

Water supply and demand policy

This paper summarises the work we have done over the past year to develop our policy in several key areas of water supply and demand. It is not a comprehensive statement of our policy. It covers:

1. Water efficiency
2. Leakage
3. Metering
4. Climate change

We have provided further information in our reporting requirements for companies' PR09 business plans, and in the following documents:

- guidance in our PR09 [methodology paper](#) on security of supply;
- [RD 02/08](#) and [RD 16/08](#) on leakage issues; and
- the overview of water resource planning issues attached to [Regina Finn's letter](#) of 23 September 2008 to the Environment Minister.

November 2008

1. Water efficiency targets

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As population growth and climate change put increasing pressure on our water resources, it is even more important that we waste as little water as possible. Water companies must play their part by maintaining leakage at a sustainable, economic level, and they also play a key role in encouraging consumers to use water wisely.

Since 1996, each water company in England and Wales has had a duty under section 93A of the Water Industry Act 1991 to promote the efficient use of water by consumers. We check companies' annual June return submissions to ensure that they comply with this duty, but we have not yet had a quantitative framework for assessing companies' performance. In [PR09/15](#), we published our proposals for water efficiency targets, which will provide such a framework. We present our conclusions in full in appendix 1 of this document and summarise them below.

Two-part targets

There are two main reasons why water companies should promote water efficiency to consumers:

- Helping consumers to use water wisely also helps them to control their bills. It is part of good customer service.
- Water efficiency measures can form part of a best value strategy to balance the supply and demand for water, bringing benefits to consumers and to the environment.

Our targets reflect this dual purpose, comprising two parts: base service water efficiency (BSWE) targets and the sustainable economic level of water efficiency (SELWE).

BSWE

The BSWE target represents the **minimum** activity that we expect companies to carry out. It is made up of three elements:

- an annual target to make an assumed saving of one litre of water per property per day, on average, through water efficiency activity;
- a requirement to provide information to consumers on how to use water more wisely; and
- a requirement that each company actively improves the evidence base for water efficiency.

Having taken into account the responses we received, we think it is reasonable for each company to have an equivalent base level target because each company has the same statutory duty to promote water to its consumers. A target of one litre per property per day represents a 40% increase in estimated savings from water efficiency activity, compared with the average over the past three years on a like for like basis, excluding savings from supply pipe leakage. It will prove stretching for many companies, but several have previously demonstrated that it is achievable.

Nevertheless, we accept that there is a limit to how much we can expect consumers to reduce their consumption. We have therefore concluded that companies with very low average per capita consumption (PCC) should be set a lower target. For companies that report PCC below 130 litres on average over the previous three years, we will halve the litres per property per day target to half a litre. This currently only affects Tendring Hundred Water.

We will expect companies to meet their targets on a three-year rolling average basis with a carry-forward provision. This will allow them to schedule their water efficiency optimally, with larger programmes in some years than in others. We recognise that companies will deliver assumed savings unevenly, and that they might carry out more activity early in the reporting cycle. We do not want to penalise companies that carry out water efficiency activity early, or discourage them from doing this, so we will allow companies that exceed their targets in a single year to carry forward any excess assumed savings into subsequent years. We explain this in more detail in appendix 1.

We will not make any additional allowance in price limits to meet base service targets. Some companies already provide a level of service sufficient to meet the base level target we have set. Companies may need to do more to achieve targets. If this involves additional expenditure, they will effectively be compensating their consumers for having done little in the past. They will also no longer benefit from an unmerited, favourable effect on their relative opex efficiency.

We will implement the BSWE target **on a trial basis** during 2009-10, and will amend table 1 of our June returns to accommodate this.

SELWE

Under SELWE, we require companies to consider additional water efficiency activity, above the base level. We expect them to plan for such activity if it forms part of a sustainable, economic approach to balancing supply and demand.

We encourage companies to consider the value of water efficiency as part of a portfolio of measures, helping to minimise overall risk. Companies will be responsible for determining their SELWE as part of an economic appraisal of the options to balance supply and demand. We will make appropriate financial allowance in price limits.

