6 June 2011

Urban Water Inquiry
Productivity Commission,
GPO Box 1428
Canberra City ACT 2601

Dear Sir/Madam,

In this submission we raise a few points with regard to:

- pricing reform, and
- security of supply.

Pricing reform

In general we support the Draft Report's findings on pricing. However, we would like to reaffirm the importance of pricing reform in the urban water sector and elaborate on a few key points.

Efficient pricing of any commodity is of critical importance. Efficient prices serve two important roles. Firstly, prices provide incentives — for consumers to manage demand and for suppliers to augment supplies. Secondly, prices are an efficient means of transmitting information to enable better decision making. Through these two functions, prices play a central role in managing supply and demand.

Unfortunately pricing in the urban water sector it is not efficient. On most measures water is the most abundant (e.g. in terms of volume or weight) and cheapest (e.g. in terms of price per volume / weight) good that people purchase. As with fuel, water supply can change over time. Like food its availability can be affected by drought. Yet despite its abundance and low cost, unlike other resources we consume, Governments use rationing to manage the balance between supply and demand.

A commonly recognised starting point for efficient pricing is the setting of price to marginal cost. As noted by Alfred Kahn:

> *The central policy prescription of microeconomics is the equation of price and marginal cost. If economic theory is to have any relevance to public utility pricing, that is the point at which the inquiry must begin.*
>
> Kahn AE. *The economics of regulation: Principles and Institutions*, Volume I, page 65.

Currently regulated pricing in urban water is not at marginal cost. There are two significant deviations: the use of increasing block tariffs and rigid pricing.[1]

[1] Often volumetric prices are set to an approximation of long marginal cost.

The use of increasing block tariffs (IBT)

The Draft Report (pages 177 -180) notes that Increasing block tariff (IBT) structures leads to inefficient outcomes and are inequitable because they relatively disadvantage large family households. However, it should also be noted that IBTs are less equitable to small users.

The IBT structure provides water at discounted rates for consumption up to a tier level ('discounted tier level'). The value of this discount is greatest to those who consume at least the amount of the discounted tier level — that is, the value of the discount is smallest for small users.

The requirement to recover costs means that value of the discounts needs to be recovered through greater top-tier rates and/or fixed charges. In practice it is not practical to recover the value of the discounts from the top tier rates alone without a significant distortion to water use. This is because the low tier discount applies to *all* consumption up to the discounted tier level and a top tier surcharge only applies to the portion of consumption above the top tier levels. To preserve cost-recovery, fixed charges need to be higher than they would be in under a simple two-part tariff.

The implication is that under IBT rate structures, relative to a simple two-part tariff, small users will be financially worse off because they get a small volume discount but pay higher fixed charges. Under an IBT, users whose consumption is around the discounted tier level fair the best. Large users may be financially better or worse off depending on the tier structure. Thus the IBT structure has the effect of a financial transfer from small users to medium and possibly large users. As supported by the Productivity Commission's own analysis (Draft Report, chapter 9) those on lower incomes tend to be small water users.

This disadvantage to small users is in addition to the inefficiency costs created by the IBT structure. A further disadvantage of IBTs is that they can reduce the effectiveness of the price signal. The multiple tier levels make it more difficult for consumers to determine what the financial benefit of conserving water is.

One rationale for IBTs is that they provide protection to small users from temporary rate rises. In Australia, regulated water prices have been rigid (i.e. not responding to changing conditions in the short term) and thus this argument is not applicable. If, as discussed below, flexible pricing is introduced, then a more efficient and equitable method of protecting consumers is to offset high volumetric charges with a lower fixed charge. This is in effect similar to giving households a lump-sum entitlement of water — that is, a financial equivalent to a number of litres per day received regardless of use. This approach has the effect of using additional revenue collected from higher water tariffs during a drought to reduced fixed charges – thereby increasing the benefit to low-water users.[2]

Rigid versus flexible pricing

As is discussed in the Draft Report, regulated water prices are rigid in that they are established for a regulatory period and do not respond to changing conditions during that period. The Draft Report discusses the efficiency benefits of moving to a flexible pricing approach — often called 'scarcity

[2] It is similar to an IBT structure but does not distort consumption and is more equitable in providing more of a benefit to smaller users. An IBT structure whereby the discounted tier level is so low so as to not distort consumption is almost identical in effect to a 'lump sum' water entitlement scheme. One difference may occur when a residence is unoccupied.

pricing', but might be more simply described as 'efficient pricing'. As noted in the draft report, flexible pricing is more efficient as it would:

- encourage water to be used for its most valuable purpose, and could eliminate the need for restrictions, and
- promote more efficient use over time, thereby potentially avoiding or postponing expensive supply augmentations.

