A collection of essays from the Westminster Sustainable Business Forum

Westminster sustainablebusiness Forum

SUSTAINABLE SOLUTIONS

RAISING THE WATER MARK

CONTENTS

FOREWORD

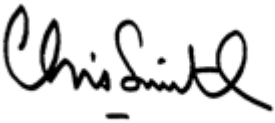
Water is a precious, essential, hugely valuable, vulnerable and finite resource. That is the clear message that emerges from this collection of significant essays that look at a number of aspects of water policy for the future. And it's a message that we need to remind ourselves of, time and again. For far too long here in Britain we've tended to think of water as infinitely and freely available. It isn't, and we need to care for it, steward it, and respect it rather better than we have before.

We also need to shape our policies and actions around it more holistically than we traditionally have. Water is essential for our daily domestic lives, but also for industry and for agricultural production. It is part of the vital biodiversity of our ecological systems – the living natural environment that we all ultimately depend on. Water is an economic resource, and the costs of cleaning it, delivering it, and safeguarding against its scarcity are too often forgotten. And water can also rise up and bite us, as we have sadly experienced so forcefully during the succession of summer floods across many parts of the country in 2012.

We can't deal with any one of these aspects of water without addressing the others as well; and that's why this collection of essays, looking at all these issues, is so valuable. Climate change is already beginning to impose precisely such a holistic approach on us. Climate science tells us that we are going to encounter more extremes of weather as the concentration of greenhouse gases in the Earth's atmosphere intensifies. And this year we've seen this all too clearly – a period of serious drought with groundwater levels in a perilously low condition, followed by the wettest summer in decades, with some places in June experiencing a month's entire rainfall falling in 24 hours.

So we need to husband our water resources well, and plan for their proportionate use, in order to cope with drought. And reforming the abstraction regimes, and encouraging wiser water use across society as a whole, have to be a key part of this. But, we also need to be prepared for flooding emergencies, and probably on a more frequent basis than we have in years gone by. It looks increasingly likely that the world's greenhouse gas trajectory won't start moving downwards soon, and that we'll be lucky to keep the overall warming effect on the earth to two degrees centigrade. This means that we will face the consequences of climate change, come what may. Building this realisation into how we prepare for water use and flood protection is going to be crucial.

Nor should we forget that – alongside water resource issues and flood preparedness – the quality of the water itself, and the fish, insect, bird and natural life it supports, is another vital part of the overall picture. The Water Framework Directive gives us a huge challenge in trying to bring our rivers and lakes up to good condition. But we need to accept and to relish the challenge, work hard to improve conditions, and enjoy the improvement that results. The catchment management approach, touched on in a number of these essays, is a key element in being able to do this. Looking at the whole catchment of a river, at all the impacts on it, at the agricultural and urban and industrial and discharge effects that change and destroy the river's quality: this is the way we'll be able to make progress. And it'll help us to make the right judgments about water resources and about flood risk, too. The river is a living entity. It runs from one community to another. What you do in one part has an impact elsewhere. We have to look at it in its wholeness, with all the impacts on it and effects it has and challenges it brings. These important essays give us the perspective to do that.



Lord Chris Smith, Chairman,
Environment Agency

EXECUTIVE SUMMARY

The UK's water supply chain needs to become more sustainable if we are to pass on a healthy and reliable water legacy to future generations. Whilst the Government's Water Bill will address some of the changes needed in the sector, further measures are required to safeguard our water resources against degradation, depletion, the impacts of climate change and population growth.

This collection of expert essays explores a range of viable ideas aimed at improving sustainability across the water supply chain. The authors have each tackled a different theme, providing a background to the topic and offering one policy recommendation designed to increase resilience in that area of the sector.

Recommendation 1

Professor Alan Jenkins, Deputy Director, Centre for Ecology & Hydrology

The Government should ensure that all future legislation relating to agriculture and industry contains management incentives that are fully supportive of the need to guarantee future water security.

Recommendation 2

Janez Potocnik, European Commissioner for the Environment

The Government should ensure that all surface water bodies achieve 'good' ecological and chemical status by 2015, excluding those granted exemption under Article 4 of the EU Water Framework Directive.

Recommendation 3

Mark Fletcher, Director and Global Water Leader, Arup

The Government should ensure that an assessment of ecosystem services, including natural capital, is integral to any infrastructure planning within the water cycle.

Recommendation 4

Dr Mike Clarke, Chief Executive, RSPB

The Government should produce a rigorous framework to enhance water security, which improves our water resources in the long-term and for the public good.

Recommendation 5

Peter Jones OBE, Director, Policy Connect

The Government should transfer the regulation and ownership of all dirty water treatment in England and Wales to the Waste Resources sector.

Recommendation 6

Lord John Krebs Kt FRS, Chair, Adaptation Sub-Committee, UK Committee on Climate Change

The Government's forthcoming National Adaptation Programme should set out concrete actions over the next five years to ensure that the country is preparing for some of the largest risks from climate change, such as flooding.

Recommendation 7

Dr Jerry Bryan, Executive Chairman, Albion Water

The Government should encourage innovation by removing barriers to entry (particularly for SMEs) with a fast-track appeal route to the Competition Appeal Tribunal, and consider reviewing Ofwat's concurrent powers (under the Competition Act 1998) as a competition regulator.

Recommendation 8

David Nussbaum, Chief Executive, WWF-UK

The Government should, in the forthcoming Water Bill, remove the red tape that is limiting roll-out of universal metering and give Ofwat a primary Sustainable Development duty.

Recommendation 9

Tony Smith, Chief Executive, Consumer Council for Water

Ofwat should set tough leakage targets that take into account the reputational and behavioural damage that leakage causes, when encouraging water companies to reach a 'sustainable level of leakage'.

Recommendation 10

Justin Taberham, Director of Policy, Chartered Institution of Water and Environmental Management

The Government should ensure that, in the longer-term, all household customers are metered where practical and innovative water tariffs are introduced that take account of environmental, social and public health needs.

INTRODUCTION

The UK's current system for managing our water resources is out of date. We lack the necessary frameworks of governance, and supportive regulations, to adequately steward this precious resource so that it nourishes our ecosystems, businesses and wider society for generations to come.

The symptoms of our managerial shortcomings and lack of stewardship are evident right across the water supply chain. Our current abstraction regime outstrips the rejuvenation rates of most aquifers; our supply of treated water suffers from leaky infrastructure; we waste an enormous amount in our homes and businesses; many of our houses are becoming increasingly vulnerable to flooding; and our water-dependent natural ecosystems, and the services that they afford, are largely in decline. To compound these stark realities, climate change is set to create more variability in the supply of water, potentially increasing the risk of floods and droughts, in addition to the increasing pressure on water resources from growing populations.

