of local energy solutions, such as the use of sewage to create biogas), the possibility of setting up a 'smart water' forum to oversee research in the area of water efficiency and pricing signals and the potential for developing localism in the sector, including the possible role of community interest companies.

3. Background to the water and sewerage sectors in England and Wales

In England and Wales the water and sewerage sectors consist of ten vertically integrated Water and Sewerage Companies and twelve smaller Water Only Companies. With the exception of Welsh Water which in 2001 changed its structure to become a mutual company limited by guarantee with no shareholders (but 59 independent members), since privatization in 1989 the companies have all been privately owned. Scottish Water by contrast has always stayed in public hands.

The companies have remained as local or regional monopoly providers. Although some moves have been made to introduce retail competition for non-domestic consumers, apart from in Scotland, these have so far had a minimal effect. Householders remain captive consumers of their local incumbent with virtually no choice of services. There has been even less progress on 'upstream' reform.

Part of the rationale for privatisation was to access new capital from equity funding for the significant investment required in the industry's infrastructure. Much of this investment has actually occurred through increased borrowing. Networks within some company areas are also still sometimes fragmented. This reflects sources of supply and the fact that as a heavy product, transporting water is energy intensive and expensive. It is only recently that more systematic moves have been made by some to connect neighbouring areas, both within and between companies, to meet supply shortfalls. Most commentators do not view a complete national water grid as a feasible option due to the costs that would be involved.

A complex policy and regulatory landscape has evolved to try and protect consumer and environmental interests. The European Union (by agreement through the Council of Ministers of member states) has set the framework for most water policy decisions with a long-term quality or environmental dimension. The Water Framework Directive (2000) is the most significant piece of legislation. This Directive (as transposed into UK legislation) requires companies to produce River Basin Management Plans (RBMPs) to six-year planning cycles. The next cycle will start in 2015, with targets needing to be met by 2025.

Regulation of the sectors in England and Wales is mainly dealt with via three regulators: the environmental regulator, the Environment Agency; the economic regulator, Ofwat; and the quality regulator, the Drinking Water Inspectorate. In Scotland, there is a separate suite of equivalent regulators: the Scottish Environment Protection Agency; the Water Industry Commission (WICS); and the Drinking Water Quality Regulator. Close liaison between the various regulatory bodies is necessary to ensure that their respective interests are represented in decision-making. This is particularly important during price reviews that determine the revenues that can be collected from customers. The next price controls are due to be set in England and Wales 2014 (PR14) and through the strategic review of water charges in Scotland in 2015 (although in the latter, charges are collected through Local Authorities).

Consumer interests in England and Wales are represented through the statutory Consumer Council for Water. For the 2014 price review, company based Customer Challenge Groups have been established, many, but not all of which, are chaired by Consumer Council for Water board members. Ofwat has also set up a Customer Advisory Panel to give advice on cross cutting national issues for the price review. However, the regulator has no internal 'standing' consumer panel to give it on-going advice or act as a sounding board on consumer issues. In Scotland, an independent Customer Forum has been established for the 2015 strategic review of water charges.

4. The challenges faced in aligning short and long term interests

Policy makers, regulators, companies and consumer representatives face several challenges to align the interests of current and future consumers. This section explores the most significant of these: climate change; demographic change; and affordability. Taken together, these challenges mean that the way in which water and sewerage services are regulated, planned and delivered may need to alter significantly if the interests of future generations are to be protected. Given the previous points about the structure of the industry (vertically integrated local or regional monopolies) and the complexity of the policy and regulatory framework, achieving such significant change will be challenging. It is worth noting that these challenges are not unique to the water sector. A very similar set of issues confronts energy consumers. Ensuring learning and best practice is shared between the two sectors will be important.

4.1 Climate change

Climate change could mean that future generations will have to cope with a far greater risk of both flooding and drought than current consumers. The White Paper *Water for Life* noted that in the longer term climate change could have a bigger impact on available water sources than population growth. Table 1 provides the UK Climate Change Committee's estimates of risks in terms of too much and too little water in the coming decades.

Table 1 - Climate challenges and consequent risks for current and future consumers

Climate challenges	Risk to current consumers	Estimated risks to future consumers
River and coastal flooding - Properties in an area with a significant risk (at greater than 1 in 75 chance in any given year)	330,000 in England	630,000 – 1.2 million by the 2080s (assuming no further action to repair, no population growth and no change in property stock). With population growth this could increase to 680,000 – 1.9 million.
Surface water flooding - Properties at 1 in 30 annual chance or greater	50,000	Increase by between 60 and 220% over the next 50 years.
Sewer flooding - Properties at 1 in 10 annual chance	4,700 (<0.1% stock in England) *	Increase from between 4,700 and 8,100 by the 2040s due to climate change. If the impacts of population growth and urban creep are taken into account, this could increase to between 5,500 and 8,900.
Water resource levels	Surplus of around 900 Ml a day	Deficit for the period 2010-39 ranging from negligible to 3 billion litres per day which would represent a fifth of total current demand and ranging between 300 million litres to 6.5 billion litres a day by the 2050s with large regional variations.
Experience of drought	Every seven years on average	Half of water resource zones could be at risk of deficit during a drought by the 2020s (assuming no action to prepare and taking into account climate change and population growth).

Source: UK Climate Change Risk Assessment 2012 and Climate Change Committee Adaptation Sub-Committee 2012 Report

* = Sewer flooding is clearly likely to affect significantly fewer consumers than other types of flooding. However, when it does occur, its effects can be severe.

Extreme temperatures can also impact on water resources in an indirect way. Very cold weather, as occurred in winter 2011/12, can lead to increased pipe bursts and hence leakage rates. Conversely, very hot weather can potentially have an impact on the amount of energy available to transfer and pump water between stressed networks. For example, in the 2003 heat wave in France, the amount of water available to operate nuclear, thermal and hydroelectric plants safely was so limited that production had to be curtailed.[1]

[1] Insight Investments, *Managing the unavoidable, - understanding the investment impacts of climate change*, 2008

The water and sewerage sectors themselves make a direct contribution to climate change. In 2006/07 the UK water industry emitted five million tonnes of carbon dioxide, almost one per cent of the UK total from 23 companies. Waste water treatment accounted for over half of this, followed by the costs of supplying water where energy is needed to capture, purify, pump and transport water around networks. Water usage in the home has an even bigger impact on carbon emissions, accounting for five per cent of the UK's total (this includes energy for water heating but excludes central heating). Demand management measures have the potential to reduce direct and short term resource pressures but also the indirect longer term pressures that can arise from climate change. [2]

Table 1 and the above points demonstrate that there are important questions about the scale, cost and complexity of future climate challenges and who they will impact:

- The significant **range** in the estimates of future impacts in terms of flooding and drought is an indication of the scale of uncertainty in this area. Clearly this area of knowledge is evolving as the evidence base develops. For example, the Government Chief Scientific Adviser recently noted that weather variability was increasing, with the mean distribution of global temperatures getting wider, over two times faster than previously thought.[3] This could make existing projections used by the industry appear conservative.
- There are likely to be **regional variations**. Although estimates are improving, they are still subject to some uncertainty. However, *Water for Life* concluded that future pressures would not be limited to the South and East of England.
- Although the impacts may be experienced to different degrees in each region, their severity could lead to **systemic consequences**. The impacts of more extreme events could spread not only between water companies but also into other sectors of the economy and hit intensive water users the hardest. These risks increase the importance of considering consumer needs from a national as well as a regional perspective.
- The potential impacts of wider **environmental damage arising from climate change**, such as pollution in sewerage, are less well understood but also need to be taken into account when assessing the interests of future consumers.

A climate change report prepared for major UK investors in 2008 noted 'Currently, neither governments nor companies are investing appropriately in adaptation. Effective and appropriate responses are constrained by a number of barriers, notably uncertainty and imperfect information, misaligned markets and financial constraints. Hence, just as profound changes to market incentives are essential for reducing greenhouse gases, so governments need to put in place the right framework of regulation and public investment to manage physical climate risks…However, as investors, we believe that the onus is on companies to evaluate the risks and opportunities associated with the need to adapt to climate change, irrespective of the policy framework.'[4]

[2] The Environment Agency and EST, *The Greenhouse Gas Implications of Future Water Resource Options*, 2009.
[3] Sir John Beddington, *Threats and Opportunities - Scientific Challenges of the 21st Century*, February 2013.
[4] Insight Investments op cit.

4.2 Demographic change and changes in water usage

According to the White Paper, the population in England is projected to grow by just under 10 million by 2035 with much of the increase concentrated in parts of the country that are already water stressed.

Households currently use about half of the water that is put into the public supply. The number of households in England is projected to grow by 10% between 2011 and 2021[5]. 28% of the increase during this time is projected to be accounted for by one-person households. This is the group that currently has the highest average annual usage per person, using 66 cubic meters per person compared to 41 in a four-person household[6]. A further 15% increase in the number of households during this period is due to the growth in 'other' households, including student households and adults sharing accommodation. The extent to which people sharing accommodation in this way will also share activities such as clothes washing or washing up, which according to Waterwise together account for 21% of domestic water use[7], is an interesting question. Per capita water consumption levels in these households may be more similar to single person households. Although many water companies are projecting reductions in water consumption per capita, total demand for water by households will increase as the population and number of households increases.