However, it is also important to acknowledge the other potential benefits of flexible and efficient pricing. In particular, an efficient pricing approach could be simply implemented so as to:

- improve the stability of financial returns to water utilities, and
- improve the financial outcomes for households and in particular vulnerable households.

These additional outcomes can be achieved by changing the mix of how revenue is raised in response to changes in supply and demand. An approach consistent with principles of efficient pricing and cost recovery is to decrease fixed charges as volumetric charges are increased. Such an approach is both financially beneficial to households and water utilities.

The household sector could benefit from these arrangements during a drought. Under current arrangements, during a drought water is sold to the non-residential sector at below its true value. Under the alternative arrangements, during a drought businesses would pay a higher volumetric rate and greater revenue would be recovered,[3] which under principles of cost-recovery could mean less revenue to be collected from the household sector.[4] The arrangements for households could also be made to be more equitable. A reduction in fixed charges could result in small users paying reduced bills during a drought.

Furthermore, under such an approach, water utilities achieve a much greater level of financial stability. Under current arrangements water utilities face substantial financial risk related to water use despite costs being largely unrelated to water use.

This approach of changing the mix of charges in response to changes in supply has been successfully adopted internationally. A well documented[5] example of this approach comes from the city of Santa Barbara in California. In response to a severe drought that occurred between 1987 and 1992 the city increased volumetric prices as the drought worsened. While volumetric charges were increased, fixed charges were reduced. The financial return to the water utility during the drought was kept reasonably stable.[6] Most importantly, Santa Barbara was able to reduce water use significantly and quickly[7] — water demand was reduced by about 50 per cent with the most significant fall happening within a year.

[3] Greater revenue is recovered because demand is inelastic.
[4] The financial outcomes depend on how fixed charges are reduced.
[5] See Loaiciga HA and Renehan S, 1997, 'Municipal water use and water rates driven by severe drought: A case study.' Journal of the American Water Resources Association 33(6): 1313–26.
[6] Average bills increased but only because of increased cost of providing services.
[7] The reduction was attributable a range of measures including price changes, water conservation measures and public education.

The Santa Barbara example provides an illustration of the potential attractiveness of flexible pricing to both consumers and industry. By adjusting both volumetric and fixed charges, small water users were financially better off and the water utility revenue was more stable.[8]

An illustration of an alternative pricing approach

To illustrate the implications of a flexible pricing it is worthwhile considering how households, businesses and water utilities may have fared during the drought with flexible pricing.

Table 1 below shows a simple example based on water use in Melbourne in the period 2005-06. The top section of the table shows the actual consumption and water bills for average household and business connections. The table presents results for the average households in the bottom and top income quintiles as well as averages for household and non-residential sectors.

The bottom section examines the effect of using a change in the mix of fixed and variable rates to achieve a further 10 per cent price reduction in demand. In the example it is assumed that a constant price elasticity of demand[9] of -0.2 applies equally to all customers (both household and non-residential).[10] Most significantly, it is assumed that the excess revenue collected from volumetric charges is returned to consumers, in this case, in proportion to existing fixed charges.

The bottom row of the table summarises the financial impact on total bill of achieving a further 10 per cent demand reduction by changing the mix of fixed and volumetric charges. The average total bill per connection does not change and thus there is no change to water utility revenue. Small users fair much better and on average the household sector is financially better off.

Table 1: Example of flexible pricing on water use and water bills

	Residential			Non-residential use	Average per connection
	Bottom income quintile	Top income quintile	Average of all		
Actual for Melbourne 2005-06 (weighted average)					
Average consumption per connection (kL per year)	174	255	202	1,126	271
Water usage charge (at average)	$138	$212	$164	$950	$222
Fixed charge	$60	$60	$60	$90	$62
Total water bill	$198	$272	$223	$1,040	$284
Scenario: prices changed to reduce demand by 10%					
New demand	157	229	182	1014	244
New water use charge	$224	$327	$259	$1,447	$348
Fixed water charge (rebate)	-$61	-$61	-$61	-$92	-$64
Total bill	$162	$266	$198	$1,355	$284
Impact of pricing change on average total bill to achieve 10% reduction	-$35	-$6	-$25	$315	$0

Source: Water consumption for households is taken from the Draft Report. All charges, number of connections and non-residential consumption is derived from the final determination of the Urban water price review 2005-08 (available at http://www.esc.vic.gov.au/public/Water/)

[8] Of note, the city applied an IBT tariff structure.

