

ST GEORGE'S HOUSE CONSULTATION

# THE FUTURE OF WATER

THURSDAY 21<sup>ST</sup> – FRIDAY 22<sup>ND</sup> FEBRUARY 2013

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## ST GEORGE'S HOUSE, WINDSOR CASTLE

### “THE FUTURE OF WATER” CONSULTATION REPORT

THURSDAY 21<sup>ST</sup> TO FRIDAY 22<sup>ND</sup> FEBRUARY 2013

Newly erratic extremes of weather in the UK, combined with rising populations and growth in industry and agriculture, require us to develop new strategies to guarantee our water supply in the near future. We need to implement a package of many overlapping, partial solutions, including some innovative changes. Recommendations include:

- improved communications between stakeholders; shared, consistent, professional, balanced messages across the industry; better connections between water companies; good communications by water companies and other bodies to and with the public about water
- reform of the abstraction regime; controlled abstraction to make best use of supply
- new ways to determine and communicate water levels and drought status
- more efficient water use overall, through, for example, appropriate metering, dynamic tariffs, price review, and grey-water systems
- expanded water storage facilities, including distributed small-scale storage
- new engineering and technological solutions; encourage broader uptake of existing inexpensive technologies, and better leveraging of old technology
- novel funding models such as voluntary and community enterprise schemes, local partnerships, and pension-fund investment in water infrastructure
- incentivising reductions in pollution
- water footprint advertised on food packaging (and other products?)
- reductions in UK's consumption of embedded water, especially from water-short areas

We need a National Water Plan and a national coordinating body to help develop longer-term thinking, good communications, and programmes of activities to take such recommendations forward for future water security in the UK.

## Black swans

After a decade of weather characterised by extremes, 2012 saw parts of the UK experience both drought and severe flooding within the same few months. Overall, our annual rainfall level still resembles those of previous decades but its distribution has changed markedly.

At the end of 2012, if southern England had suffered a third dry winter in succession, large areas would have faced severe water shortages. The precarious margin between normal supply and a standpipe crisis has focussed attention now on our unreadiness for more ‘black swans’ in UK weather – events that exceed or defy knowledge based on past experience.

The problem of erratic extremes of weather interlocks with and exacerbates other problematic issues that influence water use and supply in the UK and around the world, including:

- **population growth:** higher consumer demand for safe, clean water; more sewerage needed; more paved areas (more water run-off); more irrigated land needed for food production; agricultural pollutants in run-off
- **industrial growth:** higher water consumption; downstream water quality affected
- **changing agriculture:** more land needed for meat, dairy, and biofuel production

Britain is also a particularly big spender on water from abroad in the form of water-expensive goods and foodstuffs. As other nations become more concerned to conserve their water, we will find it more expensive and difficult to maintain our current consumption of imported water, while the increasing pressure on water availability worldwide already makes for volatile international change in markets and political relationships.

## Uncertainty

Like every other nation, therefore, we face daunting linear increases in water demand, pollutants, and agricultural or built-up areas. But, even more worryingly in terms of supply and infrastructure, in Britain we must also recognise the newly *non*-linear course taken by our previously stable temperate climate, and accommodate the consequences for the future of our water.

Rising population figures, industrial growth, and land use changes look set to continue worldwide. To stabilise population growth in the UK would slow the rate of increase of demand for water but would not stabilise supply. Areas needing urgent improvement are:

- balancing supply and demand
- addressing *all* users of water
- long-term investment in infrastructure

We are governed and guided by various policy and regulation including the European Water Framework Directive (WFD), DEFRA's White Papers, *Water for Life (2011)*, and *The Natural Choice (2012)*, and the Draft Water Bill of 2012. Britain's existing water infrastructure, policy and regulation are just cause for pride internationally, but they were not designed historically for series of unpredictable, unprecedented water events of unknowable duration (notwithstanding the long view taken by the Victorian engineers who built London's sewer system). However, what we already have necessarily offers the starting point for piecing together an even more resilient, flexible system which must be able to deal with what *might* happen.

### **Adaptation and resilience**

Mitigation strategies such as reductions in water use and water waste are important to help soften the impact of (for example) sustained droughts on UK water supply, but won't guarantee even short-term solutions to the bigger problems outlined above. Rapidly building stronger, locally distributed adaptive capacities into the whole water system is more plausible in terms of being better prepared for water shortages and floods.

There is no readily conceivable single silver bullet. Rather, by envisaging a flexible package combining many complementary partial solutions across the UK, and implementing in each area all those which will be most effective, a more adaptive and resilient system will emerge overall. Such a flexible package could include elements such as public-private partnerships for small-scale catchment; voluntary selective abstraction depending on water supply levels; domestic metering as the default system; new engineering catchment solutions; LGA support for domestic grey-water storage/ use; novel funding models for infrastructure; dynamic water tariffs, reflecting availability; innovative technologies; etc.

## **Consumers \***

Our abstraction from current sources is as high as it can be in many places, so that there is no give in the system to allow for surprises. Nevertheless, we abstract relatively little of the water that is available – but making changes increases cost, so we must both reduce demand and store water better while also introducing new engineering and technological solutions.

