

Evidence

A Low Carbon Water Industry by 2050

Project summary SC070010/S3

This report consists of six short essays, or 'think-pieces', from six academic authors who were invited to independently describe their visions for a low carbon water industry in 2050. The essays have different styles and emphases, but the authors agree on many of the present and future challenges, opportunities and constraints that will shape the water industry of 2050. Consequently, they describe remarkably similar visions of the industry's future.

All of the authors identify a holistic approach as the key to reducing the industry's carbon footprint. They emphasise that the challenging targets for reducing CO₂e (carbon dioxide equivalent) emissions can only be met if the industry enters far-sighted partnerships with its suppliers and consumers and is supported by a framework of effective policy.

This report is an important part of an Environment Agency science project that is examining the potential for, and barriers to, reducing greenhouse gas emissions from the water industry. Failure to appreciate the breadth of opportunities for reducing carbon footprint and how they are inter-related may result in failure to maximise the benefit of particular opportunities. Failure to appreciate the challenges and constraints that surround opportunities may lead to poor planning and policy-making.

The context for this report, and the EA's wider project, is the Climate Change Act, which imposes a legally binding target of reducing, by 2050, UK greenhouse gas emissions by 80% from their 1990 levels.

The 'think-piece' authors were asked to consider especially:

- what paradigm shifts are needed to deliver a low carbon industry, for example in water infrastructure, scale of operations and technology options?
- what associated behaviour change from consumers and companies will be needed and how could barriers to achieving this be overcome?

- are the mechanisms, to deliver a low carbon industry, already in place through use of the Shadow Price of Carbon and Carbon Reduction Commitment from 2010?

The authors identify a holistic approach as the key to reducing the water industry's carbon footprint to meet the UK's national target.

They specifically refer to the need to:

- decarbonise the electricity industry,
- exploit renewable energy sources available within the water industry,
- encourage cultural change amongst consumers (water efficiency, appreciation of water's 'value'),
- develop risk-based decision-making that balances water quality against carbon mitigation,
- reduce levels of pollutants at source,
- decentralise the water supply,
- use sustainable drainage systems (SuDS),
- encourage research, development and deployment of new technologies,
- make appropriate and effective policy changes and,
- develop carefully targeted financial incentives.

The water industry will be at the forefront in dealing with the effects of climate change. Several of the authors highlight the effects of climate change on the UK and describe both the likely extent of the impacts and the uncertainties associated with predicting impacts. The complexities are illustrated by visions of sea level rise and increased drought driving population migration within Europe and the UK, while the water industry simultaneously addresses the effects of extreme weather events e.g. more frequent and severe flooding and increased incidence of water-borne disease.

Climate change is a significant additional challenge. However, it may in fact facilitate the development and deployment of new infrastructure, technologies and management systems, which could contribute to the 2050 low-carbon target.

The authors recognise that stakeholder engagement is crucial in affecting consumer behaviour and managing societal expectations through a period when radical changes in the industry will have to take place. The authors acknowledge this is a task that should not be underestimated.

All of the authors identify energy use as the water industry's main source of CO₂e emissions. Several suggest that water companies may merge with energy producers to create more effective partnerships for tackling emissions. There are suggestions that water industry 'wastes' could be used as renewable energy sources. One author describes a pilot project that is currently generating 4% of a company's power requirement from a third of their treated sewage.

New technologies for treatment and processing of 'waste' streams are suggested, which would recover heat and valuable raw materials for agriculture and manufacturing, further reducing carbon use.

Among the visions described in the essays are many innovative and radical approaches to reducing CO₂e. Together they highlight what is captured by a quote from one of the authors "*the only certainty for 2050 is that the situation will be more different than the one we can imagine now.*"

It is in this context that the authors emphasise the need for effective, joined-up and far-sighted policy-making, which encourages and supports desired changes in the behaviour and performance of the water industry, its suppliers and end-users.

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