Whilst total household demand may be going up over time, *Water for life* noted that non-household demand for water is expected to reduce as production processes change and industries evolve (e.g. the water intensive paper industry is in decline due in part to electronic communication). Future modeling will however need to take account of the fact that some new technologies that may be developed are likely to be more water intensive. This is particularly true in the energy industry where power plants with more advanced cooling systems, biofuels, carbon capture and storage and fracking all use more water than previous technologies. Indeed, the International Energy Agency notes that energy is becoming a 'thirstier resource'. It has projected that the amount of global water consumed to produce energy (i.e. not returned directly to the environment) will increase by 85% by 2035.[8]

The combined effects of increasing population, smaller households and changing usage patterns both in England and Wales and overseas are likely to raise demand for water. The White Paper found that water resources are already under pressure. Pollution and over abstraction have led to only a quarter of our rivers and lakes being fully functioning ecosystems. It estimated that demand could increase by around 5% by 2020 and 35% by 2050. Future generations of consumers could have to adapt to sharing less water and more unpredictable supplies. .

[5] DCLG, *Housing Statistical Release*, April 2013
[6] Consumer Council for Water website
[7] Waterwise website.
[8] IEA *World Energy Outlook* 2012

Global pressures

It will be increasingly important to better understand how the global pressures on water resources are likely to impact on water use in this country. The world's population is expected to rise from 7 billion to 8 billion by 2025 and potentially 9 billion by 2050. The Insight Investment report highlighted that 'Hundreds of millions of people will be exposed to increased water stress' and that companies and their investors would need to take this into account in their future plans.[9] The impacts of this on immigration into the UK and hence water demand in this country are highly uncertain.

The Economist Intelligence Unit's 2012 report Water for All? notes that China, India and the US are already over exploiting the ground water in their large aquifers which are crucial to agriculture and world food security. If this pushes up global food prices, it could reasonably be assumed to start to change the attractiveness of growing food in the UK which could have a knock on impact on water demand by UK farmers. It will also be increasingly difficult for water intensive production processes such as printing (where there is a high degree of 'embedded' water) to take place in water stressed areas overseas. This could push these types of activities to counties where there is relatively more resource such as the UK.

4.3 Affordability

Water affordability is already a pressing issue for some consumers. Researchers at the University of York have noted that in 2009-2010, almost a quarter of households (23.6%) were spending 3% of their incomes on water bills, the threshold used to determine water poverty (or 11.5% at the higher threshold of 5%). They found that un-metered, one adult households in receipt of benefits have the highest probability of being in water poverty (0.67). This group makes up 5.4% of total households.[10]

Statutory safe guards rightly prevent disconnection in the industry. However, the knock-on reality tends to mean that water debt is treated as a lower priority by some consumers than other debts (e.g. rent, energy) and hence contributes to rapidly rising levels of company bad debt. In June 2012, the Defra Select Committee heard that bad debt in the sector had added an average of £15 to water bills. This clearly has a negative impact on those who do pay, many of whom may be struggling to do so themselves.

Affordability is likely to become an even more important issue for future consumers if bills need to increase to cope with the effects of climate and demographic change noted above.
In its 2012 report, the Climate Change Adaptation Sub-Committee noted that whereas the annual expected costs of flooding for England were currently around £1 billion, these might rise to between £1.8 and £5.6 billion by the 2080s (at present prices and assuming no further action to repair defences etc. and no population growth). Although flooding costs are clearly shared between various actors, some will undoubtedly fall to water and sewerage consumers through bills as flooding can impact on water treatment and delivery costs.

[9] Insight Investments op cit.
[10] Huby and Bradshaw, University of York, *Water Poverty in England and Wales*, 22 June 2012.

Significant investment is also needed to meet the requirements of European legislation, (much of which is driven by water quality requirements). Failure to do so can result in infraction proceedings. This happened when the UK breached the EC Urban Waste Water Directive in the Thames and was an instrumental argument for the construction of the new multi-billion pound super sewer, the Thames Tideway. The step change in investment is also being driven by the need to replace much of our Victorian water and sewerage infrastructure.

Huby and Bradshaw modeled a range of simple scenarios of the relationship between bills and income until 2033. This is shown in Table 2. It clearly illustrates the significant impact that even minor increases in bills could have on water poverty rates.

Table 2 - Water poverty rates in 2033 given various year on year changes in bills relative to income from 2010

Threshold	Water bills rise faster than average income by:				
	-1%	**0%**	1%	2%	3%
3%	17.2%	**23.6%**	32.4%	42.3%	53.7%
5%	8.5%	**11.5%**	16.1%	21.9%	30%

Source: Meg Huby and Jonathan Bradshaw, University of York, *Water Poverty in England and Wales*, 22 June 2012

It is important to note that the affordability challenge for domestic water consumers is likely to be compounded by the fact that energy prices are also expected to increase. Roughly two thirds of household water use is hot water, for activities like bathing and washing (EST, *Measurement of domestic hot water consumption in dwellings*, 2008 found the average household used 122 liters of hot water each day). Rising water and energy bills would present a double affordability challenge to consumers.

These points demonstrate that future consumers could face even greater affordability challenges than current consumers.

5. What is currently being done to address these challenges?

5.1 Government

The 2011 Defra White Paper, *Water for Life*, accepted the need for long-term fundamental change in the water and sewerage sectors to ensure that future supplies are reliable and affordable. Amongst other things, it:

- Recognized the need to tackle unsustainable abstraction and announced the intention to develop a long-term abstraction plan and to reduce the barriers to trade in abstraction licenses.
- Stated that plans to increase competition and innovation would limit future rises in customers' bills.
- Announced plans to develop a broader understanding of future demand.
- Recognised that Defra has a role in encouraging companies to pilot new local approaches that include initiatives such as water banks.

The *Water Bill* 2013, which is currently going through Parliament, has a much narrower scope than the White Paper.

One potentially significant proposal in the *Water Bill* is the introduction of a new overarching primary Resilience Duty for Ofwat (with the existing Sustainability Duty remaining as a secondary duty). The stated aim of this change is to enable the regulator to prioritize long-term interests and ensure that the White Paper's vision is delivered. This is therefore designed to meet one of the previous criticisms of the Bill- the lack of a long-term focus. According to the Bill's Explanatory notes, the objective is to ensure resilience '*against environmental pressures, population growth and changes in consumer behavior. Action taken to secure resilience may include, amongst other things, promoting long-term planning and appropriate investment; and the full range of appropriate measures to manage water resources and to secure effectual drainage. For example, relevant activities to reduce consumer demand and to ensure the effective management of water resources both within the network and in the wider water environment*.'

The Bill's immediate focus - and much of the commentary surrounding it - is on retail competition for business customers by 2017. The Bill does not include proposals for functional separation within incumbent businesses and instead proposes to prohibit undue discrimination and to facilitate competition and new entry. The success of this will depend to some extent on the market codes that are developed governing relationships (the detail of this is yet to be developed) and how effective Ofwat is in monitoring these and exercising the associated enforcement role (level of fines etc.). However, several commentators, including the EFRA Select Committee, have raised concerns that this will not lead to a level playing field for new entrants. A Ministerial duty to produce charging guidance is also proposed in the Bill to protect households as retail competition is opened up for non- domestic users. Such guidance would also aim to protect all consumers once upstream competition is developed. However, there is currently little detail on this. Ensuring that this is debated and implemented in a timely and decisive way will be important if this charging guidance is to be effective.

The Bill has much less detail on upstream and abstraction reform than may have been expected from the White Paper with much of the change in this area being delayed until 2019. In its pre-legislative scrutiny of the draft Bill, the EFRA Select Committee said that the proposals in this area

were uncertain and that the Department '*appears to lack a sense of urgency*' in reforming the abstraction regime. In its response, the government stated that '*primary legislation now would be self defeating...the regulator and participating businesses are best placed to define the shape of well functioning markets'*.[11] Whilst a collaborative approach does indeed have many benefits, it will be important that the pace of change does not stall. More importantly, from the viewpoint of current and future consumers, the question of who captures the economic rent in abstraction rights - current holders (largely water companies and farmers), taxpayers or water consumers - is sensitive but important. To safeguard the long-term consumer interest and to maintain consumer confidence, it will be vital that there is a public debate around any fundamental changes to the abstraction regime. Defra has already held workshops on this. The consultation on the proposals that should follow could attract significant interest.

The Bill is less prescriptive on the issues of social tariffs and water metering and says little about understanding future demand. On the former, the government continues to take the view that giving guidance to companies that they are expected to develop social tariffs for vulnerable customers is appropriate. This clearly leaves the issue to each company's discretion. The extent to which companies take up the option to develop social tariffs remains to be seen. In its response to the Defra Select Committee in June 2013, the department noted that only a number of companies had introduced social tariffs this year with '*several more'* (but not all) consulting on this for the future. The Bill therefore continues to fail to pick up the recommendation from the 2009 *Independent Review of Charging Household Water and Sewage Services* (The '*Walker Review'*) that at a minimum, a discount scheme should be introduced for low-income households with children. The only area where affordability assistance has been mandated, is in the south west where the *Water Industry (Finance Assistance) Act* 2012 introduced direct payments to reduce water bills by £50 per year. This is a notable contrast to the energy sector where formerly voluntary social tariffs have been replaced with the mandatory Warm Homes Discount for low-income pensioners.