On a global basis, agriculture is the world's major user of water, and a significant consumer of water in the UK, as well as a significant contributor to pollution in run-off. It is also one of the most promising areas in which to nurture better storage and stewardship of water, through good communications towards funding incentives and voluntary schemes, local partnerships, introduction of inexpensive technologies and better leveraging of old technology, etc.

Industry and commerce also consume large quantities of water; commerce has made perhaps the most striking progress among UK sectors in reducing consumption levels and pollution, mostly using existing technology. In the same way that businesses' carbon footprints are publicly available, we might begin water-footprinting (green, blue and grey?)

Domestic use of water receives the most political and media attention. Better use of water overall in the UK absolutely requires the general population to see its value (rather than only its cost) and to use it well, assisted by measures such as default metering, dynamic tariffs, grey-water systems in new builds and good communications by water companies and other bodies to and with the public about water use, groundwater levels, supply, etc.

Universal metering would have to be introduced appropriately sensitively, owing to (a) its cost and (b) likely customer responses based on research showing that around a third of customers are opposed to universal metering and more than half want a choice as to whether or not to have a water meter. Strong adverse customer reactions and loss of legitimacy for the industry would likely be politically unacceptable and would lessen the likelihood of future investment in the sector.

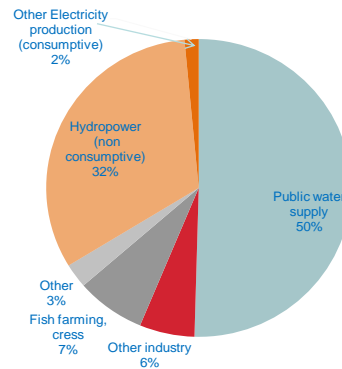
A dynamic-tariff system might comprise a basic, low-cost allowance per household, with a rising block tariff above that. The basic allowance, set by (for example) the Environmental Agency in the public interest, could then be varied according to prevailing water resource availability.

## Our Water Account: Recent Performance

Draft:

Total abstraction for the calendar year 2011 from non-tidal surface water and groundwater sources in England and Wales

Water companies abstracted 15,500 MI/d. Nearly 500 MI/d, or about 3%, less than previous year



Water in food is a related issue. Domestic food waste sends water, often costly embedded water, to landfill or (somewhat better) garden compost. Food labels showing water footprint will help raise awareness of what water is acceptable, what not: for example, drip-irrigated new potatoes from the West Country would use water far more acceptably than (to take an extreme example) Egyptian new potatoes grown using sprinkler irrigation and irreplaceable fossil water.

### Suppliers

Water companies supply the vast majority (around 95%) of UK consumers from public water supply; those on private supply may be even more vulnerable to climate change and other disruptive factors. Good communications and consistency are key for maintaining goodwill and understanding so that water-users will value water and its supply appropriately.

Our water is considered very safe for drinking and could be termed 'pharmaceutical-grade' -- but new or increasing levels of micropollutants and new climate conditions make for further unpredictable events in terms of its safety for consumption. Shared, consistent, professional, balanced messages, as issued during the difficult period of drought-flood in 2012, make a huge difference to consumer comprehension of difficulties, and open the way for companies, authorities and individual consumers to devise and introduce better adaptive strategies and cooperative measures, whether to deal with variable supply, prices, or quality.

### **Water capture**

At all levels in the UK water system, there are needs for more water, and opportunities to capture and keep water more effectively. In urban environments, engineering solutions may be needed for effective stormwater capture but at the level of individual households and businesses, even very small-scale rainwater catchment and unpaved areas help to 'pre-abstract' water that otherwise would run off. Green areas in town planning similarly help reduce demands on sewer systems. Farmers in partnership with water suppliers can contribute significantly by helping to store water in 'mini-reservoirs' of rainfall and along rivers.

### **Waste water**

In agriculture, industry and domestic use, new solutions for waste water and models for grey-water use are needed just as much as better water capture to enable the UK to make best use of resources. Pollutants in agricultural run-off and industrial waste water become more of a health and environmental concern when water levels are low. In the domestic setting it seems ridiculous to send highly treated drinking water down the drain by the litre every time a toilet is flushed. Sewer systems overload where dense populations are rising. Leaking supply pipes are taken as continual cause for public dispute of water prices. Again, many partial solutions could and should be compounded to improve our waste-water use.

### **Wish list for change**

With reference to British water issues, a well-informed wish-list might include:

- (Accelerated) reform of the abstraction regime, in that historical rights embedded in the legacy system ignore current realities of when and whether water is available.
- (Controlled) abstraction to take place at high flow levels rather than low, for a more flexible system overall – while leaving enough flow to 'flush out' the rivers network.
- Creating more small-scale water storage to enable abstraction reform and flexibility; more funding is needed; existing grants to achieve this need more active promotion.
- Better connections between water companies: cooperation and coordination between regions and catchments for (careful) moving of water when advisable, taking into account pumping expense and ecological imperatives.



