

## SUBMISSION RE URBAN WATER POLICY

Urban water policy is a complete economic disgrace in this country and its nadir has surely been reached when the NSW Government has spent billions on a costly desalination plant which sucks in sewage. The only other place in the world to do that is Windhoek in Namibia.

It's wonderful to see that "water reform" is turning Australia into a genuine Third World country.

This, of course, is not reform at all: it is the spirit of rapacious monopoly and vested interest cleverly exploiting the stupidity of some and the naïve well-meaning goodwill of others.

I wonder what the public would think if they knew I had some years ago an email from a regulator who admitted that dams were a much, much cheaper water source but that if our politicians in their wisdom have decreed that dams (such as the Mitchell or Shoalhaven) are not to be built then the regulators must set the price of water up to the level required to justify investment in things such as desalination. (Good work for merchant bankers and construction contractors if they can get it.)

I attach various documents which shed more light on this particular economist and lawyer's protest.

Yours sincerely

Dr Terence Dwyer

# WHAT SHOULD CLEAN SAFE WATER COST?

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In giving this talk tonight I wish to make it clear that what I am presenting are my own opinions and not those of any institution or employer with whom I may be affiliated. I ask no one here to accept anything I say as fact; on the contrary, I invite you to make your own inquiries and come to your own opinions and conclusions. I would, of course, be grateful for any assistance in refining and extending data, since published sources occasionally differ somewhat or data is aggregated.

I should also mention that I have no financial interest in what happens to ACT water, apart from some small dividends on some AGL shares. I should also warn you that while as an economist I loathe monopoly, as an investor I love it, which may explain why water is now such an attractive asset class for merchant banks, private equity firms and governments seeking to extract more cash from your pockets.

## 1. WHAT DO WE PAY FOR WATER?

First, let us start with what has happened to ACT water prices.

ACT water prices have skyrocketed since 1991.

The pre-paid allowance was 455 kilolitres per household in 1991 and anything over was charged at 47 cents per kilolitre.

ACT households now pay \$1.33 cents per kilolitre from the first drop and pay \$3.12 for every kilolitre over 300 kilolitres. That includes a so-called “water abstraction charge” of 55 cents which is supposed to reflect water scarcity. (If you ask, why then does the price rise from \$1.33 to \$3.12 if scarcity is already being charged for, you are a good economist!)

If you used 455 kilolitres back in 1991, you paid \$400. Now you pay \$1,548.86 - an increase of 287%.

If you have a family or garden and used 950 kilolitres back in 1991, you paid \$632.65. Now you pay \$3,093.26 - an increase of 389%.

So you shouldn't have a family or create a garden, it seems.

By contrast, irrigators, such as rice farmers downstream, pay a lot less. For permanent high security water downstream costs \$2.20 per kl, equivalent to around 12 cents per kl annually. Temporary water downstream costs about 21 cents per kilolitre.

ACT households are paying 16 to 30 times more than what irrigators are paying downstream and nearly 1,000 times more than what a Queensland river licensee would pay. Partly the difference reflects higher security and quality together with sewerage and drainage but by no means most of it.

The increase in ACT water prices has delivered a big increase in ACT Government revenue. What happens to all this money?

No new dam has been built.

In 2005-2006 ACTEW earned a gross profit of \$93 million on revenue of \$168 million.

It paid \$80 million as dividends and income tax to the ACT Government in addition to the water abstraction charge.

Half of ACTEW's revenue goes to ACT Government as taxes or dividends, so you can see household water and electricity bills contain a large measure of hidden taxation.

Not bad for the ACT Government, considering much of the water infrastructure was paid for in the lease payments for land when blocks were laid out and sold as serviced with water.

Only a monopolist can make people pay twice over for what they have already paid for.

## **2. IS WATER SCARCE?**

There is no scarcity of water in the ACT. ACTEW's *Future Water Options* project said the ACT had enough water for a million people.

Where supply exceeds demand, prices should be zero, no matter how useful a thing is.

For example, air costs nothing to breathe though, like drinking water, it is essential to life and literally priceless

*On average* 494 Gigalitres is available annually from ACT catchments.

Even after a very high environmental flow allocation of 272 Gigalitres, Canberra and Queanbeyan only use a gross 65 Gigalitres, less than one-third of the 222 Gigalitres allocated for human use.

35 GL is treated as sewage and returned to the river system at Lower Molonglo sewerage works, leaving an apparent net usage of 30 GL a year.