On water metering, the Bill states that this is still an issue for consumer choice and should again be determined by each company and its customers (the extent to which the proposed water charging Guidance will cover metering, remains to be seen).

Legislative change in Wales

At the same time that the Water Bill is going through the Westminster Parliament, the Welsh Assembly Government (WAG) is considering a Sustainable Development Bill that will make sustainability a 'central organizing principle' in WAG's work. This will build on the Sustainable Development duty that was introduced in the 2006 Government of Wales Act. Some of those interviewed for this paper from Wales considered that this duty already has an impact on the work of Welsh Water. The new Bill should in theory make the protection of the interests of future generations in Wales a much clearer priority.

[11] *The Government's response to the EFRA Committee's pre-legislative scrutiny of the draft Water Bill,* June 2013

5.2 Regulators

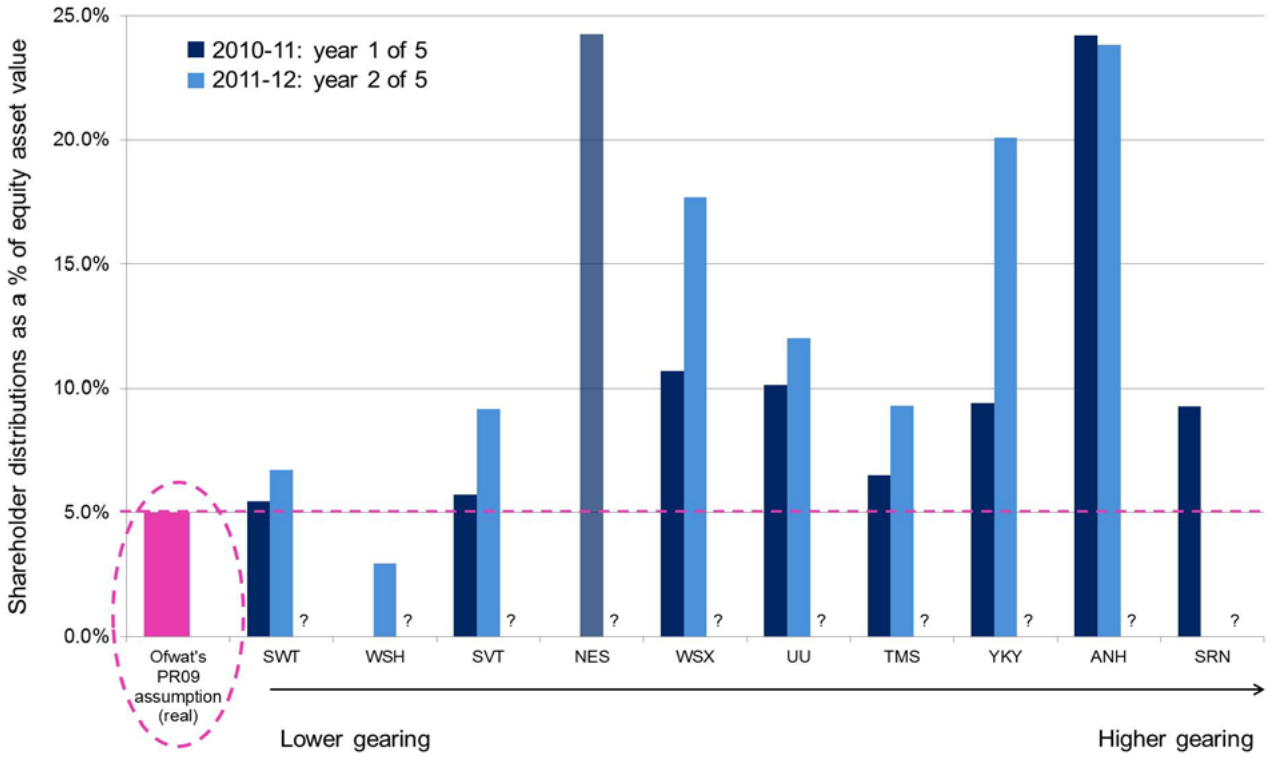
In preparation for the current price review (PR14), Ofwat has reviewed its regulatory methodology and approach for England and Wales. In doing so, it has sought to be less prescriptive and more risk based in the way it works and to get companies to own their problems and solutions. Some of the key changes being introduced to the methodology include:

- **Outcomes based regulation -** this should give companies more choice in terms of approach and enable Ofwat to stay out of the detail of individual decisions.
- **Totex approach** (similar treatment for capital – capex- and operational – opex – expenditure) - this should help address the strong capital bias in decision making where investors are often thought to have an incentive to build more assets due to the positive impact that these can have on Regulatory Capital Values.
- **Separation of retail and wholesale price controls** - this should help reveal more information about the sectors and their cost structures.
- **Tailored incentives** - if a company's business plan is judged to have been well prepared, it could receive 'enhanced' treatment from Ofwat - greater incentive rates and potentially an earlier final determination. Conversely, companies with plans judged to be more poorly prepared may need to resubmit for review. This change should encourage companies to put their best plans in first rather than seek to negotiate with the regulator during the determination process.
- **Customer Challenge Groups** - These independent groups have been established at company level at the request of Ofwat to enable companies to engage with consumer, environmental and quality representatives and for these groups to provide a report to Ofwat on how companies have addressed the interests of current and future consumers in their business plans. This initiative, which includes local Consumer Council for Water, Environment Agency and Drinking Water Inspectorate representatives, should give companies and consumers the freedom to innovate and should empower local decision making.

This set of measures represents quite a significant change to the way in which the industry in England and Wales is regulated.

At the same time that these changes have been made to regulatory methodology, Jonson Cox, Ofwat's new Chair who came into post in late 2012, has also signalled that he considers that there needs to be more focus on company legitimacy and governance. This has started to open up a much wider debate about how the interests of consumers (both current and future) are being balanced with the need to ensure that companies can finance their functions (this is another of Ofwat's primary duties). In a lecture on *Observations on the regulation of the water sector,* on 5th March 2013 he pointed out that in the last five years most companies paid dividends well above those assumed in the last periodic review (see Graph 1) and noted '*As this generation of customers is paying to address past neglect and to build resilience in the future, these issues of legitimacy are important. Given that the license relates to a long-term monopoly public service, I would have hoped that companies would have shared gains that derive from external factors with their customers (gainshare) just as pain is shared with customers (painshare) through, for example, notified items'.*

Graph 1 - Company shareholder distributions versus Ofwat PR09 assumptions (%)



Source: Jonson Cox, *Observations on the regulation of the water sector,* 5th March 2013

Note - companies listed on the horizontal axis (South West, Welsh, Severn Trent, North East, Wessex, United Utilities, Thames, Yorkshire, Anglian, Southern).

He went on to ask '*What steps might we need to take to ensure that companies and others do not put at risk legitimacy of the sector and the customer's perspective during this or future Asset Management Periods*?' One of the issues of concern that Cox highlighted is taxation. Highly geared financial structures have enabled low or minimal tax payments. This has been possible for two reasons. Firstly, because tax is calculated after debt payments have been taken into account (but before dividend payments). Secondly, shareholder loans among the complex offshore holding structures of the privately owned companies which have replaced some of the former publicly listed water companies can also reduce company tax liabilities. Consumers might have two concerns about this. Firstly, as water customers they may feel that the companies could have managed with lower revenues from customers in view of their ability to reduce costs in this way. Secondly, as citizens, they may consider that behavior to reduce corporation tax revenue to the Exchequer is raising the burden on other taxpayers. It may lead some to think that the companies are able to behave according to different taxation rules to the average citizen. The short term financial gain to the companies from lower taxes thus needs to be seen against the longer-term reputational damage that this may cause.

In the lecture, Ofwat's Chair also expressed concern that in some companies the regulated business was run by only an operational board - with strategy and structure reserved for the investor boards

and noted that '*It seems the current principles of the UK corporate governance code are not widely observed*.' If this is correct, it could mean that the interests of consumers are at risk of receiving inadequate attention at the regulated company level.

Scotland

It is worth noting that regulation in Scotland is also going through a process of change. WICS has stated that it will take a top down rather than a building block approach to the 2015 strategic review of water charges. It is also worth noting the difference in approach to customer engagement north of the border. WICS is providing guidance to the independent Customer Forum on the acceptable range of each of the key in-put factors for the price control and then the Forum is empowered to make trade offs within these ranges. Providing the Forum's decision falls broadly within the ranges WICS has outlined, the regulator will endorse their decision.

5.3 Companies

The extent to which the industry is preparing for the long term challenges ahead varies from company to company and is influenced by each company's resources and experience. The sectors were viewed by most of those that we talked to for this paper, as being 'good in a crisis.' However, there was also recognition that problems could develop over a long period of time before they come to light. This point, combined with the fact that in many cases the impact of climate change will only be felt gradually can make it more difficult for companies to prepare in a proactive way for some of the challenges that they face.

Some companies have done significant work to improve connectivity within their own area or make new connections with neighbouring companies. The Water Resources South East project (set up by companies and the Environment Agency in the region for the previous price control and continuing), and the more recently established Water Resources East Anglian group, are examples. Several of those interviewed for this paper expressed frustration that at the last price review, Ofwat would not support some of the recommendations of these groups if they involved cross boundary work that extended outside a given company region - even though this would have benefited the consumers of that company in the longer term.

