



WWT Round Tables 2012

Carbon Leadership

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Participants

Chair: Bob Baty OBE,
Former chief executive, South West Water

Richard Ackroyd,
Chief executive, Scottish Water

Bruce Ainsworth,
Executive vice president, Black & Veatch Water

Ian Barker,
Head of water (land & biodiversity)
Environment Agency

Piers Clark,
Commercial director, Thames Water

Graham Dixon,
Director of production, Yorkshire Water

Mike Pedley,
Head of energy, Dŵr Cymru Welsh Water

Gavin Shuker MP,
Shadow minister for Water & Waste

Mark Worsfold,
Chief engineer, Ofwat

Bob Baty: Good morning to you all and welcome to this round table gathering organised by Water & Wastewater Treatment and sponsored by Black & Veatch. The topic that we are seeking to explore – Carbon: what are the water industry's leaders doing to balance the budget? So clearly very topical and a challenge for us all. I am obviously a little bit behind the curtain. My last input was in the run up to AMP5 [Asset Management Period 5] and at that particular time I recall the industry was looking then to see how they could deliver the forthcoming then capital programme carbon neutrally, ideally, if we could, so we certainly didn't make the position any more difficult going forward.

Now, I am not sure that has proved to be the case, but maybe that is a good time to open the discussion on that particular area and see how we go. Richard, I know that you are not quite in the AMP sequence of the English water companies, but how is progress as far as Scotland is concerned?

Richard Ackroyd: Well, if I may be perhaps mildly controversial to start off the discussion, I suspect as far as capital programme delivery is concerned the industry hasn't made very much progress around reducing carbon. I think we might find in the course of the discussion that there are other areas where a lot more progress has been made, but we still seem to me to be building the same kind of solutions that were being built in the past. Doubtless there have been reasons behind that, and that will probably come out in the discussion as well, but my view would be 'must try harder'.

Bob Baty: How about for Yorkshire?

Graham Dixon: At Yorkshire Water we are increasing our renewable generation in this period from 8% of our total to 16% and hopefully we can get to 20%. On the capital programme side we are using some new mathematical modelling that has helped. For example, at our Sheffield works we have found that we can reduce the energy demand by 25% by modelling and not having to build the capital as extensively as you might have done in the past. I think part of the conversation is that we are still not incentivised or don't manage to really bring energy efficiency into the capital solutions.

Bob Baty: What about in Welsh terms?

Mike Pedley: In terms of delivering efficiencies and reductions in carbon and the link back to economic efficiencies, it is a bit like Graham was saying, some really good steps forward, big investments in renewable in Wales. We were coming from frankly a pretty poor start point of around 2-2.5% and it will be around the 15-18% by the end of the AMP period in terms of percentage from renewables. So from that side of things there has been some great progress that is being made in AMP5. Capital, Richard made a good point. The awareness has improved; the teams are considering carbon, but I don't think it has made any great changes in behaviours.

Richard Ackroyd: I think that's right and there are quite a lot of reasons that underlie that. One is if you try and assess carbon in an economic context, you have an issue about 'what price do you put on carbon?' and most of the various prices that you might use are relatively low and don't seem to make much of a difference between one solution and another. There is a question that Graham has

raised around incentives, and we are still in a world where largely, the environmental standards we have to meet are pass/fail type of standards and the incentives are to take a risk averse approach and be confident that you build a capital scheme that will guarantee you meet the standard, rather than more of a trial-and-error type of approach. There are all of those and there may well be other factors at play here, but all of those are issues that need addressing one way or another.

Piers Clark: There is a certain amount of resonance in all of the things that have been said today, which is not surprising. I think there are some great stories, but the point is that for every great story you can find equivalent stories of, 'Well, you still use a conventional solution on this particular site' and the great stories are things like the large photovoltaic schemes, which we have been able to build in London in particular. 'Thames Water is the largest photovoltaic [PV] generator inside the M25' is one of the bizarre statistics that I came across and that is mainly because we put some photovoltaics on some of our land. I am less concerned about the incentives because the incentives come from the operational savings that you make and those –

Bob Baty: We can explore that in a few moments.

Piers Clark: Yes, that is worth just picking through. And the other big thing that is a huge opportunity, which we have seen more movement in the last 12 months than we had in the previous ten years, and it has been talked about for ten years, is on waste of energy inside anaerobic digestion and that is something I know Mark has been a strong advocate for supporting, finding a way through that works. It is not without its challenges, but it is something that for the water companies is probably the easiest win in terms of getting a carbon hit, a carbon benefit.

Bob Baty: I will speak to Ian and Mark when we come onto incentives; just setting the scene really. What does it look like, Gavin, from outside the industry? What is your view? And perhaps you could let us have your view from comparisons with other parts of the world?

Gavin Shuker: Of course the elephant in the room when we talk about carbon reduction is the cost of it and as someone that is involved in politics I suppose there is a degree of crossover with Mark here, we have a responsibility to make sure that water remains affordable as well. On both of those issues, on reducing the carbon footprint of the industry but also on water affordability, which are linked, funnily enough the water white paper that has just been published is pretty silent on both and we have been quite critical of that because we think you have got to tackle both of those issues and find a way to do it. I suppose the missing piece is the amount of water that we use. There are some easy wins there in terms of reducing – I forget the figure – I think it is about 1% of all of the carbon emissions this country produces comes from the water industry and we have to look at that in greater detail if we are going to tackle it. I think it is about having that long-term approach which at the minute is lacking.

Bob Baty: Is it your perception of the water industry as somebody coming to it relatively recently?

Gavin Shuker: Well, Piers makes a very good point which is, for every anecdote and every project that we see which is brilliant – I was up with Graham last week at a treatment works, and brilliant projects going on there – there are equal anecdotes and stories and there is the stuff that you don't see. It is a carbon intensive industry. Probably the first question that everyone that has ever done my job has asked when we talk about water shortages is, 'Well why can't we just have a national grid for water?' and it always takes five minutes for the Minister involved to have explained by the civil servants as to why; it is carbon, right? It is a heavy industry with extensive treatment processes so we have to acknowledge the reality of that, but we have to see much more in this area because we can't get by on anecdotes over the next period.

Bob Baty: Bruce, you're experienced in the UK and elsewhere – where do you think we are?

Bruce Ainsworth: There is a lot that rings true from what was said here about maybe things haven't been pushed as far along as they could have been, but the UK is actually leading much of the world in focussing on the carbon reduction and if you look at other parts of the world, you will see that they are not as advanced or not as far along. One of the things I would say that we find is that there are really untapped energy sources in the water and wastewater systems, and we are now beginning to see that energy being harvested. Some of that is via some new technology; you have talked about PV and there is also the processes that drive more methane out of the sewage sludge so that we can generate more electricity that way. Then there are some old technologies like wind and hydro, but maybe there is one area that perhaps other parts of the world are ahead in, and that is really in the commercial model. It is a model in which you go and undertake energy audits and operational audits to find ways to drive wastage out, and by driving that wastage out you can generate funds to pay for the capital improvements to drive these efficiencies. So that is an area that some parts of the world, and the United States is particularly focussed on that sort of model where they can actually generate a carbon reduction and it creates a savings to the operating cost and to the overall cost of the customer.

Bob Baty: That interface is with the incentives and what opportunity there is to build incentives into a regulatory regime. Ian, perhaps from an Environment Agency point of view?

