Environment Agency

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Water neutrality: an economic assessment for the Thames Gateway development

Science summary SC080033/SS3

The Thames Gateway is the UK's largest regeneration area. It straddles the lower Thames Estuary, stretching for some 40 miles from London Docklands to Southend in Essex and Sheerness in Kent. Over 160,000 homes and 180,000 jobs are planned for the Thames Gateway between 2001 and 2016. The area lies in a region where water resources are already under stress, so water supplies and consumption are important issues – in particular whether water neutrality can be achieved, i.e. total water used after development is equal to, or less than, total water use before development.

Detailed cost estimates for a number of scenarios likely to achieve water neutrality in the Thames Gateway were presented in a report published by the Environment Agency in 2007. As part of a subsequent project, 'Delivering Water Neutrality in the Thames Gateway', the Environment Agency and Communities and Local Government (CLG) asked economic and environmental consultants, Metroeconomica Ltd, to undertake a cost–benefit analysis of water neutrality for the Thames Gateway. Other parts of the project were carried out by Artesia Consulting Ltd.

The new project explores and analyses the options for achieving water neutrality in the Thames Gateway. It makes use of data from spreadsheets developed by ENTEC to prepare the 2007 report and relates to a current ENTEC project to refine the definition of water neutrality and to assess how to monitor the performance of eco-towns with respect to water issues.

Two water efficiency measures scenarios were used as set out in the earlier report:

- The **water neutrality scenario** sets out how water neutrality can be achieved within the period over which the Thames Gateway is being developed. The assumptions made represent the preferred combination of measures considered necessary to bring about water neutrality rather than an assessment of what is realistically achievable.
- The **progressive scenario** is based on the upper limit of what might be achieved within current and potential future regulatory frameworks.

In terms of demand side measures, both scenarios would see extensive deployment of water-saving appliances in existing and new homes (e.g. low flow taps, low flush WCs). Many of the proposed water efficiency measures would also reduce energy consumption due to the reduced need to heat water as well as greater use of more efficient white goods such as washing machines and dishwashers.

Supply side benefits were analysed at supply zone level for the three main companies that supply water to the Thames Gateway development area. The supply model developed for the analysis estimated the benefits due to a reduced need to build additional infrastructure and took account of proposals in the companies' draft Water Resource Management Plans designed to help meet future predicted demand. The analysis incorporated social costs and environmental benefits, including the cost of reduced carbon dioxide emissions.

The benefits of proceeding with either scenario were found to outweigh the costs of implementing the necessary measures. The net present benefit of proceeding with the water neutrality scenario is slightly greater than the progressive scenario (£65 million as opposed to £58 million), but the progressive scenario has a greater benefit to cost ratio (1.64 as opposed to 1.39) and therefore represents a better return on investment. These net benefits are based on water efficiency scenarios developed to save water, not energy. If water neutrality is adopted in the Thames Gateway, there are likely to be additional benefits if the measures are chosen that capture the significant energy benefits associated with the water savings.

A sensitivity analysis demonstrated that the positive net present benefits depend on the savings associated with reduced domestic energy consumption.

If a conservative wholesale value of gas and electricity is assumed, the benefits remain greater than the costs for both scenarios. Where more conservative economic parameters are applied (4.5 per cent rate of discount and 25 years rather than 3.5 per cent/3.0 per cent and 60 years), both scenarios still provide total net present benefits.

An assessment of the likely winners and losers from water neutrality suggested that the only potential losers in the Thames Gateway are those residents who opt not to adopt any of the proposed water-saving measures. There are likely to be considerable cost savings available for Thames Gateway residents moving into new properties.

The study also identified a number of potentially unintended consequences relating to water companies should the water neutrality scenarios be implemented. These include:

- a potential incentive for water companies to opt for demand side measures in preference to developing supply side initiatives;
- water efficiency targets set by Ofwat being displaced outside the Thames Gateway;
- distortion of existing metering programmes;
- an improvement in the water company's trading position under the Carbon Reduction Commitment (CRC);
- potential benefits to energy suppliers involved in the rollout of measures.

With the exception of the CRC, it is believed that these potential unintended consequences can be successfully mitigated, although co-ordinated efforts will be required by the regulatory bodies during detailed planning of how water neutrality will be brought about.

Previous experience of promoting water-saving measures suggests that the uptake rates assumed in the water neutrality scenario will be challenging to achieve. Closer scrutiny of the demographic profile of the Thames Gateway population in the light of Defra research on pro-environmental behaviour indicated that concerted engagement would be required to ensure the required levels of uptake. This may well involve innovative initiatives that engage residents and propose the measures as a default or social norm, as well as providing a level of incentive for action. The estimated administrative costs (undiscounted) of implementing the water efficiency measures (based on data from Waterwise) are about £7.8 million for the water neutrality scenario and £5.6 million for the progressive scenario.

Overall the water neutrality provides a slightly higher net present value (NPV) but lower benefit to cost ratio than the progressive scenario. The progressive scenario therefore represents the risk adverse scenario. However, the concepts and aim of the water neutrality scenario are likely to help the concerted action required to achieve water neutrality in the Thames Gateway as well as providing a valuable example for other development areas to follow.

This report will give the Environment Agency, government departments, planners, other regulators and consultants a broader understanding of water neutrality and how to achieve it. Its findings will:

- inform policy based around the concept of water neutrality;
- inform the development of water companies' Water Resource Management Plans;
- offer lessons for other significant housing growth proposals in the UK.

This summary relates to information from Science Project SC080033, reported in detail in the following output(s):

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