However, even this net usage is necessarily overstated as it takes no account of water returning to the rivers from houses, parks and gardens outside the sewer system (which is increased by urban run-off). In Canberra's case, urban areas are thought to produce on average about 13 GL more runoff than the previous largely rural environment – a significant impact.

So the net human usage is at most 17 GL out of 494 GL or 3.4% (which still does not account for returns by way of evaporation and precipitation within the river basin).

So the ACT only uses on average less than 4% of its water resources. Even this is an over-statement as much of the water used on gardens would seep back into the rivers and what evaporates may fall elsewhere in the Murray-Darling Basin.

So what's the problem?

The problem is that rainfall is highly variable and past rainfall averages are no guarantee any year will be an average rainfall year.

*Storage* of water when rain does fall is the issue. To quote ACTEW's 2005 *Future Water Options* project "The ACT is therefore water rich relative to its population. It has enough water under ACT control to meet the environmental requirements and to supply more than a million people, *however storage is currently limited.*"

*Storage* is what is scarce and what costs money

### **3. WHAT IS THE COST OF WATER RESTRICTIONS AND SUPPLY FAILURE?**

It is not generally realized that the ACT Government plans a deliberate reduction in water use per person of 25% over the next 20 years. This comes on top of a 20% fall in per capita consumption since 1992.

ACTEW's *Future Water Options* project estimated this further 25% reduction (to little more than half of 1992 per capita consumption) would inflict costs on the community of \$400 million.

Looking at the costs in more detail, it is likely that at least 16,000 trees have been lost due to lack of water. To take a "back of the envelope" computation, if it costs \$1,000 to \$2,000 to chop down a dead tree and dig out its roots for replanting and if a new tree costs \$100-\$200 and takes 30 years to grow, then the replacement cost of a tree at a 7% interest rate compounded over 30 years is \$8,000 to \$16,000.

The cost of dead trees alone to the community could be \$300-\$400 million by now. This cost ignores the cost of trimming damaged and dangerous trees.

The time cost of forced labour and wasted effort being inflicted on people also needs to be valued. If 80,000 ACT householders have to spend an average of 3 hours extra per week holding hoses or lugging buckets through 16 weeks of water restrictions, that cost comes to a labour time levy of 3,840,000 hours annually. Taking an hourly labour value of \$30.54, the total time cost of just one year of such water restrictions is then \$118 million.

Turning to lawns and gardens generally, if we assume it would take an average of \$2,000 to restore lawns and gardens per household, that implies a cost over 100,000 households of \$200 million.

If we took into account the structural damage done to buildings through clay soils reacting to extreme moisture changes around houses and took into account the loss of amenity from damaged and dangerous sports ovals, costs would be higher.

All up, it seems a fair estimate that socio-economic costs which may exceed a billion dollars have already been inflicted by water restrictions and the failure of the ACT Government and ACTEW to supply water to the people of Canberra and Queanbeyan.

The truly horrifying thing is that these costs may become perpetual if chronic water supply failure continues to be tolerated. ACTEW itself put a very low figure of \$71 million on the costs of water restrictions prior to 2005. But even this under-estimate if repeated as a regular cost would represent the equivalent of a one-off loss of \$800-\$900 million.

#### 4. DO WE HAVE ENOUGH STORAGE?

Yes, if we don't empty dams with very large and unnecessary environmental flow releases.

No, if we empty the dams.

The ACT Government *has* emptied dams and has recently supplied some figures as follows.

##### Environmental Flows Since 2000

Year	Required environmental flow releases	Actual Environmental Flow Releases (ML)	Eflows as % of start of year storage	Storage at end of year
2000	40478	40478		100 %
2001	38679	38680	19%	97 %
2002	32394	32394	20%	79 %

2003	14713	14714	13%	54 %
2004	8932	8932	7%	59 %
2005	8069	<b>14477</b>	13%	54 %
2006	8300	<b>15719</b>	11%	67 %
2007	3500 Planned	580 (to end March 2007)	5%	38 %

The total releases have thus been 166 Gigalitres since 2000 (or nearly two and half years worth of Canberra's normal non-restriction usage of 65 Gigalitres).

The figures do not include spills over dam walls, which can be very large. They include the releases from final dams in river sequences (i.e. Bendora and Googong, pre 2005; Cotter and Googong, post 2005, since Cotter was brought back into service after that time).

The 2005 and 2006 figures include a proportion of the Bendora release that spills over Lower Cotter.