In the summer of 2012, the Environment, Food and Rural Affairs Select Committee, which I Chair, reported on two inquiries into the 'Water' and 'Natural Environment' White Papers, which were published by the Government in 2011. We collected evidence from over 100 interested parties, many of which I am happy to see as authors in this publication by the Westminster Sustainable Business Forum. A primary theme that emerged from both these Select Committee reports was that if we want to live in a country with a healthy natural environment then we must value our natural resources and ecological amenities more appropriately. We need to establish mechanisms which ensure that those who protect and enhance our ecosystem services, such as the supply of clean water, are recognised as such by the beneficiaries of those environmental systems. Furthermore, we concluded that the Government's proposals for metering and abstraction reform lack ambition and are unlikely to deliver meaningful change within an acceptable timescale. The Water Bill will address some of the problems that we face, but its scope is narrow.

If we are to have a sustainable water sector that supports all the needs of society and nature in addition to connecting all the various stakeholders, then we must focus on fixing the root causes of the dwindling health of our environment instead of tinkering with the symptoms. The EU Water Framework Directive, which became UK law about a decade ago, set a precedent for this type of approach. It gives us an

opportunity to plan and deliver a better water environment across Europe, one that focuses on ecology and is not hindered by national boundaries. We also need to work together to improve our understanding of how water functions at the catchment level and disperse that knowledge into our environmental policies. In doing so, we should break down the regulatory barriers between other sectors, such as energy and waste, which so often inhibit the efficacy of environmental policies. We also need to value water better, so that people understand the importance of it but also so that its relative availability or health is reflected in the prices we pay. Installing water meters into homes will improve the public's perception of the value of water, which in turn will help to drive efficient behaviour. These are just a few of the themes explored in the following essays, and through the expertise of the authors that have contributed, this report explores some enduring solutions which can enhance nature and benefit our society.

Sustainable solutions for our water resources, which incorporate innovative technologies where appropriate, are what we need. Moreover, we should combine the top expertise from governments, industry, the scientific community, environmental organisations and those that represent the public, in order to discuss and deliver those sustainable solutions. We should seek to first understand our ecosystems, then work to improve them.

I would like to thank everyone who offered their expertise and participated in writing and bringing together these water essays. I am also grateful to the RSPB and Arup for their sponsorship of this publication. The suite of policy recommendations provided by the contributing authors forms a robust message to Government: we need pan-sector policy changes if our water resources are to be truly sustainable into the future.

Anne McIntosh MP, Chairman,
Environment, Food and Rural Affairs Select Committee

1. SYSTEMS THINKING: THE RIVER CATCHMENT APPROACH

Professor Alan Jenkins, Deputy Director,
Centre for Ecology & Hydrology

Surface water catchments (river basins or watersheds) are basic hydrological units that are central to water resource planning. They are defined by topography and reflect the drainage area that delivers the maximum available water resource, unless water is pumped into the catchment from elsewhere. Groundwater boundaries do not always coincide with topographic boundaries, but water stored in aquifers also contributes to water resource availability at the catchment scale. The available water resources must support all demand within a catchment, including potable supply, irrigation, cooling during power generation, incorporation into industrial processes and maintaining ecosystem functions.

> "...land management techniques might be employed to reduce river pollution from agricultural runoff..."

The concept of catchment management gained pace in the 1970s when it was recognised that human manipulation of landscape features, for instance land use change, had downstream consequences such as increased flooding, more contaminant transport and greater delivery of sediments to coastal areas. Catchment Management Plans were developed to guide water resource management. Primarily, these Plans were focused on the management and allocation of available water resources. However, the Plans also focused on controlling water quality, as it was recognised that pollution made water 'unavailable' as a resource for some uses. To establish which land management techniques might be employed to reduce river pollution from agricultural runoff, Defra has established the Demonstration Test Catchment project. This project focuses on three catchments (the Hampshire Avon,

Wensum and Eden) and will provide observations of the efficacy of changing agricultural practices on nutrient and pollutant runoff over the next three to five years.

Internationally, the importance of catchment management to protect water resources was established at the UN Conference on Water in 1977. In the US, the 'watershed protection approach' was developed in 1993. This approach was designed to be integrated, holistic and problem-solving. It aimed to restore and maintain the physical, chemical and biological integrity of aquatic ecosystems, protect human health and promote economic growth. This approach has three cornerstones:

- problem identification, which ascertains the primary threats to human and ecosystem health within the watershed;
- stakeholder inclusion, which involves the people most likely to be concerned or most able to take action; and
- integration of actions.

Using this approach, best management practices were established for the Chesapeake Bay Program in the mid-1990s, in an effort to reverse serious nutrient pollution problems. Although this improved the situation significantly, the full and rigorous implementation of good agricultural management practices proved extremely challenging and often met with resistance from local farmers.

> "The ecosystem approach... ...addresses the complex levels of biological organisation that are required to sustain essential processes..."

The ecosystem approach provides a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. Thus it helps to identify synergies between different perspectives within a catchment and develop common goals. Based on scientific understanding, this approach addresses the complex levels of biological organisation that are required to sustain essential processes, functions and interactions among organisms and their environment, whilst recognising that humans are an integral part of ecosystems.

The ecosystem approach offers the opportunity to include many benefits in future decision making that are often ignored. These include the longer-term benefits of climate regulation and flood alleviation, which are rarely recognised as a clear part of a land manager's financial calculations. Decisions around land management are frequently taken on the basis of short-term financial gains, such as increased

agricultural production from wetland drainage. The hidden cost of this may lie in the loss of wider benefits over a longer time scale, which may lead to an increased risk of flooding and poorer water quality, for example. To maintain water ecosystems within environmental limits, natural capital and ecosystem services must be seen as valuable assets. Also, because land management is fundamental to water resource management at the catchment scale, every opportunity should be taken to ensure that legislation and management incentives that affect agriculture and industry are fully in line with the goal of sustainable water resource management. For instance, farmers could be given incentives to improve local water storage within future reform of agricultural policy.

> "The catchment, as a spatial unit for integration, provides a framework for systems understanding..."

In summary, catchment management has moved from single issue management to that of multiple issues. There is a realisation that successful management requires a balance between environmental protection and enhancement; increasing the potential for economic growth; and awareness of social perspectives, attitudes and beliefs. The catchment, as a spatial unit for integration, provides a framework for systems understanding that links air, land and water. The quality and quantity of water available to people and the environment is a barometer of the current state of the environment. Scientific advancement is key to the improvement and more effective management of catchments in the future, but it cannot deliver the necessary changes alone. People need to be empowered to implement, monitor and adapt any agreed solutions.

Recommendation 1

The Government should ensure that all future legislation relating to agriculture and industry contains management incentives that are fully supportive of the need to guarantee future water security.

