

Balancing supply and demand through water metering

United Kingdom

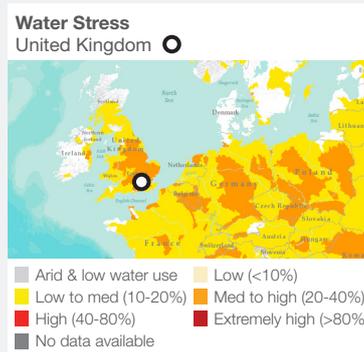
water scarcity impact

Reduced withdrawal	●
Reduced consumption	●
Improved water quality	
Increased productivity	
Net basin benefit	●

volumetric impact
10 220 000 m³/yr

capital cost
\$192 000 000

estimated unit cost of water
140 ¢/m³



Water Stress Map:
F. Gassert, P. Reig, T. Shiao, M. Luck and M. Landis, 2015. "Aqueduct Global Maps 2.1."

Confidence level
● Low ● Medium ● High

Water Scarcity Impact Key
● Main ● Minor

Credits
We would like to acknowledge Southern Water for their input in the preparation of this case study.

Project Overview

The south and east of England has an average annual rainfall of around 700mm, with effective rainfall only about 400mm; much less in drought years. The low rainfall, coupled with a high density of population, forecast significant growth and the potential impact of climate change mean that an already water-stressed region will become even more so over the next two decades. Southern Water Services Ltd (SWS), a privately owned water and wastewater service company, provides supplies to 2.26 million customers in the coastal counties south of London.

The government and its regulators require all water companies in England and Wales to plan water resources at least 25 years ahead to ensure secure supplies. This is a twin track approach where the company must consider the cost-effectiveness of demand management measures before they propose resource developments. In 2009 compulsory water metering was identified as the preferred option for meeting the supply demand gap and in 2010 SWS commenced a five year project to install 500,000 intelligent meters. This was accompanied by significant customer engagement and an aggressive leakage reduction programme in order to demonstrate that the company was also working to reduce losses. The metering programme resulted in a 16.5% reduction in water demand.

Key Elements

- Regulatory requirement to reduce risk to supply security from population growth, climate change and reduced water availability
- Detailed cost benefit analysis showed metering was best option
- Universal Metering Programme reached over 90% of households in five years; over 500 000 meters fitted
- Use of intelligent meters in order to minimize operating costs.
- Intensive customer engagement before and during rollout
- Emphasis of the financial benefit to customers of reduced water usage arising from reduced associated energy usage.

Key Outcomes

- Total decrease in water usage of around 16.5%, equivalent to 10 200 000 m³/year, and in excess of the forecast reduction of 10%
- 62% of households have lower bills with meters
- 1.5% of households were found to have undetected leaks on their supply pipes or internal plumbing
- Better targeting now possible of advice to high users, and support for low income families to access social benefits
- Major new resource development deferred to future planning cycles.
- No increase in water tariffs with the investment paid for through efficiencies elsewhere within the water company.



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Intervention Features

- Demand management through metering

Project Levers

(1) Water Resource Management Planning

Southern Water undertook a detailed water resource management plan over a 25 year time horizon. This identified the supply demand imbalance and followed a twin track approach of assessing a series of both supply side and demand side options. Options included the development of new water resources, desalination, leakage reduction and voluntary or universal water metering. A detailed cost benefit assessment was undertaken which identified universal metering as the least cost option.

(2) Technology Selection

A number of meter technology options were considered for installation. The most cost beneficial option was intelligent meters which enable meter reading to be undertaken using a 'drive by' facility that uses a radio signal. Whilst this increases the capital outlay it significantly reduces the operational cost and increases the effectiveness of meter reading. This choice of technology was a critical aspect in making universal metering the least cost option.

(3) Extensive programme of customer outreach

With no recent widespread history of compulsory household water metering in the UK customers needed to be persuaded that the company's plan was sustainable, soundly-based and would have the least impact on their bills. The financial benefit of reduced water usage on a customer's energy bill (arising from reduced hot water usage) was a key part of this message.

(4) Transition support with the switch to metering

Customers' awareness had already been raised before their meter was installed. Before their contract was switched they remained on the previous property rateable value charge, and after three months with a meter received a letter with information about their water usage and a projection for their first bill, at six months. This progressive supply of information meant that many customers had already responded by reducing their use before the first metered bill arrived. In addition, alarms on meters detected nearly 7000 leaks on customer pipes between 2011 and 2015.

Outcomes and Challenges

In England and Wales changes in water tariffs require the agreement of the regulator Ofwat. The universal metering strategy was identified as the most economically advantageous option but did not result in an increase in customer bills. Whilst the implementation programme cost circa £120 m this was funded through efficiency savings achieved by the water company in other parts of its business. Whilst investment in new water resources may be required in the future, this intervention has enabled it to be deferred until the next water resource management planning cycle.

As the first major programme of universal metering in England and Wales the outcome, in terms of customer response, was by no means certain. The planning assumption was that demand reductions would be 10% but the indicative savings of 16.5% were a surprise. A concern now is the longevity of those reductions, and the risk of 'bounce-back'. The company is therefore planning a sustained programme of customer engagement, with water audits, retrofits and information campaigns in order to minimise the likelihood of consumption increasing.

Southern Water is now building up a much clearer understanding of its household customer base, and so is able to target advice to high users and support to those customers who are struggling to pay their bills. In addition, customers now have a much greater level of understanding of the degree of water stress in southern England, and are more conscious of their water use. The metering programme has ensured water supply security for the long term at least cost to bill payers.

