

# FROM ABSTRACT TO ACTUAL

DEFRA is joining the dots between natural and manmade water systems and developing an ambitious vision where abstraction, retail and upstream reforms work together. But as abstraction policy evolves from theory to practice, affected sectors are becoming vocal about risk.

**D**EFRA set out ambitious possibilities for abstraction reform at the Marketforce Water Market Reform conference in July. It envisaged abstraction reform working together with upstream and retail reform to offer a plethora of options to those who need to buy or sell water.

The work comes on the heels of the government's January 2016 publication of its abstraction reform policy decisions, which are summarised in the box.

The key element of the emerging thinking is to enable pipe networks and natural features such as rivers and aquifers to work together rather than as distinct systems. While water resource zones don't map neatly onto catchments, DEFRA believes thinking innovatively could enable the dots to be joined up, offering more choice to water wholesalers, retailers and consumers and better outcomes for the environment.

Among the potential commercial transaction options in scope, applicable to trading both surface and groundwater, are:

- New entrants selling water to incumbents, either via direct delivery into the pipe network or via the abstraction market
- Incumbents or new entrants buying from or selling to other abstractors via the abstraction market
- New entrants or other abstractors selling to retailers with direct delivery into the pipe network via access pricing or with delivery via the abstraction market.

Traders could potentially sell a wide range of services to make the most of water resources. These could range from the straightforward delivery of new water resources either into pipe networks or through release to rivers, to more innova-

tive services such as aquifer recharge or river restoration works which would allow more water to be abstracted. In fact, the vision extends to the creation of brokered markets where those who restore rivers, for instance, could sell the benefits to those who want them, be it for water supply, or flood protection, or for quality improvements.

Some of these deals are already possible; new entrants can sell water to incumbents already, for example, while work is also going on in some areas to explore the benefits of water course restoration. For instance, Affinity Water is undertaking a project to improve the morphology of chalk streams in its area. Affinity has to make sustainability reductions to its groundwater abstractions to replenish water in the streams, but the streams are heavily degraded and de-naturalised, which fundamentally undermines their ability to support life. So alongside the reductions, the company is looking at how to work with landowners and others to re-naturalise some of the streams. As part of the work it has set up an extensive monitoring project to improve the data it holds on the relationship between abstraction reductions, river restoration and water quality. Abstractors of the future could have an interest in helping to re-naturalise the catchment they exist in so their water supply is more resilient.

What implementation of the Water Act 2014 will change is that there could be buyers beyond incumbents in the market. Dedicated retailers whose profits will in large part rely on keeping costs down could well be more open to thinking outside the box on procuring water than incumbents. If, for instance, they could secure supplies through a river restoration scheme

more cheaply than through buying straight from the incumbent wholesaler, they may well do it.

Potentially an extensive role for brokers could emerge in all of this. Third parties could perform a range of functions – from the straightforward use of market data to help different stakeholders strike deals, to potentially even performing the fundamental role of developing trading rules to underpin the market (though these would need to be officially approved by the Environment Agency).

Such brokers could come from the private sector, with water innovation company PyTerra being a strong candidate for involvement (see Industry comment, p14-15). Some academic establishments are working on water market solutions – Cranfield University for instance is developing options contracts for access to water that work like insurance. Barry Bendall of The Rivers Trust argues there could be “a key role for the third sector as an honest broker”. He said his organisation, for instance, has no vested interest in anything other than the catchment functioning well so could be trusted to be fair, to work for the good of all, and to build an evidence base to aid future operations.

#### Hydrological connectivity

The picture is complicated but seems to boil down to shuffling water around the system to where it is needed and can be delivered efficiently, via a patchwork of overlapping natural systems and infrastructure networks. The obvious alarm bells surround water quality and the potentially serious implications of mixing waters of different types (see DWI interview, p8-11). DEFRA is alive to these issues – for instance, of invasive species, varying treatment requirements for waters from different catchments, and drinking water quality risks. But it counters that abstraction trading would be in waters that are hydrologically connected already, so quality issues should not be in play. Pre-approved trading rules would be developed in catchments to ensure that trading did not put extra pressure on the environment.

