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Maintaining water supply

The Environment Agency's advice to Ministers on the final water resources plans submitted by water companies as part of the 2004 periodic review

July 2004

Environment Agency

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Our work includes tackling flooding and pollution incidents, reducing industry's impacts on the environment, cleaning up rivers, coastal waters and contaminated land, and improving wildlife habitats.

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Foreword

It's all too easy to take secure water supplies for granted. In England and Wales we rely on water companies every day to provide sufficient clean water for our needs.

The Environment Agency's vital role in managing water resources means that we take the needs of water companies and their customers very seriously. We expect water companies to develop long-term plans showing how they will manage supplies for the future. We scrutinise these plans carefully to make sure that companies are not taking unnecessary risks with essential water supplies or the environment.

I do not underestimate the difficulties that water companies face in developing comprehensive water resources plans. The population of England and Wales is growing, and we face the prospect of climate change. At the same time, we all value our natural environment and, in particular, we expect important wildlife sites to be protected from damage. Only by careful long-term planning can we be sure that water supply will be managed in a way that meets the social, economic and environmental needs of the society in which we live.

For these reasons I am pleased to report to Ministers that all the water companies of England and Wales have plans that will allow them to manage our supplies for the next five or more years. Some, however, must act quickly to reduce short-term risks to security of supply. All companies will need to work to keep their plans up-to-date, and some need to pay particular attention to parts of their plans that are weak.

Many companies still have plans dominated by resource development such as the construction of new or enlarged reservoirs. We will expect these companies to carry out more work to demonstrate whether demand management measures could deliver the same benefits as new resources. At the same time the companies must work with local communities to understand the impact of their proposals on people's lives and the environment that they value.

We believe that companies should publicise their plans widely. All companies need the co-operation of their customers to help them to manage supplies, especially in time of drought. Communication will also help companies to understand how people feel about their plans, and whether they have the right balance of demand and resource options. I am pleased that the Water Act 2003 means that the next set of company plans will have a statutory basis and that companies will have to carry out wide public consultation on their draft plans. Ministers can be assured that we will work to make sure that companies follow and improve their present plans to maintain secure water supplies and a better water environment for this and future generations.

Sir John Harman
Chairman

July 2004

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Summary

This is the Environment Agency's report on the final water resources plans submitted by water companies as part of the 2004 review of water company prices.

Background

As part of the Environment Agency's role in ensuring that there is good management of water resources, we seek long-term plans from all water companies. Good long-term planning is essential because many of the best options to manage future water supplies take many years to implement. Without such planning and appropriate early actions, water companies may be forced to take steps to maintain supplies that are expensive and environmentally damaging.

These plans show how companies intend to provide sufficient water to meet customers' needs while protecting and enhancing the environment. The plans have been developed within a framework agreed between the Agency, the Office of Water Services (Ofwat) and the water companies of England and Wales. The plans identify:

- the actions that each company plans to take to maintain supplies;
- the costs and benefits of these actions;
- the uncertainties in the plan and the ongoing work that is needed to keep the plan up-to-date.

We are pleased to report that all companies, if they follow these plans and their drought plans, will be able to meet their customers' needs for water for the next five or more years without unnecessary restrictions or inappropriate drought permits and orders.

Some companies need to carry out urgent work to improve security of supply. All companies in this position have plans in place on which they need to act. Other companies need to start work on measures to secure supplies into the 2010s and 2020s.

We are concerned that many plans are still dominated by resource development. Three schemes to extend existing reservoirs are proposed before 2015. Five new reservoirs providing 550 Ml/d are planned between 2015 and 2025. These timescales are ambitious. More work is needed to justify these schemes in comparison with other options including demand management, to demonstrate that they can be implemented in time, and to show that they provide value for money for customers.

We believe that these plans underestimate the role that demand management can play in managing water resources for the next 25 years. We are pleased to see all companies proposing increased levels of household metering. Metering provides a way for people to understand the value of water, and accompanied by good publicity campaigns can help to manage the supply-demand balance effectively. A range of measures is available to ensure that metering does not have a detrimental impact on poorer households. To reach the rate of meter penetration that they propose many companies will need to work harder both on promoting the benefits of metering and by taking opportunities to meter households on change of occupancy.

Important water company issues

We have identified important issues with some companies' plans:

- **Anglian Water** is planning low headroom (the margin between supply and demand) in the early years of its plan with a significant rise in later years. In some zones the rapid increase in headroom may be unnecessarily cautious. The company needs to carry out further work to demonstrate that the target headroom values are appropriate, particularly where resource developments are planned beyond 2010. The company also needs to carry out further work to address the impact of the ODPM's sustainable communities plan, which may lead to significant growth in some parts of East Anglia.
- **Dŵr Cymru Welsh Water** has deficits in seven of its 25 zones. It is aiming to achieve low headroom in these zones by 2010. The company

needs to make good progress on its plans to improve security of supply in these zones.

- **Essex and Suffolk Water** plans to have a deficit against target headroom for most of the period to 2014. The company needs to consider options that will allow it to reduce its deficit more quickly.

- **Folkestone and Dover Water** has a tight supply-demand balance. It proposes to apply for water scarcity status by 2010. We believe the company should make its application as soon as possible and continue to ensure that its customers understand the company's resource situation.

- **Mid Kent Water** forecasts significant growth in household water use, partly as a result of increased population and new households. However, this growth in water use is also driven by rapid growth in per capita consumption. The company must pay more attention to the role that demand management could play in managing per capita consumption. The company proposes a new reservoir at Broad Oak, near Canterbury. Mid Kent Water needs to move quickly on studies to demonstrate more fully the need for this new resource.

- **Portsmouth Water** is planning to develop a new reservoir to meet peak demands in the 2020s despite a healthy annual surplus throughout the planning period. The company needs to carry out more work to evaluate this option and look at the possibility of sharing this reservoir with other companies. Portsmouth Water must also increase its rate of metering. The company plans the lowest meter penetration in the south of England, despite its problems in meeting peak demands. Metering is particularly good at reducing peak demand.

- **Severn Trent Water's** plan addresses the existing deficit in many of its zones. Further work is required to justify fully both the scale of the deficit and some of the schemes proposed for future years. However, the company needs to act quickly to reduce these deficits. Severn Trent Water has estimated that climate change will reduce water availability so much that a new reservoir will be needed somewhere in the lower Severn catchment. As this reservoir would take many years to promote and construct, the company needs to make good progress on studies to refine its calculation of the impact of climate change, to investigate possible reservoir sites, and to consider alternative options in more detail.

- **South East Water** plans low headroom for the first years of its plan. This strategy means that its customers face a high risk of restrictions and the environment faces unnecessary pressure from drought measures to increase water supply. The completion of remaining schemes identified in the 1999 review should resolve most deficits by 2005. However, the implementation of measures to improve the company's supply-demand balance over the last five years has been slower than expected and we are concerned that these deficits still remain. South East Water must increase its rate of metering to reflect the part that this can play in reducing demand. This is especially important because the company's supply-demand balance is precarious.

- **Thames Water** has a significant deficit in London. To redress this the company proposes a mains replacement programme to reduce leakage, and a desalination plant to increase supply. These should redress the deficit by 2007. Both need to progress quickly. Until the balance is restored, customers in London face an unnecessarily high risk of supply shortages in prolonged dry weather. The environment may suffer from more frequent drought permits and drought orders. Thames Water should ensure that its customers understand the difficult supply situation in London and should campaign vigorously to make customers aware of the need to use water wisely. We also expect to see further active leakage control to complement a targeted mains replacement programme. Thames Water proposes a new reservoir in Oxfordshire by the 2020s. Work should proceed on demonstrating the need for this new resource.

By the end of November 2004, we expect these companies to provide schedules demonstrating how they will address these issues. We expect to see good progress before the 2005 annual review of plans. We will write to all companies providing details of our views.

Environment programme

We are pleased to report that all companies for which we had identified clear schemes in the water resources environment programme have included these schemes fully in their final plans. All companies have made an allowance for further investigations at statutory sites where water company abstractions may be damaging the site. Companies must carry out these investigations quickly enough to allow any remedial work to be carried out to the agreed timetable.

Other conclusions

Other findings are:

- all companies are planning for increased household metering over the next 25 years. Most are assuming modest water savings from their metering programmes. Some companies are still proposing low levels of metering. We believe that with appropriate social safeguards further metering should be part of every company's plan. This is especially important in the south of England;
- almost all companies predict an increase in household demand for water over the next 25 years. This is partly the result of increased population and new households, but most companies also predict a rise in individual water use. We believe that most companies have not addressed the full potential of demand management;
- most companies have allowed for the Office of the Deputy Prime Minister's proposed sustainable communities but no company has taken account of the intention that these communities should have less impact on the environment and use less water;
- no company is now proposing significant increases in leakage. All companies have assumed that their economic level of leakage will remain effectively constant over the next 25 years. This conservative assumption neglects the benefits that new technology is likely to bring, and may advance the need for new resources. However, some companies do intend to reduce leakage below the economic level as part of their plan. We have seen very few robust long-term zonal analyses of the economic level of leakage, despite guidance from Government;
- most companies have made an estimate of the impact of climate change. Some believe that the impact is small and that it can be managed within existing plans. Others have shown that it could have a serious effect on the supply-demand balance. We expect all companies to carry out more detailed analyses to help them understand the scale and scope of the impact, as well as to help them to choose appropriate adaptation measures;
- a few companies are planning to have very low target headroom (the margin between supply and demand) for the next few years. We are concerned that some of these companies may not be able to offer their customers an acceptable level of service;
- companies with low available headroom or poor security of supply should make sure their customers understand the risks that are faced and the reason for the planned level of target headroom. These companies should make particular efforts to promote the efficient use of water;
- options still seem to be dominated by resource development. Many of the studies supporting option choice are out of date or superficial in their analyses. Companies planning resource development will need to carry out further studies to show that the preliminary options appraisal in the plans remains valid as more information becomes available. This must include thorough investigations on a representative scale into alternative options, including demand management measures.

As the results of investigations into the impact of water abstraction on the environment become available, mitigation measures may need to be taken by some companies. In some cases these may necessitate significant changes to plans.

We also recommend that:

- all companies with inadequate consumption monitors should work to improve these;
- companies should share consumption monitor data to make best use of available information;
- all companies should ensure that they take proper account of the ODPM's proposals for sustainable communities, including the commitment for lower water use;
- all companies should develop robust long-term zonal economic level of leakage analyses for the next annual review of plans;
- companies should share information on the costs and benefits of generic options, to ensure that analysis is robust;
- companies should ensure that they are taking steps to promote demand management to household and non-household customers;
- companies should work together to improve their understanding of the possible benefits of demand management by trialling schemes on an appropriate scale;
- companies should publish useful and comprehensive summaries of these plans and help customers to understand their proposals.

We will develop proposals for targets for water into supply, to complement leakage targets. We will also consider options for promoting demand management to non-household customers as part of our work looking at the way that measures and incentives for demand management can be improved.

We do not expect any company's plan to remain fixed for the next five years. Companies must keep their plans under review and make changes as necessary. However, we do expect companies to implement appropriate actions from their plans. These measures are needed to maintain an adequate water supply now and in the future. We will work with companies to make sure that they are following their plans and we will report to Ministers annually on progress.

Introduction

Reliable and safe water supplies are an essential part of life in England and Wales. Long-term planning is vital if we are to continue to enjoy the benefits that secure water supplies bring.

The water companies of England and Wales are responsible for planning and managing public water supply. The Environment Agency is the statutory body with a duty for water resources planning and environmental protection. Our aim for water resources is that there should be enough water to meet people's needs while providing proper protection for the environment.

As part of the framework for the management of water resources, the Environment Agency seeks long-term plans from all water companies. These plans show how companies intend to continue to provide sufficient water to meet customers' needs while protecting and enhancing the environment.

This is the second time that water companies have developed full water resources plans. Five years ago we saw the first comprehensive plans from all the water companies of England and Wales. These were submitted to the Agency as part of the 1999 periodic review of water company prices.

The final plans discussed in this report are part of the 2004 periodic review of water company prices. In December 2004 Ofwat will set the price limits for water companies for the five years from April 2005 to March 2010. These price limits will allow water companies to finance their functions. This includes the work that they need to carry out on water supply and demand, including making environmental improvements at sites damaged by water company abstractions. The Environment Agency has worked with Ofwat to analyse the companies' water resources plans and advise Ministers on their adequacy. It is important that water resources plans take a long-term view that stretches beyond the five years of the immediate price review. These plans cover the period from 2005 to 2030. This 25-year planning horizon reflects the time that it can take to make significant changes to water supply systems.

These final plans have been developed within a framework agreed between the Agency, Ofwat and the water companies of England and Wales. The Agency's Water Resources Planning Guideline adopts methods and practices that have been developed and refined by joint work by the companies and their regulators. The planning guideline encourages a modular approach to the development of company strategies. This means that more sophisticated approaches can be used where they are necessary, allowing companies to make their own decisions about their plans while presenting the results in a common format.

Water companies have developed these final plans from the draft plans submitted to the Agency in August 2003. We reported to Ministers on these in November 2003. Our report, "Securing water supply", identified the improvements necessary to produce these final plans and sought Ministerial views on a number of policy matters. In March 2004 the Secretary of State for Environment provided guidance on these and other issues for English water companies, while the Minister for Environment, Planning and Countryside at the Welsh Assembly Government gave guidance for the two Welsh companies. We also asked for early drafts of final plans from the five companies that had presented draft plans that needed most work to produce final plans. These draft final plans were presented in February 2004. All companies submitted their final plans to the Agency according to a timetable that set down dates between early April and mid-May 2004.

This report presents our views on the final plans submitted by the water companies. It is intended to advise Ministers as they consider their final guidance to the Director General of Water Services on the 2004 periodic review of prices. It will also help Ofwat to consider the water resources aspects of companies' plans. It will assist companies in refining and improving their plans over the coming years. Finally, it will allow customers and other interested parties to understand how their companies plan to maintain supplies for the next 25 years.

The report covers all aspects of the water companies' water resources plans. It considers the background to the plans and policy framework within which they have been developed (Section 2). Section 3 looks at the issues arising both from individual companies' plans and from the overall approach that companies are taking. Section 4 considers the maintenance and improvement of these plans over the next five years. Our conclusions (Section 5) are followed in Annex 1 by detailed commentaries on each company's plan.

We will write to all companies to explain our views in detail. We will expect all companies to maintain and follow their plans to ensure that they take the right steps to maintain secure public water supplies and the proper level of environmental protection.

Background and policy framework

The important role of water companies in providing secure water supplies is reflected in the framework of legislation and policy within which they operate.

Parliament sets the primary legislative framework and central Government and the Welsh Assembly Government determine policies within which water companies and their regulators work. The Environment Agency has statutory responsibilities to secure the proper and efficient use of water resources and to pay particular attention to the statutory requirements of water companies. The Environment Agency also has a duty to protect and enhance the environment, and to implement some aspects of European legislation at designated nature conservation sites. Ofwat has a duty to ensure that water companies' statutory functions are properly carried out and that they are able to finance these functions. The Drinking Water Inspectorate ensures that the water supplied meets regulatory drinking quality standards. English Nature and the Countryside Council for Wales are statutory advisers to central Government and the Welsh Assembly Government on nature conservation.

This part of the report explores the background to the water companies' plans.

2.1 2004 periodic review of water company prices

The 2004 periodic review of water company prices will set price limits for the period from April 2005 to March 2010. These price limits place an upper bound on the change that water companies can make to their charges to customers. The 2004 review is seen by Government as an opportunity for all those involved in water to work together to ensure an integrated and comprehensive approach to forward planning.

Ofwat's review of prices looks at all aspects of water companies' regulated business. Water resources plans focus on one of the companies' important roles: the need to ensure that water companies maintain security of supply to customers in a way that is economically, socially and environmentally sound. Ofwat and the Environment Agency have worked closely together to develop the approach that companies have used. The water resources plans submitted to the Agency also form part of the companies' submission to Ofwat. The two regulators have shared information and the results of our analyses. We believe that this co-operative approach provides benefits not only for the regulators but also for water companies, which have been able to concentrate on developing one integrated submission.

2.2 Policy framework

The policy framework for the 2004 periodic review is set out in guidance from Government. Initial guidance was published in 2003 (Defra 2003 and Welsh Assembly Government 2003). In March 2004 Ministers set out their main decisions and policies for England (Defra 2004) and Wales (Welsh Assembly Government 2004). Both Governments recognised the prospect of significant real price increases between 2005 and 2010 and emphasised the need for water companies to carry out their programmes at minimum cost to customers. They also identified the need to deliver existing commitments including European Union obligations for environmental improvements and protection.

Both Governments gave similar specific advice on water resources and the supply-demand balance. Relevant decisions are summarised below.

- Government expects all water companies to reach and maintain an adequate security of supply for all customers.
- During drought conditions companies should put measures in place to reduce demand for non-essential uses. In this way the environment can be protected and customers need not face the high bills that would result if companies developed systems that could cope with unconstrained demand under any circumstances.
- Government does not expect water companies to allow leakage to rise. All companies should continue to examine the scope for additional leakage reductions over the longer term. Companies should establish and manage leakage within an economic level established for each resource zone rather than as an average across the whole company. Companies should constantly be seeking to improve leakage performance, within the framework of economic leakage rates, through improved leakage management techniques and utilising the benefits of new technology.
- Government expects companies and regulators to ensure that the impact of metering on demand has been considered fully in final plans.
- Government will expect to see evidence that proposals for the development of new water resources have been subject to proper option appraisal and can be justified as cost-effective against other options.
- Government looks to the regulators to work with water companies to ensure that water efficiency measures are accorded an equal priority to resource development.

Central Government guidance added the following principles to emphasise the need for effective management of water resources:

- Government believes that, where major new resources are planned, further investigations are necessary before further commitment is given, and that as part of the investigative work there should be a sound and evidence-based understanding of the potential benefits of water efficiency and demand management measures.
- Companies and regulators should take a strategic and imaginative approach to addressing the impact of climate change, which may mean looking beyond relatively short-term and obvious engineering solutions.
- Where specific outcomes and environmental improvement schemes have yet to be identified through investigations, if it is found that a company needs to take further action there should be no delay in implementation. Ofwat will want to ensure that adequate arrangements are in place to deal with any adjustments that may be necessary to ensure adequate funding by the companies.
- In the event of an unnecessary and unjustifiable delay to environmental improvement schemes, and where there is a risk that statutory obligations will not be met, the Environment Agency will be in a position to use its powers to modify or revoke the licence in question. In exercising its powers the Agency should be mindful of the need not to jeopardise the public water supply.
- Companies should look at the full range of options for reducing demand for water, including reducing leakage and helping customers to reduce their demands. Only where a demand management approach is clearly insufficient or unjustified in terms of cost should companies look to the development of new resources.

These policies provide clear guidance to water companies and their regulators on the principles that should lie behind their final water resources plans. Our analysis of these plans is guided by these policies and the clear expectations that they set out.

2.3 Water resources environment programme

The Environment Agency has worked with English Nature and the Countryside Council for Wales to develop proposals for a five-year programme of environmental improvements to be delivered by water companies. The programme seeks to improve water quality and to reduce the damage to important nature conservation sites caused by the abstraction of water. The UK is obliged under European law to reduce and reverse the damage caused by abstraction of water at many of these sites.

For their draft plans, water and sewerage companies were asked to consider two possible scenarios of environmental improvement. Reference Plan A represented the minimum change to water company abstractions that statutory improvements at important wildlife sites could require. Reference Plan B represented the upper bound of the changes to abstractions and included improvements at non-statutory sites where benefits were likely to outweigh costs. In addition, companies were able to set out their own preferred packages of environmental improvements.

The principal Ministerial guidance provides details of decisions on the water resources environment programme. In England, water companies will be expected to deliver schemes under the following circumstances:

- where investigations have shown that there is a requirement to revoke or vary an abstraction licence at a Natura 2000 or Ramsar site, final business plans should include the cost of any appraisal of options needed. Government expects that once an option has been determined, it will be progressed to ensure compliance with statutory objectives over the period 2005 to 2010;
- where investigations have shown that there is a requirement to revoke or vary an abstraction at a Site of Special Scientific Interest (SSSI) final business plans should include the cost of any appraisal of options needed. Government expects that once an option has been determined, it will be progressed to ensure compliance within statutory duties over the period 2005 to 2010 and to achieve the Government's Public Service Agreement (PSA) target for SSSIs;
- where action is agreed by the conservation agencies and the Environment Agency to meet a target under the UK's Biodiversity Action Plan and where the costs and benefits justify action.

In England there are relatively few sites where the action required to mitigate the impact of water company abstractions is known in sufficient detail to identify the precise measures that are necessary. Where work has shown that water company abstractions may have an impact on the environment but that further investigations are necessary, the Government expects companies to undertake these investigations early in the period 2005 to 2010 to allow for timely implementation of solutions. As further work is carried out the Government recognises that it is likely that additional schemes for implementation may be identified. The Government expects water companies to work with English Nature and the Environment Agency to ensure that if it is found that a company needs to take further action there should be no delay in identifying the appropriate actions and implementing them.

The costs and benefits relating to Biodiversity Action Plan schemes and investigations will form part of the Regulatory Impact Assessment into the discretionary elements of the environment programme that is being undertaken by Defra. Final Ministerial guidance will be informed by this assessment.

In Wales, there are no water resources schemes ready for implementation. Several schemes need further investigation. The Welsh Assembly Government expects these investigations to proceed and therefore these should be included in companies' final business plans. When the results of such investigations show that schemes are necessary these should proceed.