Welsh Water

Since becoming a mutual, Welsh Water has cut its gearing level to 63%, the lowest in the sector - largely as it has not had to pay out dividends to shareholders. This has given the organisation greater financial stability and the ability to focus on customers and the long term. The company sees this as a 'virtuous circle.' For example, Welsh Water is able to invest in energy schemes that have pay back periods that go beyond the five-year price control period for proven low risk technologies such as PV and Hydropower. The company's 'Rainscape' approach to surface water management is another good example. Here Welsh Water support a range of initiatives which aim to reduce the amount of rain water going into sewers, many of which also have wider community benefits and which may be lower cost solutions than traditional engineering responses. Previous poor performance in terms of environmental indicators such as pollution incidents is now being turned round.

Climate and demographic change are likely to increase the importance of water companies innovating and/or working with partners from beyond the industry itself. The number of companies that have developed innovative approaches and long term partnerships with a wider group of stakeholders, particularly those upstream or who face similar flood challenges (such as highways authorities), is fewer. Wessex Water is worthy of note here for their pioneering work introducing 'Payments for Environmental Services' to farmers to get them to change the way that they farm to help reduce polluting run off. New entrant Albion Water's work with developers, which is evolving to the provision of wider environmental services, is another leading example. Anglian Water has established a Water Innovation Network to develop new ideas and approaches with a wide range of stakeholders.

Community based solutions - the role of new entrants

Decentralized local responses to specific problems have the advantage of connecting communities to the water resources that they use. Demand management may be easier if consumers involved feel that they have a personal stake in the resources that they use. For example, Albion Water has already found that in some new developments, its staff are able to work closely with customers on multiple issues, including water efficiency. The flexibility and diversity of response that smarter solutions can bring should help improve the resilience of the sectors. As almost by definition such measures will be introduced in an incremental way, they should reduce the risk of redundancy and stranded assets. Such innovation has the potential to ensure improved service continuity and stability and secure a lower cost of capital.

6. Gaps in addressing the challenges and opportunities for change

6.1 Long term focus – Ofwat resilience duty

The proposed resilience duty for Ofwat in the *Water Bill* does indicate support for the importance of long term planning by companies. However, the current lack of detail makes it difficult to assess how it will work in practice. As the Bill goes through Parliament, it will be important that Government clarifies various points. The extent to which the new resilience duty is different from Ofwat's existing secondary sustainability duty will need to be fully understood. In theory, resilience should be easier to define than sustainability, making it easier for Ofwat to set appropriate boundaries in its decisions in this area. However, using resilience standards (such as the ability to withstand drought in a given time-period) may lead to an inflexible approach. A resilience duty which just reinforced or locked companies into existing ways of working and was narrowly defined to favour capex solutions and 'pouring more concrete' may not be beneficial. Read across from current debates on the Reliability Standard that is being devised as part of Electricity Market Reform may be helpful here (this is being formulated on the basis of willingness-to-accept a loss of supply rather than willingness-to-pay). How Ofwat chooses to interpret the resilience duty alongside its existing primary duty to protect the interests of current and future consumers will also be key.

In interpreting this duty, Ofwat will clearly need to think carefully about not only what level of investment is appropriate to ensure resilience but also the extent to which redundancy in the system, and potentially stranded assets, is acceptable. A network, which is engineered to withstand all droughts, may be resilient but would come at a cost that some consumers, and indeed GB Plc., may find difficult to afford.

How the resilience duty is embedded in the regulatory approach will also be important. For example, might the duty enable Ofwat to take a different starting point or 're-set' with companies? So, for example, rather than asking them to justify their metering or Sustainable Urban Drainage Systems (SUDS) plans, might it require them to justify why they have not opted for a universal metering plan or more widespread SUDS? Will it lead to more regulatory focus on long term Strategic Direction Statements? And how will the new duty be taken into account in PR14? What will companies need to do to ensure that resilience is reflected in their Business Plans? Will it need to be integrated into Cost Benefit Analysis? How will resilience be incorporated into long-term company plans?

Developing a set of principles, which could help give effect to this duty, could be useful. For example, these could include:

- Resilient services should be able to withstand long-term climate, demographic and affordability challenges. They should thus take into account both environmental (covering flooding, drought and water and sewage quality) and social impacts. Services which are socially resilient need to recognise affordability issues and the perceived accountability and legitimacy of company financial structures and return policies.
- Resilience should be assessed on outcomes for current and future consumers, not on the methods used to secure change.

- Resilience can be achieved in different ways, not just by doing things as they have always been done. Examples of resilience related initiatives could include catchment management, local co-operation, demand management, storage and interconnectivity.
- Resilience, particularly to systemic problems, can often be better achieved by organisations co-operating and working together across boundaries (whether these are geographical, company based or functional) and over price control periods. Resilient business plans should thus look beyond a company's own immediate and direct challenges.
- Resilience requires measures to reflect scarcity and the importance of the wise use of resources. Where appropriate it should take the precautionary principle into account
- Resilience requires some degree of diversification and the spreading of risk, both within and between companies and their supply chains.
- Resilience should encourage no regret options to be developed, along with modular and scalable solutions.
- Resilience in sewerage services is just as important as resilience in water supply.

Given the potential significance of this new duty, it will be important that its effectiveness is assessed. This will necessitate the collection of both quantitative and qualitative evidence.

6.2 Government strategic vision

Although many of those interviewed for this think piece thought that the White Paper was a good assessment of the challenges facing the sectors, some considered that it lacked a discussion of the financial implications. For example, it does not cover how the money to pay for the investments needed will be raised. As such, customer legitimacy and benefits sharing are considered to be not adequately addressed.

The *Water Bill* which is going through Parliament is not as currently drafted a comprehensive response to the areas that were identified in *Water for Life* as needing action. Beyond the commitment to a long term focus as encapsulated in the proposed resilience duty, it is not clear from the Bill what the Government's strategic vision for the sectors is, particularly after 2025 - the deadline for meeting the requirements of the Water Framework Directive. As noted in David Gray's report for Defra, the Government has yet to make clear its preferred approach to the trade offs between affordability, financeability and environmental issues to Ofwat.[12]

On the issue of affordability, for example, the Bill does not make the introduction of social tariffs or any other forms of social protection a statutory requirement. Rather, it seeks to address the issue indirectly through the introduction of retail competition for non-domestic users, in the hope that this will help to drive down overall costs and hence make bills more affordable. The potential scope for this to lead to long term, as opposed to one-off, efficiency savings and for these to trickle down from the non-domestic to the domestic customer base remains to be seen.
Whether market reform is able to reveal more information about resources, assets and costs, and is thus a pre-requisite for other changes, is an important issue that will need to be monitored. Arrangements will need to be put in place to ensure that as much of this information as possible is

[12] Defra, *Review of Ofwat and consumer representation in the water sector*, 2011.

made publicly available so that new entrants are aware of the opportunities and to ensure that domestic consumers do not bear the costs from the development of a market from which they are excluded.

Analysis will also be needed as to whether the efficiencies and cost savings envisaged could be largely achieved through competition for the market (i.e. through more competitive procurement practices) rather than through introducing competition in the market. The Cave Review[13] recommended introducing a duty on companies to consider schemes proposed by alternative suppliers - whether these are inside or outside their current company boundaries - so that they procure the best value services. The review identified that this measure would have a discounted Net Present Value (NPV) over 30 years of £1,300 million. This is significantly higher than the NPV the review calculated for retail competition that was £600 million.

By opting for retail market reform for non- domestic users before these questions have been answered, there is a risk that Government will get tied up in detailed process issues before the bigger picture questions of the future direction of change have been clarified. The extent to which retail competition is a distraction from the more fundamental challenges that the sectors face is an issue that was raised by many of those we interviewed for this paper. Several thought that potential supply / demand imbalances were the most pressing issue and that this was not sufficiently addressed in the Bill. There were some doubts as to whether the Bill's plans for abstraction reform would make a significant contribution to addressing such imbalances.

During the passage of the Water Bill, the Government needs to clarify its strategic priorities for the sectors in the long term and how trade offs between affordability, resilience, environmental interests and financeability should be dealt with. Prioritising policies should help remove some of the complexity from the policy framework and enable a more simplified, streamlined and strategic approach. Such a framework will need to articulate what value should be given to protecting the interests of future generations as well as current consumers.

A clearer policy framework should give companies the room to respond to the challenges that they face in an agile and flexible manner. It is important to note, however, 'flexibility' if implemented without a long-term strategic framework, could potentially risk increasing unpredictability and uncertainty and thus push up the cost of capital. Getting agreement on the context in which flexibility is to be exercised is therefore important. This will be an important part of the debate on Ofwat's new resilience duty proposed in the *Water Bill*.

Whilst each company faces different resourcing challenges, and must clearly own and be responsible for its own problems and solutions, a better understanding is needed as to what contributions different initiatives may make at the macro level to the supply / demand question so that Government can prioritize its policy development accordingly. The Cave Review's NPV analysis of different mechanisms provides an excellent starting point here.[14] The following box demonstrates the key initiatives where a clearer public narrative is needed as to what Government policy priorities should be.

[13] Professor Martin Cave, *Independent Review of Competition and Innovation in Water Markets*, April 2009
[14] Professor Cave, op cit.

What priority should be given to developing policy in the following areas?