Ian Barker: It is interesting to look across the industry in this current period in that there is some good stuff going on, but in many ways it does look and feel very much like previous AMP periods and it is very easy to criticise, but I do know just how difficult it is to drive innovation in this area in terms of carbon reduction because we need to remember that the Environment Agency itself has a big capital programme for £300-500M a year capital spend and we are spending in just the same way as colleagues around the table from the companies. I guess it is interesting to compare where the water companies are with adaptation compared with mitigation because as one would hope and expect, the water industry is quite well ahead of the curve in terms of adaptation. Not to say there isn't a lot more to do, but it is doing better than most industries. In terms of mitigation, as I say, it does look and feel very much the same and we have to say can we carry on like this and the answer is, 'No' for two reasons. The first is the Government water white paper, Water for

Life, which came out just before Christmas, which made very clear that the status quo is not an option and that we do need to start doing things very differently across the board in terms of managing water resources and managing wastewater. Secondly, Ofwat's consultation on future price limits recently closed and introduces two areas which will help to drive innovation and fresh thinking, I hope. One is the Totex [total expenditure] approach to move away from operating expenditure and capital expenditure and the second is the outcomes approach. Richard mentioned earlier that by and large, the water industry is pretty risk averse. In terms of meeting standards it is pass/fail and can it afford to have a trial-and-error approach? It will be interesting as we work through how the outcomes approach will work in practice to consider where the risk lies and the appetite for risk amongst companies and regulators and governments in terms of meeting necessary standards. But there is a huge opportunity there for innovation and carbon reduction which it will be interesting to see how the next set of business plans, PR14, shape up to that.

Mark Worsfold: The challenge at the end of the day around incentives is that balance between risk and that understanding of risk and Piers picked up the very points there about there is a lot of innovation and technology out there that is being applied. Our challenge as a sector is having that whole understanding about cost and therefore risk about its delivery, because a lot of our challenges come down to the fact that delivering a lot of these schemes and so forth are actually very different to the things we have done before. There are risks associated with their deliveries, and if we look at their delivery in other sectors, the risk and returns on them are far higher than the level of risk that we are used to in the water sector. So there, one great challenge is to try and present those so that we can have meaningful discussions between regulators and companies about the balance of risk in those projects and the balance of whether that should be funded through customer bills or whether those are risks that should be borne by the shareholders. That is the biggest challenge, risk, because we need to understand it and we need to effectively deliver against it.

Piers Clark: And the positive side of risk is that there is always opportunity, and that is about understanding, because you know what, if you get the carbon bit right, there is money to be made.

Bob Baty: Certainly in my experience when we promoted 40 coastal clean-up projects the customer influence on the solution had to be enormous to get them delivered. That inevitably involved picking up discharges at a low point, pumping the whole of that discharge back up to some remote location away from where they lived and then bringing it back down again and discharging the treated effluent into the marine environment. Now, we had debate after debate after debate about the cost of pumping all this back, but in terms of promoting it, it didn't matter how you tried to incentivise it, that is what the customer wanted. Again, that is just an element that needs to be built into it, because at the end of the day whatever we are doing has to be promotable as well.

Gavin Shuker: It is really helpful just to draw people's attention to that; that carbon and water are intrinsically linked and the reason why we are all sitting around this table is we have bought into that argument and we understand. I think some of this is the

responsibility of Government and some of it is the industry, but very few people realise the major ways in which those two are entwined. If you talk to someone about reducing their water usage, for example, very few people will make the link with the fact that they probably heat that water somewhere down the end of the chain and you have to start there and start working backwards and say, 'You learned about the water cycle in school, but let's talk about the energy that is used in that process as well', otherwise you are never going to win an argument such as the one of which scheme should we implement that is environmentally friendly and sustainable.

Piers Clark: Well, it's not just the heating; it's also the pumping. It is the treatment, the pumping, the extraction, every bit of it. You mentioned 1%; I had heard the figure of 2%.

Graham Dixon: It is 2%, yes. I think the point you made Gavin is strong because we have done some work and the carbon footprint with the customer, based in Yorkshire, is three times ours and for a region, it is something to get into there for the carbon footprint and it is good business; it saves the customer as well. You know, less water, less heating.

Ian Barker: So that sense of perspective is really important in terms of the relative carbon footprint of the water industry and what the customers then do with it. There is a link to their energy use in the home as well as the money for their energy bills and if we can make that link more strongly, there is a chance of a win-win.

Graham Dixon: Yes, and it will be a really rich area and talking about AMP5 and AMP6, it is changing now in the industry ready to move on into these areas.

Richard Ackroyd: Customer perceptions of this vary depending upon circumstance and how the issue is explained. I find it quite interesting having been working in Scotland in the water industry for four years where the perception and the reality is there is absolutely no problem about availability of water. I mean, it never stops coming out of the sky, so people are sceptical about any argument that says that we have to conserve water because there isn't enough of it. I appreciate that that will be different in other parts of the UK.

The energy issue is also interesting, depending on how you ask the question. If you ask the question that says that, 'The carbon cost or the energy cost of getting your water supply to you is 1.5%, 2% of the country's energy demand' customers will say, 'Oh, gosh, that sounds a lot. We must do something to reduce it'.

If you say to them, however, 'that is equivalent to the energy consumed by your fridge in about nine months', then they take a different view and suddenly it doesn't seem quite so much of a priority. So the challenge to me is around getting the view of what is the real value to society of making a saving in water consumption and the associated carbon which will be different in different parts of the country, and then explaining that in a way that customers can respond to.

Mike Pedley: The customers do express surprise when they realise that, or you can talk to them, 15% of the operating costs, 15% of the cost of producing the water is energy and the water industry is in an interesting situation compared to a lot of other industries. The energy component of our carbon emissions is huge.

Piers Clark: It's even higher for wastewater.

Gavin Shuker: I take a lot of those points on board. There is a reality, though, coming up in our rear-view mirror which is the carbon reduction commitment. All of your companies are intrinsically involved in that process, so there is a really good question around what is the scale of the challenge that we face. I suppose big picture politics is about coming up with some kind of hierarchy where we say, 'Well, here are the things that are priorities' and very few of my constituents would argue that water isn't a high priority in terms of the energy that we use, certainly if we tried to weaken those standards.

But there are commitments that the water industry will have to live up to and I suppose it kind of comes full circle, doesn't it? It is asking the question, 'What is the regime in which those companies can best step up to the plate of what they have already committed to do?', and certainly the evidence so far has been mixed; that we probably need to go a bit further on it.

Bob Baty: The list that is in front of you, the third point there, 'To what extent do water companies feel CO₂ reduction is good business in terms of cost and benefits for customers and shareholders and owners?' That is the sort of area that we need to explore a little bit; how do the companies see it? Someone said, 'Well, you know, it is not that cost effective'. Is it not like leakage to some extent? There is the cost of actually finding the leakage, but there is the upstream saving that you will benefit from, and how we move that up the agenda is quite important.

Richard Ackroyd: We have found that it is more cost effective to substitute carbon generated electricity with renewables than it is to simply try and reduce the amount of carbon per se. Now, that may be a consequence of the way that renewable power is currently subsidised, but that has been our experience. We have also taken a view in Scotland that we are prepared to take longer payback periods than the regulatory incentives in England have implied, so if we take a view on paybacks in the seven to ten year arena rather than five years, quite a lot of things become economic that otherwise wouldn't have been.

We are currently installing things called Difgens, which are basically pressure-reducing valves that generate power from the flow within water mains. We are putting in micro-hydro installations in places that you otherwise might not have been able to make the case. That is where we will make our biggest breakthrough. It is not inconceivable that Scottish Water could be more than 100% self-sufficient in our generation from within our asset base within not many years. That to me is the key strategy. It is substituting carbon generated power with renewable power.