At the moment, these ideas are just that – ideas that need to be worked through, and the implications and response from stakeholders scrutinised. One important pilot project is underway in Kent to explore some of the issues and opportunities arising from abstraction reform for water hungry fruit and vegetable producers in Kent (see box, p18). At some point of course, a Bill will be needed. In the meantime, DEFRA is aiming for reform of the current system by the early 2020s, including a review of the abstraction charging system.

The Department points out that what is essential at this early stage is not to cut off any relevant options as rules for retail and upstream markets crystallise. Timing is critical; specifically, as Ofwat refines the headline policies for upstream markets scoped out in its Water 2020 documents, it will need to take care not to do anything that could prevent all the markets – retail, upstream and abstraction – working as well as they possibly can together down the line.

#### Shared endeavour

Abstraction reform is about as multi-stakeholder as it gets, and since the publication of the January policy document, many stakeholders have been developing their thinking on both the policy and the practical aspects of how to deliver it. Earlier this summer, CIWEM held a full day event to help scope out the

### ABSTRACTION REFORM RECAP

#### DEFRA's January 2016 abstraction policy specified three tiers of reform:

|| **Changes that will apply in all catchments.** These are reforms to modernise 50 year old abstraction arrangements and increase flexibility in light of population growth and climate change; to increase efficiency; support investment; protect natural capital; and enhance resilience. These changes include:

- The replacement of licences by permits from the early 2020s, where daily and annual volumes will be issued based on past peak water usage over ten years (for non water company abstractors). Water companies will need to prove they need their licensed volumes.
- The removal of unused licensed volumes (“paper water”) in catchments where there are environmental pressures.
- Removal of seasonal permits.
- Rules for each catchment to be introduced and published.
- Time limited rights to end; instead permits will be reviewed on a risk-led basis according to the health of the catchment. The abstractor would get three years’ notice of any change unless serious damage was involved but no compensation.
- Low flow controls applied to all.
- Discharges to be brought in to the system.

|| **Additional changes that will apply in enhanced catchments where there is pressure on resources and competition for supply.** These include:

- A Water Shares accounting framework will be introduced which would give abstractors a share of the available water in a catchment, rather than an absolute amount. This will be accompanied by annual volumetric limits only changeable through reviews.
- Pre-approved trading rules (though no requirement to trade)
- A transparent information platform and the encouragement of private brokers to provide trading systems.
- “Bonus water” – the EA will alert abstractors when flows are above a set threshold; they will then be able to take water and store it without it counting towards their annual permitted volumes. This should encourage storage.
- The conversion of on/off based controls to gradual ones.

|| **Pilot catchments.** A small number of catchments will be used to trial more radical and experimental approaches. These include shorter term allocation periods (variable periods will be trialled) and ‘put and take’ trading, where water is released from reservoirs, re-use schemes and groundwater abstraction, discharged into rivers to be traded with others.

|| The rationale for the new stance is to foster confidence by minimising regulatory change and cost, reducing implementation risk and facilitating learning in a reasonably safe environment, while getting a practical framework that emphasises the shared nature of water resources, encourages water efficiency and fosters collaborative catchment management up and running – all the while leaving the door open to possible further development in future. The policy fits with a broader reform trend, which is to move away from a one-size fits all approach towards more sophisticated water management that can be tailored to suit local circumstances.

|| In addition to the future reform arrangements, the government and EA said they are also tackling abstraction that is causing damage to rivers and groundwater now:

- Unsustainable abstractions. The EA has intensified its work to tackle historical unsustainable abstraction licences, including completing the Restoring Sustainable Abstraction programme by 2020. Since 2008, 200 licences in England have been changed and around 250 licences are still being investigated. This action has returned just over 27 billion litres of water per year to the environment.
- Exempt abstractions (e.g. trickle irrigators). Exempt abstractors will be brought under licensing control to create a level playing field for the reformed system.
- RBMP measures. A number of other measures are also being taken under the River Basin Management Planning process linked to the WFD.

implementation challenges, options and solutions around abstraction reform. The meeting brought many different interests together, and DEFRA conveyed its hope that, having set the raw parameters, others would: work through the detail on how the policy might apply in particular circumstances; scope out new services and options; help build evidence; and collectively get the regime to where it needs to be.