Abstraction reform - some of the water companies in the most water stressed regions already hold most of their abstraction rights. Reform in this area, which will be complex and time consuming, will require a wider cultural change and could therefore have a potentially low and / or delayed impact to overall levels of supply. However, if this led to the *auctioning* of abstraction rights so that some of the economic rents could be captured by Government or a regulator on behalf of consumer and environmental interest, it could have some long-term benefits. For example, Jon Stern has explored new ways of dividing abstraction rights which are based on a model of percentage shares, where environmental interests can also have a stake and could thus lead to a more equitable distribution of the limited resource available.[15] Such measures will need careful analysis before they are implemented, and if beneficial, would need to be embedded in further reforms.

Increased connectivity and water trading - there continue to be significant differences in how companies optimise and interconnect their networks, although many of the companies in the most water stressed regions are already well connected and transfer water on a regular basis. Some of those interviewed for this paper were concerned that it may be difficult to get companies to trade water in the event of a prolonged or widespread drought as they will wish to assure their own customers' supplies. Several of those interviewed thought that Defra's estimates of the amount of water that could be traded were therefore unduly optimistic. Monitoring and potential further regulatory changes may be needed if a reluctance to trade becomes evident. More detail is needed on the pricing rules for network access and bulk supply provisions in the W*ater Bill*. When assessing the contribution that connectivity and trading can make to future supply, it will also be important to bear in mind the associated energy costs of moving water around.

Increased small scale water storage solutions - may be beneficial on green and brown field sites, but the extent to which these can be developed within existing networks needs to be assessed. Even if their contribution to the supply / demand imbalance is limited, they may well have an added benefit in terms of providing local storage for storm water and thus help reduce the surface water run off that can cause flooding. Solutions such as reed beds and water banks can fulfill these functions and also have an important visual amenity / recreational value.

Large-scale water storage solutions - it has been a very long time since a new reservoir was built in England and Wales. The costs of doing so, in terms of the time taken to get planning consent, relocation costs and the energy needed for the build, are however likely to be high. It will be important to learn the lessons in terms of time needed and obstacles faced from other significant national infrastructure development such as the Thames Tideway and High Speed 2.

Leakage - As the Climate Change Committee's Adaptation Sub Committee *found*, leakage levels have leveled off since the 1990s.[16] As water becomes increasingly scarce, the perceived 'economic' level of leakage will change. Ensuring that consumers understand the reasons for the street works that may be needed to mend leaks will require a long-term communications strategy.

Continued /

[15] Jon Stern, *Water Rights and Water Trading in England and Wales*, May 2013
[16]Climate Change Committee, Adaptation Sub Committee. *Is the UK Preparing for Flooding and Water Scarcity?* 2012

/ Continued

Demand management / water efficiency - there is considerable scope for reducing water consumption through demand management and water efficiency initiatives. The White Paper noted that there was already a significant range in per capita consumption levels between different water company areas in England and Wales, ranging from 110 liters per person per day in the former Veolia Water's East region to 165 in South East Water. The potential for reduction is reinforced by the fact that the average per capita consumption level in Europe in 2008 was 130 liters, going down to 110 liters in Belgium and the Czech republic. [17] Indeed, The Economist Intelligence Unit's survey of water companies in developed markets found that the main barrier to ensuring sufficient clean water supplies by 2030 was thought by 48% of those questioned to be wasteful consumer behavior.[18] As the Climate Change Adaptation Sub-Committee found, water companies currently tend to focus their efforts on supply and only then demand and leakage. Although demand management is an integral part of every company plan for PR14, the *Water Bill* is almost silent on this issue and the question remains as to whether the pace of change in this area is fast enough. Work to promote greater efficiency and behaviour change in the energy sector perhaps points the way.

Water metering - this is widely seen as a prerequisite for substantial and sustained behavior change in terms of water usage. Although on average 40% of households in England and Wales are currently metered, there are wide variations with some companies already metering over 70% of their customers. There is clearly scope for further change in some areas. The reluctance of some companies to push faster on metering is in part due to the fact that as this extends to those who will pay more with meters, such as large families, there will be increasing pressure for the distributional impacts to be dealt with. The *Walker Review* recommended a revised approach to metering which could deliver an 80% metering rate by 2020.[19] To enable this transition, the report recommended measures to protect low-income households and that Ofwat be tasked with assuming proactive leadership in this area). The White Paper and the Water Bill 2013 have not followed through on the *Walker Review's* recommendations in this area.

Planning, building and product regulations - changes in standards and 'choice-editing' could reduce the demand for water and the potential contribution of consumers to flood risk. For example, this could include requiring increased grey water use in new build, or, as the Climate Change Adaptation Sub-Committee has identified, tightening rules on building in flood plains (where developments have occurred at a faster rate than elsewhere in England in the last 10 years) or measures to prevent the paving over of front gardens (where the area of hard surfacing in England's towns and cities has increased in the last ten years). There could also be scope for further requirements on large water users such as golf courses or certain types of agricultural or horticultural businesses to do more to collect and store their own water and increase the use of grey water.

[17] The Environment Agency, *International Comparisons of domestic per capita consumption*, 2008.
[18] The Economist Intelligence Unit, *Water for All? 2012*
[19] Defra, *The Independent Review of Charging for Household Water and Sewerage Services (The Walker Review),* December 2011.

In prioritizing policy initiatives, Government will need also to consider interdependencies. For example, company leakage rates will need to be seen to have improved before some consumers are willing to engage in demand management activities. Similarly, companies which have not got extensive metering or leakage programs in place are unlikely to get support to build a new reservoir.

A high level analysis may suggest that without the construction of new reservoirs there is likely to be a national water shortfall. However, two points need to be taken into consideration. Firstly, some lower cost measures may well have limited impact but may help to buy time and defer the need for more significant investment. Delaying significant capital expenditure can thus help address shorter-term affordability concerns. It can buy time to put social protection measures in place and to develop new innovative mechanisms for service delivery, which may be cheaper. Clearly, careful cost benefit analysis will be needed to ensure that any deferral does not put up the long-term cost of a solution, which may anyway eventually be needed. It will also be important to assess and monitor what is being done to address the issue through other means to ensure that is is not just 'kicked into the long grass'. Secondly, although the contributions of some of these initiatives on their own may appear to be minor, taken together they could signal the start of a different way of providing water and sewerage services which could alter the costs and benefits of the other options.

6.3 Regulatory approach

A clearer direction from Government on its vision for the sectors should help regulators to enable smarter solutions. The current complexity has meant that despite recent positive steps by Ofwat to reduce the regulatory burden, the regulatory system continues to be technically detailed and difficult for outsiders and new entrants to understand. For example, some companies are having to get external regulatory experts to help them with regulatory menus for the price review. There is a risk that the Boards of these companies may not have a clear line of sight of how their Business Plan is constructed. When this is considered alongside the different approaches of the environmental and quality regulators, the position is even more multi-dimensional. Split agency problems and inconsistent treatment and messages remain a risk that many new entrants may consider is not worth taking. At the same time, consumer representatives may feel alienated from the decision making process.

Regulators should continue to move towards providing a more **strategic, simpler and less interventionist** approach. Ensuring clarity around how Ofwat's new resilience duty will be interpreted and implemented will be a necessary pre-cursor to this. As well as focusing on five year planning rounds, Ofwat should also specifically focus on companies' longer term 25 year Strategic Direction Statements. In doing so, companies should be able to focus on long-term delivery to customers and other stakeholders. More analysis of how the interests of future consumers' interests are represented in these Statements would be helpful.

Support for innovative initiatives, which although more expensive in the short term may have greater long-term consumer benefits could be part of such a change. Making it easier for plans to be funded that may straddle company boundaries (such as some bulk transfer arrangements) or involve companies who are not immediate neighbours, as suggested in the Cave Review, would be similarly important. Innovative schemes that recognise water at the heart of a sustainable environment, such as Payments for Environmental Services, should also be encouraged by regulators. The Cave Review had also recommended that a Research and Development body be established with funding from customers for the water sector to produce an agreed R&D vision and

to co-ordinate work in this area. To further this goal, Ofwat could consider introducing an innovation funding mechanism, along the lines of Ofgem's Low Carbon Network Fund and Network Innovation Competition for the electricity and gas distribution and transmission companies, to give more impetus to achieving change.

Regulatory **transparency**, not just around price review decision points, but also on what is being done to smooth investments and take into account plans which extend beyond price review periods would be helpful. Transparency could range from more detail on company returns (for example, a regulatory requirement for companies to make an annual disclosure on each of the onshore and offshore holding companies, showing their debt and equity structures, the directors interests and their governance) to providing information in a format that consumers can understand (such as quoting price changes in nominal terms rather than RPI percentages). Opening up reporting should make it easier for companies, new entrants and consumer groups to engage with the issues and help the different stakeholders to test their ideas on each other. It will help in the on-going education that will be needed so that consumers and others understand the difficult trade offs that exist – particularly around climate change and intergenerational equity.

Changes along these lines should reveal whether the sectors have been under-pricing their services leading to long-term under investment and cumulative degradation of the infrastructure (particularly in sewerage). Without greater openness, there is likely to be growing and more vocal opposition to price increases. For example, the Centre Forum's recent report concluded '*As we approach the next price review, there must be an acceptance that further price rises cannot be an option. Given the returns made by companies in recent years they have no justification.'* [20] Greater transparency and simplicity should build consumer trust in the regulatory regime and also help to signal to investors what the real level of risk in the sector is.