Mike Pedley: There are a lot of parallels there between Scotland and Wales, not least the ability to take that long-term view and a similar strategy in terms of the hydro and I know that Scotland has a good programme there on the hydro. One thing I would like to emphasise, though, is we had a lot of customer consultation recently around doing on-site wind. Wind is a very touchy subject, but looking at single turbines, micro-turbines on sites. We had a surprisingly positive response, but interestingly it was the economic arguments that actually seemed to drive the positive response with customers. The carbon gave them a warm feeling, 'Will it make a difference to

our bills?' – maybe that is the current economic climate, but that is the thing that really came across.

Piers Clark: I think that is a good thing.

Mike Pedley: I am not saying it isn't.

Piers Clark: It is fantastic. What you have done in Scotland is a great example for all of us to follow. The stuff you have done on hydro is brilliant. Unfortunately in Thames Water we don't have the geography and we also don't have the topography for wind either, so generally it is just not good for us. But we in Thames have a shareholder base that not unsurprisingly is looking for much shorter returns that you have been able to accept either in Wales or in Scotland. We are addressing it in a slightly different way. We look at the waste-to-energy opportunity and we think that there are returns there that probably are in the high teens in terms of IRR [internal rate of return], so it becomes quite exciting.

Exactly as Richard said, it is much easier to purchase renewable energy. It defies logic – how can it be easier for me to purchase green power than it is for me to change my behaviours and actually use less energy? But that appears to be the route we are looking at and there are big schemes out there. It is not appropriate to go into the detail here because it's not signed, but in London we are looking at a renewable energy scheme which could be in the order of 15-20MW of power that would be generated on one site, which is coming from a third party. It is a big renewable scheme and it is just easier for us to facilitate making that scheme happen than it is for us to –

Bob Baty: It is interesting with the issue of returns, isn't it, because we see ourselves as a long-term industry and yet when it comes to the commercial part we have very short horizons. I do recall when we built Roadford Reservoir we had a long discussion about whether we put a hydro generation as part of the compensation water. It didn't stack up from an investment point of view, but the Board decided it was something that needed to be done, and by Jove, has it paid for itself subsequently – unbelievably so.

So there needs to be that wider thinking in terms of moving away from the straight commercial rate of return for a particular investment into a much broader vision of how things fit together, because the one thing we would all have no difficulty in agreeing is that the situation and the cost of providing the energy is only going to go one way, so it might take a little bit longer but the rate of acceleration of getting the benefit will be quite enormous in a relatively short period of time.

Graham Dixon: The returns are very good for anaerobic digestion and there is a facility now within the regulated world where that could be spread over more years, the return. If you run an efficient company, that happens. Secondly, what we have had to do is - in the non-regulated world – invest in wind. That is what we have been doing, but we have put hydro in as well, which have a longer return and as long as there is a synergy between that investment and the scheme, we get a return for that. But the regulated world is investor money, but even then some of the returns are outside the five years, but still healthy returns.

Piers Clark: Are your hydro in the regulated business?

Graham Dixon: Yes.

Piers Clark: And I assume your Diffs are in the regulated business?

Richard Ackroyd: We have a mixture of renewable generation, so some of it is in the regulated business and some is non-regulated activity. There is no particular science as to –

Piers Clark: I am desperate to try and understand what you are doing.

Bob Baty: Just in terms of the regulated regime as such, what responsibility do you feel the regulator actually has in designing the regulatory framework to push companies in that direction, or do you think companies should take that route anyway?

Mark Worsfold: Again, it is about companies understanding the delivery of that and the returns associated with it. The point that Ian was making earlier about us moving through the next price review to a Totex approach is to get everybody to think of the totality of those business cases and the cost of those and to be able to articulate those and present those so that we can effectively look at those going forward. The point of returns gets reflected through that in that the outcomes are over a much longer time period for the companies to reflect on the milestones across multiple AMP periods. We would be looking for how are they delivering and how are they setting up against those long-term milestones which allow long-term thinking and deliverables and the risk Ian was talking about.

Bruce Ainsworth: That they see that there is this nexus that we talk about between water and energy and that also correlates to good business. You posed the question, and clearly it is a good business environment and we have seen that here and in other locales where, if you drive your carbon usage down, you can also drive your cost to the customer down and get a better return. I am not sure they are all at odds. There is the right balance you strike, but we have seen utilities, water companies, get to the right balance and get a positive out of all those aspects.

Graham Dixon: I think you are right. It is a good thing to do, and it is good business.

Bob Baty: That's the win-win, isn't it; that is what you have to get into that sort of framework. From a politician's point of view, what contribution do you think politicians can make? I am thinking in a more direct way than generically that we were going in the right direction?

Gavin Shaker: It is a hugely interesting time to be talking about water politics. We have the framework for the next 25 years out there, and others alluded to, some areas are lacking and some not so much. The role of politicians is to sometimes take a broader step back from the really local stuff and say, 'Well, what are the factors that are going on?' Both upstream and downstream there is a convergence of energy, water and waste. We know that and we are all feeling the pressure of it. The question is, in terms of the regulatory regime, how best do you deal with that convergence? Obviously we are aware that Ofwat are currently looking at maybe stretching

out those timescales and moving to a more flexible regime for companies. I would be really interested to know whether or not that is something that would be helpful in the debate. Particularly, we are talking about return on investment for new technology, for a breaking down of different silos within the balance sheet and a more flexible regime. I have picked up some animosity within the industry towards going to that, but it strikes me that maybe that would be a good way forward if we are looking at energy and water together. What do you think?

Graham Dixon: Shouldn't it be a longer period for returns? [Yes] And I think that possibly is, probably is. It affects how we work in the business because we try and get a return within the five years and there are lots of areas where we could have more generation over a longer period. We could put more efficiency kit in with a longer payback period as well.

Richard Ackroyd: It is quite interesting, Graham. We have a different regulator in Scotland as you probably all know, and in discussions with the regulator and the Scottish Government we came to the view that there is no magic about five years. You can pick whatever period seems reasonable, and what we will be doing in the next price review is a tripartite approach with the Scottish Government and the regulator where the Minister is quite likely to say, 'One of your required outputs will be a certain amount of renewable power generation during the period' and we will produce plans as to how we can achieve that and the regulator will recognise that in the price review. We will have to do that in a way that means we get a reasonable payback for the customer, because ultimately the customer pays for it.

Piers Clark: There is a dynamic in Scotland because there is only one supplier whereas in England and Wales with the comparators, it creates a different dynamic between the relationship between the regulator and the –

Bob Baty: The problem with the five years, it does get a life of its own in many respects.

Piers Clark: Yes, a famine/feast cycle exists in the industry.

Bob Baty: Yes, and coming back to the point, it is a long-term industry. The trouble is you can't see ten years ahead in terms of environmental legislation and that is the big cost driver. That relates back obviously to carbon use because of the bulk commodities, and each time we talk about, 'Well, it should go to ten years or longer for investments', you can bet your life there will be interim reviews because of the circumstances changing all the time. But trying to divorce the five-year regulatory cycle within that framework to these other benefits from a commercial point of view, because the commercial point of view locks into the five years because people want to know where they are for the next review – it is how you can separate those things out is part of the challenge.

Richard Ackroyd: And there are ways and means of doing that.

Bob Baty: Well, there must be; there must be.

Mark Worsfold: The outcomes approach that is in the future price

limits is very much about companies looking at what those long-term outcomes would be and set out a plan by which they intend to deliver those through the milestones over the periods and then we look at the overall funding stream associated with that to give that continuity and that understanding. That is a very different place to where we have been in previous price reviews, and I really suggest to everybody that you have a long think about what that means and what that means for your businesses, because we lock ourselves culturally into the five-year cycle and the reality is we can all think outside that box and that is the dialogue we should be having.

Bob Baty: What about the Environment Agency's point of view, Ian?