We do not think it is appropriate to assess targets under the SELWE heading on the same three-year rolling average basis as for base service. We will agree a timeframe with each company to complete this activity, and we will expect companies to report progress annually in their June returns.

Targets for water supply licensees and inset appointees

Since 2005, the duty to promote water efficiency has applied to new entrants to the water supply market. In deciding whether targets should apply to new entrants, we must make sure that any regulation is proportionate to the issue it addresses. We have therefore decided that any supplier that serves fewer than **50,000** properties should not be subject to water efficiency targets. However, we would expect all companies, whatever their size, to provide information to consumers on how to use water more wisely.

Incentives and penalties

Companies would have the following incentives to meet or exceed their targets:

- The revenue corrected price cap will compensate companies for any revenue shortfall relative to expectations, but companies will get to keep the cost saving within the 2010-15 period from supplying less water.
- We will 'name and acclaim' the best performing companies.

Where a company failed to meet its targets, and we think the failure is not because of circumstances beyond the company's control, we may impose a

penalty. This will depend on the extent and circumstances of its failure and could include:

- naming and shaming failing companies in annual reports on security of supply issues;
- requiring an action plan from companies explaining how they would return to required target levels and make up previous shortfalls. Reporters would comment on these action plans,
- requiring interim reports (between June returns) on progress on restoring required activity levels – again with Reporters comments;
- making a shortfall adjustment in subsequent price limits; and/or
- stipulating under s93B(2) of the Water Industry Act 1991 (WIA91) that any subsequent failure to achieve the targets will constitute a breach of s93A WIA91, which is enforceable under s18 WIA91.

2. Leakage

“Our recent review of leakage issues is complete, and the basic methodology that companies should apply in calculating their PR09 leakage targets is now settled. But we see scope for further improvements, many of which companies can do now to improve the way that they implement the current methodology.”

Leakage review

In July 2006 we launched a review of our approach to setting leakage targets (see [RD 11/06](#)). We asked for stakeholder views on what the review should include, and as a result commissioned three specific pieces of work. In November 2007 we published on our [website](#) the purpose of each project and the key reports, and we explained our next steps. In summary, the findings were as follows:

| Project | Purpose | Conclusions |
|--|--|---|
| Review of per capita consumption estimates | Are current variations in PCC estimates across companies to be expected? Is there room for improvement? | Variations in PCC are mostly explained by differences in underlying drivers. The report made recommendations for companies to improve their own methods of calculating PCC |
| Review of different methods for setting leakage targets | Are there better ways of setting leakage targets? | ELL (the economic level of leakage) scored well in comparison with more than 20 other approaches. The report recommended considering a modified ELL and a possible frontier approach |
| Incorporating environmental and social costs and benefits into leakage targets | To provide guidance on how best to take account of the environmental costs and benefits of leakage control | The report provided a useful framework for incorporating values, including environmental benefits based on the Environment Agency’s Benefits Assessment Guidance (BAG). But companies should use the best available evidence rather than relying on values from the BAG |

Environmental and social costs

In [RD 02/08](#), we discussed the outcomes of the reports, and provided guidance on how companies should incorporate the reports' findings into their business planning process for PR09. Reflecting the greater emphasis that we are placing on environmental and social costs, we described the basis for future targets as the sustainable, economic level of leakage (SELL).

At the time of writing RD 02/08, we were unable to update the industry on the progress that a sample of companies had made with trialling the guidance on incorporating externalities into their SELL calculation. Those trials are now complete, and the consultants have taken account of the findings in revising their report and the draft guidance. The changes that they have made have not altered the substance of the guidance, but they have made it more user-friendly. A final version of the report and guidance is attached at appendix 2.

Frontier

In [RD 16/08](#), we reported the outcome of a follow-up study to the report on target-setting methodologies. The new study explored the idea of a frontier approach to setting leakage targets. With this project we aimed to drive less efficient companies to catch up with the performance of the best companies. Due to data constraints, however, the consultants were unable to produce models of the cost efficiency of companies' leakage control activity. Instead, they produced a model of leakage levels, but we did not think that we could apply this meaningfully as part of the target-setting process.