Clearer objectives should increase the scope for tools such as **reputational regulation** and other initiatives which encourage companies to be more consumer facing, focused on the bigger picture and empower them to pursue no regret plans and plans which don't foreclose future options. The 'enhanced' treatment for robust business plans as proposed by Ofwat for the current price control is a good first step. The impact of this initiative will need to be carefully assessed. Regulators may need to bolster their communications and relationship building skills to fulfil this type of role - not just around price reviews.

More could be done to learn from the diversity of approaches in the UK, to identify examples of different ways of approaching the sector's challenges. Case studies could also help in understanding how risk and cost sharing models are viewed by the wider public and water consumers. For example, the Water Industry Commissioner for Scotland's forthcoming Strategic Review of Charges for Scottish Water, in which the regulator proposes to take a top down rather than a building block approach, should provide valuable insight. Learning from experience overseas is also important. In this context, several of those interviewed for this think piece have pointed out that the lessons from Australia and the US where they have already had to face extreme climate events are relevant. The European experience, where the sectors are still largely in the control of municipalities, and where costs are frequently less transparent, may not always be as applicable.

[20] Centre Forum, *Money down the drain*, July 2013

6.4 Company governance and culture

Company governance is likely to be important to unlocking some of the changes in corporate behaviour required to drive innovative approaches. Consumers may increasingly want to know to what extent water company Boards focus on strategic objectives, not just in terms of financing, but how they develop the forms of corporate culture and behaviour necessary to deliver long-term investment and innovation. Consumers may legitimately ask how far Strategic Direction Statements, Water Resource Management Plans and Business Plans are aligned, owned by the Board and used to drive the business and investment decisions - not regulatory submissions which 'sit on the shelf.'

To change the corporate culture in some companies may require the development of more **diversified boards and executive teams**. Leadership groups which proactively seek to benefit from a wider range of backgrounds, including those with expertise in customer communications and reputational risk management, are likely to be more resilient and better placed to develop long-term stable relationships with their consumers. Such groups will recognize the importance of 'owning responsible capitalism'[21] and ensuring that company values are reflected not just in Corporate Social Responsibility (CSR) work but also in the core business.

Involving **external partners** is a good way of changing culture throughout the business. As previously noted, although some companies are engaged in initiatives to develop smart solutions, this approach has been patchy. More needs to be done to encourage all companies to operate in a smarter way and to encourage new partnerships and skills. This will necessitate moving away from a risk adverse engineering culture to a more open one where companies are willing to try new approaches.

The *Water Bill's* proposed 'undue discrimination' provisions should in theory help bring new entrants and partners into the sectors. However, other measures are also likely to be required to attract a broader range of participants who may bring fresh approaches and expertise in dealing with the sectors' challenges. The EIU report *Water for All?* Identified lack of **skills and expertise** as a barrier to change in the sectors. The shortage of skills (political, sociological and managerial) in the UK could be exacerbated by an international shortage. 27% of those questioned in the EIU survey from developed markets also said that they were uncertain whether they had the necessary risk management skills to cope with the challenges that they faced. These skills are needed both to manage downside risk but also to take advantage of upside opportunities.

Corporate culture can also be influenced by the **pay and reward structures** of senior leaders. Performance rewards which are linked to short term performance targets such as share prices rather than longer term goals such as resilience targets or efficiency programs may make it more difficult to ensure that the interests of future generations are taken on board in strategic decision making.

There is potential for alignment between future consumer and **investor interests** here. Investors such as pension funds will want to ensure that they have exercised their stewardship responsibilities under the UK Stewardship Code to ensure the long-term success of the companies that they invest in. The guidance notes to the Code state, 'Stewardship activities include monitoring and engaging

[21] JCA Group, *Leaders on Leadership*, 2013

with companies on matters such as strategy, performance, risk, capital structure, and corporate governance, including culture and remuneration'.[22] If they are signatories of the UN Principles for Responsible Investment, such investors will also want to ensure that their investments meet Environmental, Social and Governance (ESG) criteria.

[22] Financial Reporting Council, UK Stewardship Code, 2012

7. Aligning current and future consumer interests

7.1 Future consumer views

In order to develop a more integrated vision for the sectors, Government should start from the long-term needs of future generations and then work back. Defining consumer interests in the water and sewerage sectors can be difficult. The delivery of what may be seen as a public good (or as it would be termed in the EU a service of general interest) through the private sector can mean that many consumers are confused about who is responsible for what, and may not recognise their own responsibilities. Relatively low water bills in historic terms, lack of choice of provider, a method of charging which often has no relationship to the volume of the water used and no exposure to disconnection have helped to make many consumers indifferent to their water and sewerage services. It can be difficult to get people to value the water that they use or to be demanding customers.

Defining future interests is even more challenging, as people have a tendency to discount the future and can find it difficult to envisage being in a situation that they have not yet personally experienced. Market research, such as the willingness-to-pay research being conducted for the 2014 price review, amongst current water and sewerage customers is a helpful starting point. However, this needs to be supplemented and linked to other analysis to take into account future interests.

The water and sewerage sectors are in many ways a classic case of the tragedy of the commons - individual consumers can on their own act rationally although this may lead to degradation or depletion of the resource on which they depend. In such cases, deciding on how the collective interest of future consumers is best taken into account needs careful thought. One option may be a bigger role for environmental and citizen representatives. These groups should be in a good position to develop some of the principles that could underpin and define the concept of resilience.

There is also the question of whether elected representatives, whether at the national or local levels, should play a greater role in this process. Elected representatives should represent a broader range of citizen and community concerns than single-issue pressure groups. However, their involvement would also present other challenges. Elected representatives may have a bias towards short-term electoral cycles and concerns such as land-use planning, or local job creation, rather than the interests of future generations. This has led Sir John Armitt, the former Head of the Olympic Delivery Authority, to propose new infrastructure planning commission to oversee long-term infrastructure projects.

It is also worth noting the disengagement of many young people (and thus future generations of voters) in the political process. For example, in a recent study the Hansard Society found that only ten per cent of those under 35 could name their MP (*Audit of Political Engagement,* 2013). Elected representatives may also be biased in favour of their own constituency and may find it more challenging to represent citizens in other localities who may be impacted by uncertain long-term change. Placing their involvement in the context of long-term strategic frameworks, as has happened in the Devolved Assemblies, is one way of tackling this point.

Who best represents future consumer interests becomes more complex once the systemic consequences of climate change are taken into account. If the water problems in one region have a knock on effect elsewhere in the country, there are likely to be increasing calls to share the risks and

costs of meeting the challenges. The challenges facing Thames Water, which has the largest projected supply-demand deficit in the country, could bring this issue to a head as the political and economic importance of protecting supplies and property in a world capital cannot not be overstated. This not only raises questions about how future interests should be represented but also goes to the heart of the issue of who should pay for the costs of adapting to such long-term challenges.

If there are going to be increasing demands to share the costs of inter-connection, it begs the question of whether it would still then be appropriate for costs of the infrastructure associated with interconnection to be recovered through water consumer bills on a company by company basis - rather than through a national levy on water bills, or indeed via national taxation. Other methods of raising money to meet future challenges may be needed such as the auctioning of abstraction rights.

As water is at the heart of a sustainable environment, if the more severe climate change scenarios become more probable, all consumers, whether domestic or non-domestic, direct users or indirect users, are likely to become more vocal in arguing for their rights in terms of access to water resources, who should get what and how much they should pay. Again, this raises distributional questions. If costs are to rise significantly as a result, is it possible to ensure social protection through tariff structures or would it be easier to ensure some or all of these costs are met through the more progressive tax system? The lessons from the energy sector where rising prices have seen fuel poverty rates rocket are salutary here.

7.2 Future engagement and ownership

The Customer Challenge Groups established for PR14 represent a significant development in consumer representation in the water and sewerage sectors. It is clearly important that the interests of future consumers are integral to their work. Annex A contains a list of questions which could be used to structure conversations between Customer Challenge Groups, companies and others about how best to meet the needs of current and future consumers both in this price review and going forward. It is hoped that these questions will facilitate discussion around the pace of change in the water sector and make the trade-offs between short and longer-term interests clearer. At the end of PR14, it will be important to review the process. Some of the issues such a review could explore, in terms of consumer involvement, could include:

- The extent to which the new Customer Challenge Groups have been able to take the views of future users into account and the mechanisms that they have used to do this;
- The extent to which questions around company legitimacy, company structure and governance, have been seen as an appropriate area of interest for the Groups (by Ofwat, companies and consumers) and the extent to which they have featured in the Groups' engagement work and what behaviours and safeguards are seen by the public as important to preserve legitimacy;
- How consumer interests which are likely to cut across company boundaries in the future have been dealt with in the price review process at a strategic level; and
- What arrangements have been put in place to ensure that there is a continued consumer dialogue with companies between price control periods to ensure that long-term issues are tackled in a measured way.