In total the water resources component of the environment programme consists of 21 certain schemes to be implemented between 2005 and 2010. Of these, 11 involve changes to sources of supply that need to be taken into account in companies' supply-demand balances. The other ten involve changes to abstraction infrastructure such as fish screens. A further 53 schemes have been identified where changes to abstraction regimes may be needed but the most appropriate course of action is yet to be determined. There are 127 further investigations identified for water companies, each of which may lead to a scheme. Ongoing work as part of the review of consents at Habitats Directive sites may identify additional wildlife sites that are being adversely affected by water company abstraction.

3

Analysis of final plans

We have scrutinised water companies' plans to ensure that they make adequate and timely provision to maintain public water supply within the policy framework set out by Government.

Water companies have a statutory responsibility to ensure that they can meet their customers' water supply needs, with particularly strong duties for domestic supply. Companies must make their own decisions about the best way to do this. Such decisions should be based on the best possible knowledge and methods, but must also take into account companies' views and policies. All water resources plans contain an element of risk. It is not possible for companies to be certain that their plans strike a perfect balance between demand, cost and environmental impact. The Environment Agency's role is to ensure that companies' plans are based on sound, reliable data, and that decisions that are taken are a reasonable response to the pressures faced by the company.

We have taken a systematic approach to each plan to ensure that our analysis is consistent and thorough. We have investigated the basic data within each plan to look for anomalous figures and trends. In doing this we have made comparisons between different companies as well as comparisons against data and information held by the Agency. We have looked at the techniques that companies have used to develop components of their plans to ensure that appropriate methods have been followed. We have read the supporting reports supplied by companies to understand how decisions have been made. Throughout the process we have maintained a dialogue with companies and asked for further information and clarification where necessary. We have paid special attention to issues that have a significant impact on decisions or actions in the next few years.

This part of the report sets out our main findings. First we present our general findings. These are followed by company-specific issues. Further information on each company's plan is presented in Annex 1. We will also be writing to all companies to provide more detailed information on our views.

3.1 Overview

We are pleased to be able to report that we received reasonable co-operation from all water companies during the preparation of their final plans. All companies submitted their plans to the agreed timetable and most companies have responded quickly to any further questions that we asked. We know that companies worked hard to produce their plans and we feel that the co-operation we have seen demonstrates the water industry's commitment to the planning process.

We are also pleased to note that final plans are a significant improvement on draft plans. Most companies have paid particular attention to the issues that we raised in our report on draft plans. We are pleased with the progress made by the companies from which we sought draft final plans. We asked for these because we felt that these companies had most work to do to turn their draft plans into final plans. All of these companies rose to the challenge and produced final plans at or near to the required standard.

We believe that these plans generally represent a reasonable way to manage water supply for the next three to five years. Most of the plans justify the work that companies need to carry out to maintain supplies beyond the immediate price review. For most companies this involves investigations and trials of longer-term options, but a few need to start work on implementing schemes to maintain long-term supply. All companies will need to carry out further work on aspects of their plans to ensure that they provide an appropriate basis for maintaining supplies beyond 2010. For many companies this work will involve keeping the plan up-to-date and making appropriate progress with investigations. Other companies need to undertake much more work. We may find that, as a result of this work, the plan needs to change significantly even within the period covered by the present price review. We expect these companies to act on any changes to their plans as soon as this becomes necessary. We do not expect companies to delay action for any reason.

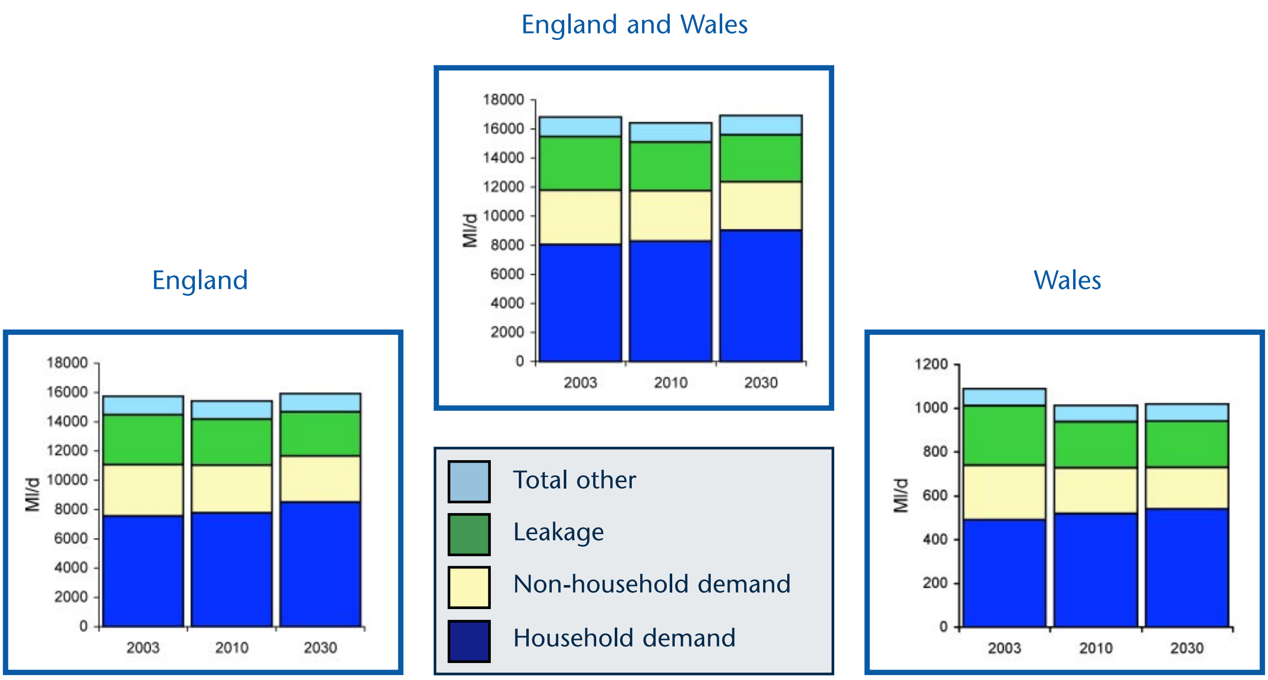
In general, we believe that the standard of these plans reflects a high degree of commitment from water company water resources planners. However, these teams are often small and some of them have faced considerable pressures in developing these plans on time. Some companies rely too heavily on consultants for the development of plans. While sensible use of consultancy can help to deliver high quality work, it is vital that the company itself has a clear understanding of the work that has been carried out and the assumptions that have been made. Without this, companies may produce plans that are insufficiently robust and they may also find it difficult to understand the implications of any subsequent changes that need to be made.

3.2 General issues

In this part of the report we provide an overview of the way that water companies plan to manage their supply-demand balance for the next 25 years. We cover the general points that we raised in our report on draft plans, as well as new issues that have arisen. Where necessary, we identify concerns that may affect some or all companies' long-term plans. In most cases any changes required will have little immediate impact, but may need substantial action or resolution over the next few years to continue to meet the water supply standards that customers expect.

Almost all companies predict an increase in total demand for water over the next 25 years. Across England and Wales, leakage is expected to remain constant or decline slightly, non-household demand is expected to fall, and household demand is expected to increase (Figure 1). Details of each company's predicted changes are shown in Annex 1.

Figure 1 | Water company forecasts of total demand for water in England and Wales.



Water resources environment programme

All companies for which we have identified certain schemes (those schemes where the required changes and most suitable options have been defined clearly) have included these schemes fully in their final water resources plans. We will work with these companies to ensure that the full environmental benefits of these schemes are delivered to the agreed timetable. We will use our powers to modify or revoke licences if we believe that a company's progress is unsatisfactory.

Where appropriate, all companies have made allowances for further investigations at statutory nature conservation sites where company abstractions may be damaging the site. We will work with water companies, English Nature and the Countryside Council for Wales to ensure that these investigations are carried out early in the period between 2005 and 2010, and that they address all of the necessary issues while delivering good value for money.

Household metering

All companies are planning for increased household metering over the next 25 years (Table 1 and Figure 2). We welcome increased metering as we believe that, with appropriate social safeguards, this is the fairest way to pay for water.

Figure 2 | Water company household meter penetration 1998-2030.

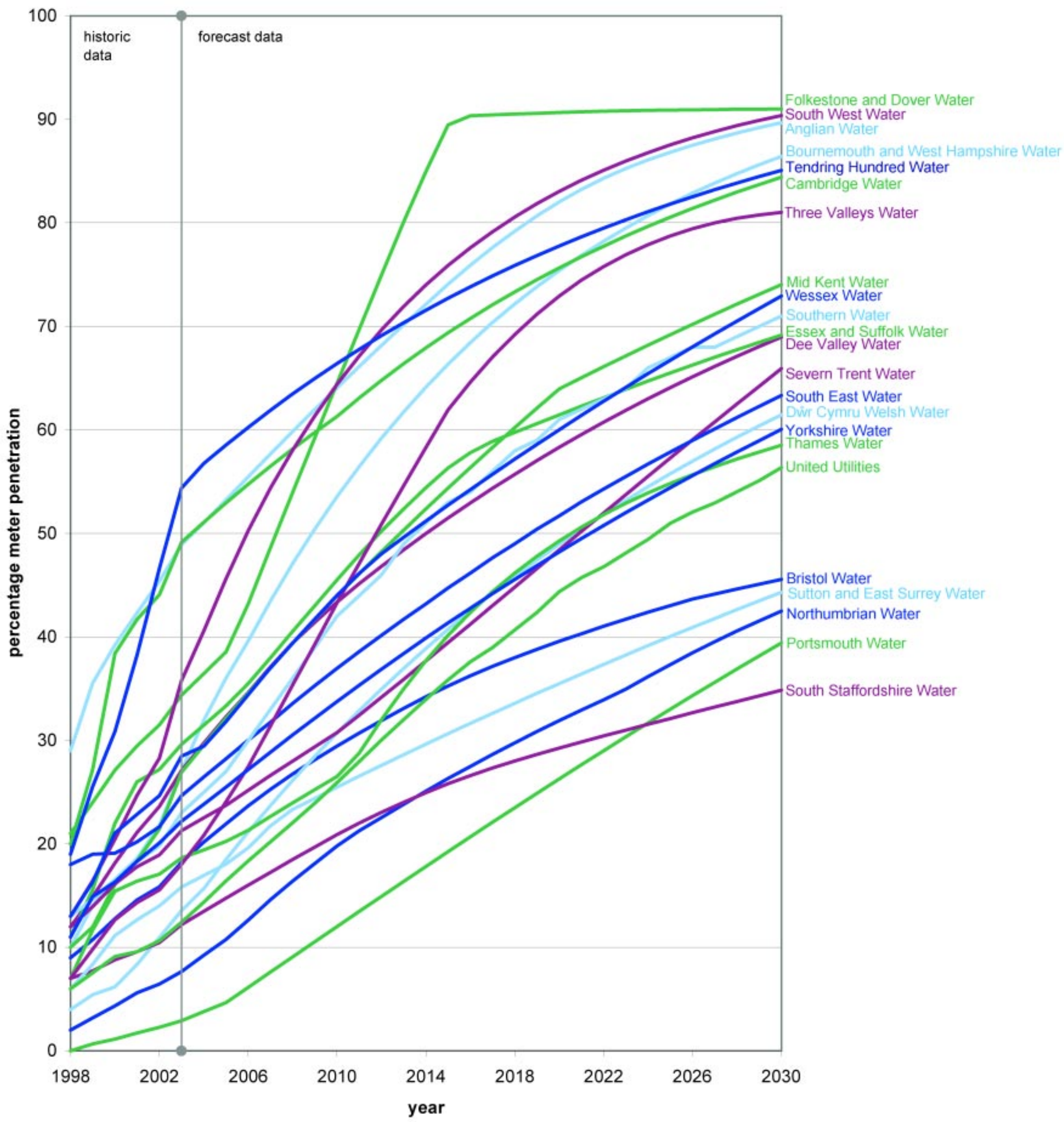


Table 1 | Water company household meter penetration 2003, 2010 and 2030.

Company	2003	2010	2030
Anglian Water	49	64	90
Bournemouth and West Hampshire Water	27	54	86
Bristol Water	18	29	46
Cambridge Water	49	61	84
Cholderton and District Water	13	22	No forecast supplied
Dee Valley Water	27	43	69
Dŵr Cymru Welsh Water	14	31	61
Essex and Suffolk Water	30	46	69
Folkestone and Dover Water	34	65	91
Mid Kent Water	27	44	74
Northumbrian Water	8	20	43
Portsmouth Water	3	12	39
Severn Trent Water	21	31	66
South East Water	25	37	63
South Staffordshire Water	12	21	35
South West Water	36	64	90
Southern Water	23	42	71
Sutton and East Surrey Water	16	25	44
Tendring Hundred Water	54	66	85
Thames Water	19	27	59
Three Valleys Water	18	43	81
United Utilities	12	26	56
Wessex Water	28	44	73
Yorkshire Water	22	34	60

Meter penetration numbers can vary depending on whether void household properties have been included in the calculation. Meter penetration numbers in this table have been calculated including void household properties. This is consistent with the calculation that was used in "Securing water supply", (Environment Agency, 2003).

We are still concerned that some companies may not be able to deliver the levels of metering that they are proposing or achieve the rate of change that they assume in early years. This is particularly the case where companies have had low rates of meter penetration in recent years. Increased rates of optant metering may result from price increases but experience shows that more people opt for meters when there is targeted and consistent publicity from the water company. At present, companies' approaches to this are variable. We presume that all companies with high proposed metering rates will pursue metering on change of occupancy, although not all have stated this. We are concerned that a few companies tell us that their computer systems may not allow them to identify change of occupancy consistently or sufficiently quickly.

Some companies are proposing relatively modest increases in metering over the next 25 years. Six companies tell us that metering will reach fewer than half of households in their company area by 2030. We think this is particularly inappropriate in the south of England, where we would expect at least three-quarters of households to be metered by 2030, with rapid progress towards this in the next decade.

Companies are still forecasting low water savings as a result of metering. Recent water company research seems to suggest savings of between two and 14 per cent, with an average of about nine per cent. We believe that companies' assumptions of lower savings need further investigation, and that this could have an important impact on the supply-demand balance by the 2020s. Few companies appear to have considered the contribution that tariff structures could make to suppressing demand for non-essential uses such as garden watering.