We considered whether, as a longer-term project, we should collect the data required to model the cost efficiency of companies' leakage control activities. We concluded provisionally that setting specific leakage efficiency targets would not provide the correct incentives for companies to improve their operating expenditure efficiency overall. We want to encourage companies to be efficient in all areas of their business, not just in leakage management. If we only set efficiency targets for one area of supply/demand expenditure, we are concerned that companies would have a distorted incentive to reduce leakage costs in preference to reducing other costs. This could mean that companies' plans were less efficient overall, leading to higher bills for customers.

We recognised that there might be a case for leakage-specific efficiency targets if current regulation skews companies' incentives in favour of efficiency improvements in other areas over efficiency improvements in leakage control. We invited stakeholders' views on this, but received no

evidence to support the existence of the skewed incentives that would justify leakage-specific efficiency targets. On that basis, we have no immediate plans to do further work on the frontier approach because we doubt whether it would provide the right incentives for companies overall. However, one company has commented that a frontier-type approach might be valuable in making intra-company comparisons of leakage efficiency, helping to identify zones in which a company can improve its processes. We urge companies to consider this.

As part of our Forward Programme, we are planning to review in 2010-11 the whole package of regulatory incentives. We will consider the incentives for companies to become more efficient in different aspects of their business, including leakage control activity, as part of that review.

Where next? Better estimates of SELL

Our recent review of leakage issues is complete, and the basic methodology that companies should apply in calculating their PR09 leakage targets is now settled. But we see scope for further improvements, many of which companies can do now to improve the way that they implement the current methodology.

Issues that companies should consider when preparing their final water resource plans and final business plans include:

- **Considering whether the costs of reducing leakage are temporary or permanent.** There is evidence that, within reasonable bounds, some of the costs of maintaining a given level of leakage may not depend on whether that level is relatively high or low. If some of the costs of reducing leakage are one-off, the SELL might be lower than companies previously thought. On the same basis, companies operating below their current SELL estimate might find that some of the cost savings from allowing leakage to rise are one-off, perhaps suggesting that it is more economic not to allow leakage to rise.
- **Comparing the cost savings from allowing leakage to rise with the costs of bringing it back down again.** Companies with a significant supply/demand surplus may have no clear need to maintain leakage at existing levels, but if there is a reasonable prospect that they will need additional capacity in the future, they might find that the cost savings from allowing leakage to rise in the short run are outweighed by the greater costs and risks of bringing it back down in the long run.
- **Recognising links with other areas of company activity.** In particular, if some mains are deteriorating to such an extent that they

might need to be replaced or relined in the foreseeable future, there may be a case for bringing that work forward in order to secure combined leakage and serviceability benefits at lower overall costs. Similarly, companies should consider the benefits that arise when more customers have meters, making supply pipe leakage easier to detect.

- **Considering the value of leakage control as a more flexible option in an uncertain world.** The magnitude of the effects on supply and demand of climate change, population growth and changes in PCC are all uncertain. Committing significant capital investment to deal with these uncertain effects carries a risk because some of that investment might prove to be unnecessary. Once the investment is in place, it can be difficult or impossible to reverse it. Leakage control is generally a more flexible option, allowing companies to take smaller incremental steps to balance supply and demand. This can have a substantial value, allowing companies to defer large capital schemes until better evidence shows whether or not they need to invest in such schemes.
- **Taking account of the scope for future efficiency improvements.** If there is greater scope for companies to become more efficient at controlling leakage, relative to the potential for efficiency improvements in other activities, this would make additional leakage control more favourable when compared with other supply/demand options.
- **Integrating leakage control more fully into the supply/demand appraisal.** In many cases, companies calculate their SELL in a separate modelling process, which is more limited than the full supply/demand appraisal. They then use the resulting SELL as an input in the supply/demand appraisal, allowing leakage to vary little (or not at all) from this initial value. We think that companies with supply/demand deficits should calculate their SELL as part of the same appraisal that determines the rest of their preferred solution for balancing supply and demand. Our view is that this integrated approach is the correct interpretation of current water resource planning guidance, and companies should act now to integrate leakage control fully into their appraisal process. We also intend to move this forward after PR09 as part of a review of the existing guidance on "The Economics of Balancing Supply and Demand."