2. BEYOND OUR BORDERS: THE EU WATER FRAMEWORK DIRECTIVE

Janez Potocnik, European Commissioner for the Environment

Clean water is a precondition for human, animal and plant life and an indispensable resource for the economy. Protecting water resources as well as fresh and salt water ecosystems is therefore a keystone of environmental policies in Europe. The issues extend well beyond national boundaries and this is why concerted action at EU level is necessary to ensure the effective protection and sustainable use of water.

> "The over-arching objective of the Water Framework Directive is to... ...restore water bodies to bring them to 'good status' by 2015."

EU water policies are anchored in the Water Framework Directive, which was adopted in 2000. Building on the achievements of existing EU water legislation, it introduced new and ambitious objectives for EU waters.

The over-arching objective of the Water Framework Directive is to prevent the deterioration of the EU's water status and to protect, enhance and restore water bodies to bring them to 'good status' by 2015. In practice, this means that by that date the ecology and chemical composition of surface waters should deviate only slightly from natural conditions, and that a sufficient quantity of unpolluted groundwater should be available.

The Water Framework Directive focuses on cost-effective action to counter the pressures that have the worst impact on water status in river basins, such as eutrophication, excessive abstraction and barriers that prevent fish migration. It incorporates the key principles of integrated river basin management into a legally

binding instrument. The principles call for the consideration of the entire hydrological cycle and all the pressures affecting it, as well as for the integration of economic and ecological perspectives into water management.

> "...25 Member States and Norway have produced 121 River Basin Management Plans..."

The Directive introduces the concept of river basin planning and determines a number of steps that must be undertaken. These include assessing the status of river basins, putting in place monitoring programmes, as well as setting environmental objectives and developing programmes to reach these objectives with all interested actors.

The implementation of the Water Framework Directive has advanced, but further significant progress is needed. So far 25 Member States and Norway have produced 121 River Basin Management Plans, out of a total of 174, for their national parts of the River Basin Districts. Others are lagging behind: in Belgium, the Flemish Region and the Federal Government (responsible for coastal waters) have adopted plans but proposals for the Walloon and Brussels-Capital Regions are yet to be formed. In Spain, only the plan for the Catalan River Basin District has been adopted and reported. In Portugal and Greece, no plans have been adopted yet.

The Commission is currently finalising an assessment of the River Basin Management Plans to give an overview of the progress so far and to highlight where future effort is needed for the second and third planning cycles. Final results will be published in autumn 2012. A snapshot of progress so far shows that in 2009, 43% of the total number of classified surface water bodies in Europe were of a 'good' or 'high' ecological status and this is projected to rise to 53% by 2015. This is an improvement but it is not enough to reach the targets set by the Directive. This needs to be addressed by the Member States through the remainder of the first cycle and in the second cycle plans.

> "Coordination between Member States on trans-boundary river basins has significantly increased..."

The assessment shows that while there is no out-right exemplar when it comes to implementing the overall river basin planning process, there are examples of good practice on different components around the EU. In Austria, for example, methodologies for assessing water status are well advanced. In Denmark, the specificity of measures addressing agriculture's impact on water bodies is distinctive and in Germany there are clear measures to restore ecological continuity.

Coordination between Member States on trans-boundary river basins has significantly increased and public participation in water management has improved across the EU as more information is made publicly available.

In the UK, the implementation of the Water Framework Directive presents strengths and weaknesses. The overall level of improvement to 'good' status by 2015 is low, and it is not always clear which measures will be implemented where. However, the recent launch of the catchment approach is a step in the right direction – it will bring together local stakeholders to devise and implement measures that address water quality, quantity and land management, using an ecosystems approach. The Commission is keen to follow the progress of this initiative and see it translated into the second cycle of river basin plans.

Making sure that enough good quality water is available, in the right place and at the right time, is essential to our health and economic growth. In order to address these challenges, the European Commission is working on a Blueprint to Safeguard Europe's Water, to be released in autumn 2012. The Blueprint will set out concrete proposals to improve the implementation of EU water policy with the aim of ensuring good quality water in sufficient quantities for all legitimate uses by 2020. Water is a precious resource and we do not intend to waste it.

Recommendation 2

The Government should ensure that all surface water bodies achieve 'good' ecological and chemical status by 2015, excluding those granted exemption under Article 4 of the EU Water Framework Directive.

3. UNLOCKING VITALITY: VALUES AND FOOTPRINTS

Mark Fletcher, Director and Global Water Leader,
Arup

Water is a natural resource, essential for life. The water cycle explains how it is transported, abstracted, used, transformed and replenished through natural and human influenced processes. We take for granted its availability for our personal, industrial and agricultural needs. This demand comprises obvious direct use such as drinking water, as well as less obvious indirect use, for example, in meat production, agriculture and industrial steel production. Indeed, agricultural and industrial demand for water often far exceeds the obvious water requirements on first inspection.

"Valuing water is complex, mainly because of its unique characteristics..."

The value that we attach to water is often related to the more obvious demands rather than the less obvious ones. We may purchase a bottle of water and what we see is what we get. Yet when we buy a car or make a meal, the amount of water used remains an unknown, potentially very significant, quantity. Valuing water is complex, mainly because of its unique characteristics and socio-cultural importance. The monetary value that customers pay reflects only what has been done to get the water from the source, treat it and then distribute it. The value of the resource itself is ignored.

The value of water is not uniform and will depend on quality, location, reliability of access and time of availability. Water is more valuable in a dry period and supply costs can increase disproportionately with increasing output if water sources are largely exploited. Techniques such as the 'Average Incremental Social Cost' (AISC)

include the social, environmental and economic costs of developing water resources.[1] The AISC provides a quantifiable mechanism for comparing the value of water and incorporating these latter costs. It can be applied to both water supply and water efficiency projects which may have varying quantities of water supplied or saved each year. With tools like the AISC, we can get closer to understanding the variable nature of water value across large geographical areas.

> "A 'water footprint' measures the volume of fresh water used (consumed or polluted) to produce a particular product..."

The Natural Choice White Paper[2], published in June 2011, identifies water as a key factor for achieving a better quality natural environment and states that many benefits are not properly valued, leading to bad choices and missed opportunities for growing a green economy. The provision of ecosystem services depends on the adequate allocation of environmental flows. In terms of water, these environmental flows include both water availability and water quality. Water related ecosystem services will consist of:

- Provisioning services (water for people, water for food supply and water for industry)
- Regulating services (physical and chemical water quality control, flood mitigation and health control)
- Cultural services (recreation and tourism)
- Supporting services (habitats and biodiversity)

In the UK, the award winning Beam Parklands scheme in East London has delivered a flood storage scheme that has also provided a range of wider benefits, or ecosystem services. These include new habitats, new links between local communities, enhanced natural playgrounds and a restored river channel. Although not directly valued, these indirect 'services' were an integral element of the scheme.