Figure 3 Reported average per capita consumption 2003

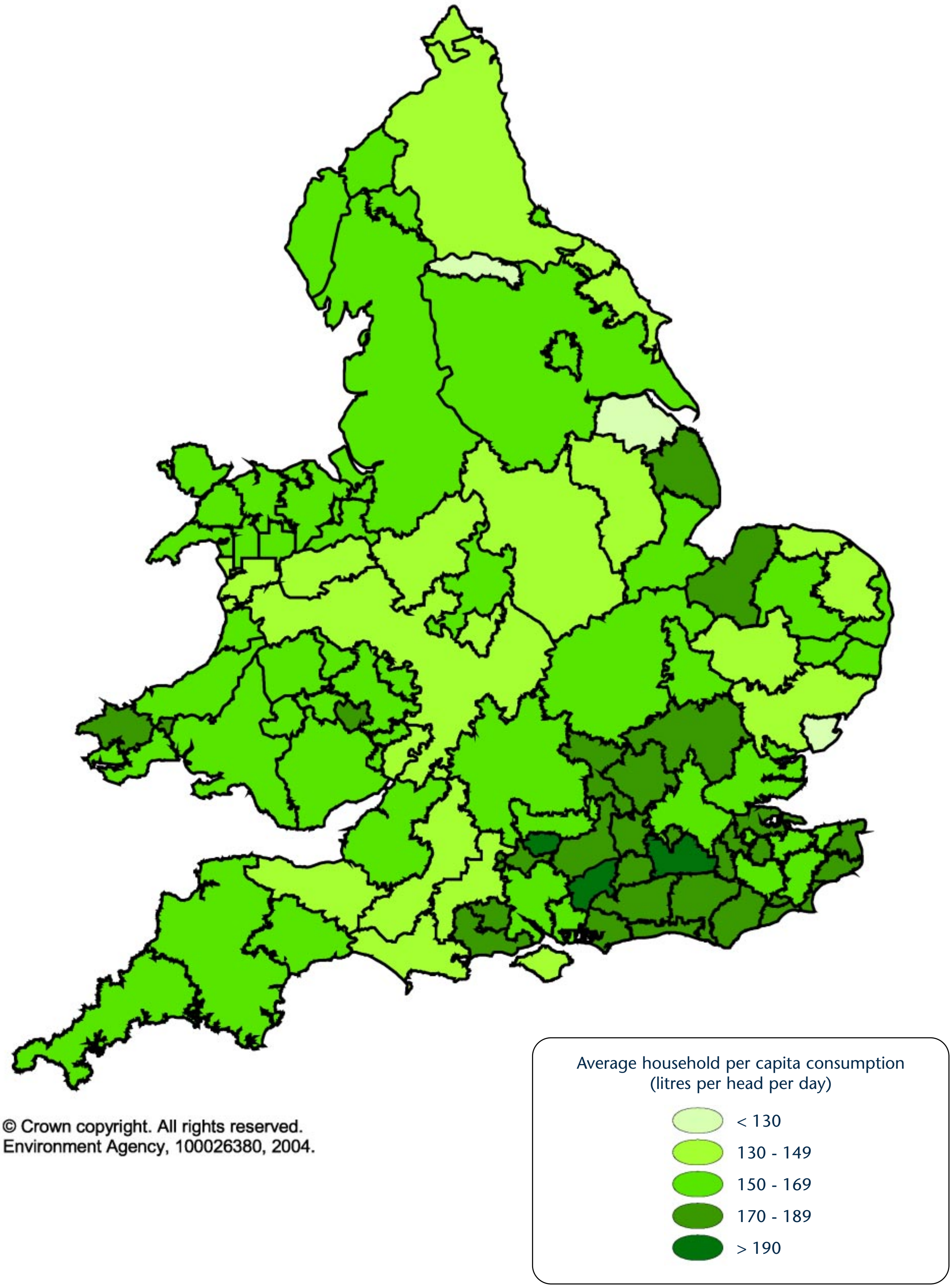


Figure 4 | Forecast average per capita consumption 2010

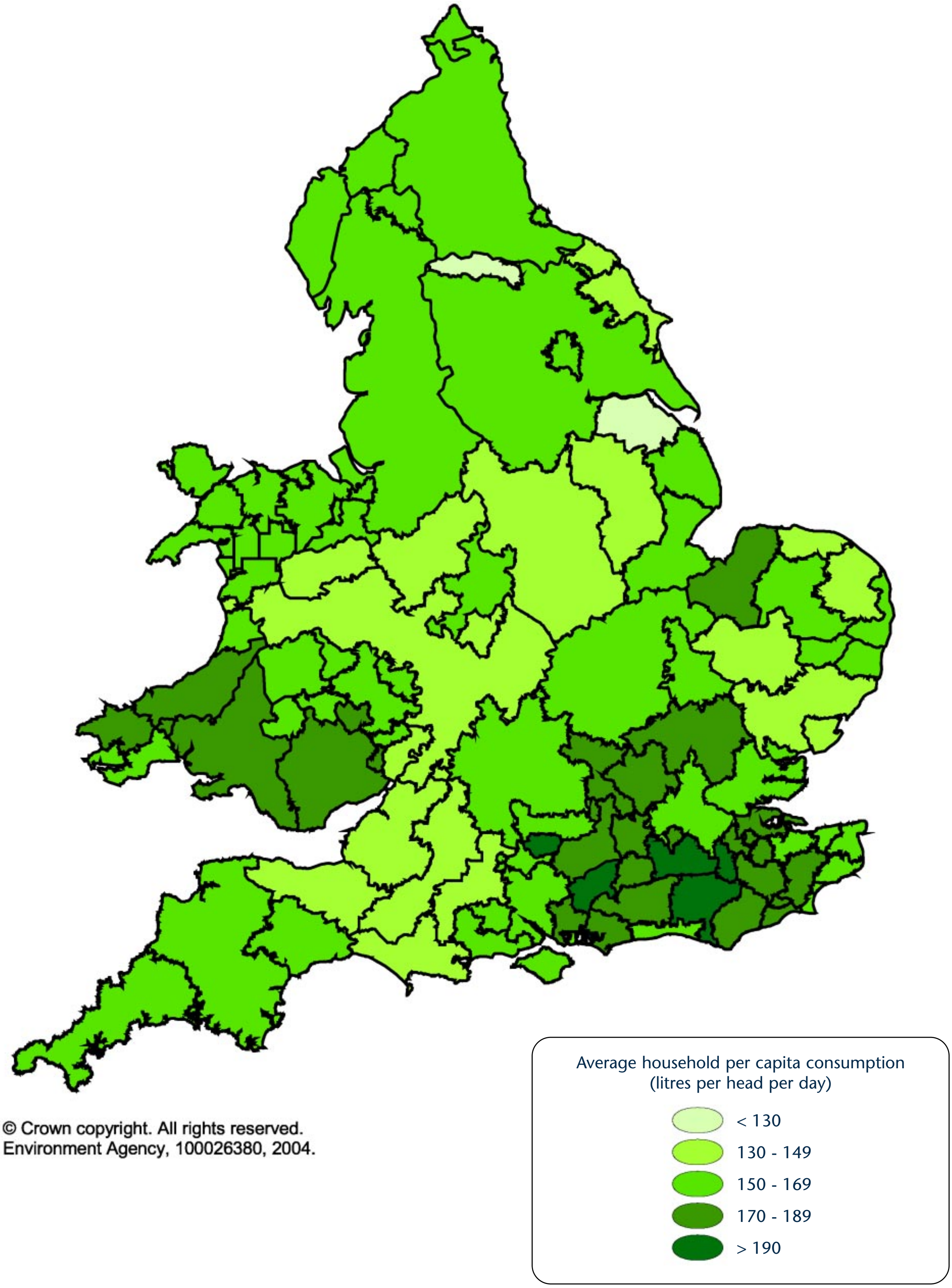
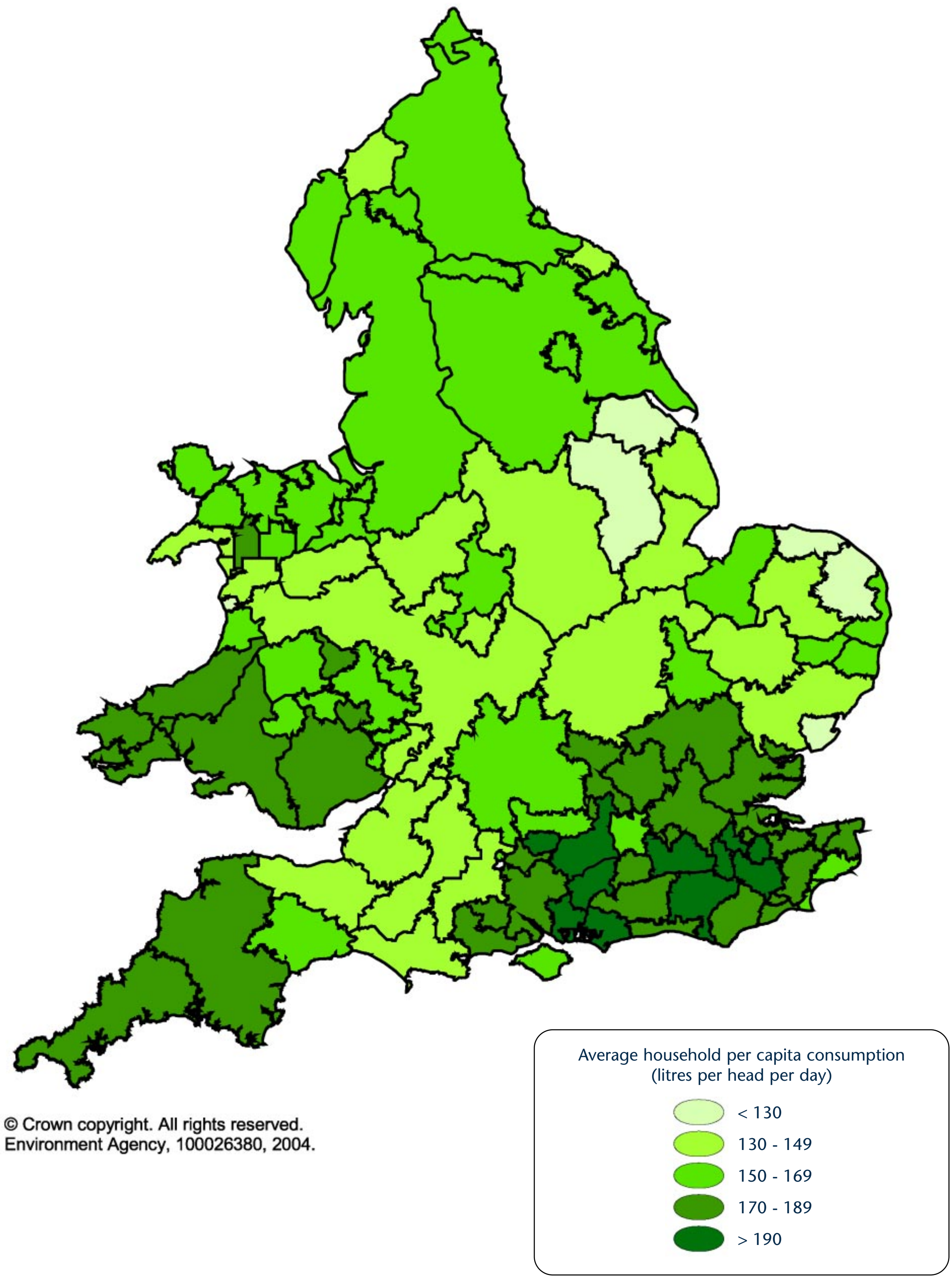


Figure 5 | Forecast average per capita consumption 2030



Only one company, Folkestone and Dover Water, tells us that it will seek water scarcity status in the next five years. We believe that Folkestone and Dover Water should pursue its application as quickly as possible. We also believe that other companies in south-east England should consider this option further. In comparison with many resource development options, compulsory metering as a result of water scarcity status can provide a reliable way of moderating demand and improving the supply-demand balance.

Household demand for water

Almost all companies predict an increase in household demand for water over the next 25 years. Most also predict an increase in average per capita consumption of water (Figures 3 to 5) despite increased metering rates. As a result, household demand drives the long-term water resources plans of many companies.

We remain concerned about the variability of base year individual water use (also known as per capita consumption). The variability in per capita consumption does not seem credible, particularly when contrasted with the apparent precision with which companies meet their leakage targets. As we stated in November 2003, we will work with Ministers and Ofwat to explore the possibility of setting targets for water into supply to supplement leakage targets. In line with Ministerial guidance, we expect companies to maintain and where necessary improve their consumption monitors. Companies without adequate consumption monitors must ensure that they develop these over the next few years. We also expect companies to work together to make best use of the data on consumption. We will play an active part in encouraging companies to pool their consumption monitor data and experience.

Most companies have followed industry good practice and produced micro-component based forecasts of demand. However, a few have used trend analysis. The uncertainty associated with this increases over time. The risk to supply of this inappropriate approach is low in the next few years but this is not a suitable basis for long-term planning and the adequacy of the later parts of these companies' plans is questionable. These companies must improve their approach to demand forecasting as a matter of urgency.

New households and sustainable communities

Household numbers are predicted to rise over the next 25 years across England and Wales. The Office of the Deputy Prime Minister (ODPM) has also identified some locations for the development of further households within sustainable communities.

Most affected companies have made some allowance for the housing associated with the ODPM's sustainable communities initiative. In some places this has proved difficult. For example, the Milton Keynes – Cambridge corridor stretches over several water companies' areas. There is a risk of double counting or omission that will need to be addressed carefully as proposals are developed.

No company has taken into account the ODPM's intention that these communities should have a lower impact on their environment. The ODPM has stated that water use will be at least 25 per cent lower than the current average, yet companies have assumed the same water use for all households. We expect companies to consider the savings associated with these households as proposals become firmer.

Non-household demand

Most companies forecast a reduction in non-household demand over the next 25 years. This is to be expected as our industrial base shifts and manufacturing becomes more efficient. Many studies have shown that industrial and commercial water users can normally save between a third and half of the water they use by adopting low cost measures. Despite the financial benefits, many of these users do not look for water savings. Some are unaware of the benefits, while for others the monetary savings may be low compared to the benefits of applying the same effort to other parts of their business. Few water companies appear to have considered actively promoting industrial demand management to accelerate the uptake of these water saving measures. This could be a valuable way of improving the supply-demand balance quickly in zones where supplies are short. We expect to see water companies taking positive action either individually or together to promote demand management in commerce and industry. We will work with Ofwat and water companies to consider whether further economic or regulatory incentives could help to encourage companies to improve industrial and commercial adoption of demand management measures.

Leakage

Companies that were predicting rises in leakage over the next 25 years in their draft plans have followed Government policy and are now planning no rise in company-level leakage. We welcome this improvement. However, all companies tell us that their economic level of leakage will remain effectively constant over the next 25 years. This may reflect a limited improvement in technical progress, because both the length of mains and the number of connections are projected to increase. However, these new mains and connections should be more reliable than current distribution systems.

We believe that this constant economic level of leakage is a conservative estimate because as demand for water rises the value of reducing leakage should also increase. As part of their plans, some companies intend to implement leakage control that takes them below their calculated economic level. We have seen few robust long-term zonal analyses of the economic level of leakage, despite guidance from Government that this should be carried out. We believe that zonal economic level of leakage analysis will help companies to put most effort into the areas where leakage management activity will produce the greatest benefits.

The level of leakage in London is of continuing concern. It increases significantly the risk of supply restrictions if there is prolonged dry weather. We welcome early signals that leakage in London is starting to fall, but further progress is vital if Thames Water is to move to an acceptable supply-demand balance for the capital.

Before the draft plans were submitted, Severn Trent Water significantly increased its base leakage estimate. This was based on a reinterpretation of company data including per capita consumption. Work by Ofwat's reporter has identified that Severn Trent Water's new leakage estimate is feasible. However, the work identified the need for the company to produce and implement a leakage action plan to improve the monitoring and management of the company's water balance. A review of the economic level of leakage is expected by 2008.

In its draft plan, Anglian Water increased its base leakage estimate by 23 Ml/d. This change was caused by new, lower population estimates from the 2001 census. We will work with Ofwat to understand this change. We do not expect to see similar modifications to base year leakage from other water companies now that final plans have been submitted.

Climate change

Most companies have made an allowance for climate change either explicitly or in headroom. The range of impacts calculated by the companies is enormous despite common guidance and industry-wide methods. A few companies tell us that present estimates of climate change will make little difference to their long-term strategy. Most companies have told us that they can accommodate the impact of climate change by making small changes to their plans in the decade between 2020 and 2030. We urge companies that have calculated the impact of climate change to be negligible or small to keep their assessments under active review as more information becomes available.

A few companies have identified serious impacts from climate change. We welcome the preliminary analysis that these companies have carried out. We have agreed with the water industry that these analyses are not on their own sufficient to justify significant changes to investment programmes. We expect all companies that have identified significant impacts from climate change to carry out more detailed analyses over the next few years. These include detailed modelling studies using alternative global climate models (GCMs). We will expect to see timetables for this work from these companies. For many companies this is a new area of work and they may need to seek advice and expertise from climate change specialists. Joint work through Water UK and UKWIR may be a good way to carry out some of this analysis. We will work with the water industry to help to scope further investigations into the impact of climate change.

Most companies that have identified a significant impact from climate change seem to intend to deal with this by developing new water resources and, in particular, reservoirs. We understand that these are preliminary assessments of need in the late 2020s but we do expect companies to follow Government guidelines and consider a full range of possible responses to climate change rather than only the more obvious engineering options.

Headroom

Ministers and the Agency expect water companies to plan to have an adequate margin of water supply over demand. This margin, known as headroom, is intended to allow for uncertainties in the supply-demand balance. Target headroom is the minimum headroom for which a company should be planning.

For these plans the water companies developed a new method for the calculation of target headroom. This addresses criticisms levelled at the old method, which was based on an unverifiable empirical relationship between target headroom and resource zone characteristics. The new method, applied carefully, provides sufficient justification for supply-demand balance changes to meet target headroom. Therefore it is essential that this method be applied to resource zones that are in need of work to achieve target headroom. However, the new method is more difficult to apply and requires a clear assessment of risk and its impact on security of supply.

In a significant improvement from the draft plans, most companies have applied the correct headroom method to zones where improvements to the supply-demand balance are needed. Some appear to have developed variants of the approach. While we welcome innovation where it improves understanding, it is not clear that these variants were justified and we are sometimes left with the feeling that they may be aimed at justifying higher levels of headroom. Few companies have provided adequate justification of the risk level that they have chosen. In many cases we believe that the implications of the level of risk chosen have not been fully understood by the company's decision-makers. This is particularly apparent where a company has used different levels of risk in different resource zones. This implies different levels of service to customers in different zones. Companies taking this approach need to demonstrate that their customers understand and accept the variation in service that they receive.

Some companies have calculated very low target headroom values for the early years of their plans. In many of these cases there is a sharp increase in target headroom in 2011 (Figures 6 to 8). Target headroom is a measure of the uncertainty in the supply-demand balance. We know that there is considerable uncertainty in elements such as per capita consumption. This means that we pay particular attention to unusually low target headroom values in the early years of these plans, as they may lead to a company taking unnecessary risks with customers' supplies.

We are told that some companies claiming low target headroom may be concerned about poor scores in Ofwat's "security of supply index". We believe that companies that reduce target headroom to improve this score are putting customers at risk of supply shortages by pursuing short-term financial incentives. Companies that underestimate target headroom values will probably need to apply customer restrictions far more frequently than they claim, and may be placing the environment at risk as they seek drought permits and orders in periods that are not exceptionally dry.

Where companies are working from an existing deficit, immediate low target headroom values are of little practical significance because they do still represent an improvement on present security of supply. However, where the supply-demand balance is tight but positive, low target headroom values become more important, as they can make the difference between acting to improve security of supply and inaction that leaves supply at risk. We will expect companies with very low target headroom values to carry out immediate further work to help them to understand the risk that they are taking. If the risk is high we expect immediate action to improve the zone's supply-demand balance.

Levels of service to customers

In water resources plans, the phrase "levels of service" refers to the planned frequency of customer restrictions. We are pleased to see that all companies accept that customer restrictions such as hosepipe bans are appropriate measures for managing the supply-demand balance during drought. This is a further important step forward from draft plans. However, we believe that for some companies the stated level of service is not reflected by the assumptions made in plans.

It is, of course, difficult to assess the true risk to supply and resilience to drought when faced with the range of uncertainties in the supply-demand balance. Some companies have taken a precautionary approach that provides a higher level of service than stated. This may not be of great significance where no changes to the supply system are envisaged, although it may make the company think that it has little water to share with other companies in a less fortunate position. However, where changes to the supply system are planned this precautionary approach may lead to inappropriate developments.

Other companies appear to be taking a greater risk with customers' supplies than they are stating. The true level of risk may be appropriate or unavoidable but companies need to identify this. For example, a company with a deficit in its immediate supply-demand balance is unlikely to be able to achieve the company's preferred level of service for some years. Companies in this position must tell their customers about the true risk to water supply and the actions they are taking to resolve this. We find it surprising that companies with poor security of supply let their customers believe that there is no problem. Early