Googong has not spilled since 2001. Actual Googong releases with no spills have been:

2002 9,870ML

2003 1,850ML

2004 1,630ML

2005 1,950ML

2006 4,280ML

to end March 2007 300ML.

Temporary water restrictions were introduced in December 2002. Environmental flows were reduced in 2003 in line with this. Temporary restrictions ceased in November 2005 after good spring rains and dam inflows, but were reintroduced again in November 2006.

From when dams were 100% full at end 2000 to May 2004 it appears 109 Gigalitres were let out.

The dams were 67% full in late 2005 when the drought was declared over. In December 2005 *“normal” environmental releases were resumed and continued right through to November 2006, during the worst drought year on record.*

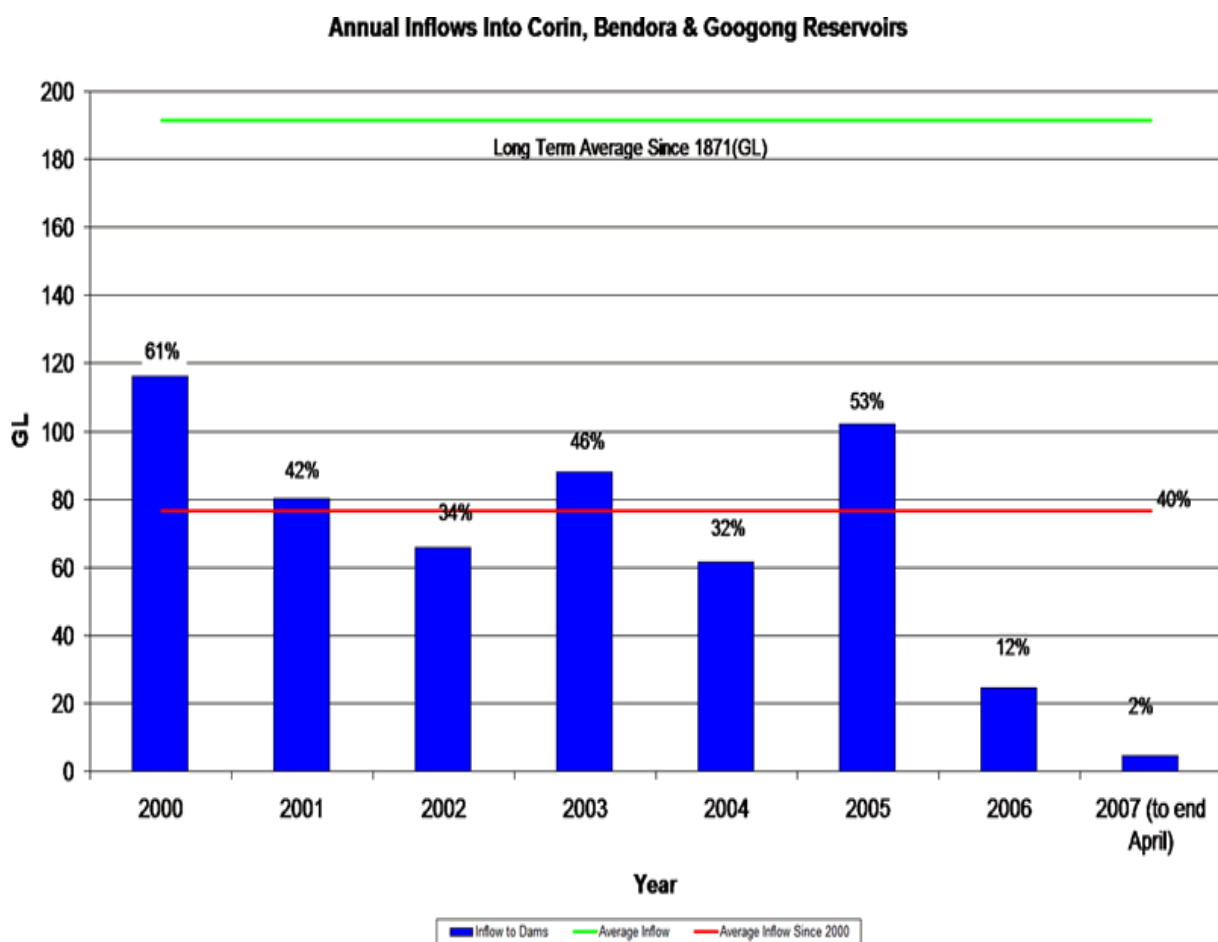
According to ACTEW's 2005-2006 Annual Report, “ACTEW commenced releasing flows in December 2005 in accordance with the ACT Government's new *Environmental Flow*

*Guidelines.* This involved reverting back to normal release requirements, following three years of sustained dry weather that had led to an approved reduction in flows.”