Such a review will make an important contribution to the debate about how the interests of future generations are reflected in decision making. In the shorter term, it could lead to changes in the

membership or terms of reference of the groups, a demand for on-going engagement or calls for greater co-ordination between them, possibly through a national 'forum'. However, in the longer term, particularly if the industry is slow to respond to some of the initiatives already in train or proposed in this paper, it could lead to more radical calls for change. Although the water industry is far from in crisis, many of those interviewed for this paper thought that the complexity of many of the issues faced, and the political unpopularity of the increases in bills that a step-up in investment may lead to, meant that there was a real likelihood that hard choices might be put in the 'too difficult box' and delayed until some unknown time in the future. This could lead to increasing pressures for more fundamental change in how consumers are involved in decision-making:

- **Securing consumer behaviour change** - as the benefits and cost-saving potential of demand management become clearer, the value of companies engaging with and building a long term trusted relationship with their customers will become increasingly important. In the absence of this, it could be difficult to get sustained behaviour change and for a wider range of techniques, such as social marketing, to be effective. Customers, who are being asked to play a greater role in terms of adapting their own usage, are likely to be more assertive in terms of what they expect from companies in return.

- **Changes to the abstraction regime** – any reforms to abstraction rights could lead to more widespread public debates around the ownership of water resources, whether these should be held in private or public hands, how far abstraction rights should be auctioned and who captures the revenue from auctioning – e.g. consumers of individual companies or taxpayers Taking abstraction rights away from water companies (and by extension therefore their consumers) – e.g. via a system of auctioning of abstraction rights in localities - could lead to demands for new ways of dividing up the resource into fair shares.

- **Bills and affordability** - The longer investment to meet climate and demographic change is put off, the greater the likelihood that bills will have to rise steeply to pay for the changes needed. Consumers do not like 'bill shock.' As long as water bills remain at relatively low levels in historic terms, consumer interest maybe somewhat limited. However, as has been seen in the energy market, in an era of rising bills there is likely to be increased public comment and scrutiny in how prices are set and whether bill increases are justified. As has already been noted, affordability is already a significant challenge in the sector. Rising bills and any moves to compulsory water metering could lead to customer actions such as a boycott and / or a bill payment strike. With companies unable to disconnect for non-payment, the impact of this could be significant. Examples of similar mass protest include the poll tax protests in the early 1990s where in some areas non-payment rose to 25%.

- **Optionality** - Delaying tackling the underlying challenges facing the sectors could foreclose some future options, particularly those that have longer lead times. If companies and investors are viewed as not exercising the appropriate degree of stewardship in the sector, consumer resentment could build.

- **Extreme events** - Change may be forced on the sectors if they are unable to respond to extreme weather events. For example, if flooding left consumers without water supplies for any length of time, this could lead to a strong political and customer backlash. This situation almost happened in Gloucester after the 2007 floods, where customers were left without water for 10 days and social unrest became a distinct possibility. As well as leading to short to medium term service disruption, this raises the risk that the solutions adopted are short-termist and not well thought

through. As companies increase water-sharing initiatives, the degree to which the sectors as a whole can be insulated from the failures in any one organisation will reduce. A domino- effect could potentially emerge and more widespread unplanned change be forced on the companies.

- **Financial impacts** - should the cost of long-term borrowing rise, companies may find it difficult to refinance their debt (e.g. if we see higher inflation). This, especially if it was to coincide with the costs of dealing with extreme weather events, may make calls for increased state involvement a possibility. This could range from intervention in specific schemes (as is happening with the Thames Tideway and Thames Water's proposed £29 customer 'levy') to the potential for greater involvement (possibly along the lines of Network Rail). Highly geared companies have traditionally tended to be more risk averse and have found it more difficult to respond to external challenges. Given that in 2010 the average gearing rates in the sectors were 72%, many companies could be affected in this way. [23] Those companies which are seen as having made the greatest returns could be particularly vulnerable to change being imposed from the outside:
- **Changes in other sectors -** as customers are being increasingly asked to pay through their bills for other infrastructure investment programmes (Infrastructure UK has highlighted that £300 billion of investment will be sought in the next 30 plus years), it will be difficult to isolate how consumers view and engage with the water industry with how they view and engage with other sectors.

Taken together, and particularly in the absence of any fundamental change in wider policy or regulatory arrangements, the above factors could lead to increased questioning about how companies relate to their customers and indeed whether they retain a 'social license' to operate. To some extent this is what happened with Railtrack, leading to the creation of Network Rail.

The amount of public interest in this area has already started to grow in recent months. Following the take over bid for Severn Trent in May this year, the profitability of the company led Corporate Watch to speculate on the need to renationalize the water sector. Although others have stopped short of calling for such significant change, public concern with legitimacy is very much a live issue. For example, in a report for Unison by The New Policy Institute, they have argued that Government should carry out a root and branch review of the industry to make sure that '*it's being run in the public interest.*'[24] Others have also questioned the level of dividend payments: '*For twenty years, UK water companies have paid out dividends substantially in excess of their cash flows net of interest. We have argued that there is no convincing explanation for such high payouts to be found.'* [25]

The funding of the Thames Tideway Tunnel has acted as another focus for this concern. In his Foreword to the Centre Forum's July 2013 report *Money Down the Drain*, Sir Ian Byatt noted Thames Water's 'excessive' dividends and how these had damaged the company's credit rating to the extent that it was having to ask the Government for guarantees to enable it to carry out the super sewer project. In response, he has called for a sliding scale of dividend control to be introduced

[23] Severn Trent, *Changing Course - delivering a sustainable future water industry for England and Wales,* April 2010
[24] New Policy Institute. *The Water Industry: A Case to Answer,* 2013
[25] Seth Armitage, University of Edinburgh, *Demand for dividends: the case of UK water companies*, Draft April 2011

whereby dividend payments above that assumed by the regulator would be accompanied by reductions in tariffs to consumers. The report recommended that the EFRA Select Committee should hold an inquiry into the profits and share holder returns in the sectors over the last two price controls. Public questions in this area are unlikely to go away. For example, people may ask 'why should essential monopoly services that are 'too big to fail' be allowed to make high dividend payments whilst at the same time relying on debt financing for new investment?'

What is clear is that it is in the interests of current and future water consumers to maintain stability in the system (in terms of service levels and attracting investment at as low a cost of capital as possible). Crucially, to meet the challenges outlined in this paper, this will need to be achieved within a flexible and gradual programme of change. To address these needs, the Chief Executive of WICS has recommended a long term 'grand bargain' should be struck between the key players and consumers. Such a bargain could set out what each side would agree to do for the other in terms of sharing pains and gains, rights and responsibilities. To be successful, the agreement would need to be struck in a transparent way and to commit both sides to on-going dialogue and joint work.

A 'grand bargain' could operate at the national level, recognising that as water sits at the heart of a sustainable environment, some degree of integration and co-ordination of response between companies, consumers, policy makers and regulators is essential. As well as ensuring a joined up response, it would also need to take into account the importance of sharing learning and good practice.

Another form of 'grand bargain' could however operate at the company level, possibly along the lines of some form of 'negotiated settlement'. This type of formal constructive engagement involves the users of a regulated monopoly and the monopoly owner negotiating to reach a settlement as to the costs to be funded and revenue to be collected from users.

For such 'grand bargains' to work, at national or company levels it would be important to address the issue of capacity building in consumer and other public interest groups. Ensuring that consumers have adequate advice will be part of this. Traditional channels, such as company reporters (the expert advisers who review company plans for Ofwat) who may have a strong engineering bias, will need to be supplemented by other sources of independent expertise including finance and commercial innovation. As the prize of such an agreement should be more stable long-term returns, this is something that investors should value.

The extent to which such 'voluntary' bargains could effectively operate in the privatised English water industry may, however, be debatable. If changes to consumer engagement on their own do not convince the public that companies have a social licence to operate, there may be increasing pressure to look at different ownership models. Alternative scenarios could range from local community based solutions (such as social enterprises or Community Interest Companies) to mutual organisations, along the lines of Welsh Water. At the local community level, this may only be possible in green or brown field sites. However, changes to the abstraction regime could open opportunities in this area. There is also a lot to be learnt in this regard from community initiatives with renewable and distributed generation in the energy sector. The emergence of new alternative and sustainable ways of financing the sector, such as water bonds and community infrastructure levies, as are being explored by Anglian Water's work with the University of Cambridge on Pooling Innovation, may increase focus on this area. The potential for such approaches in the wider water sector, and the associated advantages and disadvantages, calls for careful consideration.

Table 3 is intended to open the discussion around future options for consumer engagement and ownership. The options considered are clearly not exhaustive or mutually exclusive and in a resilient water sector, a combination of different approaches may well be beneficial. Each of the options is considered against a series of possible 'tests' designed to assess how they may benefit consumers in the short and long term. Again, these are not exhaustive and are designed to stimulate debate.