- Efficient domestic use of water – reduced consumption per person per day, grey water for toilet flushing in new builds, etc. Consumers of water, in order to value water, must be enabled to know how much they consume; universal default metering seems a very necessary and simple step. It will show up leaks and inconsistencies but the overall gain will be very worthwhile.
- Price reviews in consultation with Ofwat, to build overall demand into the pricing equation and incentivise reductions in water use when they are most needed. Incentivise selling *less* water. Dynamic tariffs, if well communicated, will help reduce consumption when supply is most stressed.
- Exhort, assist, incentivise and generally induce industry and commerce to use less water; many organisations have voluntarily made large reductions in water consumption using current, inexpensive technology.
- Work for longer-term thinking in politics; water availability is a long-term problem needing long-term planning, for which four- or five-year cycles are unhelpful. Find and promote common objectives of the various political parties regarding water.
- Adaption and resilience in the water and waste water system should become guiding principles in helping to achieve long term water security.

Some such work is already taking place, so in-depth conversations are valuable to share information and increase trust and communications between interested parties. Better communications and shared understanding more generally can be promoted through partnerships between water companies and customers, and between the public and their local government/authorities as well as national and regulatory bodies. The Environment Agency is well placed to take a leading role in promoting stronger national communications.

### **Policy**

Many desirable actions need to be enabled rather than disabled by existing policy and regulation. UK water regulation must allow for innovative solutions, and not serve price alone but also value. The Water Framework Directive indicates what we would aspire to, and at a high level sets goals by which to maintain course. The Draft Water Bill provides an incentive to improve upon what we have; the White Paper offers a fuller and perhaps usefully nuanced examination of the issues. Good regulation depends on good science, which again requires manpower and public and political engagement, and returns again to the question of effective communications and how the various stakeholders can be helped to help each other to achieve mutual benefits.

We need a National Water Plan. It is vital to gain political (but not party-political) championship at a high national level, to bring water-related issues into public awareness, keep them there, and maintain momentum for change. At the same time, grassroots interest and activity pushes topics up the ministerial agenda. Is a coordinating body needed? The National Drought Group, for example, in 2012 put together a common message which discouraged media searches for conflict-based news stories and helped focus attention where it was needed. The National Adaptation Programme for climate change affords a great opportunity to make the case for adaptive strategies to help secure the future of Britain's water.

Categorisation and handling of climate events such as drought should be based on quantitative thresholds (eg, 'how much groundwater remains'), rather than frequency of events ('driest winter since 19xx'), so as not to base actions on past data that are no longer a reliable index of extremes. Basic human needs must come first, but we factually don't need to use so much, especially in drought periods. Food supply, industry, and the natural environment on which we depend cannot continue without water either. British water is a substantial portion of our natural capital, a point of view strongly supported by the European Water Framework Directive, and weighing up the costs and benefits of assigning priorities helps to find the right balance between people, environment and business.

### **Partnerships**

Towards environmental protection, better monitoring will provide a stronger evidence base to guide improvements, in part through partnerships between amateur associations or individuals, eg interest groups, conservationists, local residents teaming up with the Environment Agency. More information could be made available from private data-collection but this requires justified trust that it will be used responsibly and not against its gatherers, nor jeopardise customers' privacy.

Community enterprise schemes could offer new ways to make things happen per catchment area or per provider; there is already good work in this area for improved communications by water companies, and examples of opportunities such as management of mini-reservoirs for public supply held on private land, which might also offer environmental benefits and alternative means of funding. A general decentralisation of resources and tactics, using different methods according to location, will offer more systemic robustness and resilience.

Innovative funding methods and investment strategies could and should take other exciting forms, too. Water bonds might simultaneously raise funds and also engage public and community interest and involvement in its good use and management, thereby also raising the perceived value of water. Perhaps pension monies could be invested, to assist longer-term thinking. Perhaps, too, we should already be looking for ways to bring water-infrastructure ownership back to the UK rather than selling it abroad.

### **Looking ahead**

In weighing up costs against benefits, different answers result if looking to the near future rather than a few decades ahead. Water is not a short-term commodity. Without its reliable and safe supply, we collapse as a nation. It is essential to take into account the balance of the whole system, and human response.

For example, the cost of finding and repairing leaks at the moment is prohibitive to water companies while there is no immediate cash benefit to doing so. But if customers are to be credibly exhorted to value water, it cannot be wasted by its delivery system. As soon as domestic metering becomes the norm, it will be much easier to show exactly how much is being used where, and where leakage is taking place. Customers responding to consistent, reasoned messaging from different bodies will be more inclined to understand how their water company works in fact. This is only one example of an area in which costs and benefits might usefully be re-examined from various angles and with various longer-term risks in mind.

The future of water in Britain faces substantial, unprecedented challenges of which all we know certainly is that they *will* arrive. By compounding better use of existing technologies with greater efficiencies, rapid improvements in the existing systems and careful planning for better ways to deal with the unforeseen without having to foresee it, we can do something effective to secure the invaluable supply of water that we expect every day to be easily available.

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