Ian Barker: I was just reflecting, I have just lost a wager with a colleague, which was that within the first half-hour we would be having a conversation about higher environmental standards driving treatment costs and energy use within the industry. Perhaps that is still to come, so perhaps I could pre-empt that. A lot of the discussion we have had so far is around renewable, which is excellent, increased use of AD and wind and so on, all of which is good, but fundamentally for me it is about how we reduce overall the energy used; the carbon footprint of the industry and energy use in particular. Part of that, yes, one can lay at the door of regulators like ourselves in terms of quality standards, but it is important to remember that we don't specify that a water company has to adopt a carbon intensive solution to a challenge, and this is why I am cautiously optimistic about the approach for the next set of price limits to encourage innovative solutions at a catchment-scale, for example, as some companies are trialling in this current AMP period.

I am really pleased to see Ofwat funding 108 catchment schemes and it is really important that those trials come through to fruition and are then objectively assessed in terms of their effectiveness. Some companies have already done that and have come up with incredibly positive results in terms of the cost effectiveness of a catchment-scale solution to a challenge of removing pesticides and nitrates for example. So there is a lot to play for within that side of things. Also in terms of the way in which the Environment Agency's regulatory regime works, we have been talking to a number of companies who recognise that water works within a catchment, and water and sewage companies also operate within catchments, boundaries, and thinking about ways of linking abstraction and discharge and looking at perhaps more flexible and innovative permitting on our part; working in harmony with the companies; working more in real-time, so that when it is critical to have a particular quality in the river, to a particular standard, and that is met, when it is less critical because flows are higher then there is a more relaxed standard. But again, there is a lot to play for in that. I don't yet know how it will work out in practice because it is still very early days in terms of the thinking.

We are certainly open-minded about some of those opportunities, but it does come back to the very beginning of this conversation, which is around risk and understanding risk and where that lies. That will be quite a challenge for all of us, not least because Ofwat are saying, 'Outcome approaches are fine' – forgive me, Mark – 'but if it doesn't work, you will have to stand the cost yourself'. I am paraphrasing.

Mark Worsfold: It wasn't paraphrasing. And therein lies the challenge, because we all have to move ourselves out of our

standard approach of end-of-pipe type solution, pouring concrete, to thinking very differently about the types of solutions that would be involved. Within that inherently comes a level of risk and we have to transition ourselves as an industry from where we are today to being able to manage that risk and effectively be able to deliver that in, as you say, real time to be able to release those benefits in terms of energy and in terms of quality compliance and benefits ultimately for the consumer.

Richard Ackroyd: Can I pose a question to either Ian or Mark that from a regulatory perspective what is preventing moving quite quickly to the kind of situation you have described, Ian; flexible permits, conjunctive use of assets? What is actually preventing it?

Ian Barker: A viable proposition from the company.

Graham Dixon: We have a couple of examples in Yorkshire. One is the River Don, looking at the whole catchment for impounding reservoirs, sewage system, rivers and that flexibility will come. We have had recent approval on the River Aire, we have been able to not carry out as much investment on a couple of works downstream of a large works which helps carbon footprint. So people are starting to look at the outcomes, what the river needs, and that is a big change, isn't it? We are now in that position with the environment that we can start doing it. The River Don catchment work will help and it is quite a complex catchment model, so it is going to take some working through.

Mark Worsfold: My take on it is this is a journey we are on as an industry and we are working through that journey and we are getting better. We are starting to understand more about the things, because we have responded to all of the basic needs, back to Maslow's 'Hierarchy of Needs'. We have the basics sorted and we can start to think more about the environmental. Just reflecting on how our knowledge is then helping us take those next steps, the challenge is about pace and delivery and therefore the returns that come from that. There is bound to be a discussion, but at the same time we have to really understand those risks and how to deliver against them.

Bob Baty: Is there anything in less developed countries, Bruce that can help? In my experience of it, when we talk about innovation we talk about more sophisticated types of treatment which tend to be more energy intensive, certainly after privatisation. Slow sand filters were the order of the day at one time, a vast area, but quite low in energy required. Then we have gone to rapid gravity filters and we add energy to speed up the process and have a much smaller footprint because land was a bigger driver. I am just wondering if some other countries are still exploring more of the lower technology type of activities that achieve the same objectives.

Bruce Ainsworth: Certainly we see that, and it relates more or less to the catchment management type of approach [which] is the one that is most prevalent and more natural types of treatments that don't rely on as much energy intensive actions, but rely more on natural filtration or natural absorption of some of the constituents that you want out. But I do think one of the things that we have begun to see is that water utilities are beginning to factor in the whole carbon energy management into their master plan, into

their long-term planning. In the past it was primarily driven around the regulation or growth and energy use and the carbon footprint associated with what was needed to be done was a result of what you had to do. Now it has become one of the key parameters as people start to put a master plan together or they are thinking about the long-term, they are bringing that energy usage into their not only individual solution developments but the whole scheme of how they are going to operate their system, how they are going to manage the stewardship of the environment that has been established, that has been given them for that catchment for that area. So I see that as a big benefit, that it is a broader view that the more forward-thinking water companies and utilities are taking in terms of it is not just about solving this problem for today but it is also about thinking about future generations and what is the impact on the carbon footprint from this solution.

Bob Baty: That interfaces with the next bullet point on the list, 'At what level does responsibility for CO₂ lie within your organisation?' Mike, you are the only chap here with 'energy' in your job title. What sort of power do you have within Welsh Water?

Mike Pedley: It doesn't feel like I have a lot of power, but our job in my team is to influence.

Bob Baty: Is there a positive response to that influence?

Mike Pedley: There is, but we have to be realistic and energy, and therefore carbon, is one of a number of competing issues. If you talk to any operational manager who is sat there with his pollution figures and his water quality figures if they are on clean water, we all know that energy and carbon is going to struggle to get to the top, but it is still there. I know a lot of companies, rather like Welsh as well, have brought a lot of the energy and carbon elements together and people are prepared, a bit like we talked about on the customers, to listen. Generally people managing our assets want to make a good impression on the carbon footprint of their organisation. They all have energy there in their targets, it is all built into their objectives, whether it is talking about a whole directorate or –

Bob Baty: Is that part of their financial targets overall?

Mike Pedley: It is part of the financial targets, but I don't think there is anything wrong in using finance, economic targets. It is a way people understand.

Bob Baty: I agree. Just how strong is the linkage between the thought process in terms of finance?

Mike Pedley: It is growing, certainly in our company and I am sure it is true of others. You get better and better data, all the whole development over the past few years with online metering (and we are very close now to 100% online metering looking now at online sub-metering), that gives people data – not just data – but information that they can look at quickly and make decisions, because the people that can make the decisions are often the guys who are operating the plants. If we can support them and make it easy for them, they can take decisions about how they optimise their plants. Often you give them the data and they think, 'Oh, yes – I can do that; I can change that'. So certainly with my team and within

Welsh Water it is all about 'time is precious, let's get the information they need accurate so that we can help them make those decisions'. Then we drive the sort of things we have been talking about; that next step in reducing consumption, not just generating it.

Piers Clark: For us in Thames a lot of it is around energy security, which does all link to this. It is around just not knowing what the price of energy is going to be, how much a kilowatt hour is going to be in three years' time and so we are desperately forward-buying power if we can at the right prices, and doing our own generation just gives us more control over that.

Graham Dixon: I can understand that being the case.

Piers Clark: Your comment earlier about old technologies. We have a great example in Thames Water. We used to have, before Heathrow Airport's latest runway was built, a huge sewage treatment works there. We had all of the settling ponds and lagoons and drying beds, and it was a massive works that treated effluent in an incredibly efficient and practical way. Of course as soon as the runway was built, we then had to build Iver South Sewage Treatment Works which is an intense, small footprint, high energy using site. It is amazing how the world just moves on.