***A remarkable thing is that in both 2005 and 2006 environmental release were even above requirements.***

***Another remarkable thing is that right through most of the drought right up to 2006, enough water was coming into the dams to cover 60 Gigalitres a year usage. Indeed, in November 2005 ACTEW and the ACT Government thought the drought was over.***

Only in 2006 did inflows drop way down to 22 Gigalitres. This is shown in ACTEW’s own graph.



The dams were 67% full in late 2005. 18 months later they are now at 31% full.

The capacity of the dams is about 207 Gigalitres.

Putting it in round figures, that means about 75 Gigalitres has gone from the dams. Who got it over the last 18 months?

Inflows were 22 Gigalitres in 2006. If we used 62 that year, it means we took 40 Gigalitres out of the dams.

Extrapolating over the last 18 months our usage accounts for 60 Gigalitres, not 75 Gigalitres.

So roughly 15 Gigalitres of our water went missing over the last 18 months.

The ACT Government has now admitted over 15 Gigalitres was released for environmental flows.

To put that in perspective, we use roughly 5 Gigalitres a month.

***So the ACT Government and ACTEW have now admitted to letting 3 months' worth of water out of the dams in 2006, the worst drought year on record.***

At the \$3.12 per kilolitre price the regulator, ICRC, and the ACT Government have now put on water, that 15 Gigalitres of water was worth \$47 million. *So it seems that the ACT Government poured \$47 million worth of water down the river in 2006 on its own valuation.*

The 166 Gigalitres let out down the river since 2000 during the drought would be valued at over \$500 million on the ACT Government's current valuation.

And now prices have gone up to compensate ACTEW and the ACT Government for the lost profits because we did not use or pay for the water. One might say that in reality water was not scarce at all, but it has been made scarce by the actions of ACT Government.

While many Canberra and Queanbeyan water users would not wish to injure rice growers and others downstream, there seems little reason why they could not have used more of those 166 Gigalitres first before sending them on their way downstream.

It a strange concept of economics that says that if I throw away my stock customers should pay me more the remaining stock I kept for sale.

There is a strange logic in an ACT Government saying that water is scarce but they should give most of it away for nothing without even letting the people of the ACT use their water first.

***Looking back it seems that not only have the ACT Government and ACTEW inflicted over \$1 billion worth of damage on the people of Canberra; they have thrown away water that they themselves would now value at over \$500 million – or nearly twice the cost of a new dam.***



## 5. WHAT WOULD IT COST TO EXPAND STORAGE?

Tennent Dam would cost \$250 million to store another 159 Gigalitres, expanding our storage from the present 209 Gigalitres by 74%.

Paying by instalments at 10% to meeting interest and loan reduction means a cost of \$25 million a year.

Spread over 100,000 households that means an average rate increase of \$250 per year.

These figures are conservative. With a longer payback period and a larger population figure it's closer to \$150 per year which is what ACTEW itself said was the likely cost.

Operating costs to deliver the water would be 9.2 cents per kl.

That's a long way below the \$3.12 blessed by ICRC, the water price regulator and supposed consumer watchdog.

## 6. WHAT ARE THE COSTS OF RECYCLING SEWAGE?

ACTEW and the ACT Government are proposing to spend \$250 million on a new lower Cotter Dam to store 75 Gigalitres (less than half of a large Tennent Dam) and \$150 million on a sewage recycling filtration plant and a Mt Stromlo treatment plant upgrade.

On the face of it, that is spending 40% more than the cost of the Tennent Dam to get half as much storage.

The sewage recycling is meant to add 9 to 18 Gigalitres back to the flow of the lower Cotter River.

This involves a lot of water treatment and pumping which is very expensive compared to the fairly low operating cost of 9.2 cents per kl of water from a Tennent Dam.

Sewage recycling involves a high usage and cost of electricity in water filtration.

Pumping costs are also high since water is allowed to drop down to the lower Cotter and then has to be pumped uphill to Mt Stromlo for treatment. Later it would have to be pumped back uphill again from the Lower Molonglo sewage treatment plant back into the Cotter River.

The electricity costs seem to be about an extra \$5 million per year.