[9] That is, a 10 per cent price demand reduction is achieved by roughly a 50 per cent price increase.

[10] The core findings are not sensitive to assumptions as to the price elasticity.

This simple example demonstrates a number of key results in using efficient (scarcity) pricing coupled with changes to fixed charges:

- demand is reduced without the need of restrictions or other measures
- households are protected from price shocks, and
- water utility revenue is unaffected by the reduction in demand.

Furthermore, in the example given, households are financial beneficiaries in the case of a drought due to the higher financial burden borne by business. This later result depends on how the additional revenue from volumetric price increases is distributed. The most appropriate policy would depend on how risks might be shared between customers.

It is noteworthy that, in the example given, rather than pay a fixed charge, customers receive a financial rebate. In the example the rebate is still less than fixed charge for wastewater and thus a customer with no water usage would still have a positive bill. However, it is possible that the rebate may be so great as to exceed all fixed charges (and thus exceed all charges if no water is used), which may cause some challenges for billing arrangements. That customers may receive a financial benefit reflects that at times the marginal cost of supply exceeds the average cost.

Restrictions

The report notes evidence that there is general community support for water-use restrictions. Care should be taken how this information is interpreted as the survey results depend on how options are presented to survey respondents.

When water is priced below its true value (as was the case during drought) then greater water use by one consumer places a burden on others. As a result, when water is under priced, we would expect people who are not heavily burdened by restrictions to be in favour of them. Even respondents heavily burdened by restrictions may be in favour of them if they perceive the alternative is greater spending on augmenting supply.

Unfortunately there are not surveys (at least published) that test the alternative of restrictions to an efficient pricing approach with cost recovery. To evaluate restrictions against the alternative of efficient pricing the choice put to consumers should be similar to:

> *During a drought to manage demand would you prefer:*
>
> *a) water restrictions to be imposed; or*
>
> *b) no restrictions but the mix of charges to change so that large users pay more and small users pay less?*
>
> *Under both alternatives – the total water use would be the same. Under option b) the average household bill would be lower as more would be paid by the non-residential sector*

Security of supply

Security of supply is a key issue for the urban water industry and an important rationale for Government oversight.

The Draft Report has correctly noted that concerns over supply security are a potential issue for a market based solution for bulk supply (the Draft Report's option 5).[11] There are a variety of reasons why a liberalised market may not adequately provide for supply security. Potential concerns that have been identified include the existence of public costs of shortages and investment risks to industry.[12]

These concerns primarily relate to issues associated with the variability of water prices that might result in a liberalised market and the risk of Government intervention that would deter investment. The extent to which this might be the case depends on each water system. For example, desalination plants can provide minimum levels of water supply which would help dampen price movements. Similarly increasing diversity of supply sources can serve to reduce the risks associated with high price movements.

It would be premature to reject a liberalised market without an evaluation of the extent to which markets may fail to meet security of supply and consideration of alternative means to address these concerns. Furthermore, Government planning and procurement of water sources is only one means of addressing these market failures in supply security. Alternative arrangements might be considered. For example, Governments may contract for a secure level of supply and leave the remainder to be supplied by the market.

Regardless of whether a market-based solution to bulk supply is considered, it is important that greater consideration be given to the issue of security of supply. Currently, there are not clear frameworks for managing the risk associated with security of supply — security of supply criteria are set on the basis of convention, without clear underlying objectives.[13] The lack of a clear framework for setting objectives and managing supply security is likely to contribute to political intervention in urban water industry and sub-optimal outcomes for water consumers.

Yours sincerely,

Dr Hugh Sibly[14] and Dr Richard Tooth[15]

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[11] The Draft Report also expresses concern that with regard to Option 5 that a spot-market may not be efficient because 'Water can be stored'. The durability and cheap storage of water should not be a consideration — there are spot markets for many goods that are stored (e.g. gold and other non-perishable commodities).

[12] For a discussion of these see 'Competition in the Australian urban water sector', by Sapere Research Group (formerly LECG), Waterlines report 42 - April 2011.

[13] See *ibid, (page 33)* .

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