Figure 6 Target headroom as a percentage of demand 2003

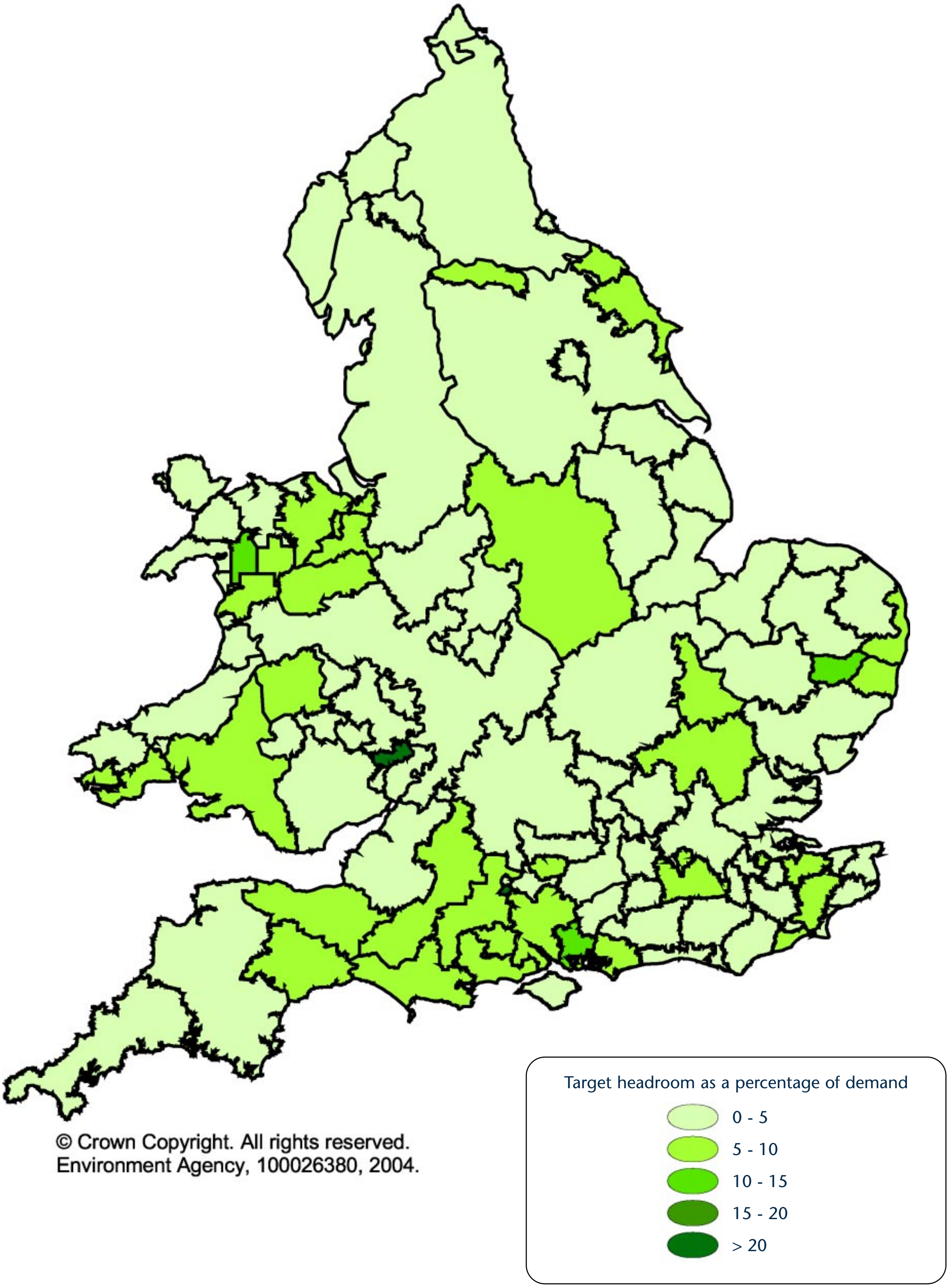


Figure 7 Target headroom as a percentage of demand 2010

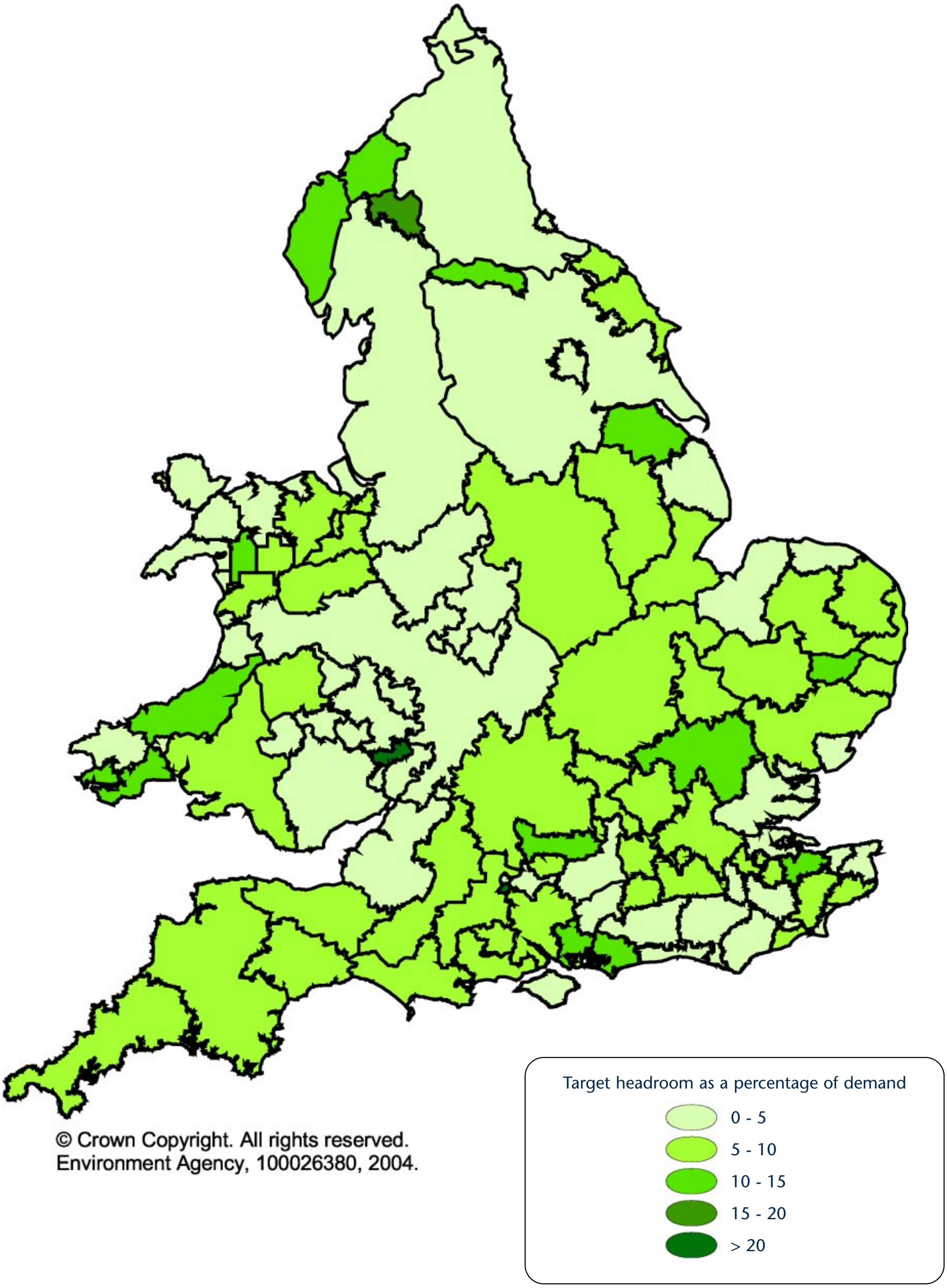
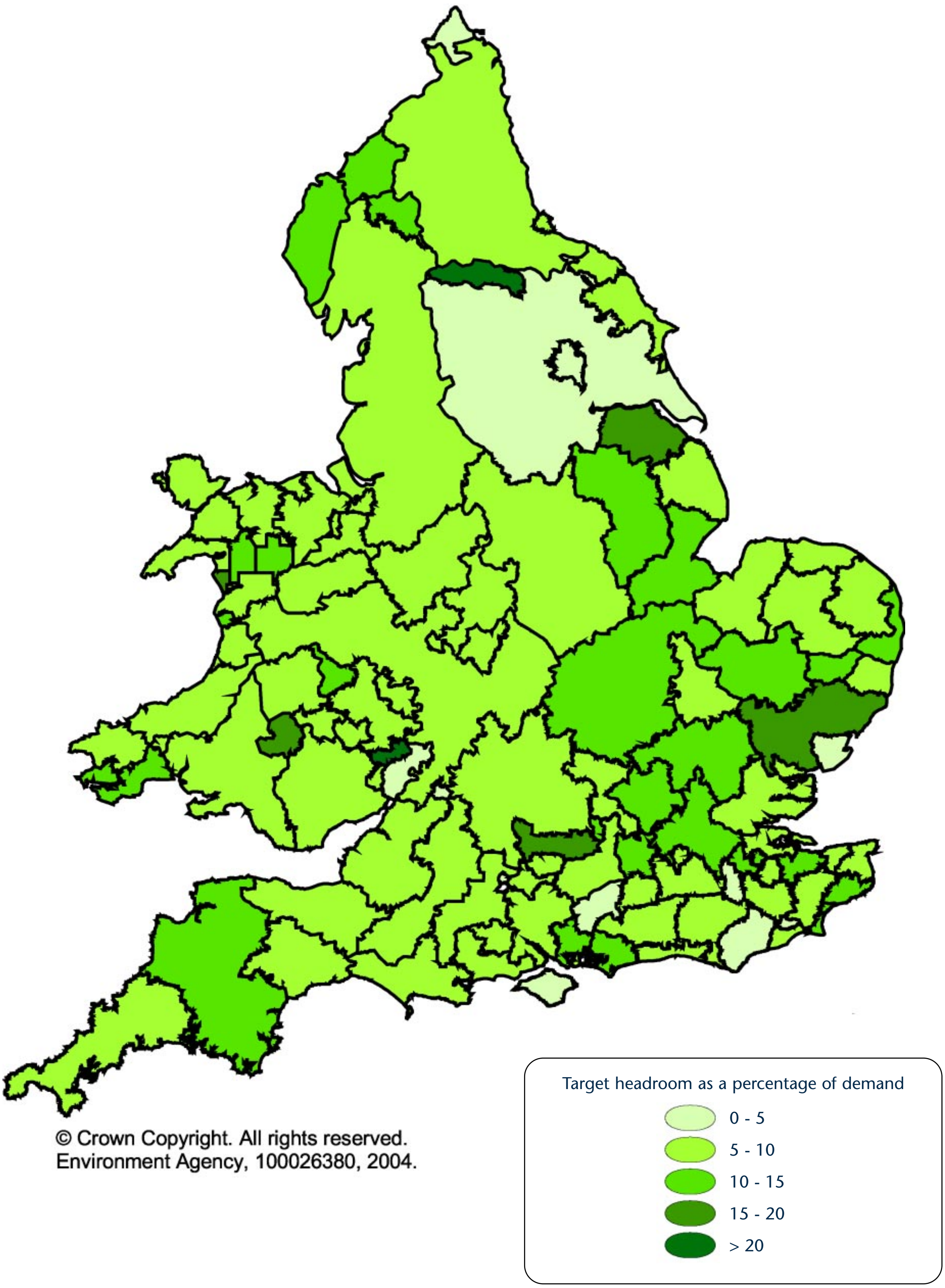


Figure 8 | Target headroom as a percentage of demand 2030



dialogue with customers will help to secure co-operation during droughts. We remind these companies that decisions about restrictions this summer or autumn must be based on the usual assessment of risk to supply. Concerns about publicity around the price review have no part to play in these decisions.

Selection of options

Ministers expect companies to follow the twin track approach to option selection, looking to new resource developments only where a demand management approach is clearly insufficient or unjustified in terms of cost.

Few companies have provided clear descriptions of the rationale behind their selection of options. Most plans still seem to be dominated by resource developments. Part of the explanation for this may be the incorporation of a level of demand management in baseline demand forecasts. However, most companies appear to have little faith in their ability to manage customer demand, seeing resource development as a more certain option.

Very few new resource development studies have been carried out for these plans. The result is that most of the details on resource development options are ten or more years old. In many cases assumptions do not take into account current legislative obligations or Government policy on nature conservation sites and the wider environment. Cost assumptions in these old studies are questionable, and the local acceptability of schemes has rarely been explored. In most cases the plans assume a degree of certainty over the cost, yield and timing of new schemes that seems misplaced given the experience of developing the two most recent supply reservoirs in England.

It is important to note that these plans are only the first stage in making changes to the supply-demand balance. If a plan shows that resource development is needed, more work must be carried out to demonstrate the feasibility and desirability of the proposed solution. This will include detailed technical studies and subsequent demonstration that the results of the preliminary options appraisal in the plan remain valid as more information becomes available. This must involve more detailed investigations into alternative options, including measures to reduce demand. We expect companies that have identified resource development options to ensure that the preferred option and several sensible alternative options are evaluated in more detail. These investigations should be completed to a timescale that allows further decisions to be made in good time.

We are surprised that companies have had to rely on old studies for options appraisal. We expect all companies to ensure that they have appropriate, relevant and up-to-date information about the options available to them. This investigation work should continue through the period from 2005 onwards so that the next set of plans is based on consistent and up-to-date information. In carrying out this work companies should be aware of the need to carry out strategic environmental assessment (SEA) on such options.

It is essential that companies follow Government policy by carrying out investigations not only into supply options but also into demand management. It may be appropriate for companies to work together on the evaluation of demand management options. Without proper trials of demand management options we cannot see how a water company could persuade a public inquiry that a resource development option was justified as the most cost-effective solution. All companies that are proposing significant resource developments must provide a clear timetable for alternative investigations and trials, covering both resource development and demand management options. In carrying out this work, we believe that companies need to pay more attention to the flexibility and robustness of different options.

We note substantial differences in the cost of apparently similar options from different water companies. We believe that it would be valuable for companies to share cost information on different options. This would help to reassure Government that options are being evaluated fairly and that decisions made by companies are appropriate.

3.3 Company issues

We expect all companies to work to maintain their plans over the next five years and beyond. However, some companies need to carry out specific work or particular investigations in the short-term. This work is necessary either to provide further justification for plans that appear risky or to improve security of supply or environmental protection in plans that make inadequate provision for these. In this section we identify specific issues that we expect to see addressed quickly.

We expect these and other companies to develop detailed plans and schedules for the work needed to improve their plans. We expect to see these schedules by the end of November 2004. We will expect to see real progress on these issues by the annual review in June 2005. We will work with the companies listed here and all other companies to ensure that they understand the reasons for our requirements. We will report to Ministers if progress is slow or if further investigation demonstrates other problems.

Anglian Water

Anglian Water's target headroom is small for the first five years of the plan, but then rises rapidly after 2010. Anglian Water needs to carry out further work to show that these target headroom values are appropriate. The company has made no allowance for the impact of the sustainable communities identified by the ODPM. The company needs to update its plan appropriately as further information becomes available.

Anglian Water's plan shows substantial variation in base year per capita consumption, even between adjacent zones. Base year zonal per capita consumption is disaggregated from company-wide billing data. This variability in per capita consumption is important because it is propagated through the plan to 2030. Where the supply-demand balance in the new zones is tight, Anglian Water must carry out more work to understand the zonal customer base and the way the population uses water. Further understanding may lead to an altered strategy that involves pursuing different options from those presented in the current plan. Therefore this work needs to be carried out quickly.

Dŵr Cymru Welsh Water

Dŵr Cymru Welsh Water's final plan is an improvement on its draft plan. However, the company has not followed the Agency's guideline in assessing parts of its supply-demand balance. The company has still used company-wide revenue forecasts to drive its household demand forecasts. This is not good practice and the company needs to carry out more work to develop a household consumption monitor that reflects the characteristics of water use in Wales.

For most of the company's area we are satisfied that the plan provides sufficient certainty over security of supply at least for the next five years. However, seven resource zones are in deficit now against either annual average or peak week demand. In three of these zones the deficit is small and can probably be managed with customer restrictions such as hosepipe bans in dry years. In the other four zones deficits are larger. In these zones target headroom values are very low. Target headroom has been calculated using a variant of the new headroom method which appears to lead to unusual patterns in target headroom. In these four zones target headroom should be reassessed by the next annual review using the correct version of the new method. This may well lead to an alternative plan for managing the supply-demand balance in these zones.

Dŵr Cymru Welsh Water needs to make substantial and rapid progress in implementing its plan to improve its supply-demand balance in the four zones that have significant deficits. Until this is achieved, customers in these zones face a high risk of restrictions, and some of the most valuable water environments of Wales may suffer from the effect of drought permits and drought orders.

Essex and Suffolk Water

Since it submitted its draft plan, Essex and Suffolk Water has reviewed its available supply and found a reduction in the volume of water available in its large Essex zone. It has also changed its demand forecasts. Development of small resource schemes as well as continuing demand management will help to manage the supply-demand balance. However, target headroom will not be achieved reliably until 2014 when the company's programme to enhance Abberton reservoir is fully implemented.

The company needs to make good progress on the activities identified in its plan. It should also continue to consider alternatives that will help to reduce the deficit in Essex more quickly. These further options may be essential if there are delays or problems with any part of the company's preferred options. We will expect to see improvements in the 2005 annual review of company plans.

Folkestone and Dover Water

Folkestone and Dover Water has a tight supply-demand balance in both of its resource zones. The company proposes a number of options to improve security of supply, including application for water scarcity status during the period from 2005 to 2010. Water scarcity status permits compulsory metering for zones where supply is limited. We believe that Folkestone and Dover Water needs to pursue its application quickly. The company must continue to keep customers informed about the present resource situation and the need to use water sensibly, as well as helping customers to understand the reason for compulsory metering and the benefits that this will bring.

Mid Kent Water

Mid Kent Water forecasts a substantial increase in the demand for water. This is partly because of new housing and increased population. However, the company's demand forecasts do not use a micro-component approach and the company forecasts a high rate of rise in per capita consumption. As part of its plan, Mid Kent proposes to develop a new reservoir at Broad Oak by 2019. Further work to justify this reservoir proposal must include an improved demand forecast using micro-components, as well as considering in more detail the role that water efficiency can play in reducing household demand. This work is urgent: 15 years is a very short period for a new reservoir development and any delay to investigations could jeopardise the feasibility of this project or its ability to deliver water when it is needed.

Portsmouth Water

Portsmouth Water has a substantial surplus of available supply over demand and can maintain a surplus in its annual average supply until 2030. The company predicts a significant increase in household demand, partly as a result of new housing and increased population and also because of a high forecast rate of growth in per capita consumption. The company proposes the development of a new reservoir by 2021 to meet peak week demand. Portsmouth Water should continue to investigate this proposal because the reservoir may be of value to neighbouring water companies. These investigations should include improved understanding of Portsmouth Water's own demands as well as consideration of the role that the reservoir could play in securing supply for other companies.

Portsmouth Water should also increase its rate of meter penetration. The company proposes to have only about 40 per cent of households metered by 2030. This is the lowest meter penetration in the south of England and is inappropriate for a company proposing to develop a new reservoir to meet peak demands. We believe that household metering is particularly effective in reducing peak demands, as it tends to discourage excessive discretionary use such as garden watering.

Severn Trent Water

Severn Trent Water has improved its plan significantly since its draft submission. The company has provided additional evidence for its estimates of available resources and plans further work to reduce the uncertainty of its resource estimates and supply zone boundaries. The company has a deficit in four of its six resource zones either now or from 2005. Some progress has been made on developing a micro-component based demand forecast, but more work is required to integrate this fully into the plan. Target headroom values for Severn Trent's zones are small but initial deficits mean that significant improvements are needed to meet target headroom. The company proposes a mix of demand management, leakage reduction and resource development to resolve these issues, with 93 Ml/d of resource development before 2010. Of this, 26 Ml/d is required for Severn Trent Water's proposed nitrate blending strategy. We believe that elements of this programme are ambitious and that alternative options may be preferable. The company should continue its work to provide better estimates of resource availability, as well as investigating other options.

Severn Trent Water predicts a substantial reduction in its available supply as a result of climate change. The company accordingly proposes a major new reservoir by 2025, to supply Birmingham and the Severn resource zone. The company believes that this reservoir should be somewhere in the lower Severn valley. The company will need to carry out further detailed studies of the impact of climate change on its supply-demand balance. These must include improved demand forecasts and take into account the company's work on improved monitoring of leakage, including the company's review of its economic level of leakage, due in 2008. The company must also explore alternative solutions, including demand management, more conjunctive use of existing sources, and other development options. All of this work must start immediately to allow for the long lead times required for major resource development. The company will also need to identify possible sites for a reservoir and carry out technical feasibility studies.

South East Water

South East Water has made some progress in water resources planning since the 1999 periodic review. The completion of the remaining schemes identified in the 1999 review should resolve most deficits by 2005. However, the implementation of measures over the last five years has been slower than expected and we are concerned that these deficits still remain.

South East Water's plan proposes further resource developments throughout the next decade, including a new reservoir by 2015. The timescale for this reservoir is ambitious. The company has also calculated very low target headroom values for the first few years of the plan. These may be masking poor security of supply for customers. The company has assumed low rates of growth for housing and population, although its per capita consumption is high.

The company proposes to meter only 63 per cent of households by 2030. This level of metering is too low for a company in the south of England experiencing existing and future pressures on the supply-demand balance. The company needs to increase its rate of metering immediately and must consider metering on change of ownership. It should also investigate the possibility of applying for water scarcity status. South East Water should also pursue options for sharing schemes with other companies. It must carry out detailed investigations into the options that it proposes to implement before 2010. This work is particularly urgent because the company's supply-demand balance is precarious.

Thames Water

Thames Water has a deficit in its London zone, where leakage remains very high. The company identifies leakage control as the most important element of its strategy. It proposes substantial mains replacement to reduce leakage. We support targeted mains replacement but we believe that a high level of active leakage control must supplement this replacement programme.

Leakage control alone will not resolve deficits in London. Thames Water proposes some groundwater development and a substantial desalination plant in the Thames estuary by 2007. We believe that the company needs to make rapid progress with this plant, as well as increasing demand management activity to help customers in London understand the risk to supply. Thames Water also proposes a new reservoir in Oxfordshire by 2021. Seventeen years is a short time for the development of this reservoir, which is likely to meet serious local opposition. The company should make rapid progress on further studies to demonstrate that this option is justified. It must also carry out further studies into the impact of climate change on its resources.

We will ask Thames Water to record its progress on improving its supply-demand balance in formal quarterly reports to the Agency. We will keep Ministers informed about any issues that may delay or affect the development of adequate security of supply.

Other companies

All companies will need to carry out some further work to implement their plans or aspects of the environment programme. More details can be found in Annex 1.

3.4 Water resources in the south-east

The "water resources in the south-east" group was set up in 1997 following a recommendation from the Monopolies and Mergers Commission. Chaired by the Environment Agency, members include all of the water companies of south-east England as well as Ofwat and Defra. The group's aim is to facilitate the sharing of resources across this complex water supply area. It has focussed on bulk supply agreements between companies and the modelling of resources that could be shared by several water companies to reach a solution that is better for customers and the environment than individual companies could achieve alone. The group has been instrumental in establishing four new bulk supply agreements. It has also proved a useful forum for discussing measures to manage demand.

We expect the group to continue to operate and we welcome the establishment of a memorandum of understanding between the parties. We will work to ensure that the water companies of the south-east of England continue to consider wider issues and the sharing of resources. We expect the companies to work with renewed vigour throughout the next five years. We will also look at the value of setting up similar groups in areas where supply systems are complex and where water companies could benefit from closer co-operation.

4

Maintaining and changing plans

Good planning involves changing plans as better information becomes available or as circumstances change.

We do not expect these plans to remain fixed for the next five years. Companies must keep them under review and make appropriate changes as necessary. In this part of the report we look at the changes that we expect and the way in which we expect these to be addressed.

4.1 Environment programme

We have identified a number of investigations that need to be carried out to understand the impact of water company abstractions on designated wildlife sites. We expect companies to make good progress on these so that solutions can be implemented within the statutory and policy timetables.

As the results of investigations become available we will expect companies to consider all of the options for dealing with the changes that are necessary. In some cases the results of these investigations may necessitate significant changes to plans. Some companies have told us that reducing abstraction to meet environmental needs could lead to significant new resource developments. We expect companies to act on appropriate changes to their plans and not to delay implementation for any reason. Companies will need to work with Ofwat to identify the appropriate mechanism for funding necessary statutory schemes, but questions about funding must not cause delays to the implementation of solutions. We will work with companies to ensure that security of supply is maintained throughout the implementation of the environment programme.

4.2 Changes to plans

All companies have identified the need for more work on aspects of their plans. We will be writing to companies with details of the areas where we expect more work or analysis. The results of this work may lead to changes to plans. We expect companies to make these changes as they become apparent and to keep the Agency informed of these changes. We will work with companies to develop a timetable for the work that will be carried out over the next five years.

We expect companies to make changes to their plans only as a result of new or improved information or options. Changes must not be made as a response to the outcome of the price review. It is the company's duty to maintain an adequate supply system. Ofwat's role is to ensure that the company has sufficient funds for this. A company cannot reduce or delay actions identified in its water resources plan because it believes that Ofwat has not provided funding for these actions. The company may question Ofwat's decisions through the appropriate channels but it must provide adequate security of supply to customers and it must carry out work that is necessary to ensure long-term security of supply. In particular we do not expect to see delays to investigations either for the environment programme or for schemes to improve the supply-demand balance. There must also be no delay to the appraisal or implementation of solutions to abstractions that have been identified to be damaging the environment.

We expect companies to implement the appropriate actions contained in their final plans. The approved measures in companies' plans are necessary to maintain an adequate water supply. It will not be appropriate for companies to delay actions identified in their plans without good reason. If a company is failing to act on its plan and has not demonstrated that changes to the plan are appropriate, we will consider our options carefully. We will refuse abstraction licence applications that are not supported by the company's current plan. If a company is failing to maintain an adequate security of supply or to make adequate progress towards this, we will consider steps to compel changes to the company's operations or activities. We may apply for abstraction licences on behalf of the company or we may ask Ministers to take enforcement action against companies. We do not expect to need to use any such measures but we will continue to review all companies' activities and act as appropriate.

We will use the annual review of water company plans to track changes to plans. In previous years the annual review has concentrated on collecting data and information about water supply during the year. Starting with the 2005 annual review we will expect to see clear information on progress against plans and justification for any changes that need to be made. If changes are significant they may trigger the resubmission of part or all of a company's plan. We expect companies to inform us of any likely changes at the earliest possible occasion, so that we can agree the degree of change to the plan that will be necessary. We do not believe that this will be an onerous task for companies, as they will need to carry out this work for themselves as changes are made. We will, of course, continue to work with companies to help them to maintain their plans and identify suitable options as more information becomes available.

4.3 Statutory water resources management plans

The Water Act 2003 makes water companies' water resources management plans statutory. The next plans that companies produce will be submitted to Ministers. We envisage that the technical basis of these plans will be broadly in line with the present process. We believe that all companies have already started to develop a sound basis for their statutory plans, though some companies are still some way from plans that will meet future requirements. The main change in the next plans will be the need for wide public consultation on a draft of the plan. If there are objections to the draft plan Ministers may hold a public inquiry to allow these objections to be heard.

Companies should use the next few years to ensure that they are ready for wider scrutiny of their draft plans. We will work with companies to help them to ensure that they have gathered appropriate information in good time. We believe that it would be beneficial for companies to publish their present plans, so that the public and other interested parties can understand the companies' strategies and will be in a position to comment in an informed way on the statutory plans. We understand that the current plans will be subject to the provisions of the Environmental Information Regulations when they come into force in 2005.

Companies should not underestimate the value of discussions with customers over proposals to maintain the supply-demand balance. Recent surveys demonstrated that the quality and security of water supplies is of most importance to customers. Companies can expect enormous public interest in their next plans. Customers and their representatives will certainly compare the quality of information provided by different companies. It would be in companies' own interests to start this discussion early and to be prepared to act on responses from customers before the statutory plans are due.

Recommendations and conclusions

In this section of the report we present our recommendations and conclusions.

We are pleased to conclude that all companies, if they follow these plans and their drought plans, will be able to meet their customers' needs for water for the next five or more years without unnecessary restrictions or inappropriate drought permits or orders.

Some companies need to carry out urgent work to improve security of supply. All companies in this position have plans in place on which they need to act. Other companies need to start work on measures to secure supplies into the 2010s and 2020s.