3. Metering

“We will include selective or planned metering proposals in our CIS baseline assumptions for PR09 as long as each company can show that the benefits are likely to outweigh the costs. We accept that the quantified costs might exceed the quantified benefits, but we will make allowance for selective metering as long as there is a reasonable prospect that unquantified net benefits can bridge that gap.”

Most companies that plan to meter their customers compulsorily have pre-selected particular levels of metering in their draft water resource management plans (WRMPs) and draft business plans. In our formal representations on the WRMPs, and in our discussions on their draft business plans, we have explained to companies that they must only include optional metering in their baseline supply/demand balance projections. They should choose the pace of any further selective metering (including planned metering) by comparing its costs and benefits with those of other options to find a solution that provides the best value to customers and the environment.

High-level assessment of selective metering

Some companies have told us that they would not be able to justify selective or planned metering programmes on economic grounds. We would be surprised if the case against large-scale metering was so clear cut. Some simple calculations suggest that, at the industry level, the gap between the quantifiable costs and benefits of near-universal metering could be quite small. We calculated that the average household bill would have to increase by about £13 to cover the cost of metering 12 million households (using £200 unit capex, £8 unit opex, a 5% discount rate and an average asset life of 20 years, but ignoring financeability adjustments). This would increase meter penetration to 90%. To calculate the benefits, we assumed that metering would reduce previously unmetered customers' demand by 10%, and that 75% of the new meters would be installed externally – yielding supply pipe savings of 242Ml/d. We valued these savings by applying the industry average unit cost of water, which was 86p in 2005-06. This gave an average saving of £11 per customer.

It is not unreasonable to suppose that wider benefits could bridge the gap between this simple assessment of costs and benefits. For example:

- reducing demand will generate environmental benefits, which are likely to outweigh the environmental costs of installing and operating meters;

- customers would have heated some of the water saved, so there are energy cost savings too;
- it is fairer to charge customers according to how much water they use rather than according to the rateable value of their property; and
- metering opens up the possibility of even more cost-reflective charges through new measured tariffs, providing greater flexibility for managing demand in the future.

Company-level assessment

We are not suggesting that companies apply the same simplistic assumptions that we adopted in our high-level assessment. Each company will have its own unit cost assumptions, and will be best placed to consider any unit cost benefits from installing meters on a planned rather than ad hoc basis. Each company will also be able to work out the value of the savings much more accurately by calculating the value of deferring, reducing or avoiding capital investment. We encourage companies to expose all of the wider costs and benefits of metering, providing a qualitative assessment of factors that are not easily quantified.

When assessing the case for selective metering, it is important that companies take into account the present value of future costs that they would otherwise have incurred for installing more optional meters. (To avoid double counting, companies should also net off the present value of any future savings from optional metering.)

A stylised example illustrates how important this could be. Company X has a baseline supply/demand surplus of 15 MI/d in year one, declining by 5MI/d a year over the 25-year planning period to leave a 105 MI/d deficit by year 25. This baseline forecast assumes 20,000 meter optants a year over the whole period. Company X has only two options in its supply/demand appraisal, as follows:

| | |
|--------|---|
| Plan A | Construct 120 MI/d resource over years one to three, coming into service in year four. Install 20,000 optional meters a year throughout the period. |
| Plan B | Install 60,000 selective meters a year until year 18. Develop 30 MI/d resource in year 18. Install 20,000 optional meters a year until year 18, when all customers that can be metered are metered. |

The costs of these options are as follows:

| Present value costs (£m) | Optional metering | Selective metering | Resource development | Total |
|--------------------------|-------------------|--------------------|----------------------|-------|
| Plan A | 56.4 | 0 | 135.3 | 191.7 |
| Plan B | 46.8 | 102.2 | 35.3 | 184.3 |

We used a unit cost for optional meters of £200, and for selective metering of £190. The 120 MI/d resource costs £150 million, while the 30 MI/d scheme is proportionately more expensive, costing £85 million. The discount rate is 5%.