A 'water footprint' measures the volume of fresh water used (consumed or polluted) to produce a particular product (or group of products) in a distinctive region during a specific period, as measured over the full supply chain. Established water footprint approaches consider:

[1] Harou, J., et al. 2009. Hydro-economic models: Concepts, design, applications and future prospects. *Journal of Hydrology*. 375:3-4, pp.627-643.
[2] Defra. 2011. *The Natural Choice: Securing the value of nature*. UK.

- Green water (rainwater)
- Blue water (freshwater)
- Grey water (polluted water)

In their 'State of the Nation – Water'[3] report, the Institute of Civil Engineers emphasise the need to recognise the increasing importance of our global water footprint, as three quarters of our total water needs are currently met by water resources from other nations. Proctor & Gamble are currently working with Arup to create sustainability design guidelines for their worldwide manufacturing and office facilities.[4] The new measures include using less water in processing and making sure that equipment runs more efficiently. The overall aspiration is for a significant reduction in their global water footprint.

> "...accounting for natural capital encourages more sustainable, and often less capital intensive, interventions."

We need to work more effectively with natural systems and processes to manage water across catchments, within a water hierarchy approach. Traditional approaches that do not consider the wider value of water encourage infrastructure led interventions. Understanding and accounting for natural capital encourages more sustainable, and often less capital intensive, interventions. We need to continue to build on the approaches being developed by Design Council CABE and Natural England[5] and the Center for Neighborhood Technology[6], amongst others.

Recommendation 3

The Government should ensure that an assessment of ecosystem services, including natural capital, is integral to any infrastructure planning within the water cycle.

[3] Institute of Civil Engineers. 2012. *State of the Nation – Water 2012*. UK.
[4] Arup. 2011. Liquid Gold – A Water Special. *A2 Magazine*. Issue 11. UK.
[5] Natural England, et al. 2010. *Building natural value for sustainable economic development: The green infrastructure valuation toolkit user guide*. UK.
[6] Center for Neighborhood Technology. 2010. *The Value of Green Infrastructure: A guide to recognizing its economic, environmental and social benefits*. USA.

4. MINDFUL MANAGEMENT: SUSTAINABLE ABSTRACTION

Dr Mike Clarke, Chief Executive,
RSPB

The principle behind the idea of sustainable abstraction is simple. It is about meeting the water needs of society within environmental limits – limits that ensure healthy river and wetland ecosystems. But, as often, the practice is more problematic. In this case, it is complicated by a tangled web of competing vested interests, operational constraints and uncertainties.

At source is the problem created in the 1960s by the authorisation of far more abstraction than the environment could sustain, when regulation was introduced. These Licences of Right, granted in perpetuity and without environmental restrictions, are implicated in some of the most high profile problems like low-flows on the River Itchen, the Darent and the tributaries of the River Avon in Hampshire and Wiltshire. They are also, of course, high value assets that no water company, irrigator or business would give up lightly.

> "...low flows reduce the dilution capacity of rivers receiving sewage..."

Dry rivers only tell part of the story. Across the country, low flows reduce the dilution capacity of rivers receiving sewage; depressed groundwater levels turn winterbournes (intermittent streams) into dry ditches and threaten the viability of the last few fragments of wetland habitat; and the control of river flows by reservoirs chokes the natural processes which maintain floodplain wetlands. Meanwhile, the dredging and straightening of our rivers compounds the vulnerability of river wildlife to low flows. Population growth and a changing climate will drive these trends even further.

The good news is that the issues have been pretty well understood since the time when the last Government came into power, with drought fresh in people's minds. The bad news is that, despite the then Government's water summit, the ensuing White Papers and Water Act 2003, there has been precious little action by Governments or regulators.

> "...the 'Restoring Sustainable Abstraction' compensation programme could take 300 years or more to deliver the scale of change required!"

Powers to revoke unused and under-utilised abstractions, for example, have been in place since the original Water Resource Act 1963 but, to my knowledge, have never been used. Despite measures allowing revocation or modification of damaging abstractions without compensation being on the books since 2003, the regulations required to enact them have only recently been consulted upon. Under the current funding model, WWF have estimated the 'Restoring Sustainable Abstraction' compensation programme could take 300 years or more to deliver the scale of change required!

> "...integrated approaches have a proven track record in permanently reducing demand..."

There are some very good but isolated examples of water efficiency retrofit, education and full metering being rolled-out to water stressed areas in southeast England. Such integrated approaches have a proven track record in permanently reducing demand here and abroad. However, investment in efficiency and demand management always struggles to compete with big ticket infrastructure, attracting feeble levels of spending across the industry as a whole.

> "What we need is leadership for the long-term..."

Unfortunately, those looking for a long-term vision in the draft Water Bill will be disappointed. Rather than addressing the state of this fundamental asset, the Government has chosen to prioritise competition and market reforms. Fundamentally, the asset here is a natural resource. Seen through that lens, the Water Bill is the equivalent of banking on derivatives and swaps without addressing the security of the underlying assets and credit risk. What we need is leadership for the long-term public good, something that doesn't require major policy proposals or new sophisticated economic instruments.

The problem is that abstraction reform may be living on borrowed time. Yes, the official Government line is true. Reform really is difficult. But perhaps, in truth, the

reason why we have seen so little movement is that, by and large, the water industry has so far coped with what the weather has thrown at it.

Past performance, though, may not be a guide to the future. Spring 2012 came close to emergency drought orders, dry rivers, people queuing at stand pipes and the headlines screaming for action. An unseasonal jet stream and dry winter was replaced by an equally unseasonal jet stream and summer recharge. Perhaps, for the sustainable management of a natural resource, this really is the equivalent of casino banking on a roll?

Recommendation 4

The Government should produce a rigorous framework to enhance water security, which improves our water resources in the long-term and for the public good.

5. COMBINING INITITIAVES: COHESIVE POLICIES FOR WATER, WASTE AND ENERGY

Peter Jones OBE, Director,
Policy Connect

The so called 'utility' sectors have traditionally referred to essential services, for which there was a historic imperative for the public purse to fund and operate, in order to deliver much needed civic wellbeing. The public purse has had to fund these services in the past, due to market failure that was triggered by high initial investment costs, in the absence of any certainty that these would be recovered via 'fair' charging in proportion to people's ability to pay. As the economy grew in size and spread, the affordability broadened accordingly. Thus health, policing and fire services remained as social entities but the water, waste and energy sectors have become increasingly privatised, and yet each service remains an island unto itself.

> "...management in the water, waste and energy sectors... ...needs to be challenged in order to reduce their environmental impacts..."

Pricing structures vary, investment returns are developed in isolation and service delivery ranges from open, transparent comparators, to geographically centred monopolies. Regulatory regimes operate largely independently, with variable cognition of environmental parameters, an arrangement which cannot endure if the water sector is to become sustainable.

