

# Counting the Cost of Carbon

by Dylan Davies & Mark Thomas

**The world's entire population is becoming increasingly aware of the need to reduce greenhouse gas in the war against climate change. Despite all the conspiracy theories to the contrary, Government has accepted that the UK Industry needs to control its carbon footprint by reducing its reliance on certain forms of energy. There is overwhelming scientific evidence that the cost of ignoring climate change will be catastrophically high in both ecological and financial terms.**

In the UK, the water industry is a major impact player in the emissions contributions league due to its energy intensive asset basis. It is, therefore, as much a victim of the effects as it is a perpetrator. The water industry is directly and greatly affected by weather changes. Whether it is increased rainfall or drought, the water industry has to adapt accordingly. Increased rainfall brings with it a strain on the drainage infrastructure and an increase in discharges, resulting in both localised flooding and an increase on energy demands relating to pumping and screening overflows. Drought is inherently the enemy of the water industry as it removes the life blood from the industry's veins, which will lead to reduced reservoir levels and the added side effect of an increased risk of pollution. This combination will naturally lead to supply issues and will have an adverse impact on the existing asset base.

In 2007, the Stern report stated that although all countries will be affected by climate change, there is still time to avoid the worst impact if action is taken. It recommended three elements: carbon pricing; technology policy; and energy efficiency.

In the Climate Change Bill (2007) the UK Government introduced a commitment to reduce the level of UK carbon emissions to 60% of the 1990 base level by 2050. It also included an interim target of a 26% reduction by 2020.

Most people would state that they have a general understanding of the term 'Carbon Footprint'. The Carbon Trust defines Carbon Footprint as "The total set of greenhouse gas emissions caused directly and indirectly by an (individual, event, organisation, product) expressed as CO<sub>2</sub>e". In essence, it is a means of measuring the total greenhouse gas emissions. Naturally, once you have the means of measuring the output, you can compare the impact of different project solutions and derive the best way to manage and extend an asset base. This will lead to the implementation of strategic carbon management.

The UK Water Industry has made significant progress in the development of carbon emissions reporting. The industry, via UK Water, UK WIR and the Carbon Trust, is currently in the process of a three phase research project. The three phases consist of the development of guidelines for calculating and reporting operational carbon emissions; the calculation of embedded and operational whole life carbon accounting; and finally supply chain emissions. The first two phases are complete. In addition, the Environment Agency has produced a very useful project carbon calculator. This tool calculates the carbon footprint of a project by assessing the various quantities of different construction materials, inputting the distance to be travelled by deliveries and the modes of transport, and multiplying these by a standard emissions factor per material.

A 'shadow price of carbon' (SPC), expressed in £/tCO<sub>2</sub>e, can be applied to the annual greenhouse gas emissions over a projected life of a project or programme to derive discounted Net Present Values. DEFRA recommended that an indicative SPC of £25/tCO<sub>2</sub>e be applied in investment appraisals. Once a standard and consistent cost of carbon is derived, it is only a small step to incorporate carbon accounting within whole life cost of ownership and long term cost

benefit analysis. This will lead to the planning and delivery of entire asset investment in terms of optimal environmental and economic solutions.

During the PRO9 process, Ofwat expects the industry to use Cost Benefit Analysis as a key tool for planning and making decisions in all areas of business. In addition, the industry is expected to incorporate carbon change mitigation strategies including the development of renewable energy sources such as combined heat and power at sewage treatment works where they can be shown to be cost beneficial.

The consumption of energy is a major expense to the running and management of a water and wastewater treatment and distribution network, which in itself provides an incentive to encourage energy efficiency. Reducing energy, therefore reduces operating costs. In addition during 2001, the UK Government introduced the Enhanced Capital Allowance scheme which provides 100% first year tax allowances for expenditure incurred on energy efficient and water conserving products and technologies. Many UK water companies are taking full advantage of this scheme and have ensured that the design and procurement functions are structured in a manner that optimise these valuable allowances.

## What is in store for the future?

**The water industry must contribute to the achievement of national emissions reduction and has voluntarily committed to increase the use of renewable energy sources.**

There are plans for a future carbon trading scheme as part of the Carbon Reduction Commitment. Basically, this scheme, the first phase of which is planned to be introduced in 2010, will enable participants to acquire carbon allowances. Participants will be able to buy or sell allowances within an overall total cap. There will be self monitoring, reporting and verifying processes in place. **The overall emissions cap will be reduced year on year, thereby introducing carbon reductions. Performance will be measured on emissions reduction per year. Participants who perform well will be financially rewarded and those who do not perform, or do not comply, will be penalised by as much as £75 per tonne of greenhouse gas produced.**

The threat of global warming affects everyone in many different ways. During the week of writing this article, the US Administration, which has long resisted imposing carbon limits, has been advised by its own intelligence agencies that climate change poses a risk to internal and foreign security. A global reduction in greenhouse gas emissions will only be achieved if there is strong cooperation between governments, industry, regulators, suppliers and customers within the global supply chain.

**The UK water industry appears to be recognising the issues, and through regulation and business change is rising to this most important challenge.**

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