Australian Government
Australian Bureau of Agricultural and Resource Economics and Sciences

Australia's urban water sector

ABARES submission to the Productivity Commission

July 2011

www.abares.gov.au
Science and economics for decision-makers

ABARES, 2011, *Australia's urban water sector*, ABARES submission to Productivity Commission, Canberra, July.

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ABARES project 43028

Contents

1 Introduction 1
2 Comments on the overview 2
3 Flexible pricing 3
4 Supply augmentation 5
5 Urban water in rural areas 6
References 7

1 Introduction

This submission provides comment on the discussion and recommendations in the draft report relating to demand management policy and supply augmentation investment policy (particularly chapters 6 and 7), as well as urban water in rural areas (chapter 13).

Overall, the findings of the report are relatively consistent with previous ABARES research in this area. Specifically, the report recommends the removal of water restrictions and advocates the use of 'flexible' / scarcity pricing to achieve demand management objectives. The report also recommends a 'real options' approach to supply augmentation that is similar in principle with the approach to investment modelled by ABARES (Hughes et al. 2008).

The main ABARES comments relate to the report's limited discussion of the practical issues surrounding the implementation of a scarcity pricing approach. While the general economic advantages of flexible pricing are clear, there remain a number of issues with regard to implementation. It would be useful to see more detail, including more detailed input from industry bodies on implementation issues.

Further, there appear to be some potential issues with the proposed system of offering multiple tariff options (for example, fixed or variable pricing) as outlined on page 191 of the report (here water price and water tariff refer exclusively to the volumetric (per kL) component of water use charges levied by urban utilities). In particular, such an approach may introduce inefficiencies in the allocation of water relative to a system involving a single price.

2 Comments on the overview

Page XXXIII of the overview section contains the following paragraph, which seems to contradict the subsequent discussion in the body of the report:

> Although scarcity-based pricing at the retail level has the potential to reduce the cost of supply in the long run, the directly attributable benefits from mandating this approach to pricing water for all consumers are likely to be small relative to other policy changes. The main reason is that on average, consumer demand is not particularly responsive to changes in price in the short-term. (p. XXXIII)

This comment gives credence to the misleading argument that scarcity pricing is constrained by the responsiveness of demand, and contradicts comments made in the body of the draft report. While there exists a range of practical constraints to the adoption of scarcity pricing, the inelasticity of demand is not necessarily one of them. This argument is made clearly in chapter 7 of the report:

> It is difficult to draw conclusions about the price elasticity of demand for water, not only because estimates vary widely, but also because the price mechanism in Australia has been suppressed due to widespread use of restrictions (p. 185)

> In addition, to the extent that the demand for water is inelastic and results in a relatively small change in demand for a given change in price, this does not mean that some other method of managing demand necessarily needs to be utilised during times of drought. Prices contain valuable information about the willingness of consumers to pay for water, so an inelastic demand indicates that consumers are willing to pay high prices to consume additional amounts of water. This suggests that the welfare of society would be larger if supply were augmented to satisfy demand […], rather than restrict demand. Indeed, the more inelastic demand is, the greater the costs to the community of restricting demand. (p. 187)

As noted in the draft report, it is difficult to assess price responsiveness given the limited application of price-based rationing in Australia to date. Further, even where demand is inelastic, this does not imply that other methods of rationing are preferred. In addition, the long-run benefits of improved demand management need to be considered simultaneously with those from improved supply augmentation (this is also something that is emphasised in the body of the report). For example, where pricing provides greater flexibility to water utilities, this may help to constrain demand during shortages and hence help to delay investment in new supply capacity.

Perhaps a more accurate statement would be that while the removal of restrictions (and replacement with scarcity pricing) is advocated, this policy change is unlikely to deliver significant benefits in the short to medium term because of the low likelihood of water shortages in major urban centres given recent large additions to supply capacity (including desalination).

3 Flexible pricing

The draft report provides limited detail on the specifics of how flexible / scarcity pricing of urban water may be implemented. This includes, for example, how water utilities may approach the setting of prices, the management of revenue effects, determining the appropriate price change frequency (length of billing cycle), and whether current metering systems are sufficient to support variable pricing.

It would be useful to see more input from industry on some of these implementation issues. For example, ACTEW (quoted in Hughes et al. 2008) raised the issue of water metering, suggesting that improvements in current metering systems or meter reading practices would be required to support a change to scarcity pricing.

On page 191 of the draft report, a multiple tariff option approach to scarcity pricing is proposed. It is recommended that consumers should be afforded more choice, with a range of pricing contracts of varying terms to be offered by water utilities. Three alternative tariff options are considered: a fixed price tariff; a flexible (scarcity) price tariff; and, 'security of supply' tariffs. However, limited detail is provided on these options and how they would be implemented in practice. A brief consideration suggests that such a multiple-tariff approach may be subject to a range of issues.