We are concerned that many plans are still dominated by resource development. Three schemes to extend existing reservoirs are proposed before 2015. Five new reservoirs providing 550 Ml/d are planned between 2015 and 2025. These timescales are ambitious. More work is needed to justify these schemes in comparison with other options including demand management, to demonstrate that they can be implemented in time, and to show that they provide value for money.

Through our analysis of the companies' plans we have drawn a series of recommendations on which we seek support from Ministers:

- Companies without adequate consumption monitors should follow Ministerial guidance and work to develop these, either alone or with companies with similar customer bases. We expect to see proposals for this from all relevant companies by April 2005. We will work with Ofwat and water companies to investigate the scope for pooling consumption monitor information to produce statistically robust estimates of present water use. This should help to resolve the substantial variability in base year per capita consumption. We will work with water companies to draw up proposals by April 2005.
- All companies should ensure that they have considered fully the commitment from the Office of the Deputy Prime Minister that households in sustainable communities will use 25 per cent less water than average households use now.
- We believe that the development of targets for water into supply could form a useful supplement to leakage targets and help companies to manage their supply-demand balance. We will work with Ofwat and water companies to develop proposals for targets for water into supply. We will consult on proposals in 2005.
- Despite Ministerial guidance, we have seen few robust assessments of long-term resource zone economic levels of leakage. We expect all companies to develop resource zone economic level of leakage assessments for their June 2005 annual review submissions. We will work with Ofwat to review these.
- We expect the water industry to make further progress on its action from the leakage tripartite study to develop additional leakage performance indicators. We expect to see a report on progress by April 2005.
- In line with Ministerial guidance, we expect companies to work together on the extensive trialling of demand management options to improve understanding of cost-effectiveness. We will work with companies to see how we can help to facilitate this co-operative work.
- We will explore with Ofwat and water companies the opportunities for companies to share cost information on generic options, so that the robustness of future plans and changes to current plans can be improved.
- We have noted in many of these plans a lack of information on flexibility and robustness of options. We will work with Ofwat and the water

industry to consider the benefits of developing a framework for the assessment of risk, flexibility and robustness. We will develop proposals for further work by April 2005.

- As part of the work on demand management that Ministers have asked the Agency and Ofwat to carry out, we will consider the best way to promote demand management to industrial and commercial water customers. We will evaluate the role that economic and other incentives can play. Ministers have asked the Agency to look at the benefits of establishing a water saving trust. We will ensure that this work considers the role such a trust could play in encouraging water conservation in industry and commerce, as well as in household water use. We will seek the views of the water industry, which is already actively considering the benefits of such a trust. We expect to report on this in January 2005.
- Companies should work together to provide useful information on demand management to their customers. We are happy to help to facilitate this work.
- We expect companies to consider how they will meet the new duty given to them by the Water Act 2003 to further water conservation.
- All companies should publish comprehensive and clear summaries of their plans early in 2005, so that their customers have the opportunity to understand how their supplies will be managed. Customer engagement will be vital for the next round of water resources plans: companies that start discussions early will see clear benefits when they consult on their statutory plans.

All companies must continue to work to ensure that their plans remain current. The actions identified in section 3.3 are particularly urgent and important. We will expect these companies to make rapid progress with these actions. We will inform Ministers about progress on these and other important actions.

We expect companies to act on their plans and ensure that they continue to maintain security of supply. It will be particularly important for companies to make good progress on the studies that they have identified, especially where schemes would take many years to implement. Companies should note the importance of the annual review process and the need to document and justify any changes to their plans. These steps will ensure that companies are ready to produce their statutory plans in good time for the next periodic review.

References

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Welsh Assembly Government (2004) *Guidance from the Welsh Assembly Government to the Director General of Water Services on the 2004 Periodic Review of Water Price Limits ("PR04").* Welsh Assembly Government: Cardiff.

Annex 1: Company commentaries

This part of the report provides more information on each water company's final water resources plan.

The commentary provides a summary of each company's available supply, demand forecast and position on leakage. It sets out the company's baseline supply-demand balance and the options it plans to implement to resolve forecast deficits.

We also list the important areas of work that will be necessary before 2010. When the results of this work affect a company's supply-demand balance we will expect it to update its water resources plan.

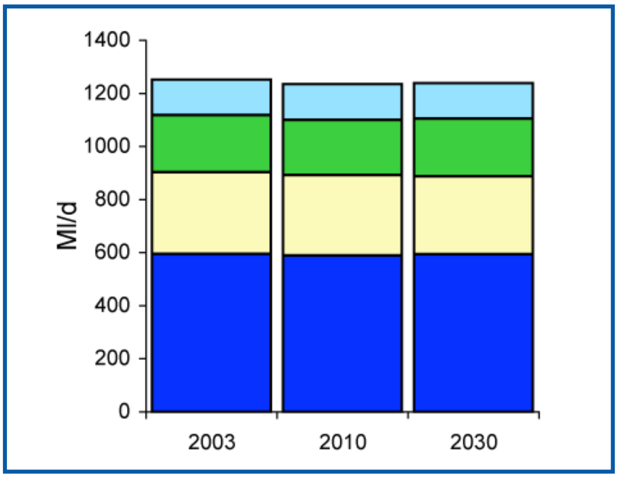
The commentary is accompanied by a chart that shows the components of demand in 2003, 2010 and 2030. The 'total other' category includes the allowance the company has made for outage and the losses and operational use that occur between abstraction and the distribution system.

Legend for company components of demand charts

Household demand	Leakage
Non-household demand	Total other

Anglian Water

Anglian Water supplies approximately four million people in the east of England and parts of the East Midlands, as well as Hartlepool in the north east. Supplies are taken from a mixture of surface and groundwater, with a large integrated reservoir system operating in the west of the company's area.



Components of the supply-demand balance

Supply	Anglian Water has reassessed deployable output to take account of changes to level of service, abstraction licences and source works. The company has calculated that it has approximately three per cent less water available than reported in the 1999 water resources plan. The company's approach to calculating available supply is in line with the guidance.
Demand	The company has presented micro-component data but does not appear to have used it as the basis for its household demand forecasts. It reports a surprisingly wide range in per capita consumption for both measured and unmeasured customers. The company also forecasts a wide range of growth rates across its twelve resource zones. Anglian Water has used 2001 census data for its population and property forecasts. It has not made any allowance for the ODPM's sustainable housing proposals within the plan. The company forecasts total demand to remain relatively steady between now and 2030.
Leakage	The company has recalculated its leakage figure using the revised population estimates from the 2001 census data. This has resulted in a baseline leakage estimate 23 Ml/d higher than would have been calculated using previous population estimates.
Baseline supply-demand balance	The company currently has a deficit in two of its 12 resource zones. It forecasts that a further four resource zones will have a deficit between now and 2012. Three resource zones currently have a deficit in peak periods. Another three are forecast to have a deficit in peak periods before 2010. A further resource zone is forecast to have a peak period deficit by 2026.
Options	Anglian Water plans to continue promoting demand management. To resolve the deficits it is proposing a major scheme to extend the water treatment works at Rutland Water by 2009. The company also proposes to develop strategic mains within and between resource zones and to make better use of existing licensed sources by upgrading works. It expects that this will deliver 100 Ml/d of additional water by 2010 and a further 40 Ml/d before 2030.

The company currently has low target headroom in all zones. In some resource zones, target headroom rises very rapidly; in two resource zones it is high by 2010 and very high by 2030. This suggests that the company may be adopting a very conservative approach in these resource zones beyond 2010.

Target headroom is a significant driver of schemes in the East Suffolk and Essex resource zone by 2012 and the Lincolnshire Fens zone after 2020.

In the East Suffolk and Essex resource zone the company plans to extend the trunk main system in 2006 and upgrade Alton water treatment works in 2012. The upgraded water treatment works and other resource enhancements will allow Anglian Water to deliver an additional 20 Ml/d of water. Changes to Alton water treatment works are driven by the need to meet target headroom in a dry year and during peak periods. Given the concerns we have about the company's target headroom, we require further explanation of the need for these changes to the water treatment works before we will be convinced this should go ahead.

The company continues to promote demand management actively and proposes a number of water efficiency research projects within the plan. It predicts that 90 per cent of all household customers will be metered by 2030.

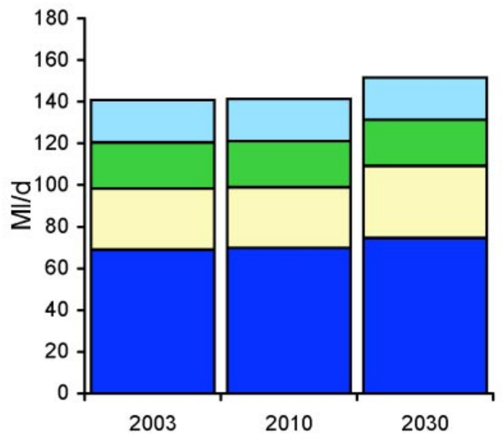
Further work

The Agency expects Anglian Water to:

- revise target headroom and demonstrate in the 2005 annual review that it is planning for a sensible level of risk across the period. This should include clarification of the need for schemes planned beyond 2010;
- assess the impact of the ODPM's sustainable communities proposals on the plan and include the findings in the 2005 annual review;
- assess the impact of climate change on demand and present the results in the 2005 annual review;
- revise non-household demand forecasts in line with industry good practice in time for the 2009 periodic review;
- produce an action plan to show how it will improve the use of domestic consumption monitor data and understand per capita consumption across all 12 resource zones in time for the 2009 periodic review.

Bournemouth and West Hampshire Water

Bournemouth and West Hampshire Water supplies approximately 420,000 people in Bournemouth and Christchurch on the south coast of England. During the peak holiday season the population increases by about ten per cent. The company relies on surface water abstractions from the Hampshire Avon and the Dorset Stour for over three quarters of peak supply. Bournemouth and West Hampshire Water has limited raw water storage.



Components of the supply-demand balance

Supply	Bournemouth and West Hampshire Water has reassessed deployable output to take account of changes in abstraction licences. The company has calculated that it has approximately the same amount of water available as reported in the 1999 water resources plan. The company's approach to calculating available supply is in line with the guidance.
Demand	Bournemouth and West Hampshire Water has used micro-components to forecast household demand. Population and property estimates are based on 2001 census data. The company forecasts a small increase in per capita consumption by 2030. It also forecasts a small increase in non-household demand. Bournemouth and West Hampshire Water experiences high summer peak demands and although its estimates of peak per capita consumption have reduced since the draft plan they remain very high. The company has made a commitment to investigate this during the next five years.
Leakage	The company plans to remain at its current economic level of leakage until 2030.
Baseline supply-demand balance	The company forecasts that it has enough water to supply average demand until beyond 2030. It forecasts there will be a deficit during peak periods in the Hale resource zone from 2014 and the Bournemouth resource zone from 2025.
Options	The company plans to continue with the current development of bank-side storage at Longham; this will increase the company's security of supply by providing additional storage and will help it to meet future peak demands. The company expects this to deliver 10 Ml/d by 2010. To meet the peak period deficit in the Hale resource zone, the company plans to increase the transfer between resource zones. It plans a further 5 Ml/d of bank-side storage to help meet the peak period deficit in the Bournemouth resource zone.

The company has adopted a policy of metering households on change of ownership as well as compulsory metering of sprinkler owners. It forecasts that by 2030, just over 85 per cent of all household customers will have a metered supply.

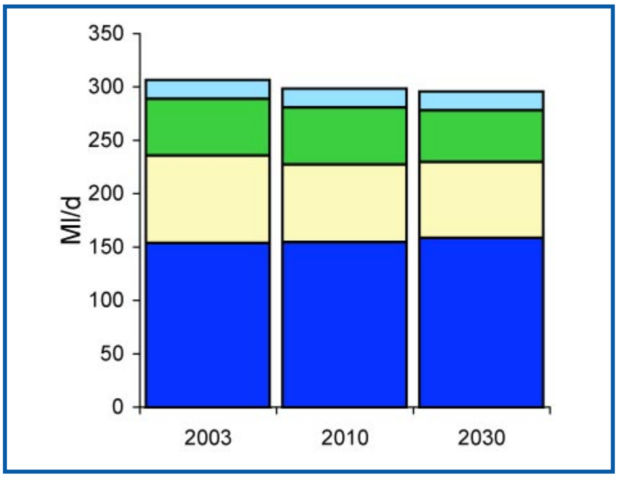
Further work

The Agency expects Bournemouth and West Hampshire Water to:

- explain in the 2005 annual review the impact of the allowance made for the company's supply to Fawley oil refinery in the calculation of target headroom;
- make improvements to its domestic consumption monitor, reporting progress on the feasibility study in the 2005 annual review and progress on implementation in the 2006 annual review;
- include a progress report on the work to increase understanding of peak demand in the 2007 annual review.

Bristol Water

Bristol Water operates a single water resource zone, supplying a population of just over a million people in Bristol and the surrounding area. Its main sources are the River Severn, via the Gloucester and Sharpness Canal, and the Mendip reservoirs, including Chew Valley reservoir. The company also has a number of groundwater sources.



Components of the supply-demand balance

Supply	Bristol Water has reassessed deployable output and calculated that it has about three per cent less water available than reported in the 1999 water resources plan. We have yet to understand fully the basis of the changes that the company has made.
Demand	The company has used a micro-component approach to forecast household demand. It has used 2001 census data to forecast population and properties. The company forecasts an overall decrease in demand to 2030. This is due to a decrease in both non-household demand and leakage; household demand remains relatively static.
Leakage	The company plans to retain leakage at its calculated economic level of leakage until 2023. After this, it plans to reduce leakage by a further 5 Ml/d.
Baseline supply-demand balance	The company forecasts that it will have a deficit by 2024.
Options	The company plans to meet the forecast deficit through promotion of demand management and further leakage control. No resource development is required.

The revisions to the company's deployable output and level of service reduce the volume of water that is available to the company. This may reduce the potential for Bristol Water to provide a bulk supply to neighbouring companies.

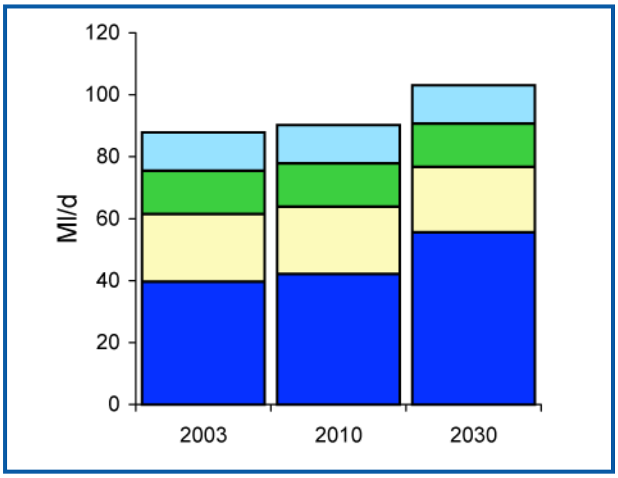
Further work

The Agency expects Bristol Water to:

- include in the 2005 annual review further explanation for the revisions made to assessed deployable output;
- work with Wessex Water to determine the benefits of joint development of options such as pumped storage of Chew Valley reservoir and present its findings in the 2007 annual review.

Cambridge Water

Cambridge Water supplies approximately 300,000 people in a small area around the city of Cambridge. It has an integrated supply system based entirely on groundwater sources.



Components of the supply-demand balance

Supply	Cambridge Water has reassessed deployable output to take account of modelling improvements and changes in abstraction licences. The company has calculated that it has approximately the same amount of water available as it reported in the 1999 water resources plan. The company's approach to calculating available supply is in line with the guidance. Cambridge Water's forecast outage figures are high and the method used to calculate them is not in line with best practice.
Demand	Cambridge Water has forecast demand using a trend analysis. The company has used 2001 census data to derive its population and property estimates and has taken account of the ODPM's sustainable communities proposals. The company forecasts a substantial growth in household demand. This is due mainly to the increase in properties resulting from the ODPM's sustainable communities proposals.
Leakage	The company is currently operating below its calculated economic level of leakage and plans to remain at this level until 2030.
Baseline supply-demand balance	The company forecasts that it has enough water to supply demand until beyond 2030.

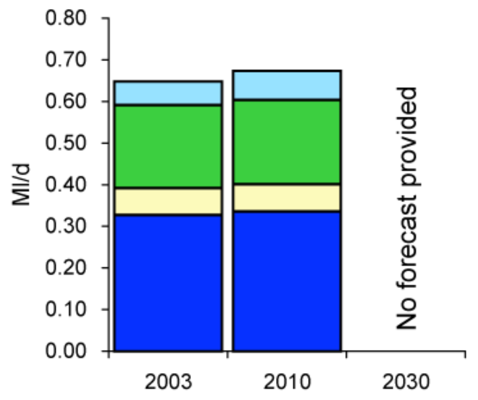
Further work

The Agency expects Cambridge Water to:

- review its approach to demand forecasting so that it is in line with industry good practice in time for the 2009 periodic review;
- review its approach to assessing outage so that it is line with industry good practice in time for the 2009 periodic review;
- establish a domestic consumption monitor either on its own or with neighbouring companies in time for the 2009 periodic review.

Cholderton and District Water

Cholderton and District Water is a small water company that supplies approximately 2000 people in a rural area on Salisbury Plain. The company is supplied by two boreholes abstracting from one groundwater source.



Components of the supply-demand balance

Supply	Cholderton and District Water reports the same deployable output as in the 1999 water resources plan. However, the company is concerned that its supply is currently at risk from poor water quality within the catchment.
Demand	The company's demand forecast is based on a trend analysis. Its population estimates are based on council information. The company forecasts a small growth in demand due to an increase in household water use.
Leakage	Current data suggests very high levels of leakage across the company.
Baseline supply-demand balance	The company believes it has adequate supplies to meet average demands. During peak periods, supplies are less certain due to licence restrictions.
Options	The company has proposed a number of options for the future. However, it has not included any suggestion of when these options may be needed.

Cholderton and District Water has produced a water resources plan looking to 2010. This is an improvement on the submission it made in August 2003. The Agency will be seeking clarification from the company on a number of issues including available supply and the risk of nitrate pollution.

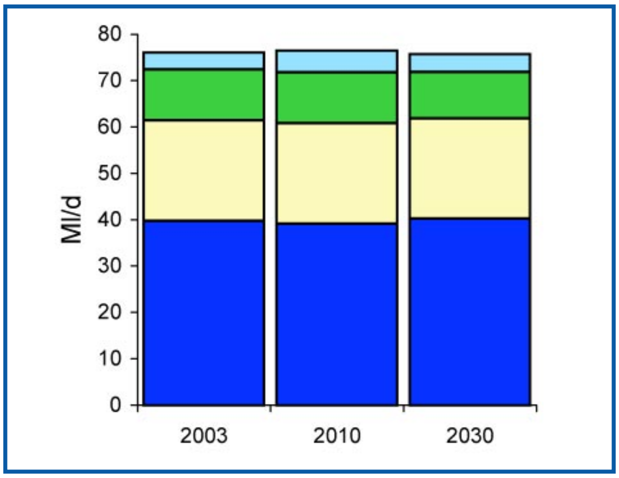
Further work

The Agency expects Cholderton and District Water to:

- increase its understanding of available supply;
- increase its understanding of current and future demands;
- consider options to ensure that rising nitrate levels do not represent an unacceptable risk to the supply-demand balance and include the findings in the 2006 annual review.

Dee Valley Water

Dee Valley Water supplies approximately 260,000 people around Chester and Wrexham. The company is dependent on the River Dee for more than three quarters of the water it supplies. Flows in the River Dee are controlled by a regulation scheme overseen by Environment Agency Wales, under powers established by the Dee and Clwyd River Authority Act 1973.



Components of the supply-demand balance

Supply	The company has reassessed deployable output and calculated that it has three per cent less water available than reported in the 1999 water resources plan. This includes the Agency's reassessment of the yield from the Dee regulation scheme. Outage has been reassessed in line with the guidance.
Demand	The company has used a trend analysis to forecast demand although it has used micro-component analysis to test the sensitivity of the results. Population and property forecasts are based on 2001 census data. Dee Valley Water forecasts that overall demand will remain relatively static.
Leakage	The company has provided further information on its approach to leakage management. It forecasts that leakage will reduce in all zones between now and 2030.
Baseline supply-demand balance	The company currently has a deficit in the Llwyn Onn resource zone. It forecasts that it has enough water to supply demand until beyond 2030 in the Chester and Pendinas resource zones.
Options	The company plans to use bulk transfers from the Pendinas and Chester resource zones and to implement further leakage reduction to resolve the deficit. No resource development is required.

The company forecasts that approximately 70 per cent of household customers will have a metered supply by 2030. It expects to reach this solely through meter optants. This seems ambitious and we believe the company should consider more proactive methods to ensure it will achieve this level of metering.