The key point here is that the choice of preferred option depends on whether or not company X takes into account the impact of Plan B on optional metering. Ignoring this, the cost of plan A is £135.3 million, which is less than the cost of plan B at £137.5 million (selective metering plus resource development). Plan A would be the preferred choice on this basis. Taking account of the impact on optional metering, however, the overall cost of plan B would be £184.3 million, which is less than the £191.7 million for plan A.

Our approach at PR09

We will include selective or planned metering proposals in our baseline assumptions for PR09 as long as each company can show that the benefits of this approach are likely to outweigh the costs. We accept that the quantified costs might exceed the quantified benefits, but we will make allowance for selective metering as long as there is a reasonable prospect that unquantified net benefits can bridge that gap.

4. Climate change

“Climate change is an important issue, and it is vital that companies plan carefully to mitigate and adapt to its impact. However, it is equally important to make sure that there is a robust evidence base for significant investment decisions that companies cannot reverse and that will have a permanent impact on customers’ bills.”

Several companies are planning significant investment in AMP5 in order to address the perceived effects of climate change on the supply/demand balance. Climate change is an important issue, and it is vital that companies plan carefully to mitigate and adapt to its impact. However, this will be a long-term challenge, requiring a response appropriate for the long-term. As set out in the guidance for water resource planning, it is equally important to make sure that there is a robust evidence base for significant investment decisions that companies cannot reverse and that will have a permanent impact on customers’ bills.

Companies will need to provide robust evidence for any step changes to the estimates of existing supply capacity (for example, deployable output) and demand that they use in their investment planning for the 2010-15 period, whether those changes are related to new information on climate change or to other factors. In preparing their evidence, companies should take account of their experience during the 2005-06 drought, which tested supply capacity and demand.

The Environment Agency (EA) requires companies to assess the impact of climate change on water supply and demand, and it provides guidance on how to do this. The EA’s guidance describes a number of approaches that differ in their sophistication. Most companies have followed the least sophisticated approach, which satisfies the EA’s minimum requirement. We share the EA’s view that companies need to provide more robust evidence to justify significant investment. And even where a company has followed a more sophisticated approach, it still needs to demonstrate that it has estimated the impact of climate change under the particular circumstances that apply within its region.

The climate change scenarios on which companies have based their modelling work to date are now up to six years old and due to be superseded shortly by UKCIP08. We will expect companies proposing significant supply/demand investment, driven by the impact of climate change on the

estimates of supply capacity and demand used for planning, to update their assessment in the light of these latest scenarios.

Our approach at PR09

We will only include in the CIS baseline significant investment driven by applying new assumptions about the impact of climate change where it is supported by thorough evidence, following the most sophisticated approaches in the EA's guidance and drawing on the scenario analysis from UKCIP08. Bearing in mind that UKCIP08 will not be published until spring 2009, that means that the draft CIS baseline, which we will publish in December 2008, will not include any allowance for significant water supply and demand investment driven by applying new climate change assumptions to components of the supply/demand balance. We will take a proportionate approach, requiring less sophisticated evidence in support of smaller investment decisions during the 2010-15 period.

We will take account of improved evidence, where available, in capital expenditure assumptions in the final CIS baseline. In some cases, the work required to improve companies' evidence might take longer than the PR09 timetable allows. We will deal with this issue through the change protocol process if a company is only able after the final determination to demonstrate clearly the need for 2010-15 investment relating to the impact of climate change on the supply/demand balance. Companies will need to present a compelling case that investment in the period before 2015 will deliver best value for consumers.

We expect companies to base their supply/demand investment plans for the 2010-15 period on robustly justified evidence. So if climate change assumptions have a material impact on a company's plan, it should set out how it proposes to build the required evidence. We also expect all companies to identify in their final business plans the effect of removing the impact of climate change on their supply/demand expenditure assumptions. In the absence of such information, we will need to make our own assessment of the impact and adjust our capital expenditure assumptions for the CIS baseline accordingly.

We think that this approach is consistent with the idea that the CIS baseline represents the capital programme that a company would pursue when taking a balanced view of risk. In our view, where such a company was subject to market disciplines it would, where possible, defer an investment decision if it could obtain better evidence soon. This approach balances the risk that customers will experience a lower level of service for a short period of time,

against the risk that they will experience permanently higher bills unnecessarily.