The separation of management in the water, waste and energy sectors, produced by their independent evolutionary paths, now needs to be challenged in order to reduce their environmental impacts and improve sustainability. Tightened standards in managing clean and dirty water make this sector a major carbon emitter, producing

over five million tonnes of greenhouse gases[1], as carbon dioxide equivalents, or 1% of the UK's total (excluding imported goods). Water purification technologies have been developed internally, without cognisance of parallel developments in similar systems needed for dealing with organic waste. The waste sector has the capacity to deliver renewable energy to these water facilities, but until recently even joint corporate ownership has discouraged the co-mingling of the asset base, due to regulatory inflexibility.

> "Sewerage management would more properly be placed in the waste regulatory regime."

The inconsistencies that exist in the water-waste-energy nexus have been highlighted further by water companies keen to supplement their existing access to profitable subsidised renewable energy production via anaerobic digestion, utilising supplementary commercial and industrial waste streams. A challenge to the fairness of using a regulated, publically funded asset base to capture commercial feed stocks has been prevented due to the Office of Fair Trade conclusion that this is not in restraint of trade; a conclusion that is surprisingly receiving the acceptance of the waste sector trade body, the Environmental Services Association. Ironically, this application from the water companies for subsidised renewable energy could have become a major platform of growth for the waste sector. Leaving the clean water sector in charge of sewerage management is an inefficient relic of the water sector's development. Sewerage management would more properly be placed in the waste regulatory regime.

> "For the waste sector... ...sewerage sites are attractive and bankable locations for integrated resource management."

As landfill progressively diminishes, waste companies will need around 2,000 to 3,000 new transition plants with mechanical, biochemical and thermochemical transition technologies to refine waste into resources such as compost, recyclate, electricity, biofuels, gas and synthetic fuels. It would be sensible to group these integrated facilities on the broad acres of the 100-150 very large sewerage sites surrounding our major cities. There are many (including waste, electricity and property companies) who are keen to broaden the scope of these facilities, and if the water companies are reluctant to adapt their prime sites for these purposes, then the value of the latter should be tested via auctioning them off with the benefit of planning consent. Furthermore, this move would provide windfall profits to the shareholders of associated water companies.

[1] Defra. 2008. *Future Water: The Government's water strategy for England*. UK.

"...perhaps we will witness an improvement in the currently disconnected water-waste-energy nexus?"

The concept of combining water, waste and energy facilities is not an idle dream. Beddington, in South West London, is the subject of such an application already, as is a site alongside Avonmouth Docks, Bristol. Similarly, industrial gas companies are on the lookout for sites to host waste-to-hydrogen facilities. The water sector has an annual turnover of around £11 billion, with capital of £46 billion.[2] Yet the regulator Ofwat has allowed a mere £57 million[3] of investment for 33 renewable energy projects in its fifth Asset Management Plan (the planning period for 2010-2015). This will fund just five sensibly sized anaerobic digesters, with a combined yield of less than 10 Mw. For the waste sector, which has an annual turnover of £9 billion[4] and a growing appetite for converting waste to resources, sewerage sites are attractive and bankable locations for integrated resource management. The majority of water assets are now in the hands of overseas sovereign wealth fund investors and pension funds, and with their appetite for maximising profit (potentially by auctioning off land for energy from sewage plants) perhaps we will witness an improvement in the currently disconnected water-waste-energy nexus?

Recommendation 5

The Government should transfer the regulation and ownership of all dirty water treatment in England and Wales to the Waste Resources sector.

[2] Keynote. 2011. *Keynote Market Report: Water Industry Market Report 2011*. UK.
[3] Ofwat. 2009. *Future water and sewerage charges 2010-15: Final determinations*. UK.
[4] Keynote. 2010. *Keynote Market Report: Waste Management Market Report 2010*. UK.

6. FLOOD ADAPTATION: A CHANGING CLIMATE

Lord John Krebs Kt FRS, Chair, Adaptation Sub-Committee,
UK Committee on Climate Change

The Government's Climate Change Risk Assessment, published early in 2012, identified *increasing frequency of floods* and *increased pressure on water resources* as two of the most significant climate risks facing the country now and in the future.

One in seven homes and businesses (3.6 million properties) face some form of flood risk in England. Of these, 330,000 are located in areas that have a significant chance of flooding, defined by the Environment Agency as a greater than 1 in 75 year chance of flooding in any given year. Around 10% of the country's critical infrastructure and emergency services are located in the floodplain.[1]

> "In 2007, widespread flooding in England affected 55,000 homes..."

Flooding can cause loss of life and injury, damage to properties and infrastructure, and interruptions to essential services and business supply chains. Additionally, floods cause substantial personal stress and hardship for affected households, particularly for the more vulnerable in society.

- In 2007, widespread flooding in England affected 55,000 homes, killed 13 people and cost the economy £3.2 billion (2007 prices).[2]

[1] Committee on Climate Change. 2012. *Adaptation Sub-Committee Progress Report: Climate change – is the UK preparing for flooding and water scarcity?*. UK.
[2] Environment Agency. 2010. *Delivering benefits through evidence: The costs of the summer 2007 floods in England*. Bristol, UK.

- In 2012, after the wettest spring on record, many parts of the country were affected by flash-flooding. Rivers burst their banks and roads turned to rivers as a result of surface runoff after some areas saw a month's worth of rain in 24 hours. This led to serious flooding of at least 1,200 properties from Sussex in the south of the country to Cumbria, Lancashire and West Yorkshire further north.

Climate change is likely to make flooding more frequent through increases in rainfall intensity, high river flows and sea level rise. The number of properties with a significant chance of flooding in England is expected to increase to between 630,000 and 1.2 million by the 2080s as a result of climate change alone. Damage costs are projected to follow a similar pattern, increasing from current levels of £1 billion per year on average to between £1.8 billion and £5.6 billion per year (today's prices) by the 2080s.[3]

"Development in the floodplain in England increased by 12% over the past ten years..."

In our 2012 report[4], the Adaptation Sub-Committee analysed how well the country is preparing for future flooding. We found that the country has become more exposed to future flood risk through continued development in the floodplain and paving over of front gardens[5]:

- Development in the floodplain in England increased by 12% over the past ten years compared with a 7% increase outside the floodplain. While much of this development took place in locations well protected from flooding with defences, one in five properties built in the floodplain were in poorly protected areas.

- In towns and cities across England, the proportion of gardens that have been paved over increased from just over one-quarter in 2001 to nearly half in 2011. This will exacerbate flash-flooding from intense rainfall events, which are likely to become more common with climate change.