Bob Baty: We have the same dichotomy, because historically sewage treatment works were always built at the bottom of the hill, weren't they? Now we have a concern about them being flooded, so it is the other extreme, so there is a trade-off all the time in terms of how these things do interface. In Yorkshire, where do you perceive responsibility?

Graham Dixon: Responsibility is right at the top. It is one of our strategic business objectives to support the vision. I am the accountable director for energy. We have created a new energy and carbon strategy manager with a team of highly technical people, and our balanced score cards are among measures we have taken.

This year, we have prepared our strategy for energy, sustainability and low carbon, which is a document. It is interesting to hear that Scottish Water will be sustainable because we believe that is a possibility in most water companies, depending on the innovation and the new techniques that you can use.

Bob Baty: It is again this dilemma between actually reducing the amount from carbon and producing it from renewable sources, because certainly in Pennon Group, because they had a waste business as well, produced 125% of the energy they actually used, which is fine from a commercial point of view, but it still doesn't address the particular concern overall about the generation of carbon. But for Scottish Water, it rests with you, does it?

Richard Ackroyd: Well, I suppose ultimately most things do. Everybody else thinks that. I agree with Mike that the way you make the biggest difference is getting the guys who are actually operating the plants to monitor the energy. About a fortnight ago I was in one of our sewage works in Glasgow, which is a pretty sort of scruffy, run-down sewage works in the East End of Glasgow, but in the mess room there the operators have a big whiteboard and what they are chalking up on the whiteboard every day is the performance of the works in terms of effluent quality, but also energy consumption,

electricity consumption and it is right there being measured by them every day. They can go out on the site and tweak things and adjust things and make a difference to it. So you can put all the sophisticated stuff in, and that's important, the metering and the control systems, but you have to have the guys who actually operate things –

Bob Baty: Having the speedometer there in front of their eyes is pretty important. It is just making sure that the philosophy behind it is driving the right objective, really, isn't it?

Mike Pedley: I met someone recently who had visited our Cardiff site and the first thing they said to me was the operators showed them the telemetry that they run the site on and went straight to the screen that showed them how many pounds they had generated in terms of saving. That was great to hear from someone who is not to do with Welsh Water, who had gone in and visited the site, and that is what the operators had shown. If we could replicate that over 2,000 people that would be great.

Gavin Shuker: Absolutely, because the question is who is responsible for CO₂ in the organisation; you may as well say, 'Well, who is responsible for cost?' and it strikes me that 20-25 years ago, when the industry went private there is a lot of experience to draw from institutionally from within the industry moving from that mindset where it was always someone else's problem to, 'This is mine'; that kind of cultural change. I suppose that is what we are starting to see in the industry again, making that link between CO₂ and cost and being able to say, 'Well, we are all responsible for cost and therefore we are all responsible for carbon dioxide in the organisation'.

Mark Worsfold: This is one of the challenges we have been looking at in the future price limits, because at the end of the day, how effective are the business processes and so forth to actually reduce that going forward? The three areas that have come up in the work we have been doing now, with optimisation around movement of water across the regions, there is the sludge treatment and all the transport associated with that and then the final area is what we touched on earlier in terms of catchment. There are three great optimisation opportunities there, and one of the things we are looking at as a regulator is how to incentivise people to be very good at that, because the returns and everything should be there.

When you look across the industry, that capability is there in pockets. It isn't universal across the sector as a whole, so one of the challenges I have is how do we move from where we are today to try and incentivise that behaviour in all of those activities across all of the companies? There should be some great savings if we could do that, and it is a big cultural challenge.

Ian Barker: Culture is exactly the right issue here. At the Environment Agency, as you would expect, from the Board downwards reducing carbon is something which is embedded within the organisation which everybody embraces in exactly the way Gavin outlined it should happen. We have done really well in terms of reducing miles driven. We keep out-performing our scorecard targets, and we are also reducing train travel as well, so we are just moving around less.

We do well within our office buildings, but the biggest challenge for us is energy associated with pumping, as it will be with colleagues

around the table here. We have a double whammy – we have to pump large volumes of water when there is too much of it and keep people's homes dry, but we also operate major regulation schemes to support river flows during dry periods, and this coming summer will be a real test of those. So we have a big carbon footprint associated with all that pumping and we have done as much as we can in terms of optimising pumping regimes and installing variable speed efficient pumps. The guys on site do their very best to optimise all of this, but there is no getting away from the fact that that is one of, or probably the most carbon intensive part of our business.

This Friday, 24 February, we are launching a competition jointly with the Technology Strategy Board to look for low carbon pumping ideas. I hope colleagues around the industry will take up this challenge because it is something which is so important to all of us, and at the Environment Agency we are now up against it. We haven't run out of ideas, but it needs a step change in the approach to pumping. One of the things we have recognised is the Victorians got it right in so many ways in terms of recognising the value of gravity and where possible we are using gravity by-passes and so on rather than actually physically having to pump water.

Richard Ackroyd: That would be a real breakthrough if we could find a way of pumping water with lower energy or lower carbon. It is just endemic in the water industry, it really is.

Bruce Ainsworth: Well, that might be part of that nexus. Sometimes if you carry that further back it might be the source of the generation that is used in order to provide that pumping power, and if you could alter the timings you might be able to impact the carbon, but in a way that you may not immediately recognise because you might be able to tap into a source of generation that is less carbon intensive than another way. And that is another way that the power generation and the water companies, or in this case the Environment Agency, need to figure out to work together to make sure that they understand what the source of that power is at the time they need it, and if there isn't some way to deal with timing to help with that issue.

Richard Ackroyd: Can I just raise a question? There are lots of examples of innovation in the industry around being more energy efficient, but they tend to be a bit on the margin in terms of the benefits that they deliver. Now, I have just had a look by contrast at the automotive industry, and the figures I am sure won't be quite right, but I would imagine that the average car now is probably 50% more fuel efficient than the average car ten years ago, and that is a huge, huge step forward in efficiency. I wonder whether there are parallels, whether we should go and look at the automotive industry and ask why that has happened, what has caused that to come about and could we introduce any of that learning into our own industry.

Gavin Shuker: I suppose the slightly uncomfortable answer is it is actually driving fuel efficiency through regulation and through legislation as well. Look at the EU. The only place that we build white vans basically in the UK now in my constituency, we build the Vivaro, which is very efficient, but what is driving the next generation – fuel economy and costs coming right down? Well, it is the EU working together and saying, 'Well, hang on a minute. These are the requirements you are going to have to hit by 2015 or 2016'. I suppose

there is a question there for the industry – how do we best drive cultural change and the amount of energy that is reduced, when we come along and say, 'You have to cut x amount from your processes. You have to do it without hitting your bottom line because we want a low risk industry. We want long-term investment and reasonable levels of return. Oh, and we also want affordability for customers at the end so that people aren't priced out of the industry,'?

Richard Ackroyd: Those are really important questions and one would have to accept the consequences. I mean, in the automotive industry, a lot of manufacturers have gone bust. In that sort of environment you have lots of consolidation going on and we would, as a society, have to form judgments about whether we can take those kinds of commercial risks with water supplies or not. But at the core of it, there may be a question there about whether you impose legislation on plant and equipment manufacturers, to make them more efficient, or whether you impose them on the end user, the water company or the Environment Agency is a debatable point; that legislation does make people do things faster than many other forces, provided that the whole cost equation balances. We can't impose stupidly high costs on customers as a consequence of this.