At the meeting, the Environment Agency's water resources manager Ian Johnson gave an update on the Agency's work towards a smooth transition from the old regime to the new.

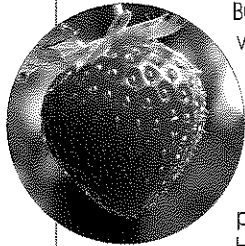
It has, he said, a "substantial technical suite of work" ahead of it to set up the new system, including digitalising abstraction licence data, preparing catchment rules, creating online water accounts through which abstractors will be able to view and manage their activities, and populating the new abstraction permits. It is also working on removing "black boxes" from the system – exemptions such as for trickle irrigators – and addressing the most seriously damaging abstractions including through progressing the Restoring Sustainable Abstraction programme. Johnson said the Agency was engaging with stakeholders early in an effort to work through issues ahead of implementation and that there would be several rounds of consultations to come. Its

huge work programme will run through to go live and be ongoing once the market is active.

For their part, water companies will be variously affected by the changes and have differing levels of enthusiasm for the reforms. The most proactive – typically those in the south and east where water resources are under pressure – are taking an active part in thought leadership, pilot projects and in driving the agenda forward. One particular issue that surfaced at the CIWEM event was how far companies could reasonably adopt a leading role. Nigel Hepworth of Southern Water, for instance, observed companies were well placed to lead on some aspects but that it would not be appropriate for a water company or any other individual abstractor to administer trades.

But the CIWEM event showed two sides to the task in hand: that while there is a sense of acceptance of the need for change and of shared endeavour among abstractors, each sector also has management of its own risks front of mind and will fight its corner hard. One abstractor's certainty of supply is another abstractor's risk. Some of the views emanating from key representatives of the sectors most affected are set out in the box, *Stakeholder perspectives*, opposite. **TWR**

ABSTRACTION REFORM AND KENT GROWERS



Business is booming for fruit and vegetable growers in Kent. The county produces 40% of the UK's fruit, particularly of the soft variety. In 2011, Kent's agriculture and horticulture sector employed 14,000 people and was worth \$500m. However the area is water

scarce and at times at risk of drought.

There is substantial pressure on water environments already with a number of water bodies falling against good environmental status due to low flows. A programme of measures needs to be put in place to mitigate abstraction pressures specifically. Moreover, the south east's population is expected to swell by 3m over the next 25 years.

Growers are highly dependent on irrigation water to maintain productivity and to help meet the quality requirements of the major retailers. In soft fruit, water intensity has also increased as growing in the ground is being replaced with substrate production (not in soil) in polytunnels, which extends the cropping period and is less labour intensive but relies totally on trickle irrigation for the crop's water and nutrient needs.

In Kent, trickle irrigation has grown by 100% over the last few years and as a result, overall irrigation water use has grown significantly. Tickle irrigators have been exempt from abstraction licensing to date and have been able to increase their abstraction levels without constraint. However under government plans, these users will be brought into the system which will constrain their access to river and ground water and consequently business growth.

Growers and other stakeholders including South East Water, Kent County Council and the Environment Agency are exploring innovations, training and technologies to improve water efficiency, productivity and returns. But a supply side remedy concerning water reuse is also being explored, made possible by abstraction reform.

Effluent from the Aylesford sewage works is currently treated and pumped out to sea. South East Water and Southern Water are developing the Aylesford water reuse scheme to process treated effluent for discharge to the Medway for reabstraction. This will effectively mean there is "extra" water in the river so lower quantities will need to be dropped in from Bewl Water reservoir to ensure existing abstraction points work. While few growers will be able to access these supplies directly, abstraction trading would allow the water companies involved to release resources from Bewl or groundwater sources to the growers, as long as hydrological connectivity exists.