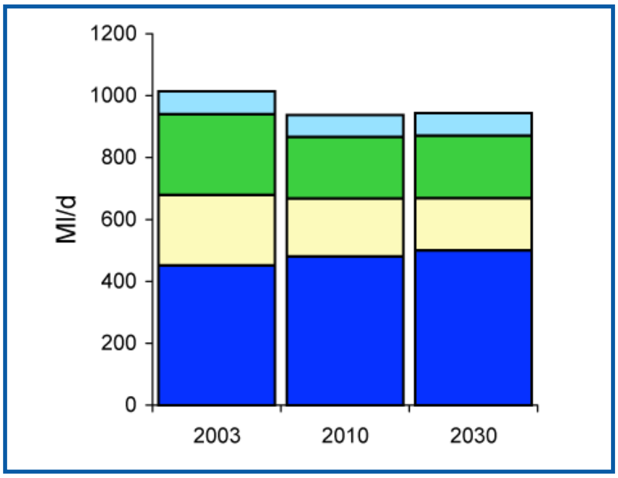
Further work

The Agency expects Dee Valley Water to:

- adopt and implement a metering policy that allows it to achieve its forecast meter penetration;
- develop an implementation programme showing how it intends to install district meters throughout the Chester resource zone. This should be included with Dee Valley Water's 2005 annual review;
- review its approach to demand forecasting, so that it is line with industry good practice in time for the 2009 periodic review;
- establish a domestic consumption monitor either on its own or with neighbouring companies in time for the 2009 periodic review;
- improve understanding of its measured household customer base in time for the 2009 periodic review; the company should report progress on this in each annual review.

Dŵr Cymru Welsh Water

Dŵr Cymru Welsh Water supplies water to approximately 2.9 million people across most of Wales and parts of Herefordshire. Supplies are drawn from a number of reservoir and surface water sources, with very few groundwater sources. The company operates 25 resource zones.



Components of the supply-demand balance

Supply	The company has reassessed deployable output and calculated that it has less water available than it reported in the 1999 water resources plan. The Agency requires further justification for the reassessment in six of the resource zones where the available supply is reported to be seven per cent less than previously reported. These six resource zones are currently in deficit.
Demand	The company says that it has used company wide revenue forecasts to forecast household demand. This is not an acceptable way to forecast demand. Population and property forecasts are based on 2001 census data. Until 2015 the company forecasts the highest rate of increase in unmeasured per capita consumption and the largest decline in measured per capita consumption of all companies. However, in total, the company forecasts a decline in overall demand. Within this, non-household demand and leakage are forecast to reduce and household demand to increase.
Leakage	At the company level, leakage is forecast to decline to its calculated economic level by 2010 and then remain steady until 2030. However, an increase in leakage is forecast in six zones, three of which are reported as currently being in deficit.
Baseline supply-demand balance	Dŵr Cymru Welsh Water currently has a deficit in five resource zones both during a dry year and peak periods. Two other resource zones have a deficit during peak periods only. The company forecasts that an eighth resource zone will be in deficit during peak periods by 2013 and a ninth by 2022. The resource zones currently in deficit were first identified as vulnerable in the company's 1999 plan. There has been limited progress since then to resolve these problems.
Options	To resolve the deficits the company is proposing a mixture of demand management, promotion of household metering, leakage reduction and a small amount of resource development. Dŵr Cymru Welsh Water's plan includes 13 Ml/d of resource development before 2025. The company's plan states that these options will resolve the current deficits by 2010. Despite the implementation of these options, one resource zone is forecast to go back into deficit in 2013 and another in 2021. The company's plan does not show how it intends to meet these deficits.

We believe the company has over-estimated the yield from some of the resource development options it plans to implement before 2010. This means that additional options may be required to resolve the current deficits in two resource zones.

The company has assumed very low target headroom until 2010. After this target headroom increases. This low level of target headroom means the customers in these zones face a high risk of restrictions.

The company has not followed the Agency's guideline in assessing significant parts of its supply-demand balance. This means that there is additional uncertainty surrounding the balance in individual zones. The zones currently in, or forecast to be in, deficit are the most vulnerable. The timing and type of options included for these resource zones are very sensitive to the assumptions used. This is not an appropriate basis for maintaining security of supply.

In the mid and south Ceredigion resource zone the company needs to resolve uncertainties with the assessment of the supply-demand balance before it can justify the Claerwen transfer scheme. The Agency believes that further work is required on costing and selection of options in this resource zone. Dŵr Cymru Welsh Water should consider alternative measures that make best use of existing supplies to resolve the immediate deficit in this resource zone.

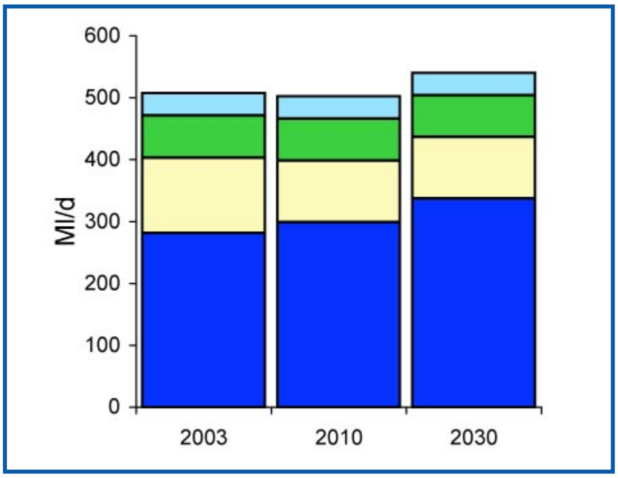
Further work

The Agency expects Dŵr Cymru Welsh Water to:

- reassess the supply-demand balance in the eight resource zones that have a deficit before 2013 and present its findings in the 2005 annual review. This must include a review of all demand forecasts, the target headroom and the options selection process to ensure that the company is planning for appropriate levels of security of supply;
- by the 2005 annual review, present an action plan demonstrating how it intends to establish an individual domestic consumption monitor;
- review measured household customer data so it can understand consumption and occupancy information for optants and new households at the resource zone level and include its findings in the 2005 annual review;
- develop plans to improve the input assumptions and model validation for the deployable output of all sources so it can better understand system performance and make a better assessment of climate change. These must be presented with the 2006 annual review;
- develop household demand forecasts based on micro-component data for the 2009 periodic review. Progress on this should be reported in each annual review.

Essex and Suffolk Water

Essex and Suffolk Water supplies approximately 1.7 million people in two separate areas. It has one resource zone covering Essex, which is predominately supplied from surface water. Three further resource zones cover north Suffolk and south Norfolk. These are supplied by a mixture of surface water and groundwater sources.



Components of the supply-demand balance

Supply	Essex and Suffolk Water has reassessed deployable output to take account of improved resource modelling, changes to existing abstraction licences and new schemes. This suggests that the company has eight per cent less water than reported in the 1999 water resources plan. The reassessment has not been fully justified in all resource zones.
Demand	The company has forecast demand using a micro-component approach. Essex and Suffolk Water's population and property forecasts are based on 2001 census data. The company has also made an allowance for the ODPM's sustainable communities proposals. The company's non-household demand forecast includes a significant amount of water that has not been allocated to an industrial sector. Over the period non-household demand is forecast to decline. The company's demand forecast numbers have yet to be confirmed so there is some uncertainty around the supply-demand balance.
Leakage	Essex and Suffolk Water plans to reduce leakage to its calculated economic level by 2010. Beyond this, it plans to maintain leakage at this level to 2030.
Baseline supply-demand balance	The company currently has a deficit in the Essex resource zone. It also forecasts that it will have a deficit in the Northern and Central resource zone in 2025.
Options	The company's plan includes demand management, leakage reduction and resource development. It plans to develop a new groundwater resource to resolve the deficit in the Northern and Central resource zone in 2025. To solve the current deficit in the Essex resource zone, the company plans to develop a new groundwater resource and a small effluent recycling scheme. These will deliver 4 Ml/d by 2005. It also plans to develop the Abberton Trilogy option. This involves three components: an initial Denver licence variation, followed by uprating of the Ely Ouse-Essex transfer scheme and raising of Abberton reservoir. In total, this is expected to deliver approximately 50 Ml/d by 2014. The Essex resource zone is forecast to remain in deficit until 2010. It will return to deficit in 2012 until the Abberton Trilogy option is fully implemented in 2014. The zone is then forecast to be in deficit again from 2024 to the end of the period. This appears to be due to the allowance the company has made for the ODPM's sustainable communities proposals, but the plan does not show how the company intends to resolve this deficit.

The company has used the new headroom methodology to calculate target headroom. It has made different assumptions about the level of risk it is prepared to accept in its two supply areas.

The company's plan has not fully considered the risks and uncertainties of the Abberton Trilogy option. The Agency believes that a development is needed to meet demand in this zone and that Essex and Suffolk Water should progress work on this option. However, the company should also consider a wider range of schemes, including more flexible options, that could help it to resolve the deficit more quickly.

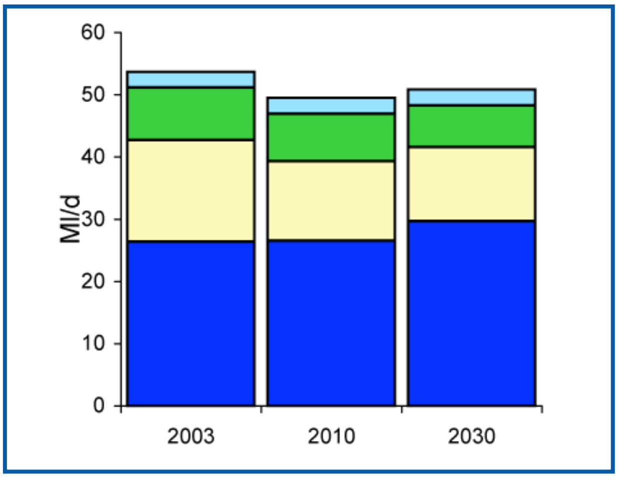
Further work

The Agency expects Essex and Suffolk Water to:

- justify the new deployable output figure presented for the Essex zone by October 2004;
- continue work on the Abberton Trilogy option, including an appraisal of the available short-term options and report progress in each annual review;
- take account of the revisions to the demand forecast and produce a plan to meet the deficit forecast for 2024 in the Essex zone. This must be presented in the company's 2005 annual review;
- recalculate target headroom reconsidering the components included and confirming whether customers will receive the same level of service in all resource zones. The outcome of this must be presented in the company's 2005 annual review;
- by the 2005 annual review, produce a contingency plan to meet the current deficit in the Essex zone if one or more elements of the Abberton Trilogy are not realised;
- reassess its declining non-household forecast as part of confirming the current deficit in the Essex resource zone and present its findings in the 2005 annual review.

Folkestone and Dover Water

Folkestone and Dover Water supplies approximately 150,000 people along the south coast of Kent. The company relies solely on groundwater sources to supply its customers. It operates two resource zones.



Components of the supply-demand balance

Supply	Folkestone and Dover Water has reassessed deployable output due to modelling improvements. The company has calculated that it has about nine per cent less available supply than reported in the 1999 water resources plan. The company's approach to calculating available supply is in line with the guidance.
Demand	The company has forecast household demand using micro-components. Population and property forecasts are based on the 2001 census data. The company forecasts an overall decrease in demand. Within this, household demand increases primarily due to growth in housing and population. Non-household demand is forecast to decline, due mainly to the decommissioning of power stations in the Denge resource zone.
Leakage	The company's reported leakage is less than its calculated economic level. It plans to reduce leakage further to 2030.
Baseline supply-demand balance	The company currently has a deficit in both resource zones.
Options	The company plans to resolve the current deficits through changes to abstraction from the Dour catchment and by building a main to transfer water between the two resource zones. The company intends to apply for water scarcity status early in the period 2005 to 2010. Folkestone and Dover Water plans to develop a small desalination scheme in 2019. The company also forecasts that it will use a share of a major new resource development, such as Broad Oak reservoir, by 2023. The plan includes approximately 5 Ml/d of resource development by 2010 and further 5 Ml/d by 2030. This includes approximately a 20 per cent share of Broad Oak reservoir.

The company plans to apply for water scarcity status early in the period 2005 to 2010. This will allow it to meter household properties compulsorily, subject to protection for vulnerable groups. It also plans to achieve further metering through meter optants and a change of ownership metering programme. The company forecasts that it will meter just over 90 per cent of households by 2015.

The company has used the new headroom methodology to calculate target headroom. It has made different assumptions about the level of risk it is prepared to accept in its two supply areas.

Folkestone and Dover Water currently uses transfers of water from neighbouring companies. Two of these agreements expire in 2013 and the company does not expect these transfers to be renewed. Folkestone and Dover Water's options include plans to replace this water.

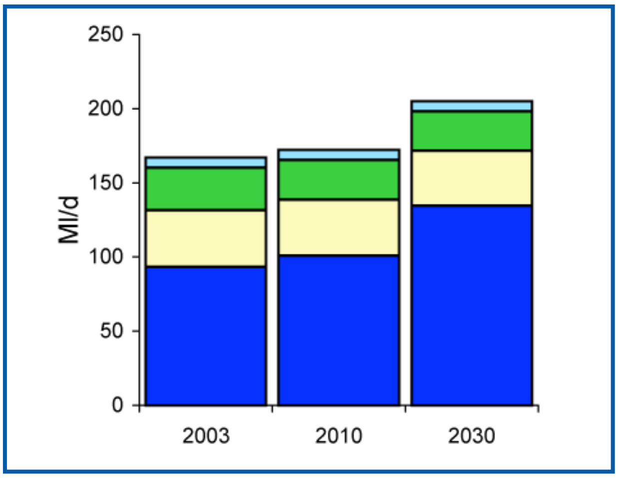
Further work

The Agency expects Folkestone and Dover Water to:

- progress its application for water scarcity status without delay;
- by the 2005 annual review, provide a plan showing how it will implement the various metering policies;
- recalculate target headroom to include the uncertainty surrounding the yield of options and confirm whether customers will receive the same level of service in both resource zones. The outcome of this must be presented in the company's 2005 annual review;
- include further justification of the need for Hythe desalination and a share of Broad Oak reservoir in the 2007 annual review.

Mid Kent Water

Mid Kent Water operates across much of Kent serving a population of approximately 580,000. Its seven resource zones are predominantly dependent on groundwater sources. The company also shares Bewl reservoir and the River Medway scheme with Southern Water.



Components of the supply-demand balance

Supply	Mid Kent Water has reassessed deployable output to take account of infrastructure improvements. The company has calculated that it has approximately the same amount of water available under average conditions as it reported in the 1999 water resources plan. The company's approach to calculating available supply is in line with the guidance. It believes that the volume of water available from its groundwater sources is more likely to reduce due to climate change than it previously thought.
Demand	The company has used its neural network model to develop its demand forecasts. Some micro-component assumptions have been used to reconcile current normal consumption. Population and property figures are based on 2001 census data. It has made an allowance for the ODPM's sustainable communities proposals. The company forecasts a substantial increase in overall demand. This is due partly to housing and population growth which is forecast mainly for the Ashford resource zone. However, the company also forecasts a higher than average rise in household per capita consumption.
Leakage	The company's leakage is below its calculated economic level in all zones. It forecasts a slight reduction to 2010 and then plans to retain leakage at this level.
Baseline supply-demand balance	The company forecasts that it will have a deficit in all seven resource zones between now and 2030. One is in deficit now, a further three will be in deficit by 2017, and a deficit is forecast in the remaining three by 2030. Two resource zones currently have a deficit during peak periods and the remaining five are forecast to have a deficit in peak periods by 2026.
Options	The company's strategy to meet the deficits includes: enhancing outputs from groundwater sources; increasing transfers between resource zones; and developing a new strategic transfer. It proposes to take more water from the Bewl and Medway scheme and plans that this will require Bewl reservoir to be enlarged by 2014. The company plans to share output from the enlarged Bewl reservoir with Southern Water. The company also plans to develop Broad Oak reservoir, north east of Canterbury, by 2019. Development will be in conjunction with Southern Water and Folkestone and Dover Water. Mid Kent Water expects to deliver a total of 35 Ml/d of resource development by 2020. This includes approximately a 40 per cent share of Broad Oak reservoir.

The company proposes to meter households on change of ownership. It forecasts that approximately 75 per cent of households will be metered across the company area by 2030. It expects household metering to reach over 90 per cent in the Ashford resource zone because of the large number of new houses.

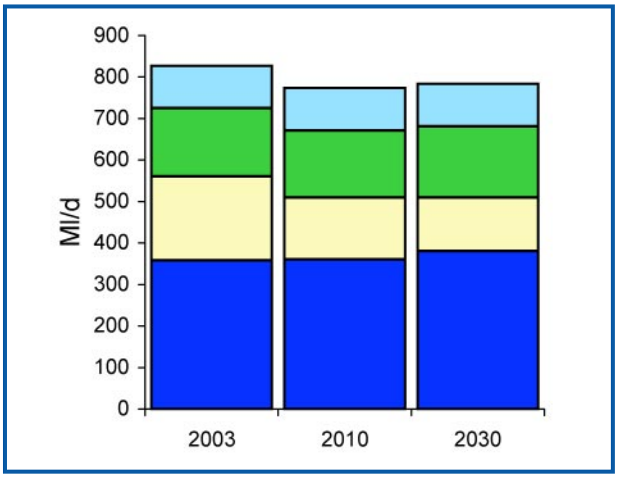
Further work

The Agency expects Mid Kent Water to:

- clarify and justify aspects of its leakage appraisal, assessment and methods as part of the 2005 annual review;
- complete a detailed review of its demand management options and the associated water savings. The results of this work should be presented in Mid Kent Water's 2007 annual review;
- continue the assessment of the potential impact of climate change for inclusion in the 2007 annual review;
- develop micro-component based household demand forecasts in time for the 2009 periodic review.

Northumbrian Water

Northumbrian Water supplies nearly 2.5 million people in the north east of England. The Kielder resource zone supplies most of the region and is supplied by Kielder reservoir. The smaller Berwick resource zone in the north of Northumberland relies on groundwater sources to supply the towns of Berwick-upon-Tweed and Wooler. The Raw Water resource zone supplies the non-potable demand within the Kielder resource zone area.



Components of the supply-demand balance

Supply	Northumbrian Water has reassessed deployable output to take account of abstraction licence and system constraints which were previously excluded. It has calculated that it has about 16 per cent less water available than reported in the 1999 water resources plan. The company has not provided data to support all of the changes it has made. We are concerned that the available supply reported for the company's Berwick zone is an over-estimate and could mask the real supply-demand balance position in that zone.
Demand	The company has used a micro-component approach to forecast household demand. Population and property figures are based on the 2001 census data. Northumbrian Water forecasts an overall decline in demand due mainly to a decline in non-household use. Within this decline, it forecasts an increase in household demand due to rising per capita consumption.
Leakage	The company has recalculated its total leakage to take account of the changes in population resulting from the 2001 census data. The new total leakage is above the company's calculated economic level of leakage. The company's leakage forecast numbers have yet to be confirmed but it informs us that it plans to reduce leakage to the calculated economic level.
Baseline supply-demand balance	The company forecasts that it has enough water to supply demand in both resource zones until beyond 2030.

Much of the company's plan lacks explanatory information and uncertainty remains around several significant parts of the supply-demand balance. Some parts of the plan do not appear to reflect what is happening at an operational level within the company. The progress that the company has made on resolving these issues between the draft and final plans is insufficient. We will expect the company to improve substantially this position by the 2005 annual review and continue to make progress after this.

Further work

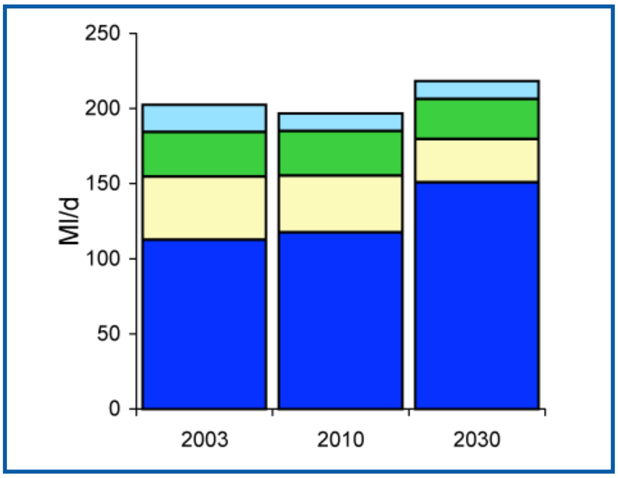
The Agency expects Northumbrian Water to:

- clarify the current leakage figures and the leakage forecast by the end of 2004;
- by the end of 2004, clarify whether there is a deficit in the Berwick resource zone and, if so, what options it is considering to meet the supply-demand balance;

- provide better base information on leakage from its district meter areas by the 2005 annual review;
- demonstrate an improved understanding of its supply system and infrastructure constraints by the 2005 annual review;
- by the 2005 annual review, provide further justification for all components of the supply-demand balance, including an audit trail of changes since the 1999 plan.

Portsmouth Water

Portsmouth Water supplies approximately 700,000 people across Hampshire and West Sussex. Its supplies are derived mainly from groundwater. The company also abstracts from the River Itchen.



Components of the supply-demand balance

Supply	Portsmouth Water has reassessed deployable output to take account of changes in abstraction licences. The company has calculated that it has two per cent less water available than it reported in the 1999 water resources plan. The company's approach to calculating available supply is in line with the guidance. The company's assessment of outage is unsatisfactory and produces a large outage figure.
Demand	The company has used a trend analysis to forecast per capita consumption although it has reconciled this with some micro-component assumptions. The company has used county council data as the basis for its population and property forecasts; this is not based on the 2001 census data in all cases. Portsmouth Water forecasts a substantial increase in household demand. This is due mainly to growth in per capita consumption. The company forecasts a higher than average increase in household per capita consumption for both measured and unmeasured customers. The company also reports very high peak per capita consumption figures for both measured and unmeasured household customers. Again, it forecasts substantial growth in these over the period.
Leakage	The company forecasts that leakage will remain relatively steady until 2010 and then reduce in all zones to 2021.
Baseline supply-demand balance	The company forecasts that it has enough water to supply demand in a dry year in all resource zones until beyond 2030. It currently has a deficit during peak periods in one resource zone and forecasts that it will have a deficit during peak periods in the other two resource zones from 2019 and 2025 respectively.
Options	The current peak period deficit is due to the high outage allowance quoted for the Gosport and Waterlooville resource zone. This outage allowance is forecast to reduce in 2005 when improvements are made to water treatment works. The resource zone is then forecast to have a surplus. To meet future peak period deficits the company plans a mixture of demand management, infrastructure improvements and a new 23 Ml/d reservoir at Havant Thicket in 2021.

