

## Water Neutrality: An economic assessment for the Thames Gateway

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### Key findings

In 2008, the Environment Agency and CLG jointly commissioned an analysis of the relative costs and benefits of delivering water neutrality in the Thames Gateway. Water neutrality is defined as where total water used after new development is no more than that used before the development. The analysis shows that for every £1 invested in water neutrality, benefits of about £1.39 would be realised. The report concludes that a significant net benefit to society would result from achieving water neutrality in the Thames Gateway.

This benefit depends principally on domestic energy savings and the benefits of displaced water supply i.e. water companies' reduced need to build and operate water supply infrastructure. A further important benefit is the reduction in greenhouse gas emissions.

This work builds on a previous study completed in 2007: <http://www.environment-agency.gov.uk/research/library/publications/40737.aspx>

#### ***Towards water neutrality in the Thames Gateway (2007)***

In 2007 the Environment Agency, CLG and Defra published a study exploring the feasibility of achieving water neutrality in the Thames Gateway, a seriously water stressed area where there is significant demand for new housing. Water neutrality is where total water used after new development is no more than that used before the development. The study modelled several scenarios which showed that water neutrality could be achieved through different combinations of the following measures:

- making new developments more water efficient,
- 'offsetting' new demand by retrofitting existing homes and other buildings with more efficient devices and appliances;
- expanding metering and introducing innovative tariffs for water use which encourage households to use water more efficiently.

The report found that the costs of achieving water neutrality would be competitive with other options. It concluded that water neutrality would be a challenging but feasible goal for this eco-region.

## Cost Benefit Analysis (CBA)

The 2007 study examined a range of scenarios for moving towards water neutrality. The CBA examined the costs and benefits of the following two scenarios taken from that study:

*Progressive Scenario* – this scenario illustrated the upper limit of what might be achieved, by building on existing approaches to demand management. It was estimated that this scenario would deliver about 30 per cent of the water savings required to achieve water neutrality.

*Water Neutrality Scenario (Composite Scenario)* – this scenario offered a means of achieving water neutrality without requiring aggressive take-up of the Code for Sustainable Homes or very ambitious retrofit rates. It assumes a 70 per cent penetration of metering across the Thames Gateway and the introduction of variable tariffs by 2018/19.

## Costs and Benefits

The cost benefit analysis (CBA) took into account the following costs relating to reducing water demand:

- Higher costs of water efficient new homes
- Costs of installing water efficient retrofits in existing homes
- Installing and maintaining water meters
- Administering variable tariffs
- Administrative and promotional costs of retrofits.

The costs of the first four of these approaches were based on the estimates of the 2007 study. The analysis then added new estimates for the administrative and promotional costs of retrofits.

The CBA assessed the financial value of the following potential benefits of water neutrality:

- Domestic energy savings in new and existing homes
- Reduction in carbon dioxide (CO<sub>2</sub>) emissions resulting from domestic energy savings (due to reduced use of heated water)
- Water companies supply less water due to water efficiencies
- Reduction in water companies' CO<sub>2</sub> emissions due to reduced supply of water
- Environmental benefits of reduced demand for water.

In the 2007 study the non-domestic sector contributed a significant proportion of water savings in both scenarios - 16 per cent for Progressive; 31 per cent for Neutrality. However, the costs of non-domestic measures were not assessed in detail due to lack of information at the time about the non-domestic development plans for the Thames Gateway. Therefore the CBA considers only the costs and benefits to the domestic sector.

Only costs and benefits which were additional to the business-as-usual scenario were considered. The CBA assumed that the programmes of water efficiencies would take

place between 2009/10 and 2018/19. A 60-year valuation period was used, along with standard 3% discount rate as advocated by Treasury guidelines.

### CBA Results

The results in Table 1 show that water neutrality would cost £165 million, but deliver benefits worth £230 million. So for every £1 invested, benefits worth £1.39 would be realised. For the progressive scenario a higher return of £1.64 per £1 invested is projected – with both the costs and benefits being lower.

The Neutrality scenario would reduce carbon dioxide emissions by more than 1.7 million tonnes – equivalent to the annual emissions of about 270,000 Londoners.

**Table 1. The costs and benefits arising from two different scenarios (domestic measures only)**

	Discounted totals (2008£m)	
	Neutrality	Progressive
<b>Total costs</b>	<b>£165</b>	<b>£91</b>
Total domestic energy savings	£111	£103
Financial benefits of displaced supply	£106	£42
Environmental benefits	£1	£0
Supply CO <sub>2</sub> benefits	£12	£4
Total supply benefits	£120	£46
<b>Total benefits</b>	<b>£230</b>	<b>£149</b>
<b>Total net benefit</b>	<b>£65</b>	<b>£58</b>
<b>Benefits : Costs</b>	<b>1.39</b>	<b>1.64</b>

### Additional benefits

Water neutrality could provide a further range of potential benefits which the CBA did not cost:

- Benefits to the environment of abstracting less water in a water-stressed area
- Benefits to households of reduced supply disruptions, such as hosepipe bans
- Financial benefits to water companies under the Carbon Reduction Commitment
- Financial benefits to energy companies under the Carbon Emissions Reduction Target
- It would help deliver the Government's water consumption target of 130 litres per head per day by 2030
- It would provide a model of a large-scale water efficiency programme which could be replicated in eco-towns and other developments.

Despite these potential advantages, current policy and regulation do not encourage the adoption of the water neutrality approach. In addition, it is unlikely to be delivered without Government support.

## **Distribution of costs and benefits**

It has not yet been determined how a water neutrality approach would be funded. However, it is likely that costs would be shared among several parties. Potential funding sources are water companies, the public sector, householders, developers and energy companies. The main financial beneficiaries are likely to be water companies and householders within the water neutral zone, and everyone would gain from the benefits to the environment.

## **Uncertainties and Assumptions**

The analysis reassessed the costs and benefits using several different parameters:

- a higher discount rate of 4.5% that water companies tend to use in their planning
- a shorter investment period of 25 years that reflects the 25 year water company planning periods
- lower energy prices at wholesale not retail prices

Under these alternative parameters the net benefit of water neutrality is reduced, but remains significant.

We did not assess the effect on our analysis of different rates of water metering. Both the progressive and water neutrality scenarios assume that 70 per cent of homes in the Thames Gateway will be metered by 2018/19. The companies plans for the next Price Review 2010-2015 suggest this is stretching but feasible. If water companies' metering targets fall much below this level, they should be encouraged to concentrate metering expansion within the Thames Gateway.

Nor did we consider the impact of lower uptake rates of water saving retrofits in existing homes. The neutrality scenario makes the assumption that 50 per cent of homes in the Thames Gateway will be retrofitted with at least one water saving device. Although this target is ambitious, independent research by Ipsos Mori for the 2007 report found that most residents supported the aim of water neutrality, especially if it is underpinned by a major publicity campaign. Furthermore, the measures envisaged, such as dual-flush toilets and low-flow showerheads and tap inserts, are simple to use, easy to install and cost-effective.