[3] HR Wallingford for Defra. 2012. *UK Climate Change Risk Assessment 2012 Evidence Report*. UK.
[4] Committee on Climate Change. 2012. *Adaptation Sub-Committee Progress Report: Climate change – is the UK preparing for flooding and water scarcity?*. UK.
[5] HR Wallingford for Adaptation Sub-Committee. 2012. *Development of spatial indicators to monitor changes in exposure and vulnerability to flooding and the uptake of adaptation actions to manage flood risk in England*. UK.

We found that actions by the Environment Agency, local authorities and businesses go some way to addressing these risks, for example through investment in flood defences and in the design of new housing developments. I observed this first-hand on a site visit to Woking in the spring of 2012. Woking Borough Council and the Environment Agency have worked in partnership to develop the Hoe Valley Scheme, a £40 million regeneration project, including an £11 million upgrade to the flood defences. The scheme has delivered several benefits, including:

- improved flood protection to nearly 200 properties, two schools and a number of community buildings;
- 27 acres of new parkland from the set-back of flood defences;
- a wider bridge over the river to reduce congestion in the city centre; and
- land for 100 new homes elevated out of the floodplain using reclaimed land from a former landfill site.

However, overall we found that national efforts to manage flood risk, if they were to continue at their current level, would not keep pace with the combined effects of climate change and economic development in the future. For example:

- Funding for flood defences from both public and private sources is decreasing – 12% lower for the current spending period compared with the previous period after inflation.[6] The Environment Agency estimates that funding needs to increase by £20 million a year on top of inflation to keep pace with climate change.[7]
- Take-up of measures to protect individual properties from flooding is 20-35 times lower than the rate required to safeguard all properties that could benefit.[8]

Recommendation 6

The Government's forthcoming National Adaptation Programme should set out concrete actions over the next five years to ensure that the country is preparing for some of the largest risks from climate change, such as flooding.

[6] National Audit Office. 2011. *Flood risk management in England*. London, UK.
[7] Environment Agency. 2009. *Investing for the future: Flood and coastal risk management in England, a long-term investment strategy*. Bristol, UK.
[8] Royal Haskoning for Adaptation Sub-Committee. 2012. *Assessing the economic case for property level measures in England*. UK.

7. STREAMS OF IMPROVEMENT: INNOVATION AND TECHNOLOGY

Dr Jerry Bryan, Executive Chairman,
Albion Water

In the mid-19th century, the threat of waterborne disease in major UK cities prompted a period of remarkable innovation and investment that, over the following 60 years, provided the water and sanitation systems that we now take for granted. Not only was public health immeasurably improved over this period, but the UK led the world in the export of those innovative solutions for almost a century. It was arguably the first water revolution.

> "...investments in R&D have decreased by around 60% from 1999 to 2008."

The world now faces a different challenge. The task for the second water revolution is to create sustainable water and sanitation solutions that are available to all. The UK should be well placed to create solutions at home and then repeat the export driven success of 150 years ago but, regrettably, much of the UK water sector has rested on its laurels for the past 50 years and Research & Development (R&D) spending is at an all-time low. In fact, UK water companies' investments in R&D have decreased by around 60% from 1999 to 2008.[1]

Large monopolistic water companies find it difficult to innovate and the innovative talents in our universities and manufacturing sector often find it difficult to find a route to market. In the meantime, the UK is struggling to build the sustainable housing it needs due to concerns about the cost of conventional solutions, such as providing additional water supply and sewerage capacity.

[1] Council for Science & Technology. 2009. *Improving Innovation in the Water Industry: 21st Century Challenges and Opportunities*. London, UK.

One promising approach is to consider afresh what environmental services are required by new housing developments. One such landmark development is the Taylor-Wimpey development at Whittingham, near Preston. A conventional sewage treatment solution would have required a huge investment in a new trunk sewer and produced a large carbon footprint. Innovative water company, Albion Water, is delivering a much more affordable and sustainable solution that will deliver significant benefits to the developer, residents and the environment. When households receive conventional water company services, drinking water is used for all purposes (including toilet flushing), with an average daily consumption of 148 litres per person.[2] Most sewage from housing is then treated using 100 year old processes that destroy the potentially valuable material in the waste.

> "Sites such as Whittingham will also become the shop window for a multitude of innovative products and processes..."

Albion's approach is to integrate these vital environmental services within the community, collecting rainwater and treating sewage so that customers are supplied with two different grades of water; potable for drinking and bathing, and a non-potable 'greenwater' for toilet flushing and garden use. The wastewater treatment processes are designed to extract the maximum energy and nutrient content, avoid odour and visual intrusion and maximise biodiversity by encouraging wetland and other valuable habitats, which will be used as the final stage of treatment for recycled water as well as providing valuable habitats. Residents will benefit from greater sustainability, lower costs and a better environment. Sites such as Whittingham will also become the shop window for a multitude of innovative products and processes that can then be proven in the UK, for export worldwide. Such technologies include advanced water and wastewater treatment, quality and environmental monitoring and metering, and advanced billing systems and data management. Such sites will also provide training opportunities for increasingly valuable sustainability skills.

> "...we also need engagement across government departments, local authority planners, regulators and the financial sector."

Sustainability is seen by many as a high cost exercise. In the absence of innovation it will be. What is needed is a greater awareness of the potential for projects like Whittingham, to address both the sustainability needs within the UK and the huge export opportunity for UK PLC. Companies like Albion need to work with organisations like the Westminster Sustainable Business Forum, but we also need

[2] Environment Agency. 2008. *Water resources in England and Wales - current state and future pressures*. UK.

engagement across government departments, local authority planners, regulators and the financial sector. If we can harness these forces there is no reason why the UK shouldn't lead the second water revolution and reap immeasurable benefits for UK PLC.

Recommendation 7

The Government should encourage innovation by removing barriers to entry (particularly for SMEs) with a fast-track appeal route to the Competition Appeal Tribunal, and consider reviewing Ofwat's concurrent powers (under the Competition Act 1998) as a competition regulator.

8. WATER EFFICIENCY: CHANGING CONSUMER BEHAVIOUR

David Nussbaum, Chief Executive,
WWF-UK

All the water we use comes from the natural environment. When we turn on the tap, most of us do not think much about it. How often do we ponder on the journey that water has made, whether that be from million year-old chalk deposits deep underground, a clear trout-filled stream, or a man-made reservoir topped up from the nearest river? Despite the recent wet summer, in some parts of the UK water is becoming an increasingly scarce resource. Already many of our rivers, and the ecosystems they support, are under pressure because too much water is pumped from them to maintain public supply. Early in 2012, rivers across much of the south and east of England were low or bone dry, as a result of the combined effects of high abstraction and low rainfall. Furthermore, this threat is only likely to increase as the effects of climate change start to bite.

> "...around a third of the water that is taken from the natural environment is squandered..."