Gavin Shuker: Absolutely, and the positive is, it is creating a level playing field for the companies involved. One thing I have been thinking about recently, and I would think this because I am a south-eastern MP, the Shadow Minister for Drought – yes, it is a busy few days at the moment – I have very flippantly talked about the idea of a national grid for water at the start of this round table, but the reality is talking about pumping, if we want to move water around the South-east in particular there is an issue. The topography of the South-east is very different to say Yorkshire or Scotland. I wonder if there is a possibility of a more North-South divide in terms of the carbon usage of different companies as well, and that is a big knock-on for us in terms of legislation. We are saying, 'You have to chop out 40% of your energy usage' and some areas will find that easier than others. That is a really pressing question to the industry going forward as well.

Bob Baty: The difficulty compared with the motor industry, the water industry is a commodity mover one way or another, and you can't shrink it. When you talk about a national grid, immediately people think about electricity cables.

Piers Clark: Or gas when you can press it and transfer it.

Bob Baty: When you explain to people that there isn't a big difference between putting it through a pipeline and putting it in a lorry and transporting it, as Yorkshire did, which is by far the most cost effective solution in those circumstances, but to get that accepted politically and from a customer point of view is very difficult. And as you say, it is mentioned on the television and on the news, 'Now we need a grid', the costs associated with it are phenomenal.

Piers Clark: But you could also argue that there is a grid. We do bulk transfers; it exists. It doesn't exist in the way that Joe Public thinks of a water grid, but there are lots of transfers of water.

Bob Baty: I can tell you, we got water from the Lake District to Mr

Callaghan's constituency in South Wales in 1976. He was the Minister that wanted it and by transferring it into various rivers, but it still involved pumping. You are still pumping it out of one source and putting it in another. You can use the conduits, so practically you can do it but it still doesn't address the fundamental requirement; they all require energy. If you are going to defy nature, you need energy to do it.

Piers Clark: One litre of water is a kilogram. One litre of gas is nothing, is it?

Graham Dixon: There is a key area that as an industry we might need to focus on more and that is we are pumping a lot of water because the usage is high, and we need to look at how we can reduce it in the household and therefore get customers on board with efficiency of water and that is going to be a massive area. As an industry I don't think we have really tapped into that yet – excuse the pun. I was at a workshop on Friday around the water shortage in the South-east and it is an area where we are looking at the symptoms and solutions rather than perhaps going back to the cause, and that is quite a tough world to get into, but that is what we need to do because less water being used in the house, less waste coming out as well and then you go for more local efficiency usages as well in the house. There is knowledge around the world, isn't there? In Australia, how do you do that? What do we need to do?

Richard Ackroyd: It is quite hard, isn't it? I wouldn't actually pin the hopes of the industry on making significant reductions in usage. The price of the product is by and large cheap and therefore the price incentive is not great. There is something in appealing to the environmental consciousness of people; that will gain some level of reduction, but I think this is all going to be at the margin.

Graham Dixon: I don't know. I am not sure. An issue we are going to face in Yorkshire is the population is going to increase from 5.4M to 7M and our thoughts are perhaps can we supply 7M people with the same amount of water that we use now? I am not saying that anything we have done to date won't be successful, but it is going to be something that as a nation we need to look into.

Ian Barker: Graham is absolutely right. There are a number of facts which back up the fact that historically we have put this into the 'too difficult' box, but it is not too difficult and in the last set of water resources management plans (WRMPs), so the ones which companies are currently implementing, for the first time overall per capita consumption reduced. Demand is increasing because of population growth and so on, slightly, but overall per capita consumption reduced in the last set of WRMPs and companies are planning to reduce it still further over the next decade. That shows that it is possible if the will is there and the commitment. Also, it is perverse, the variation in per capita consumption around the country between some of the frugal folk in the Midlands who get by 120 litres per head per day or rather less and some of the more profligate people in the South East – I am not making any value judgements –

Richard Ackroyd: You are assuming the figures are accurate.

Ian Barker: So companies in the South-east whose customers use

an average of 180l per capita per day. First of all, is that variability credible, but secondly what are they doing with that extra 60 or so litres per capita per day and what is the potential in terms of reducing it? There is a lot to play for there. Graham touched on also the fact that the less water which people use in the home then the less wastewater there is. It is also important to recognise that about a third of all the water in the sewers is actually surface water and so the more surface water that we can keep out of sewers the less there is to pump treat.

There is a double benefit there too in thinking about some of the impact of climate change – more storminess – and so a capacity, partly to cope with growth but also importantly to cope with more rainfall capacity. So the more surface water we can keep out of sewers the longer they will be able to do what they are basically there to do which is to transport sewage rather than rainwater. Now we have a combined sewage system for two-thirds or so of our network, so we are not talking about an overnight solution, but a more sustainable approach is the drainage has all sorts of wider benefits that haven't yet been adequately explored.

Mark Worsfold: Yes, right the way down to that water not actually entering the rivers and then us not seeing flooding from a fluvial perspective as well.

Piers Clark: I couldn't agree more with the comment about sustainable urban drainage. You see it in London, the number of people who have paved over their front drive and therefore all the water pours straight down into the sewer, we can't cope with it, you end up with sewer flooding or all those sorts of issues. The other point to note on the water usage, so in Thames Water we have about 163l per head per day and we are setting the challenge of how to get down to say 105l, and working with the Olympics, we are very proud, we have our own black water treatment plant that Black & Veatch built for us at the Olympic Park.

After the Olympics there is going to be the OPLC, which stands for the Olympic Park Legacy Company, and there will be some sustainable developments there and thousands of houses built and they are setting some water targets which are potentially down as low as 80l per head per day. That is very ambitious and the sort of thing that based on the discussion we have had we began, 'Well, that's a jolly good idea', apart from the fact that the only way you can get to that is by doing things like a black water treatment plant, which in terms of energy and carbon is probably more intense than using raw water sources. It is the right thing for us to be doing, to pave the way of better treating wastewater, but you almost go so far to reduce people's water consumption that you are now spending more energy to clean up the wastewater so that they use less of the potable water resources, if that makes sense.

Gavin Shuker: I was just going to ask what scope is there to do what essentially we have done with energy policy where we have tried to incentivise moving the whole process of creating and consuming per household into individual households or collections of households. Do you think there is more scope for us to be using grey sources?

Mark Worsfold: The challenge also is we don't actually want to treat the water that is going into the household. You actually want the household to use the water at the point of collection, so it isn't

transported all the way down to the treatment works to then be pumped all the way back up to them being able to use it. There have been quite a number of different studies that people have been doing, using water with tanks on the sides of their houses and all those things coming off their roofs, and culturally we really struggle with that. We really struggle with SuDS close to people's homes because ultimately we are a society who say, 'Do you know what? We want the water to leave our property as quickly as possible, please, and I would like it to go away and I would like to have my back garden as a complete living room which I have completely paved over', rather than thinking about 'There is a resource there that I could use that could save me money long-term'. We have a big cultural change to think through that.

Bruce Ainsworth: Well, they are hitting on the point that I thought might address Richard's comment about how do you think about this completely differently? My thoughts ran to places where we do business where it is water scarcity and everybody knows that it is water scarce. I think the problem we have here is people can't believe that there is a drought or there is water scarcity in the UK, and it might be beneficial for us to take a look here from the water companies in the UK to those places in the world that are water scarce. True, everybody accepts it. What do they do; how do they view it? Not that you can pick and plop what they do and put it in effect here without some tailoring of it, but at least it will give you a change in mindset to be able to think about different ways to address what really is the same issue; there is just not enough water.

Bob Baty: It is a big circle, that. I can remember one of our local MPs coming along and bringing some overseas visitor to the South-west and the guy saying, 'You must be really rich in this country, you use water to wash the cars', so it is a managed sense; there is no two ways about it. When the industry had the debate on whether there should be two water systems, a clean water system for drinking and water for general use, politically getting over that hurdle from where we have been is very, very difficult and I don't know which government would get elected saying, 'I have a brand new idea. We can save on the carbon but you will have to choose your water from different sources'.