This water re-use project would be justified on the basis of providing a public water supply to meet future population growth. Consequently it would be funded by water customers and designed to meet population levels in about 20 years' time. This means it would have initial spare capacity which could be used to supply growers. Bill-payers would gain a share of the revenue from sales to growers, under rules Ofwat would need to develop (potentially based on the precedent of water companies selling capacity in anaerobic digesters). The total use of water by all irrigators in Kent is only about 10% of the capacity of the Aylesford water re-use scheme, so it could accommodate extra trickle irrigator demand be-

yond their current water access for some years.

In the longer run, such arrangements could reveal information that would help underpin the development of more widespread trading. Short term trades in Kent could over time evolve into sophisticated contractual agreements – likely brokered by independent third parties – which would provide a clear idea of the revenue that would be available from this type of non public water supply abstractor. In turn, that could even underpin investment in a new asset – for instance, should demand for water by growers increase beyond the excess capacity in the re-use scheme. Any such investment would probably need to be part funded outside the regulated system but is likely to be financeable based on the previously established revenue streams.

According to DEFRA, this model could be applicable in other areas that have substantial irrigated farming industries including West Sussex and East Anglia. However there are many issues to work through, including:

- Understanding how future grower demand maps on to the potential for water companies to supply water at reasonable cost either via abstraction trading where there is hydrological connectivity or via pipes.
- The costs and nature of contracts to supply water from water companies to growers.
- Whether there is a need to economically regulate these abstraction markets beyond existing competition law.
- Bridging the potential gap between the licensing of trickle irrigation and the availability of water from new water resources via abstraction trading.

Source: DEFRA

STAKEHOLDER PERSPECTIVES

AGRICULTURE AND HORTICULTURE

**Guy Smith, NFU:** Smith said his sector accepted the current position is unsustainable and that farmers are working hard on water efficiency technologies and innovations to manage their consumption down.

They embrace some aspects of the change – for instance, the removal of seasonal restrictions. However, he said: “If you restrict a farmer’s access to water, you restrict his ability to produce” and cautioned that this would contribute to the existing trend of rising food imports. He argued for public support through capital grants and similar for more on-farm reservoirs, which would not only assist farmers’ water situation but could also play a role in flood management.

**John Adlam, Horticultural Trades Associations:**

The market, particularly retailers, dictate what crops are grown and set demanding standards in terms of the presentation of products. Growers cannot therefore simply switch to growing crops that need less water or supply anything other than top quality products. Growers will need some capacity in their permits to cope with changes in the crops demanded by the market. They are working to manage demand – for instance through increased use of drip irrigation which loses less water through evaporation than other methods; through widespread rainwater harvesting and water recycling; and by working with water companies such as Southern to explore trading options and other innovations such as licence aggregation.

**John Hall, West Sussex Growers:** Growers are also environmentalists and many today view mains water as backup to rainwater harvesting, abstraction and on site storage. But access to water is fundamental: crops aren’t damaged without it, they simply die. While the public wants salad vegetables and the like (and the government is promoting home grown food), growers need access to supplies. Funds for on farm reservoirs should come from sources beyond just agriculture.

**Douglas Inglis, ESWAG:** Growers plan cropping based on a normal amount of summer rainfall. If it is a dry year, they need headroom in their licensed allocations to make up the shortfall. Rainfall monitoring technologies are improving which will assist with future planning.

**Anne Stone, Agricultural and Horticultural Development Board:** Stone warned livestock and crop farmers could go out of business, with damaging implications for the national food output, if they are unable to obtain sufficient water. The AHDB feels there is a shortage of evidence on which to base decisions and has commissioned research from Ricardo AEA to model members’ water needs and usage and to compare it to EA data on water availability.

**Andrew Blenkiron, Euston Estate:** Blenkiron recognised the current system is inflexible and accepted the logic of removing completely unused licences. But he spelled out that many farmers see water as “a god given right” and will “fight to protect that asset – there’s no doubt about that”. He pointed out that in some situations, water rights are used only once every ten years or so when it is particularly dry, but that those rights are essential at those times. He is troubled by DEFRA’s refusal to compensate those who will be subject to change where damage to the water environment is perceived. He concluded the following features could limit the challenge from the farming community: demonstration that DEFRA is committed to providing adequate resources for the long term; confidence in the EA’s data and modelling; reassurance that consideration will be given to farmers who can demonstrate special circumstances; commitment to transpose total volumes and existing conditions as permits replace licences; and a swift and fair appeals process.