In a world where water is increasingly scarce, it makes sense to become more efficient in how we use it. Yet we have a long way to go, as around one third of the water that is taken from the natural environment is squandered, either lost as leaks during pumping and treatment, or wasted in our homes.[1] While there is a lot the water industry can do to drive down losses in their supply chain, there is a clear role for householders to play too. Some countries in mainland Europe, such as Germany and

[1] WWF-UK. 2009. *Rivers on the Edge*. UK.

Belgium, manage on less than 120 litres per person per day[2], yet our national average is 148 litres.[3]

Water company figures suggest that most people are using less and that the average is skewed by a relatively small number of people using a huge amount of water. Wasting water plays a big part, we have all heard about the need to turn off the tap when brushing our teeth (which can save over 12 litres per day[4]). However, there are other big wasters. For example, leaky toilets account for one billion litres of wasted water every day.[5] Fixing these would bring the national average down to 131 litres. Wessex Water found the average unmetered property used around 30 litres per day in 'continuous use events', roughly translated as dripping toilets or running taps. Furthermore, they found that the volume of water wasted through 'continuous use events' by an unmetered customer is around double that from a customer with a meter.[6]

> "The 'whole-town' approach... ...engaged residents through promoting behaviour change..."

In June 2010, WWF began work with Waterwise, Thames Water and Swindon Borough Council on the Save Water Swindon home retrofit program.[7] The 'whole-town' approach that this project took engaged residents through promoting behaviour change and installing free water efficiency devices. To date, the project is estimated to have reduced Swindon's overall water use by more than 50,000 litres per day. We hope to use this research to form a blueprint on how to run effective water efficiency campaigns across the UK. Another example of how to help households reduce water waste is Wessex Water's tariff trial, which has improved our understanding of the impact of both metering and tariffs to manage the demand and affordability of water. By using tariffs that charge more for incremental water use or put a higher price on water in the summer, these trials reduced demand (compared to

[2] Environment Agency. 2008. *Water and the Environment: International comparisons of domestic per capita consumption*. UK.
[3] Environment Agency. 2008. *Water resources in England and Wales - current state and future pressures*. UK.
[4] Waterwise. Undated. *FAQs: How much is wasted through people brushing teeth, washing hands, showering, leaking taps, etc.?*. Available Online: http://www.waterwise.org.uk/pages/faqs.html. UK.
[5] Artesia Consulting. 2012. *Final Report on Leaky Toilets: Report to 8 Water Companies*. UK.
[6] Wessex Water. 2012. *Towards Sustainable Water Charging: Conclusions from Wessex Water's trial of alternative charging structures and smart metering*. UK.
[7] WWF-UK, Waterwise and Thames Water. 2012. *Save Water Swindon Phase 1 Evaluation Report*. UK.

standard metered charges) by 6% on average.[8] The challenge now is to scale-up these activities to make a meaningful difference.

> "It is only through measuring something that you can manage it."

To mainstream water efficiency and change consumer behaviour there are a number of things we can do. We can increase public awareness about how to save water, helping people make the connection between use of scarce resources and the natural world. We can deliver better water efficiency services that are convenient, effective and available to all. Most importantly, we can get smarter at understanding whose behaviour we're trying to change and make a targeted intervention such as advice, incentives and home leak fixing services.

If there is just one thing the Government does to change behaviour, it could be to introduce smart water meters to every home, coupled with a suite of tariffs that incentivise efficient use and protect vulnerable and less affluent households. The financial incentive offered via meters is just one small part of the behaviour change story. More significantly, meters can tell us how much water is being used and when. This allows much greater targeting of water efficiency interventions to the households (such as those with the leaky toilets) that need help but may not even realise it. It is only through measuring something that you can manage it. This is why WWF believe the Government should remove the red tape that is currently limiting the roll-out of universal metering in the forthcoming Water Bill. We want British people and nature to thrive, and how we use water is a crucial part of that.

Recommendation 8

The Government should, in the forthcoming Water Bill, remove the red tape that is limiting roll-out of universal metering and give Ofwat a primary Sustainable Development duty.

[8] Wessex Water. 2012. *Towards Sustainable Water Charging: Conclusions from Wessex Water's trial of alternative charging structures and smart metering*. UK.

9. THE BOTTOM LINE: LEAKAGE AND SUPPLY CHAIN RESILIENCE

Tony Smith, Chief Executive,
Consumer Council for Water

Leakage matters to water customers. It strongly affects their view of the water industry. It also affects customers' behaviour. Our consumer research tells us that the biggest barrier to people doing more to save water is leakage – 72% of respondents stated that they would potentially do more to save water if they perceived that their water company was doing more to save water.[1] Of those, 76% would like to see companies invest more to reduce leakage.

> "...the average 14-27% of treated water currently being lost through leaks each year is too much."

People feel it is unfair to be asked to turn the taps off or take shorter showers when water companies are losing millions of gallons each day through leaky pipes. Companies and regulators emphasise the challenges companies face in tackling leakage, the level of activity already undertaken or the costs involved. But there is a widespread view that the average 14-27%[2] of treated water currently being lost through leaks each year is too much. In short, if companies want consumers to do their bit to conserve water, they must be seen to be serious about doing theirs too.

When hosepipe bans were imposed in southern and eastern England in early 2012, the Consumer Council for Water (CCWater) conducted research into consumers'

[1] Consumer Council for Water. 2006. *Using Water Wisely Survey*. UK.
[2] Ofwat. 2010. *Service and delivery – performance of the water companies in England and Wales 2009-10*. UK.

views about the restrictions and management of the drought. Of those surveyed, more than three quarters thought that leakage was as much of a contributory factor to the restrictions needing to be imposed as the lack of winter rainfall had been.

There is, however, a question over the reliability of the figures quoted for leakage, and where the water is lost, for example, how much is lost from the company's network and how much from the water pipes owned by property owners or customers. Compulsory metering is being rolled-out in some areas of the southeast of England and this should provide more reliable data, enabling improved leakage reporting and performance. This was one of the factors that supported the case for the roll-out of metering in water stressed areas, as the cost of finding alternative supplies is much higher in these locations.

> "Leakage reduction is a key component of a water company's demand management strategy."

The water regulator Ofwat sets leakage targets for each company with the aim of driving them towards a 'sustainable economic level of leakage'. However, this is a challenging concept given the difficulty of quantifying the wider potential costs and benefits associated with leakage reduction. The regulatory treatment of leakage currently takes no account of the very negative public perception and reputational issues associated with leakage. If it did, leakage targets would likely be tougher and water industry leakage would reduce.

All water companies have to prepare Water Resource Management Plans which look ahead 25 years to show projections of future demand for water and how the companies aim to meet that demand. Water companies are currently preparing their next plans, for 2014 onwards. Leakage reduction is a key component of a water company's demand management strategy. The scale and pace of activity on the network must be acceptable to customers, address the underlying problems and represent value for money. In translating these proposals into company business plans, which will form the basis for the next time water prices are set in 2014, water companies will need to demonstrate that their customers support their investment plans.