Gavin Shuker: I'll see if I can slip it in!

Bob Baty: It is how you move that thinking through.

Richard Ackroyd: Those are all real issues and these kinds of solutions will take decades to have some real benefit. That may itself be a reason not to go down that route, but it isn't going to solve the problem in the South-east of England that is here now.

Bob Baty: I agree entirely, but the whole point is you have to get that thinking moving because it does take such an enormous length of time. I have said in the past, when I first joined the industry there were two things on the agenda. I can remember clearly, they were talking about leakage and metering, but as a young lad I sat there and we had these debates and it was the same thing; it would take such a long time. Successive governments kept parking it and parking it until eventually the physical demands insist that you face it and that is what we are facing here in terms of the physical demand that will ultimately drive it. A solution has to be found and

our industry is notorious for that sort of slow process, but starting the change in thinking has to be done way up front really and finding a mechanism for doing that.

Piers Clark: Do we think water is just in order of magnitude too cheap?

Bob Baty: That's a totally different debate. Again, we want to look ahead and one of the bullet points, 'Anticipation of future legislation and regulation PR14+' – again, what should we be thinking about in terms of European legislation that the governments are contributing to at this stage and the industry is currently contributing to. What should we be looking at now which is going to help the current situation, however long ahead that happens to be? Any thoughts on that from anyone?

Gavin Shuker: Is it helpful just to outline the short-term agenda? I am sure everyone around the table will know off the back of the white paper, instead of one comprehensive water bill in the next Queen's Speech this year, Defra had lost their slot, so basically the urgent stuff, what the Government considers to be urgent, is going to be passed in the next couple of months. That is the financial vehicle for the Thames Tunnel and the £50 reduction for the South West [Water] bills. Then obviously there is the longer-term stuff – business competition, abstraction reform has been kicked into 2020/2027 I think. We know what the broad things are. I think legislation is really important for two reasons.

First of all, it creates that level playing field, and secondly, while we are having a quite inward-focussed debate about the future of the industry it creates risk for that industry. We are really keen to create an affordable product. We as a party have accepted the consensus around more severe private industry, highly regulated, absolutely, but one where we want to attract investors who want to put their assets into low-risk but decent levels of return. While this process is stretched out over a long period of time, there is an inherent risk in that and so we think Government should be acting much more urgently to push through the legislation and the reforms it wants to do, and then allow the industry to get back to its core business of what it is doing.

At the minute, if I were to put forward a critique of where we are, it is a lack of urgency around getting this stuff done, a lack of ambition around issues that we have been talking about today such as carbon reduction, such as reducing customers' water usage as well and just a lack of competence as well to some degree. I know I would say this, wouldn't I? But lack of competence in terms of transforming what is there into an agenda.]

Defra continually comes up head-to-head with other departments and seems to come off worse. My hope would be that we would get through the next couple of years, and then have a clearer level playing field so that the regulators and so that the companies can get in there and do what they do best. At the minute, I have concerns about this process of thinking about the water industry for the next 20 or 30 years stretching on for so long that it hits the risk levels of the industry.

Bob Baty: What is the perception of any drivers from Europe in terms of influencing this? I am a bit out of touch in terms of what is happening, but inevitably it is European legislation that has driven a lot of these things forward. What is on the horizon there?

Gavin Shuker: Ian may be able to speak to this slightly better than me because obviously it is about getting that level playing field in terms of standards in particular. We know what the big chunky blocks are going to be, we have talked about wastewater. There is very little in the white paper on water quality, which is quite interesting, but is important.

But we have a broad picture. We know we are at the forefront of the standards set by Europe, and I think the industry will keep up with that. The real question is about the domestic reforms much more so, and it is about how you create a level playing field for the industry right now. There will be drivers from Europe, but really we need to set our own course for the next 20 years as well to tackle these problems laid out in the water white paper.

Ian Barker: In terms of Europe, to pick up on what Gavin said, there are two areas coming from Europe, neither of which cause us any surprise nor a significant change in course. The first is around environmental quality standards for emerging pollutants and we need to understand how many of the chemicals which are now entering the environment, the aquatic environment in particular, what those do to the aquatic environment and what they do to people and the standards we need to set in terms of wastewater treatment and drinking water standards, and that is an ongoing debate. The second thing which has come out of Europe is around water scarcity and droughts and drought management.

There again we have a particularly good story to tell in our approach to water planning within England and Wales in terms of WRMPs, drought plans, what companies are in the process of implementing in those drought affected areas at the moment and our overall approach to resilience, whether it is against floods or against droughts. But in terms of changes in legislation, one of the biggest things within the water white paper was abstraction reform. I am conscious that there are some folk who say, 'Out into the 2020s or so'. Within the Government's white paper it suggested that it needs maybe a Water Bill in the next session of Parliament, so 2015 or 2016 or so which would then introduce abstraction reform. That would then be implemented in the 2020s, and that sounds a long way off the reality that you are moving from a system of embedded water rights akin to property rights to a new system of abstraction rights which are based upon flexibility, adaptability to changing water availability because of climate change, changes in our approaches to water use across a whole range of sectors, recognising it is not just the water companies that pump water out of rivers; it is also the farmers, energy companies and so on.

So we wrap up water security, food security, energy security and fundamentally recognise they all require access to water. It would be folly to move too quickly without adequate thought in terms of what the new regime needs to look like. That will take time to work through and it is Government's intention to consult on that next year, having developed proposals very much in consultation with people around this table and lots of others as well.

That approach to abstraction reform will help to reinforce what we keep talking about and never quite cracked, which is the value of water. The National Audit Office reviewed our approach to water resources management a few years back and reached the view that the value of water to society and the economy is incalculable. [Laughter] That it was incalculable, but that doesn't actually reflect the way in which it is valued – not talking about price or cost, but

the way in which it is valued and until we get there, and a new abstraction regime will help with that, then we won't really get the right sort of mindset and culture with regard to water in this country.

Gavin Shuker: Let me just challenge that really briefly, if that's alright, on the abstraction point because there are fundamentally two ways you could approach doing it. One is obviously quite a centralised process and we know it is historic licence, it is a long drawn out process if you are even trying to collate that information and then design a regime that is there. But I think we can get there faster, funnily enough, by really working with the industry to say, 'Well, you are the guys that primarily are holding these licences. What kind of regime could we come up with that gets some of those benefits earlier? What are the current mechanisms that are letting us down in that respect?'

If you look at the broad thrust of the water white paper as it is laid out, there is a very clear emphasis that this is a looming problem. I talked about the North-South divide very crudely before, but it is a looming problem and abstraction is a big part of it in terms of scarcity. We do need to keep our foot on the accelerator.

Ian Barker: We are in danger of agreeing violently, because we don't have to wait until 2025 to have a sustainable abstraction regime in place. Certainly we are very keen and are under considerable pressure from ministers to work with water companies, farmers and others to achieve that sustainable abstraction regime, to look at unsustainable headroom within licences so that by the time we come to the new regime in the 2020s we will actually be working from a sustainable, solid foundation rather than where we are at present which is not sustainable.

Mike Pedley: In getting to that point, you mentioned the value of water and of course value and price are very different things. We have to remember affordability, particularly in the current environment. The other thing that I would like to pick up on is how do we actually balance? You mentioned the example of chemicals in water – a good example – which drives us towards solutions which use more carbon, more energy if we are not careful. Do you think we are there yet in terms of understanding what the true environmental element is, because there is an environmental cost to achieving those environmental standards? How do we arrive at that balance?

