



# Section 5 :Target Headroom

In this section we explain how we make allowance for the uncertainties in forecasting supply and demand

## Introduction

5.1 As described in Sections 3 and 4 there are uncertainties in forecasting the supply and demand for water in the future, especially when making predictions 25 years ahead. To take into account this uncertainty in forecasting both supply and demand, a planning allowance, or 'target headroom', is added to the demand forecast. Uncertainties occurring in our baseline supply demand data are used to generate 'baseline' target headroom values. We provide a brief explanation of how we have assessed baseline target headroom in this section, and the technical data is included in Appendix 5.

5.2 Target headroom is defined as *"the threshold of minimum acceptable headroom, which would trigger the need for water management options to increase water available for use or decrease demand"*.

5.3 Target headroom provides a legitimate planning buffer for the uncertainty and risk included within the main building blocks of WRMP14. Our assessment of target headroom takes account of unforeseen events and uncertainty relating to items such as:

- Climate change on supply and demand;
- Bulk supplies;
- Population changes;
- Water efficiency;
- Different demand forecasting factors;
- Source loss due to unforeseen events;
- Data accuracy; and
- Output from new sources or demand management activities.

5.4 Principally, higher target headroom can lead to larger supply demand balance deficit and so more investment is required during the planning period. Equally lower target headroom can lead to



less investment, but also increases risk, particularly if our assumptions in our supply or demand forecasts turn out to be wrong. The components that we have considered in our baseline target headroom include:

- S4: Bulk Imports
- S5: Gradual pollution
- S6: Accuracy of supply side data
- S8: Climate change impact on supply uncertainty
- D1: Accuracy of sub-component data
- D2: Demand forecast uncertainty
- D3: Climate change impact on demand uncertainty

The impact on the headroom of uncertainty of new sources and demand management options has been tested as reported in Appendix 9A.

5.5 We have reviewed and updated the target headroom models created for WRMP09, which had already been fully tested and audited. In some cases the profile and values of target headroom components for WRMP14 differ to those in WRMP09 and these have been changed.

5.6 In earlier years of the planning period, we consider a lower target headroom value could be adopted due to our better understanding of how sources operate (given the recent drought, improved work on outage and process losses as discussed in Section 3). This would offer greater levels of short term resilience and reduce

uncertainty risk, coupled with greater certainty around the early year demand assumptions in the plan.

5.7 In later years of the planning period, we expect baseline target headroom to increase mainly due to the greater levels of risk associated with adopting a more ambitious demand forecast, and greater variability of weather conditions due to climate change. We believe this approach reflects the views of our customers on the need to be ambitious in our planning forecast, but also to take proper account of future uncertainties. Our stakeholders expect us not to take undue risks in the supply demand balance and consequently it is important that this is properly included in the target headroom. We consider that this assessment has done this.

5.8 The technical output from the baseline target headroom model is a set of curves which show the volume (in Ml/d) of target headroom every 5 years across the planning period, against a level of risk, which we refer to as the 'percentile'.

5.9 In effect, if we adopt the 100 percentile level of target headroom, we would plan to take absolutely no risk, and implement investment to cover every possible outcome – this would not be a reasonable approach to take. Conversely a very low percentile level of target headroom would not take reasonable account of, or buffer, the

uncertainty and risk that exists in our supply demand forecast. The percentile levels adopted by water companies are variable and typically sit in the range 50 percentile to 85 percentile depending on a number of factors, but they always represent the overall level of risk which a company is willing to accept within the plan.

5.10 In WRMP09 we adopted risk percentiles which started at 85 percentile from 2015 and reduced to 75 percentile by the end of the period. We believe that this high level of headroom is not required in WRMP14 given the improvements in the headroom component data discussed above. We have decided to adopt a 65 percentile uncertainty level in this WRMP14 which we believe provides:

- Reasonable consistency with historic levels of target headroom;
- A figure which is proportionate with the demands and resources of the Company;
- A level of risk that is within the range of other companies estimates; and
- A reasonable sharing of risk with customers and other stakeholders.

5.11 We have updated the WRMP with new information on bulk supplies and population forecasts and have included the impacts of our preferred plan on headroom as a sensitivity test in Appendix 9. We have explored a range of

sensitivities on the various percentiles, which could be applied to ensure that the adopted target headroom reflects an acceptable level of risk, and these are reported further in Appendix 5.

5.12 In comparing the previous WRMP09 with the WRMP14 figures, the previous 2015 figure should be compared with the equivalent 2020 figure, which is a similar time period ahead of the base year of the forecast. Taking this into account, it can be observed that the updated WRMP14 target headroom is below the equivalent WRMP09 figure up to 2030, and then is higher beyond this date as shown in Table 5.1. This reflects:

- (a) The improvement in the supply components which has been discussed above, and;
- (b) The increased uncertainty which we have taken account of in the longer term.

5.13 Consequently we consider that the 65 percentile adopted is the most appropriate level of uncertainty, taking full account of the views of customers and stakeholders, and maintaining consistency of supply with previous assessments and current operational experience.

**Table 5.1 Company level target headroom from WRMP09 compared with WRMP14**

	Dry Year Annual Average (MI/d)					
	2015	2020	2025	2030	2035	2040
WRMP09 Demand	564.9	573.8	592.9	614.2	636.3	
WRMP14 Demand	574.4	572.2	573.6	582.0	592.2	604.1
WRMP09 Target Headroom	32.7	42.8	50.1	50.2	55.8	
WRMP14 Target Headroom	13.7	26.8	34.1	42.1	50.1	58.9
WRMP09 Total Demand	597.6	616.6	643.0	664.4	692.1	
WRMP14 Total Demand	588.1	599.0	607.7	624.1	642.4	663.0
WRMP09 Target Headroom % of Demand	5.8%	7.5%	8.5%	8.2%	8.8%	
WRMP14 Target Headroom % of Demand	2.3%	4.5%	5.6%	6.8%	7.8%	8.9%
	Summer Peak (MI/d)					
	2015	2020	2025	2030	2035	2040
WRMP09 Demand	693.7	710.3	742.7	778.9	817.0	
WRMP14 Demand	697.5	701.4	712.1	730.7	752.0	775.8
WRMP09 Target Headroom	38.4	53.0	63.0	62.0	67.2	
WRMP14 Target Headroom	15.9	33.4	43.6	54.7	66.0	75.7
WRMP09 Total Demand	732.1	736.3	805.7	840.9	884.2	
WRMP14 Total Demand	713.4	734.7	755.7	785.4	817.9	851.4
WRMP09 Target Headroom % of Demand	5.5%	7.5%	8.5%	8.0%	8.2%	
WRMP14 Target Headroom % of Demand	2.2%	4.5%	5.8%	7.0%	8.1%	8.9%

Notes:

This uses Baseline Demand before final pref options