CCWater has pressed the regulator and each water company to establish local customer challenge groups, to make sure customer views strongly influence water company plans and pricing decisions by the regulator. This will inevitably include leakage. The regulatory framework – Government, Ofwat and the quality regulators – must take into account the views expressed by customers. It may be that customers would place higher priority on securing supplies and sustaining the environment through further leakage reduction, than on other potential investments required by

environmental legislation. This may be especially true in areas of water stress where messaging about the need to use water wisely were heeded this year, but where expectations on the companies doing their bit to conserve water are growing.

> "Supporting further research and development will also help in the longer-term."

Throwing more money at the problem is not the only answer. Water companies and the water sector generally can become more efficient, and potentially more innovative in their approach to leakage. Supporting further research and development will also help in the longer-term. As the costs associated with new water supply developments increase over time, so the economic arguments for further reducing leakage levels will become more compelling. Such arguments will need to be communicated to consumers in a way that allows them to participate in, and influence, the debate. And it will also require those initiating the debate to listen to, and act upon, the answers which are given.

Recommendation 9

Ofwat should set tough leakage targets that take into account the reputational and behavioural damage that leakage causes, when encouraging water companies to reach a 'sustainable level of leakage'.

10. IMPROVING UNDERSTANDING: THE CASE FOR WATER METERING

Justin Taberham, Director of Policy,
Chartered Institution of Water and Environmental Management

Do you leave all the lights on in your house when you go out? Do you leave your central heating on 24 hours a day all year round? I would hope the answer to these questions is 'no'. The main reason for this is obvious – you are being charged at an increasing rate for your energy supplies and you don't want to waste money. But in the UK, water has traditionally been regarded as a free resource and not one with an inherent value of its own. For around 60% of houses in England and Wales[1], there is no water meter in place so you are charged depending on the size of your house rather than by the amount of water you use. There is little financial incentive to improve water efficiency and, at present, efforts tend to focus on awareness and education measures to change householder behaviour, but this effort alone is not enough to reduce water usage and water wastage.

"To say that we take water for granted in the UK is an understatement."

Water is a necessity for life; it is our most basic need. The role it plays in energy supply, infrastructure, economic growth, food, health and culture makes it a central concern for our national policies. In the UK our water resources are already under pressure, with some 25 million people living in areas where there is less water

[1] Ofwat. 2011. *Exploring the costs and benefits of faster, more systematic water metering in England and Wales*. UK.

available per person than in Spain or Morocco.[2] Yet how many people are aware of this? To say that we take water for granted in the UK is an understatement.

There is a growing occurrence and evidence of adverse environmental impacts from over-licensed abstraction resulting in low flow rivers, dehydrated wetlands and damage to the habitats of in-situ flora and fauna. These impacts may be exacerbated by droughts and the effects of climate change. The Government, regulators and many major abstractors (including water companies) are committed to restoring the most affected aquatic environments and aim where possible to minimise the environmental impact of water abstraction. A key requirement for minimising the actual or potential environmental impact of over-abstraction is to ensure that water is used efficiently and not wasted, and wherever possible, returned to the environment in the right place and with the right quality, after it has been used.

> "...installing efficiency devices and influencing pro-environmental attitudes... ...has delivered average water savings of 40 litres per day per home."

Over the past two years, Waterwise has been running a program called 'Tap into Savings,' which is aimed at helping residents of some 4,500 social homes (and their neighbours) save water, energy and money. During 2010 and 2011, projects were delivered in Merstham and Redhill (Surrey), Coventry (West Midlands) and the Braintree District (Essex), providing free water and energy efficiency devices as well as advice. In addition, over 180 individuals participated in EcoTeams, which were small groups of local residents working together to take action in their homes on water, waste and energy. As the first water efficiency programme to build in energy efficiency and recycling, and to place an equal emphasis on installing efficiency devices and influencing pro-environmental attitudes and behaviours, the initiative has delivered average water savings of 40 litres per day per home. Overall, the programme has delivered annual savings of almost 60 mega litres of water and close to 200 tonnes of carbon dioxide equivalents.

Although climate change is likely to lead to more intense rainfall events and increase the risk of flooding, projections also suggest it will reduce the amount of water available in rivers in England and Wales by 10-15% by 2050, on an annual basis, and by up to as much as 80% during summer months.[3] Groundwater resources may also suffer. This, along with the ongoing and potential increase in the population of England and Wales, will put greater pressure on our limited water supplies and our water environment.

[2] Environment Agency, in Directgov. 2009. *Call for "near universal" water metering*. Available Online: http://www.direct.gov.uk/en/Nl1/Newsroom/DG_176942. UK.
[3] Environment Agency. 2008. *Water resources in England and Wales - current state and future pressures*. UK.

"...reductions in water use will be required to deliver reduced carbon emissions from the water industry"

Metering with appropriate tariff structures – such as the rising block tariff (wherein the unit charge for progressively higher volumes of water taken by customers rises), or a seasonally-varying or aridity-indexed tariff (wherein water costs more per unit when it is less plentiful) – is a major incentive to water efficiency looking to the future. Basic usage should be charged at a low cost with the unit cost escalating rapidly thereafter, this would enable affordability and ensure that wasteful users foot the environmental bill for their usage.

Continued growth in water use will have an increasing environmental impact which may be exacerbated by climate change, lifestyle change, population growth and housing development. The Chartered Institution of Water and Environmental Management believes that water must be used more efficiently to mitigate this risk. In addition, the need to reduce greenhouse gas emissions will mean that amongst other things, reductions in water use will be required to deliver reduced carbon emissions from the water industry.

Recommendation 10

The Government should ensure that, in the longer-term, all household customers are metered where practical and innovative water tariffs are introduced that take account of environmental, social and public health needs.

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The views expressed in these essays are those of the authors and do not necessarily represent the views of the WSBF's individual member organisations.

THE WSBF

About the Westminster Sustainable Business Forum

The Westminster Sustainable Business Forum (WSBF) is a high level coalition of leading businesses, parliamentarians and public sector organisations working to promote effective sustainability policy in the UK.

The WSBF brings together leading businesses who share a belief in the need to operate in an environmentally, socially and economically sustainable way, and who understand that these concerns need to be incorporated into core business practices in order for companies to prosper in the long-term. The WSBF is independent, cross-party and not-for-profit.

The Westminster Sustainable Business Forum's Advisory Board

The WSBF has formed a cross-party Advisory Board to strengthen the robustness and advise on the work that the WSBF performs. The Board is made up of membership from Parliamentarians and the Civil Service with the principal aim to examine, advise and discuss the merits, outputs and any potential barriers to core WSBF activity, including the WSBF research inquiries and events programme. Members of the Board are as follows:

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