Ian Barker: That is recognised in the approach to some of these emerging pollutants, which is that we will look at these separately from some of the standards within the Water Framework [Directive] to try and understand in the round what the total environmental cost is of dealing with them, and it may well be that a better solution is to keep them out of the environment in the first place rather than trying to treat them when they are in. But this is going to be an ongoing debate over the next few years.

Richard Ackroyd: Can I throw my three-penny'th in on that? I wouldn't be a great fan of further legislation. I don't think legislation always solves problems and it sometimes creates new ones. We get the most benefits through working in the existing regulatory framework we have and dealing with some of the issues around incentives. We talked earlier about some of the issues around more flexible risk-based permitting for environmental discharges, and that to me would be where I would put effort.

Bob Baty: The clock is moving on pretty quickly. The final bullet point on the list there is about organisations' views about the possibility of exporting expertise that we have been generating within the industry currently and what potential do we feel there is for sharing that elsewhere and getting some return on it? Any views? Bruce, you are probably the one that is closer to that sort of opportunity.

Bruce Ainsworth: Clearly there is great opportunity there. I said earlier, the UK water companies really are leading the world really in this effort in terms of carbon reduction. I see it from my vantage point and we see it as a company from our vantage point the efforts that are being undertaken in places like the US where they are now beginning to get more serious about harvesting the energy that is available from sewage treatment plant sludge. In the past that hadn't really been a big effort.

We see organisations like DC Water who have undertaken a big effort to do that in one of the largest treatment wastewater plants in the US, using the kinds of technologies that have been deployed for some time here in the UK really, so there is an advantage or an opportunity to undertake that type of thing. And from the regulatory standpoint, it is quite interesting that we get visitors. We had some not too long ago, about two weeks ago from other parts of the world – it was Australia – to look at how does the regulatory regime here work? They obviously have a different regime there.

We have had people from the utilities or interest coming from China to speak to us about how does it work, and I know many of the water companies here have had some of those same visitors visit them at the same time. But clearly much of what they are interested in is not just limited to how does the day-to-day work, but they are interested in how do they address this carbon footprint issue. So clearly there is much opportunity to take what has been done in the UK on the carbon issue and the water industry and move it out to other parts of the world.

Bob Baty: Richard, you are just embarking on an overseas initiative. Would you say this is part of it?

Richard Ackroyd: Absolutely. Our experience mirrors exactly what Bruce has said. There is an enormous demand in other parts of the world to find out what the UK industry has done. Each company has to take its own business decisions as to whether it is in that marketplace or not and they may be in it for different reasons, but there is certainly potential.

Bob Baty: Are there any other companies, or has everybody retrenched over time back to the UK?

Piers Clark: I can say that from Thames Water's perspective we have retrenched and do not intend to go playing overseas, mainly because we think that there is sufficient opportunity within the UK for us to meet our shareholders' objectives. But I can absolutely see that the opportunity exists for consultants and contractors and those utilities which do have the appetite to go overseas to tell a story. The only difference I would maybe put on what Bruce has said is that the story we have to tell is one of practitioners who have adopted technologies within a regulatory environment that everyone aspires to going to. We wouldn't be the first to go to a privatised water industry, but we now have a mature regulated

environment that everyone wants to see what we did and what they can learn from that. I think somewhat ashamedly that we aren't as innovative in terms of developing the products. The Difgen that you have talked about comes from Norway. The Cambi plant for enhancing anaerobic digestion comes from Norway as well. Israel is a great source for innovative technologies and we see probably a great many of the actual technologies we are adopting come from overseas to us, but where we are the leaders in terms of applying them is probably the learning.

Graham Dixon: I would endorse a lot of what Piers has said there really. If we looked how far we have come in the last five years, only now the ball is starting to roll in the use of the technology and it is on the threshold of now getting some innovation. We are on that threshold now in Yorkshire Water, but it is going to take a while for it to prove itself, so we are kind of Yorkshire-focused.

Mark Worsfold: This is one of the observations that our Strategy Board had when they looked at the water sector as a potential platform for innovation and they have chosen to go with a platform within the supply chain because they think that is where the greater opportunities are for the export internationally. That competition kicks off in March, so it is not far to go. So watch this space on that because it is going to be very good.

Bob Baty: Are there any particular points anyone would like to make before we close the session, because we are coming up against the clock now. Does everyone feel they have had a fair opportunity to make a contribution they wanted to make?

Gavin Shuker: I am sure I have had more than a fair share – it is a politician's habit, isn't it? It is a really pertinent point, the one that we just made right at the end there and I just wanted to make a couple of remarks about that. There are a couple of prizes, aren't there, in this debate? The first prize is, I guess, reducing consumption, reducing cost, reducing overheads, meeting our carbon commitments here in the UK. But more broadly, if you look at the economy and where we have been, what are the big drivers for growth in the next 20 or 30 years?

Over this cycle of water industry reform? It is going to be green growth and jobs, absolutely, and I don't think that is restricted to the energy sector. I think that is about the water sector just as much, and it is about being an export-led recovery centre. That is where the recovery has to come from and on both of these points, the debate that we are having today is really, really key. We are world leaders increasingly in using this type of technology, but how are we creating it and exporting it?

A table like this is a really good forum to have that conversation, because we don't just want a healthy water industry here; we want to see that expertise and that benefit coming back to the UK in terms of exporting it as well, and so even just hearing some of these – we don't want to be down on anecdotes, they are great – but hearing some of these anecdotes or stories is really helpful for getting a picture about where we could be as an industry in the next 20 or 30 years and how we could be leading the world in it as well.

Richard Ackroyd: If I may build on that point, in that context we need to see the industry as not just the water utilities, but the entire supply chain. It is an interesting factor to bear in mind that we have

created a regulatory system in the UK that has been absolutely brilliant at providing top quality water and wastewater services in the UK, but it has not been a system designed to encourage the British water industry to go out and market itself to the world. There is a remarkable far-reaching policy debate to be had about whether that issue can be addressed.

Gavin Shuker: I agree.

Bob Baty: Okay, well thank you very much indeed to those contributions. I tried to make a few notes just to sum up, but Gavin, you have done it rather well for me, but just some of the points that I have picked up. There is this need to think on the longer-term investment which is something which has been around for some time, but it is certainly as far as carbon consumption is concerned, whether we can push the planning horizons out a bit further, and certainly when it comes to looking at the commercial investments whether the people who are looking for those returns are happy to go along with the longer-term arrangement.

The perennial issue of reducing water usage overall is clearly fundamental to it all; can we not need the energy in the first place? So that consumer management still remains quite a big challenge for the industry. On the wastewater side of course it is a lot less visible, although that is still one of the biggest parts of the cost driving, and how we can raise people's awareness for that is quite difficult. I am certainly encouraged, and I am sure the industry is, about the exercise that is going on to be able to have adjustable standards for river discharges and reduce the cost, because inevitably the cost of the last bit of improvement in water quality is disproportionate to the earlier part, so that I found quite encouraging.

When it comes to the longer term, I can only conclude by saying it seems like yesterday when Seb Coe came round talking about the Olympics in 2012, and that seemed an eternity, and lo and behold it's here, so 2020 is just round the corner and the need to be starting those processes now just can't be over-emphasised. The time just flashes by and you are there, and these things inevitably take a lot longer than any of us think they will, so keeping the pressure on and keeping the movement going in the right direction is the fundamental requirement to any success in this sort of area. But thank you all very much indeed for your contributions. I very much appreciate it, and I found it particularly interesting. I hope you all have as well.

Thank you very much to *Water & Wastewater Treatment* magazine for organising and to Black & Veatch for sponsoring the event.





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