Firstly, the approach may lead to lower allocative efficiency relative to a single scarcity price regime. At each point in time there exists a single (dynamically efficient) market price. Water will be efficiently allocated across users in that time period (marginal values equalised) where each user is subject to that same price. Introducing multiple prices violates this principle, introducing the kind of efficiency costs associated with multiple inclining block tariffs. Where different users are subject to different prices, marginal willingness to pay will not align across users, leading to some loss of efficiency.

For example, during a drought period the optimal scarcity price may rise dramatically. However, users on fixed price contracts would be immune and face no incentive to reduce consumption. Further, where fewer users are subject to flexible pricing, the price required to ration demand is likely to increase, leading to situations with very large differences in water prices across users.

Where there are large differences in prices between households, the possibility of some form of arbitrage emerges. For example, during a drought a household on a scarcity price contract might (subject to some negotiated compensation) use their neighbours' hose (if they are on a fixed price contract) to water their garden. Given transaction costs, such arbitrage opportunities are likely to be limited. However, wherever arbitrage did occur it would undermine the effectiveness of a multiple (fixed and variable) tariff system as a demand management tool.

A similar issue arises with the different 'security of supply' options, since it introduces the possibility of differences in prices across users at a given point in time. For example, in situations of water supply abundance, users who have exceeded their 'security of supply' threshold may face very high water prices relative to the prevailing optimal price. By analogy, systems of 'security of supply' exist in irrigation water rights; however, these are implemented in the presence of relatively efficient water markets.

The fixed and variable tariff proposals also raise some serious implementation issues. While the fixed price would remain fixed for the duration of each users contract, the fixed price applying to new contracts would need to be continuously updated (as with a 'fixed' interest rate on a mortgage). Clearly, if this were not the case, a fixed price contract would likely become unsustainably

oversubscribed by new users during drought periods (and similarly undersubscribed during wet periods). This is because changes in water availability do not quickly average out (even over 3–5-year periods). The need to continuously (potentially daily) update the fixed price may become burdensome for water utilities / price regulators.

4 Supply augmentation

The draft report advocates a 'real options' approach to supply augmentation investment. This approach is consistent with the results of previous ABARES modelling work. Previous ABARES research demonstrated the advantages of an opportunistic approach, particularly with regard to rain independent options (for example, desalination) where it is preferable to delay investment through periods of scarcity, given the possibility of potentially rapid improvements in storage levels (Hughes et al. 2008).

While a real options approach to supply augmentation investment is a valid ideal, it may be very difficult to enforce. That is, it may be difficult to establish whether water utilities are following such a strategy.

Supply augmentation decisions require assumptions on the future probability distribution of inflows. While utilities can utilise historical data, the reality is that significant uncertainties surround these distributions, particularly given the potential for climate change effects. As such, many investment decisions could be justified with alternative assumptions on expected inflow probabilities.

As noted in the draft report, there is certainly evidence that an approach like real options has been implemented (at least to some extent) in a number of urban centres (including Sydney and Canberra). It is argued in the draft report that in the case of Sydney this approach was abandoned in 2007 because of political interference. As noted in the draft report (p. 122), this is a 'plausible interpretation'; however, it is also difficult to prove.

Perhaps an easier position to maintain is the requirement that utilities consider all possible alternative options (as mentioned in the draft report). In practice, there are usually a range of short-term options that can help to delay the need for large investments, as was observed during the recent droughts. For example, Sydney pumping water out of 'dead storage', and the ACT pumping water from the Murrumbidgee and purchasing water rights. As outlined in the draft report, there should be no arbitrary policy bans on alternative options (such as urban–rural trade).

5 Urban water in rural areas

Chapter 13 of the report considers reform of urban water in regional areas. While there is a recommendation to remove barriers to urban–rural water trade, this chapter could elaborate more on the interaction between agricultural water use and urban water use that often occurs in regional areas. Clearly, the greatest scope for urban–rural water trade exists within rural areas.

Another issue is the specification of discretionary or rules-based 'critical human needs' requirements in regional water sharing plans. Such requirements specify changes to water sharing arrangements—such as the direct allocation of available water to town users and away from irrigation—under defined severe drought conditions (for example, this may involve specific storage-level triggers).

However, administrative reallocation may reduce the effectiveness of market mechanisms. Where such rules-based approaches apply, this may create a moral hazard problem, where town utilities do not face sufficient incentives to improve water use efficiency. In most cases, rural town water utilities should be able to meet their needs through traditional water property rights frameworks, including through market trading with irrigators and through the use of carryover rights. Another possibility is the establishment of options contracts between urban utilities and other water users, such as irrigators. Options contracts for rural–urban water trade have previously been considered by ABARE (Page and Hafi 2007, cited in Hughes et al. 2008).

References

Hughes, N, Hafi, A, Goesch, T and Brownlow, N 2008, *Urban water management: optimal price and investment policy under climate variability*, ABARE research report.