INDUSTRY

**Debbie Stringer, Confederation of Paper Industries:**

Paper mills “need a consistent supply of water all of the time – it is not possible to stop and start”, which creates difficulty in terms of short term flexibility and makes

it hard to see how trading is applicable. Stringer noted 95% of water used by paper mills is returned to the environment. The Confederation supports the catchment by catchment approach and would be averse to blanket solutions. Nevertheless Stringer cautioned paper is a global industry and said “paper can be made anywhere” – hinting that companies could relocate should the new regime prove too onerous.

**Neil Edwards, RWE:** Thermal power plants are of national importance and need water to function. According to Edwards: “DEFRA’s future flexibility is our uncertainty and that of course is a barrier to investment.” Under the risk based review system, abstractors will get three years’ notice of a change in arrangements. This is “trivial” and more information is needed on how triggers will be set, monitored and acted on. There is a wider need for more information too, including on how allocations will take account of future rainfall.

**Andy Limbrick, Energy UK:** The power sector faces an uncertain policy future: “In the next 15 years this industry could be turned on its head.” On top of everything, abstraction reform is “a major challenge as we try to secure investment in our industry.” Limbrick said the “big question” was whether annual allocations would constrain electricity production. The sector is seeking to preserve its access to water in the long term and Limbrick called for a clear timetable and process

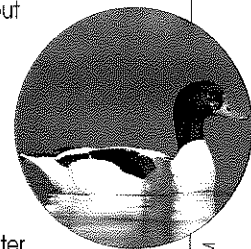
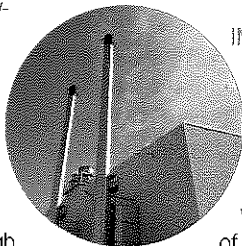
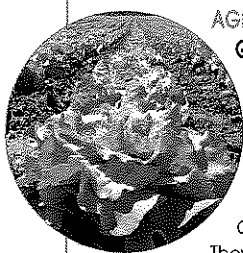
to allow for robust business planning. He added that it was vital stakeholders worked together to balance societal and environmental needs and that DEFRA and the EA must be adequately resourced to determine the best outcomes.

ENVIRONMENTAL ORGANISATIONS

**Hannah Freeman, Blueprint for Water:** Water bodies need baseline levels of protection; in particular there is a need to protect against the negative effects of low flows. Blueprint for Water members are concerned about changes to Hands Off Flow arrangements, fearing this could leave the environment inadequately protected. Stakeholders should understand that protecting the environment is consistent with protecting business, as the water environment underpins many industries, natural capital and ecosystem services.

**Nathan Richardson, RSPB:** As an environmental NGO, the RSPB supports reform. Hydrological change is the fourth biggest driver of species decline; 11% of freshwater species are now threatened. However as an abstractor (the RSPB has around 50 licences totalling 5bn litres of water a year, two-thirds of which will fall within enhanced catchments) the organisation can understand the difficulties abstractors face from the changes. Richardson argued for a collaborative path to increasing resilience, including through knowledge sharing; multi-user collaboration on water storage; progressive tariffing to incentivise better demand management; and “potentially the development of a co-owned (supply/demand) plan.”

**Dominic Gogol and Rose O’Neill, WWF:** Gogol said catchment rules are welcome and will help reach agreed common objectives. However they should not just seek the minimum of no deterioration; they should strive to deliver environmental improvements, particularly where the health of water bodies is immediately under threat such as in the case of the chalk streams of the south east. Noting there are 600 water bodies in the south and east where abstraction is unsustainable, O’Neill added it was imperative to address unsustainable abstractions prior to reform or the new system would be unworkable. She called for firm proposals on paring down unused licences and in general said we “need much greater clarity from DEFRA and the EA” on the 600 water bodies – for instance, how much water and how many licences are involved. “We need lots of transparency” she concluded, commenting WWF doesn’t want the shock of finding unsustainable abstractions as part of the new system, any more than unsustainable abstractors will want the shock of finding their licence will be clawed back.



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