Portsmouth Water forecasts an increase in demand to 2030. As the company already reports high average and peak per capita consumption the forecast increases seem unlikely. The Agency requires further information to justify the figures presented.

The company intends to begin metering all new household properties from 2005. This will bring it in line with all other companies in England and Wales. It forecasts that nearly 40 per cent of all households will have a metered supply by 2030. Whilst this is an improvement on the draft plan, which did not plan even to meter all new household properties, it is still amongst the lowest levels of metering in England and Wales. With such high per capita consumption figures and the company's sensitivity to peak periods we do not believe that 40 per cent household metering by 2030 is adequate. The company should be seeking to achieve greater levels of metering with rapid progress in the next ten years.

Portsmouth Water acknowledges in its plan that Havant Thicket reservoir may be a useful option for neighbouring companies. The justification of this new reservoir is likely to depend on it being a shared resource.

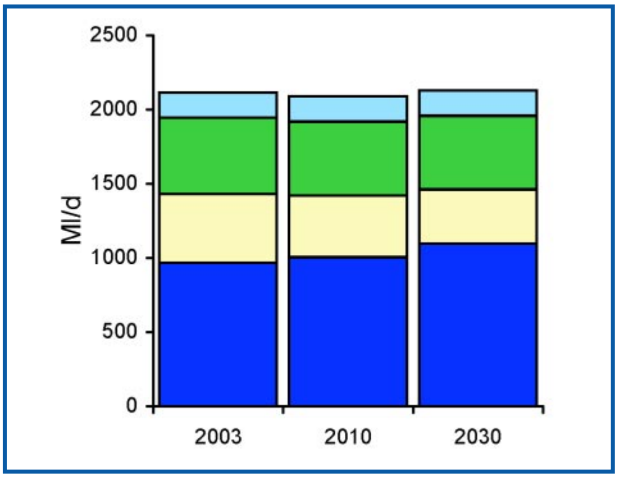
Further work

The Agency expects Portsmouth Water to:

- proactively promote household metering;
- continue to improve understanding of demand data through work on its consumption monitor and micro-component assessment and report progress in each annual review;
- revise its household metering policies to show how it intends to achieve higher levels of metering and include this within the 2005 annual review;
- apply the new headroom methodology and include the results within the 2006 annual review;
- update and enhance its assessment of the impact of climate change and include these within the 2007 annual review;
- by the 2007 annual review, revise the outage assessment using a probabilistic assessment with agreed criteria and statistics;
- produce further justification of its need for Havant Thicket reservoir in time for the 2009 periodic review;
- investigate the feasibility of Havant Thicket reservoir as a shared resource development and include its findings in the 2009 periodic review.

Severn Trent Water

Severn Trent Water supplies approximately 7.2 million people in the Midlands and across mid-Wales. The company supply area covers two major river catchments, the Severn and the Trent. Water is abstracted from numerous river, groundwater and reservoir sources.



Components of the supply-demand balance

Supply	The company has provided additional evidence to support its estimates of deployable output. An appropriate current value for the River Severn has been agreed with the Agency but the company has made a commitment to further work to reduce uncertainty around the estimates. Severn Trent Water estimates that by 2030 deployable output will be reduced by nearly 180 Ml/d due to climate change.
Demand	The company's household demand forecast is based partly on trend analysis and partly on industry wide micro-component data. It has made a commitment to collect company-specific micro-component data. Population and property numbers are based on 2001 census data. Following the reassessment of its leakage and per capita consumption estimates, the company currently reports very low unmeasured per capita consumption. Household demand is forecast to increase over the planning period. To 2010 this is offset by a decline in non-household demand but, after this, non-household use is forecast to remain relatively static and total demand is expected to increase.
Leakage	Severn Trent Water has recently recalculated its baseline leakage. The company's current reported leakage is higher than its current calculated economic level. The company proposes to reduce leakage by 17 Ml/d so that this economic level is achieved in 2011. No further reductions in leakage are included within the plan although the company does say that it will review this.
Baseline supply-demand balance	The company currently has a deficit in three of the six resource zones. A fourth is forecast to have a deficit from 2005 and a fifth from 2014.
Options	The company plans to resolve the current deficits by 2007. To do this it proposes: leakage reduction; new groundwater resources; reallocation of existing surface water abstractions from the River Wye; and better use of existing sources and infrastructure, including an upgrade to a water treatment works on the River Severn. It expects this to deliver 93 Ml/d of resource development by 2010. Just over a quarter of this development is to provide blending water to meet drinking water quality nitrate standards. Beyond 2010 the company proposes an additional 275 Ml/d of resource development. This includes: an increase in abstractions from the River Severn and the River Trent; an aquifer storage and recovery scheme and a major new reservoir somewhere in the lower Severn Valley to supply Birmingham and the Severn resource zone by 2025.

We are concerned that Severn Trent Water's resource zones may not reflect current operational practice and in some areas may be hiding the real supply-demand balance position. The company needs to review its resource zones to ensure that they are in line with the accepted definition. It then needs to review the impact that these changes have on deployable output and target headroom values.

By 2030, the company forecasts that just over 65 per cent of households will have a metered supply. It believes that this will reduce demand by approximately 30 Ml/d. The company also plans to implement a 'save-a-flush' scheme and forecasts that by 2030 this will have saved a further 12 Ml/d.

The Agency is concerned that the company's plan does not demonstrate that all available options have been considered properly. We believe that the schemes proposed in the plan may not be robust enough to make sure that the current deficits can be reliably resolved before 2010.

It is particularly disappointing that the company does not consider further leakage reduction beyond 2010 given the level of resource development it is proposing.

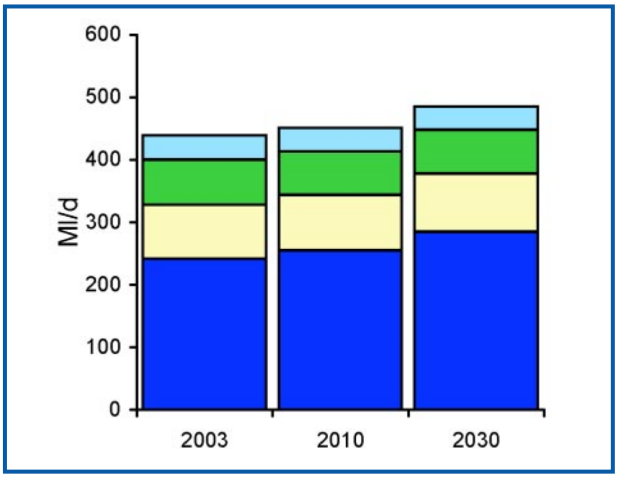
Further work

The Agency expects Severn Trent Water to:

- carry out further modelling to support its resource development proposals and justify its scheme selection. Progress on this should be reported in each annual review;
- begin work immediately to investigate the feasibility of the schemes it plans to implement before 2010. Progress made on this should be reported in each annual review;
- continue work to revise the deployable output assessment by reconsidering its resource zone boundaries in time for the 2005 annual review;
- liaise with neighbouring companies to make optimum use of opportunities to share water and report progress in the 2005 annual review;
- carry out investigations to increase its understanding of the impacts of climate change and report the findings in the 2006 annual review;
- improve its understanding of the household customer base by the 2007 annual review;
- review its leakage assessment and recalculate the economic level of leakage in time for the 2009 periodic review;
- develop company specific micro-component based demand forecasts in time for the 2009 periodic review.

South East Water

South East Water supplies approximately 1.4 million people in two main supply areas. Its ‘Southern region’ covers East Sussex and Kent, while the ‘Northern region’ covers parts of Hampshire and Surrey. The company has a mixture of groundwater and surface water sources.



Components of the supply-demand balance

Supply	South East Water has reassessed deployable output to take account of process losses and changes to abstraction licences. The company has calculated that it has approximately the same amount of water available as it reported in the 1999 water resources plan. The company’s approach to calculating available supply is in line with the guidance. Uncertainty remains about how transfers between resource zones could be developed further to help manage the company’s supply-demand balance.
Demand	The company has used a micro-component approach to forecast household demand. South East Water’s estimates of per capita consumption, while lower than in the draft plan, remain among the highest in the south of England. The company’s population and property forecasts are based on the 2001 census. The company forecasts an increase in demand to 2030. This is partly due to growth in households and population, but also due to higher than average growth in unmeasured per capita consumption. A small increase in non-household demand is also forecast.
Leakage	The company’s current Ofwat leakage target is lower than its recently recalculated economic level. It plans to meet its target in 2004 and then retain leakage at this level until 2030.
Baseline supply-demand balance	The company currently has a deficit in four of the five resource zones. Three resource zones also have a deficit during peak periods.
Options	Three of the four current deficits will be resolved by 2005 by schemes that are already under development. The remaining deficit will be resolved by 2007 through further enhancement of groundwater sources in the company’s Northern region. Within the Northern region, the company proposes two groundwater resource enhancement schemes by 2006 and an increased abstraction from the River Thames in 2008. Further groundwater enhancement is planned beyond 2010. The plan for the company’s Southern region includes a desalination plant in 2007, a new abstraction in the Medway resource zone in 2012 and a new reservoir by 2015. The company expects resource development options to deliver approximately 40 Ml/d before 2010 and a further 35 Ml/d by 2030.

The company has calculated very low target headroom in all five resource zones for the first ten years. Low values remain in three resource zones until 2030. This represents a risk to the security of supply in these zones.

The company forecasts that just under 65 per cent of household customers will be metered by 2030. It plans to achieve this through meter optants and metering properties that have been unoccupied for a long time. Given the company's supply-demand balance position and high per capita consumption, we believe it should be aiming to meter more households and should have a more proactive metering policy.

The company's plan continues to rely on developing its own new resource schemes rather than developing shared resources and bulk supply agreements. We expect the company to consider further sharing resources with other companies in the south-east of England.

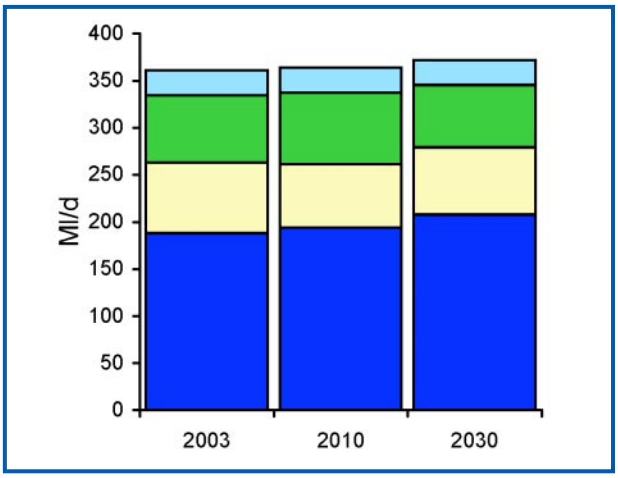
Further work

The Agency expects South East Water to:

- continue to increase its understanding of current household and non-household demand data and forecasts, progress should be reported in each annual review;
- revise target headroom and demonstrate in the 2005 annual review that it is planning for a sensible level of risk across the period;
- by the 2005 annual review, make progress on investigations into the options it plans to develop before 2010 and provide an implementation schedule;
- revise its household metering policies to show how it intends to achieve higher levels of metering and include this within the 2005 annual review;
- by the 2006 annual review, consider the options for transferring water between resource zones;
- consider shared resources as an option to solve the supply-demand balance deficits and report progress in the 2007 annual review;
- update and improve its assessment of the impat of climate change on supply and demand and include the findings in the 2007 annual review;
- complete a detailed review of demand management options and the associated water savings and present the findings in the 2007 annual review.

South Staffordshire Water

South Staffordshire Water supplies approximately 1.25 million people in the Midlands. The company operates as a single resource zone with all sources linked by an integrated supply system. Its main sources are an abstraction from the River Severn and Blithfield reservoir. The main aim of the company's plan is to provide acceptable headroom during peak week demands.



Components of the supply-demand balance

Supply	South Staffordshire Water has reassessed deployable output mainly due to modelling changes and calculated that it has about two per cent less water available than it reported in the 1999 water resources plan. The company's approach to calculating the available supply is in line with the guidance.
Demand	The company's household demand forecast is based on micro-components. Population and property numbers are based on 2001 census data. The company forecasts a rise in overall demand. Household demand increases, mainly due to an increase in forecast per capita consumption. Non-household demand is forecast to decline.
Leakage	The company forecasts that leakage will rise to 2005 by approximately 5 Ml/d. It will then be reduced to the company's economic level of leakage by 2006. Further reductions are planned to 2030.
Baseline supply-demand balance	The company forecasts that it will have a deficit from 2023. It also forecasts that it will have a deficit during peak periods from 2011.
Options	The company plans to upgrade treatment works to allow approximately 11 Ml/d of existing groundwater supplies to be brought back on line between 2015 and 2019. It also plans to increase abstraction from the River Severn and upgrade water treatment works so that it can use an additional 40 Ml/d in 2021. These schemes resolve both the dry year and the peak period deficits.

The company considers that demand management is not cost-effective. It plans to continue to deliver its current level of water efficiency activity over the planning period. It forecasts that 35 per cent of household customers will be metered by 2030. This is the lowest level of metering forecast across England and Wales and is not acceptable given the resource developments the company is proposing.

We are disappointed in the company's lack of commitment to the twin track approach and believe it will need to reconsider its position on demand management to justify new resources.

Further work

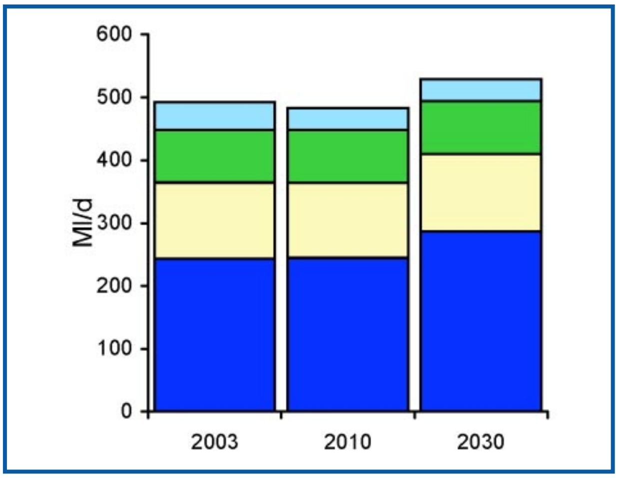
The Agency expects South Staffordshire Water to:

- reconsider its approach to demand management and promote household metering more proactively: progress should be reported in each annual review;

- review its consumption monitor and report the findings in the 2005 annual review;
- provide an interim economic level of leakage calculation by the 2006 annual review;
- within its 2006 annual review, clarify its assessment of the impact of climate change.

South West Water

South West Water supplies approximately 1.6 million people across Devon, Cornwall and parts of Somerset and Dorset. This increases by over half a million people during the summer period. It operates three resource zones, each with a large strategic reservoir.



Components of the supply-demand balance

Supply	The company has reassessed deployable output and calculated that it has about two per cent less water available than reported in the 1999 water resources plan. South West Water explains that this is partly due to the impact of climate change. Further clarification is needed on the assumptions that the company has made.
Demand	The company has forecast household demand using micro-components. Population and property estimates are based on 2001 census data. The company forecasts an overall increase in demand to 2030. This includes a small increase in non-household demand and an increase in household demand which is mainly due to forecast growth in per capita consumption.
Leakage	The company's reported level of leakage is below its stated economic level. It plans to remain at its current level to 2030.
Baseline supply-demand balance	The company currently has a deficit in two resource zones. The third is forecast to have a deficit by 2009.
Options	The company plans to resolve the current deficits by 2006 through a combination of water efficiency measures and infrastructure enhancement to allow it to make better use of existing resources. South West Water expects its programme of water efficiency measures to save a further 15 Ml/d by 2011. The company also plans to develop pumped storage schemes at two of its existing reservoirs: at Roadford reservoir in 2010 (phase 1) and in 2027 (phase 2), and at Colliford reservoir in 2023.

The company forecasts that household metering will reach just over 90 per cent by 2030. It plans to achieve this solely through meter optants and metering new homes. This seems very ambitious.

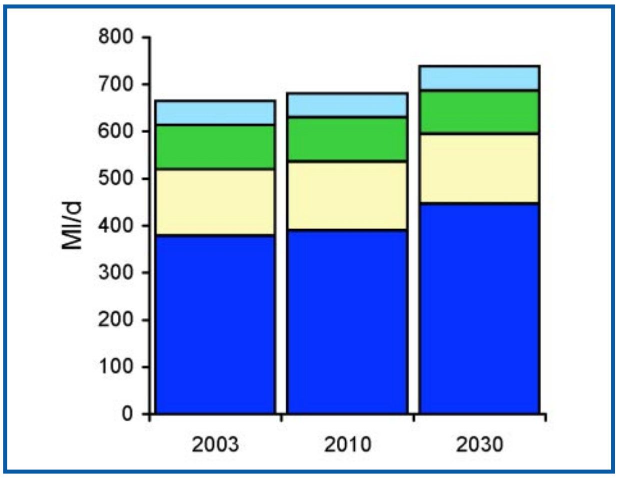
Further work

The Agency expects South West Water to:

- explain, in the 2005 annual review if the initial deficits are real and quantify the risk that this presents to its customers;
- review and confirm, in the 2005 annual review, the policies that it will implement to reach the planned levels of metering;
- include in the 2005 annual review clarification of its assessment of the impact of climate change.

Southern Water

Southern Water supplies approximately 2.3 million people across Kent, East and West Sussex, Hampshire and the Isle of Wight. The company relies on groundwater for 70 per cent of its supply to customers. Many of its zones are sensitive to peak demands.



Components of the supply-demand balance

Supply	Southern Water has reassessed deployable output to take account of changes to abstraction licences and modelling changes. The company has calculated that it has approximately the same amount of water available as it reported in the 1999 water resources plan. The company's approach to calculating available supply is in line with the guidance. It has made a moderate allowance for climate change, but has assessed that the worst case impact could be significant.
Demand	The company has used a micro-component approach to forecast household demand. Population and property numbers are based on 2001 census data. The company has made an allowance for the ODPM's sustainable communities proposals. Southern Water forecasts an increase in overall demand. Non-household demand is forecast to increase slightly. Household demand is also forecast to increase although at a lower rate of increase than neighbouring companies.
Leakage	The company's reported level of leakage is below its calculated economic level. It plans to maintain leakage at the current level to 2030 in seven resource zones and reduce leakage further in the remaining two.
Baseline supply-demand balance	Three of the company's nine resource zones currently have a deficit at times of both average and peak demand. One of the remaining resource zones is forecast to have a deficit by 2010, another by 2013, two more by 2018 and an eighth by 2030.
Options	The company plans to meet all of the current deficits by 2007 through: further leakage control; infrastructure improvements to allow better use of existing resources; increased transfer capacities; and demand management measures. By 2010 it plans a new surface water abstraction in the Sussex North resource zone and further enhancement of groundwater sources in Kent. Southern Water's plan also includes: further surface water abstraction in the Sussex North resource zone by 2015; the enlargement of Bewl reservoir by 2014 to support the Kent Medway and Sussex Hastings resource zones; and a new reservoir at Broad Oak in Kent by 2019. The company plans to share the output from the enlarged Bewl reservoir with Mid Kent Water and to promote Broad Oak reservoir with Mid Kent Water and Folkestone and Dover Water. The plan includes 10 Ml/d of resource development before 2010 and approximately a further 115 Ml/d by 2030. This includes approximately a 40 per cent share of Broad Oak reservoir.

Overall the company forecasts that just over 70 per cent of households will have a metered supply by 2030. In the Sussex resource zones, the company proposes a policy of metering households on change of ownership. It forecasts that metering in these zones will reach approximately 85 per cent of households by 2030. The company also plans to implement a dual flush retrofit scheme in two of the Sussex resource zones from 2005. This is expected to save just under 2 Ml/d by 2010.

Southern Water is central to achieving the best regional solution for the companies in the south east of England through future shared resources and bulk supply arrangements. It has demonstrated a positive approach to these options in the plan.

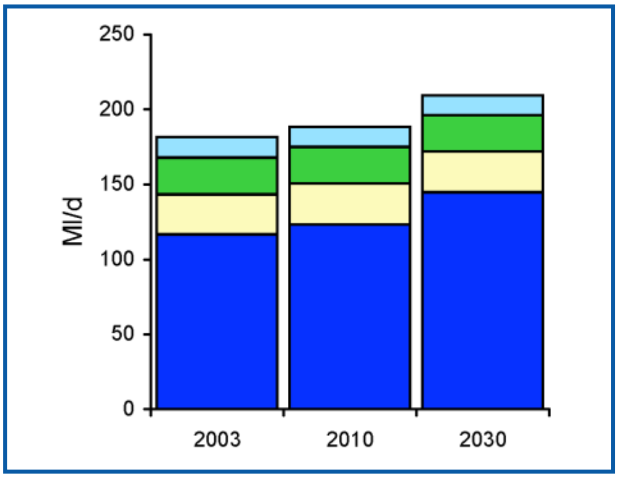
Further work

The Agency expects Southern Water to:

- update and enhance its assessment of the potential impact of climate change on surface water and groundwater resources and report its findings in the 2006 annual review;
- improve the understanding of household and non-household demand including per capita consumption, peaking factors and how tourism affects demand. Progress on this should be reported in Southern Water's 2007 annual review.
- continue to progress the review and investigation of options, including modelling inter-zonal and inter-company transfer options, and report the findings in the 2007 annual review.