Table 3 - Comparison of future possible options for consumer engagement / ownership

Possible tests		Options			
		Customer Challenge Groups	Grand bargain / negotiated settlement	Local community ownership	Mutualisation
Enables short term LOCAL consumer interest to be addressed	More difficult at very local level due to economies of scale	No	Yes - but only in green / brown - field sites.	Yes - but only in green / brown - field sites. May also not be cost effective at this scale	Enables short term LOCAL consumer interest to be addressed
Enables short term REGIONAL consumer interests to be addressed	Yes	Yes – negotiated settlements could be struck at company level	No	Yes	Enables short term REGIONAL consumer interests to be addressed
Enables long term consumer interests to be addressed	Yes - but need an ongoing role that spans price controls. May be difficult to access expertise if resources spread too thinly. The discussion framework at Annex A should be helpful here. The creation of a national forum could also help	Yes – as a grand bargain	Difficult to get access to expertise	Yes - if at sufficient scale	Enables long term consumer interests to be addressed
Enables issues which go beyond a given company area / are national /systemic to be addressed	More difficult in the absence of a national Customer Challenge Group forum	Yes – as a grand bargain	No	No	Enables issues which go beyond a given company area / are national /systemic to be addressed
Addresses concerns around benefit sharing	Possibly. Review of operation in PR14 will be needed to assess	Yes	Yes	Yes	Addresses concerns around benefit sharing
Encourages demand management	Possible if builds trust in company	Possible if builds trust in settlement	Yes	Yes	Encourages demand management
Has been tried and tested	Yes - Review of operation in PR14 will be important	To some extent this model is being tested in Scotland. Review of 2015 price control will be important	Limited - business models of some new entrants may be relevant. Valuable learning from energy sector	Yes - in Wales and valuable learning from other sectors	Has been tried and tested

8. Conclusion

The research for this paper has identified a general level of concern that the fundamental challenges and uncertainty facing the water and sewerage sectors - climate and demographic change and affordability - need to be addressed by Government, regulators and companies in a more timely and integrated way.

The White Paper *Water for Life* was seen by most of those interviewed as providing a good overview of the problems facing the water and sewerage sectors, with the exception of the issue of the funding of investment and associated benefit sharing. However, The *Water Bill* is widely viewed as a missed opportunity for dealing with the more fundamental challenges facing the sectors in a comprehensive way.

This discussion paper has identified three key levers that could be used to start to address these issues. Firstly, the inclusion of a new resilience duty for Ofwat in the *Water Bill could help* to ensure that long term interests and the interests of future consumers are more actively represented in decision making. More work is needed to understand how this duty is to be implemented and how it will be put into effect in practice. It will be important to ensure that the duty does not become a license to just 'pour more concrete' and that it enables a wider range of innovative and often local solutions to be developed and that it takes account of the need to ensure the accountability of the companies to the public.

Secondly, this paper has discussed how simpler, more strategic and transparent policy and regulation can help to increase focus on longer term challenges and build understanding and confidence amongst consumers and other stakeholders such as new entrants.

Thirdly, the paper has highlighted how company legitimacy and benefit sharing need to be tackled in order to ensure the stability of the system and to allow long term investments to take place. Clearer government objectives and priorities and more strategic and transparent regulation, which covers reputational as well as economic factors, should help to create an environment in which companies recognize the importance of sharing the gains as well as the pains of their business with their consumers, both for the short and long term. The paper discusses the concept of a 'grand bargain' between consumers, companies, regulators and policy makers as a way of aligning the interests of current and future consumers. It then asks whether changes to ownership structures, along the lines of Welsh Water, may also be necessary in the future if companies are to maintain their social licenses to operate. The strengths and weaknesses of different consumer engagement and ownership structures are assessed.

Finally, this paper has identified several areas for possible future research:

- Evolving regulation and representation - After the 2014 price review is concluded, an assessment of the effectiveness of the new regulatory approach and consumer engagement structures will be important.
- The links between water and energy use - This could examine the scope for renewable distributed power generation in the water and sewerage sectors, analysing the costs and benefits of local energy solutions, such as the use of sewage to create biogas.
- Future industry models - The potential for developing localism in the sector, including the possible role of community interest companies.

- Water efficiency and pricing signals - If there is to be a step change in water efficiency, more research may be needed on pricing signals in areas with universal or wide spread water metering. A 'smart water' forum, bringing together representatives from companies, the supply chain, consumer and environmental groups, regulators and government, could be set up to guide such research.
- The extent to which pay and reward structures for senior executives in the sectors are linked to longer term goals.

Annex A - Discussion framework to align the interests of current and future consumers

Strategy - Possible questions for discussion

1. Does the company have a coherent long-term strategic plan that is regularly updated? How do the Strategic Direction Statement and Water Resource Management Plan feed into this?
2. Does the strategy identify long-term strategic objectives and customer focused outcomes?
3. Is the Business Plan set in the context of the long-term strategy and is there a golden thread / continuous narrative running between the two?
4. Is the company's financial structure clear and transparent?
5. Does the financial strategy of the company identify flexible long-term sources of funding which recognise the importance of stewardship?

Leadership - Possible questions for discussion

1. Does the board own the strategy and the strategic objectives?
2. How does the board show leadership on company values and culture?
3. How does the board control risks especially re long term & reputation?
4. How diverse is the company's board and management team?
5. Does the board have the right skills e.g. in long-term issues or communications?
6. What does the company's board do to encourage learning /innovation?
7. What does the company do to learn from failure (their own & others)?
8. What commitments has the organisation made in terms of Corporate Social Responsibility (CSR)?
    a. How is CSR mainstreamed in the company's core business?
    b. How are the company's CSR commitments aligned with its policies regarding future consumers?
9. How are pay and reward structures of senior leaders linked to the achievement of long-term goals?

Decision making - Possible questions for discussion

1. Does risk management take into account the challenges of climate and demographic change and affordability in a dynamic way?
2. Is risk management embedded in scenario plans, options appraisal and CBA?
3. When identifying possible scenarios, does the company:
    a. Use multiple scenarios and sensitivity analysis to help deal with uncertainty and assess options?
    b. If only a few scenarios are used, are reasons for this clear/compelling?
    c. If there is still uncertainty, does the company carry out pilots or trials to test the option further?
4. When identifying possible options, does the company:
    a. Use real options analysis / valuation?
    b. Promote the up-take of low regret adaptation options with multiple benefits that will deliver whatever future climate unfolds?
    c. Automatically include all possible supply / demand side measures?
    d. Cover potential opex as well as capex solutions (e.g. water trading)?

   e. Include local as well as company wide solutions? When local approaches are identified, what is done to ensure that these are implemented within a common system to encourage connectedness?
   f. Ensure solutions which cross-organisational functions / silos are taken into account (e.g. solutions which impact the water and sewerage sides of the business)?
   g. Include partnership working (including with third sector) / community solutions or outsourcing?
   h. Ensure solutions with multiple benefits given consideration?
   i. Ensure that decisions which might foreclose future options are given extra scrutiny?
   j. Re-appraise the options on regular basis/when new information available?
5. When carrying out CBA, does the company:
   a. Ensure that resilience and long term costs and benefits are taken into account?
   b. Ensure relevant externalities are internalised? (E.g. impact on business supply lines and competitiveness)
   c. Have enough accurate and granular data (e.g. on costs, assets and consumers) in order to be able to make an informed decision?
   d. Include qualitative as well as quantitative factors?
   e. Ensure the full end-to-end process is taken into account?
   f. Involve the right people in assessing the range of options?
6. What does company do to ensure innovation is embedded into BAU?
7. If there is still uncertainty, is the company transparent about when in the future decisions may be needed on more costly supply infrastructure once low regret measures have been implemented?

Partnership working - Possible questions for discussion

1. Does the company's stakeholder mapping cover those with an indirect as well as a direct link to the company (e.g. polluters)?
2. Does the company proactively look for new perspectives and partners?
3. Does the company publish information on key issues such as network access prices or abstraction standards in transparent and consistent way?
4. What does the company do to develop commercial mechanisms to share risk and reward with other parties?
5. Does the company give partners feedback as to how valuable it has found their in-put?

Consumers - Possible questions for discussion

1. Has the company carried out a customer segmentation exercise?
2. If so, how does this include the interests of future consumers?
3. What does the company do to ensure demand side measures are fully developed?
4. Are incentives in place to ensure consumers respond to new offers (e.g. types of tariffs) and ways of doing things (e.g. water saving measures)?
5. What does the company do to assure its board that it is responsive and learns from trends in customer contact?
6. What mechanisms are in place to ensure that staff are empowered to listen and respond to customers?
7. What does the company do to communicate with consumers between price controls and on an on-going basis?
8. Are customers involved in developing future service offers?

9. Are customers involved in the long term monitoring of the company's activities?
10. Are consumers given feedback on what has been done as a result of any engagement that they have had with the company?
11. Do customers understand challenges company faces?
12. Do consumers understand the implications of their behaviour, their responsibilities in the sector and the roles they can play in meeting challenges
13. Have consumers got the right information and tools to fulfil these roles?
14. What mechanisms are in place to protect vulnerable users?
15. In addition, for large users, such as farmers, energy companies and local authorities:
    a. Do they understand the individual and systemic consequences of their actions?
    b. Are they willing to collaborate with companies and other actors to work together in partnership to meet challenges?

Sustainability *first*

Sustainability First is small environment think-tank with a focus on practical policy development in the areas of sustainable energy, waste and water.

Our aim is to improve knowledge and understanding of complex multi-disciplinary issues such as demand side response in the electricity market. We develop implementable ideas in key policy areas – such as energy, water and the roles of economic and other regulators in sustainability policy – where it can make a difference. We undertake research, publish papers and organise policy seminars. Our primary focus is on policy and solutions within the UK, but we draw on experiences and initiatives both within and outside the UK.

Our work currently focusses on the demand side response in the electricity market, through the project '**GB Electricity demand –*realising the resource*'**. Since 2006, Sustainability First has produced a series of major multi-sponsor studies on GB household smart energy meters and brings significant knowledge and insight in the fields of energy efficiency, smart metering, smart energy tariffs and demand response.

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