Sutton and East Surrey Water

Sutton and East Surrey Water supplies approximately 650,000 people across East Surrey, parts of West Sussex, West Kent and South London. The company operates two water resource zones. Groundwater sources provide 85 per cent of the company supply. The rest is supplied from Bough Beech reservoir.



Components of the supply-demand balance

Supply	The company has reassessed the supplies from its groundwater sources. This has shown a peak period deployable output nine per cent lower than reported in the company's 1999 water resources plan. The revised deployable output suggests that the company currently does not have enough water to maintain target headroom in both resource zones during peak periods. The company plans to look again at its calculation of deployable output to confirm the current supply-demand balance.
Demand	The company has forecast household demand using a micro-component approach. Population and property figures are based on 2001 census data and local authority information. The company currently reports high per capita consumption. It forecasts that this will increase to 2030. An increase in household demand is partly due to this increase in household water use, but also due to growth in population and properties. Non-household demand is forecast to remain stable.
Leakage	The company's reported leakage is below its calculated economic level. It plans for leakage to remain at the current level until 2030.
Baseline supply-demand balance	The company forecasts that it will have a deficit in the Sutton resource zone from 2012. It forecasts that it has enough water to meet demand in the East Surrey resource zone beyond 2030. Sutton and East Surrey Water currently has a deficit in both zones during periods of peak demand.
Options	To meet the forecast deficits the company proposes infrastructure improvements and resource development. It plans a new 9 Ml/d groundwater scheme and the first phase of an aquifer recharge and recovery scheme, which will deliver an additional 5 Ml/d by 2010. The company also plans to increase abstraction from Bough Beech reservoir in 2021 and a further two phases of aquifer recharge and recovery by 2027. The aquifer recharge and recovery scheme will allow the company to make better use of its existing licences. Overall Sutton and East Surrey Water expects to deliver a total of just over 73 Ml/d of resource development to meet peak demands by 2030.

The company forecasts that just under 45 per cent of household customers will have a metered supply by 2030. Given the high per capita consumption forecasts, the Agency believes that the company should extend its metering programme.

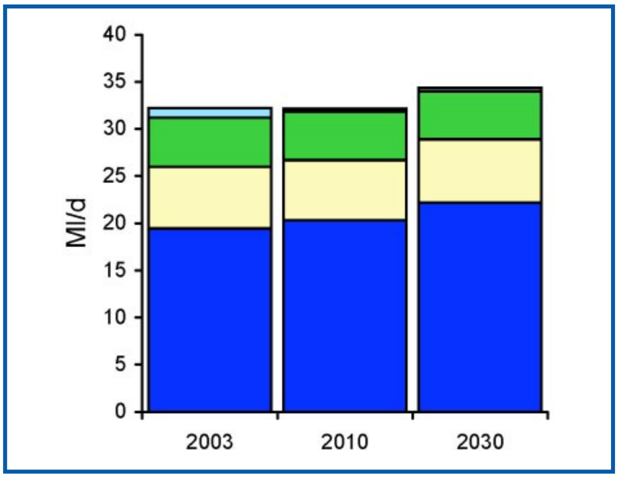
Further work

The Agency believes the company should:

- finalise the current deployable output estimate and clarify, in the 2005 annual review, if it has a current deficit;
- consider again its approach to metering and explain, in the 2006 annual review, why the company's cost of metering is substantially higher than average;
- increase understanding of per capita consumption values and report the findings in the 2007 annual review.

Tendring Hundred Water

Tendring Hundred Water supplies approximately 150,000 people in the Tendring Peninsula of Essex. It has an integrated supply system operated as a single resource zone. It can supply all of its customers from groundwater sources in the chalk aquifer, but also shares Ardleigh reservoir with Anglian Water.



Components of the supply-demand balance

Supply	Tendring Hundred Water has reassessed deployable output due to changes in output from sources. The company has calculated that it has about five per cent more water available than it reported in the 1999 water resources plan. The company's approach to calculating available supply is in line with the guidance.
Demand	The company has used a micro-component approach to forecast household demand. Population and property numbers are based on the 2001 census. The company thinks it is unlikely to be affected by the ODPM's sustainable communities proposals. The company forecasts a small increase in overall demand to 2030. This is mainly due to an increase in household demand due to growth in per capita consumption.
Leakage	The company's current reported leakage is below its calculated economic level. It plans to maintain leakage at its current level until 2030.
Baseline supply-demand balance	The company forecasts that it will have enough water to supply demand until beyond 2030.

Tendring Hundred Water has agreed to share the present surplus with Anglian Water between now and 2010. We welcome this approach.

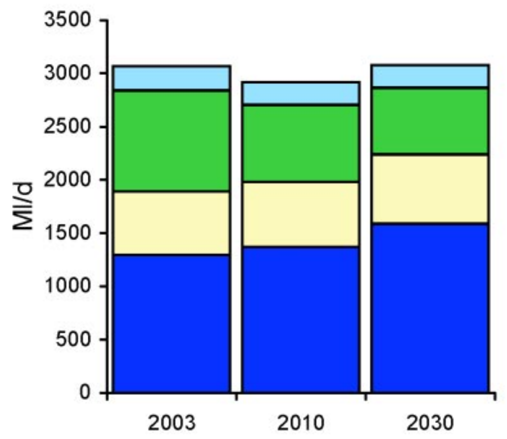
Further work

The Agency expects Tendring Hundred Water to:

- continue work on longer-term water resource investigations and report progress in each annual review;
- review its bulk supply options with neighbouring companies in time for the 2009 periodic review.

Thames Water

Thames Water supplies eight million people in London and across the Thames Valley from Kent and Essex to Gloucestershire. Water taken from the River Thames and stored in various bank-side reservoirs is the main supply for the London resource zone and the Swindon, North and South Oxfordshire resource zone. The other five resource zones are largely supplied by groundwater sources.



Components of the supply-demand balance

Supply	Thames Water has reassessed deployable output and calculated that it has about five per cent more water available than reported in the 1999 water resources plan. The company has not provided an adequate explanation to support the deployable output assessment for the London resource zone.
Demand	The company has used micro-components to forecast household demand. Population and property numbers are based on the 2001 census. The company has included an allowance for the ODPM's sustainable communities proposals. The company forecasts a small decline in overall demand by 2010. This is due to leakage reducing at a faster rate than household and non-household demand increase. By 2030, despite further leakage reduction, overall demand is forecast to have returned to its current level as household demand continues to increase.
Leakage	The company forecasts a reduction in leakage across the period due to increased active leakage control and a significant mains replacement programme in London.
Baseline supply-demand balance	The company currently has a deficit in the London resource zone. It forecasts that it will have a deficit in the Swindon, North and South Oxfordshire resource zone, in the Slough, Wycombe and Aylesbury resource zone before 2010 and in the Kennet Valley resource zone by 2018.
Options	The company plans to meet the deficit in London by 2007 by reducing leakage, further development of groundwater and a large desalination plant in the Thames Estuary. It plans to meet the other deficits forecast before 2010, by reducing leakage, demand management and increasing abstraction. To maintain the supply-demand balance in the London resource zone beyond 2010, the company proposes to develop: a further aquifer storage and recovery scheme in 2013; a desalination scheme in 2018; and a major new reservoir in Oxfordshire by 2021. The company believes that it will need a new groundwater abstraction in 2014 and a share of the new Oxfordshire reservoir to supply demand in the Swindon, North and South Oxfordshire resource zone. Thames Water's plan includes nearly 200 Ml/d of resource development before 2010 and a further 430 Ml/d before 2030.

Thames Water's plan includes a desalination plant in the Thames estuary by 2007. It expects this to deliver 140 Ml/d. We believe that Thames Water should progress this scheme quickly to help resolve the current deficits in the London resource zone.

The company identifies leakage reduction as the most important element in its supply-demand strategy. It expects to deliver 225 Ml/d of leakage savings by 2010 and a further 100 Ml/d before 2030. Nearly 90 per cent of this saving will be delivered in the London resource zone.

The company forecasts that just under 60 per cent of household customers will have a metered supply by 2030. Thames Water proposes higher metering in some zones but forecasts less uptake in London because of the high number of flats in this resource zone.

Several of Thames Water's existing supplies are being affected by bromate pollution. The company plans to develop treatment to allow it to continue using these sources. The Agency supports this approach.

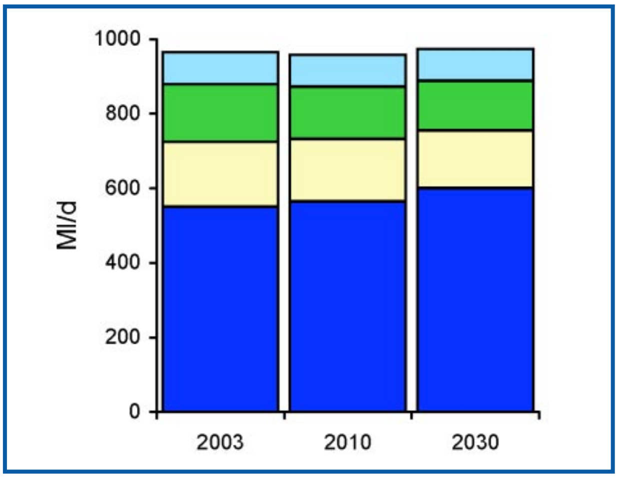
Further work

The Agency expects Thames Water to:

- as requested by Defra, report to the Agency each quarter on the supply demand situation in London. This will cover leakage reduction, progress on development of new schemes and metering. Quarterly reporting will begin in autumn 2004 and will continue until the Agency is satisfied that the deficit in the London resource zone is resolved;
- provide further information on assessment of deployable output and outage as part of the 2005 annual review;
- increase its level of water efficiency activity, including metering, and report progress in the 2005 annual review;
- produce a plan that shows how it intends to supply the forecast growth in the Tidworth resource zone and include this as part of the 2005 annual review;
- include evidence in the 2006 annual review to show that the chosen leakage strategy is the best option for achieving the reductions in leakage that it has included in the plan;
- include the justification of need for the proposed Oxfordshire reservoir in the 2007 annual review.

Three Valleys Water

Three Valleys Water supplies approximately three million people in an arc around North London from Woking to the M11 corridor. The company relies on groundwater for 60 per cent of its supply. The remainder comes from the River Thames abstractions and a transfer from Grafham reservoir.



Components of the supply-demand balance

Supply	Three Valleys Water has reassessed deployable output to take account of improved treatment, pollutants and modelling changes and calculated that it has about five per cent less water available than reported in the 1999 water resources plan. The company's approach to calculating available supply is in line with the guidance.
Demand	The company has forecast household demand using a micro-component approach. Population and property forecasts are based on 2001 census data. It has also made an allowance for the ODPM's sustainable communities proposals. The company forecasts that demand will remain relatively stable to 2030. It forecasts that non-household demand will decline and household demand will increase. The increase in household demand is mainly due to growth in population and housing.
Leakage	The company is currently below its calculated economic level of leakage. It plans to reduce leakage in all resource zones by a total of 20 Ml/d by 2030.
Baseline supply-demand balance	The company currently has deficits in the Northern and Southern resource zones. It forecasts that it will have a deficit in the Central resource zone by 2007. At peak periods, it currently has a deficit in all three resource zones.
Options	The company has limited opportunities to develop additional resources within its supply area. Three Valleys Water's plan includes: leakage reduction; water efficiency; metering and resource enhancements to resolve the deficits by 2006. The company plans a small aquifer storage and recovery scheme for 2018 and forecasts that from 2021 it will use about 10 Ml/d from Thames Water's proposed Oxfordshire reservoir. This will be solely to meet peak demand.

The company has a substantial water efficiency programme and has proposed several water efficiency research projects. It forecasts that just over 80 per cent of household customers will be metered by 2030 as a result of the company's change of ownership metering policy.

Several of Three Valleys Water's existing supplies are being affected by bromate pollution. The company plans to change the operation of these abstractions and use blending to allow it to continue using its effected supplies. The Agency supports this approach.

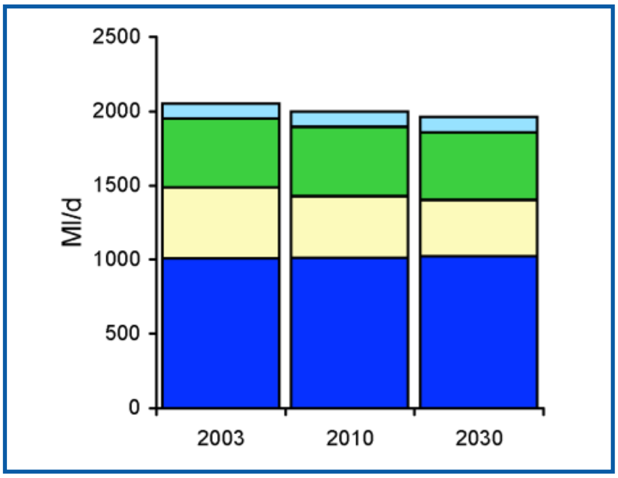
Further work

The Agency expects Three Valleys Water to:

- continue active leakage control and mains replacement and report progress in each annual review;
- continue to investigate micro-components and report progress in each annual review;
- recalculate target headroom to include the uncertainty surrounding the yield of options and present the outcome of this in the 2005 annual review;
- implement a new domestic consumption monitor to help increase understanding of per capita consumption data in time to inform the 2006 annual review;
- include the justification of need for water from the proposed Oxfordshire reservoir in the 2007 annual review;
- continue discussions with neighbouring companies about shared supplies and potential bulk transfers. The company should report progress on this in the 2007 annual review.

United Utilities

United Utilities supplies water to 6.8 million people across the north west of England. The company's area is divided into four resource zones. The largest is the Integrated zone which supplies 95 per cent of the company's customers.



Components of the supply-demand balance

Supply	United Utilities has reassessed deployable output to take account of changes to its resource zone boundaries, its supply system and its modelling approach. The company has calculated that it has approximately five per cent less water available than it reported in its 1999 water resources plan. The changes that the company has made are in line with the guidance.
Demand	The company has forecast demand using a micro-component approach. Population and property figures are based on the 2001 census. The company forecasts that overall demand will decline to 2030. Household demand increases due to population and property growth and non-household demand and leakage both decline.
Leakage	United Utilities reported an increase in leakage in 2003. The company says that this was due to weather conditions. The company's leakage is below its calculated economic level but significantly above its Ofwat target. United Utilities now plans a leakage reduction of 15 Ml/d by 2010 and a further 10 Ml/d to 2030.
Baseline supply-demand balance	The company forecasts that it will have a deficit in the Integrated resource zone by 2014. It forecasts that it has enough water to supply demand in the remaining resource zones until beyond 2030.
Options	To meet the forecast deficit the company proposes a combination of leakage reduction, infrastructure improvements and groundwater development.

The company forecasts that just over 60 per cent of household customers will have a metered supply by 2030. It forecasts that this will save approximately 45 Ml/d.

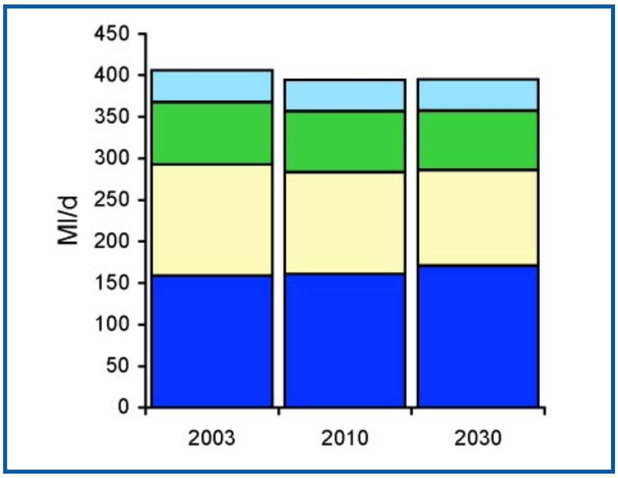
Further work

The Agency expect United Utilities to:

- make progress on the demand management studies proposed within the plan and report progress in each annual review;
- carry out its water consumption study to evaluate the effect of metering on demand and report progress in each annual review;
- carry out investigations to increase its understanding of the impacts of climate change and report progress in each annual review.

Wessex Water

Wessex Water supplies approximately 1.2 million people in Somerset, Wiltshire and Dorset. It covers a predominantly rural area, but also supplies Bath, Salisbury, Bridgewater and Yeovil. Approximately 80 per cent of the company's supply is from groundwater and the remainder is from rivers and reservoirs.



Components of the supply-demand balance

Supply	The company has reassessed deployable output and calculated that it has about five per cent more water available than reported in the 1999 water resources plan. The changes that the company has made are more in line with the guidance than in its draft plan but further work is still required.
Demand	The company has forecast household demand using a micro-component approach. Population and property numbers are based on the 2001 census. The company forecasts a small decline in overall demand. This is due to a reduction in leakage and declining non-household demand. A small increase in household demand is forecast due to population and household growth. Peak demand is forecast to increase to 2030 mainly due to growth in peak per capita consumption.
Leakage	Wessex Water plans to reach its calculated economic level of leakage in 2004. The company forecasts a further reduction in leakage to 2030.
Baseline supply-demand balance	The company currently has a deficit during peak periods in the North resource zone. It also forecasts a deficit in peak periods in the South and West zones by the end of the planning period.
Options	The company's main solution to meet deficits is to make better use of its existing supplies through developing its infrastructure. Wessex Water also proposes: changes to abstractions from an existing groundwater resource in 2007; an increased abstraction from Sutton Bingham reservoir in 2015; and a new surface water abstraction from the Bristol Avon in 2024. It expects these schemes to deliver an additional 21 Ml/d during peak periods.

In the draft plan, the company reported three resource zones. We asked it to review these to ensure they matched the definition of a resource zone. The company's final plan is based on four resource zones. It believes that these represent a pragmatic application of the guideline. We are concerned that these zones do not clearly reflect some of the infrastructure constraints that prevent the company from moving water around the system and could therefore hide local deficits.

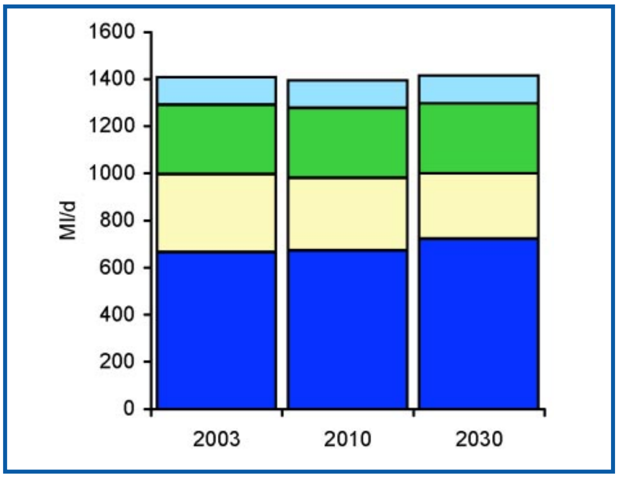
Further work

The Agency expects Wessex Water to:

- keep its resource zones under review to ensure that they meet the definition set out in the guideline;
- continue the review of deployable output and provide further justification in the 2006 annual review of assumptions it has made;
- work with Wessex Water to determine the benefits of joint development of options such as pumped storage of Chew Valley reservoir and present its findings in the 2007 annual review.

Yorkshire Water

Yorkshire Water supplies approximately 4.6 million people. Most of its customers are served by its integrated grid system which draws water from a combination of reservoir, river and groundwater sources. The company also relies on local groundwater and surface water resources in the surrounding rural areas which are beyond the reach of the integrated grid.



Components of the supply-demand balance

Supply	Yorkshire Water has reassessed deployable output to take account of changes to abstraction licences, levels of service and modelling changes. The company has calculated that it has approximately the same amount of water available as it reported in the 1999 water resources plan. The company's approach to calculating available supply is in line with the guidance.
Demand	The company has used a trend analysis to forecast per capita consumption. Population and property numbers are based on the 2001 census. The company forecasts a slight increase in overall demand by 2030. Non-household demand declines and household demand increases due to population and property growth.
Leakage	The company plans to retain leakage at its current level in most resource zones. Some small reductions are planned in the Dales and the East groundwater resource zones.
Baseline supply-demand balance	The company forecasts that it will have a deficit in the Dales groundwater resource zone from 2015. It forecasts that it has enough water to supply demand in the remaining four resource zones until beyond 2030.
Options	The company plans to meet the forecast deficit through a combination of leakage reduction, demand management and development of an existing groundwater resource.

The company has estimated the impact of climate change on the supply-demand balance. It has not included these impacts in the final plan as it believes it needs to investigate these further. However, Yorkshire Water has identified options that would be required if these changes happened.

Further work

The Agency expects Yorkshire Water to:

- appraise its domestic consumption monitor and report the findings in the 2006 annual review;
- improve its understanding of per capita consumption in the Dales resource zone and report its findings in the 2006 annual review;
- investigate further the potential impact of climate change in time for the 2009 periodic review;
- develop micro-component forecasts for household demand in time for the 2009 periodic review.

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