***The operating costs for water produced from recycling sewage appear to be around 30 cents per kl – about 3 times the operating cost for supplying fresh water from a Tennent Dam.***

## 7. CONCLUSION

Why pay more to get less and of a lesser quality and safety?

Here are the new prices for water approved by ICRC from 1 July

First 100 kilolitres    77.5 cents per kilolitre

Second 100kl            \$1.67 per kilolitre

Over 300 kilolitres    \$2.57 per kilolitre

To these is added a 55 cent per kl “water abstraction” tax which is meant to include a charge for “water scarcity”.

So ICRC’s real standard price for water is really \$3.12 per kl.

By contrast, the recent report produced for the Federal Government by the consultants Marsden Jacob on urban water pricing estimated the full cost of urban water for the ACT as being \$1.56 per kilolitre.

But this allegedly justifiable price for water was based on the absurd hypothesis that users should pay again at today’s prices to have the benefit of the water infrastructure they have already paid for! - to quote the Marsden Jacob report “what should be the full or total cost of water supply in each city if we had to replace or replicate the entire system”.

I subsequently queried John Marsden about this figure and he was kind enough to provide me with the following figures.

Buying Tantangara water and piping into Corin was, in his view, the cheapest supply option at 80 cents per kl of future used (sold) water (as opposed to sustainable yield which may be in excess of what people want).

Tennant was \$1.20 per kl on the same basis (recovering all costs from water likely to be used and sold.)

However, Tennent water would cost 39 cents per kilolitre instead of \$1.20 if all we assume charges are spread over full hypothetical sustainable yield instead of “sold water”.

In addition John Marsden did concede that if one used the land value rating method to cover fixed costs the estimate of 10 cents or so per kilolitre was the purely operational (marginal) cost of water from a new Tennent Dam.

These figures are all, of course, way below the appalling \$3.12 now being visited upon ACT and Queanbeyan residents.

*So there is your answer.*

*Additional water should cost 10 cents a kl for delivery and \$150 per year per household with no water restrictions.*

The ACTEW and ACT Government proposals for recycling sewage into drinking water are an expensive diversion of public attention away from how brilliantly they have mismanaged the water resources we have.

ACT water is not scarce. It has been made scarce.

What has happened with ACT water supply and pricing is not proper economics. It is the economics of monopoly and exploitation of an unwitting and generous public. Many people have relied in good faith on what they have been told by government. But please let no one say there is any economic justification whatsoever for the damage done to Canberra by mismanagement of and over-pricing of water supply.

We have seen a perfect example over the last few years of what economists call deadweight loss – economic costs borne by people for which there is no compensation gain to anyone else.

For myself I confess myself continually amazed at what appears to be complete irrationality in ACT water policy.

It is for others to say whether this is due to greed, fraud, pigheadedness, ideology, stupidity, incompetence or muddle-headedness and on whose part.

But if you come to a similar opinion as to the economic foolishness of ACT water “non-supply policy”, perhaps the current outbreak of infectious irrationality may be cured by you telling the ACT Government and ACTEW to stop wasting your money on spin campaigns and expensive advertisements and start providing you with water on a reasonable basis.

After all, you will pay, so it will pay you to take an interest!

# **Urban Water Policy: In Need of Economics**

**Terence Dwyer**

**T**he thesis of this article is that Australian urban water supply and pricing policies are not well grounded in rational economic thinking. It questions the policy consensus that water is necessarily so scarce in Australia as to require the sorts of penal charges, water restrictions and use regulations which are being imposed or being considered for imposition upon urban users. It also questions the policy consensus on vetoing new dams for urban water supply, a consensus from which Queensland is partly defecting. (Rural water use is a separate story, though it seems that policy failures there have been used to justify the punishment of urban water users.) This article does not question the function of the price system nor does it suggest capital for water infrastructure is a free good, but it does argue that the current 'water policy consensus' which involves deliberate non-augmentation of supply, discriminatory pricing, rationing and the creation and exploitation of monopoly rents by treasuries is hardly an economic optimum.

The thesis is illustrated by pointing out apparent logical problems with Australian Capital Territory (ACT) water supply and pricing policies. The ACT's policies are more or less paralleled by other jurisdictions and its urban water prices have been driven higher than most. It is therefore a representative example of an increasingly dominant policy consensus.

At the outset, one readily acknowledges that when a resource is genuinely scarce, rising prices do serve to ration demand. However, although Australia is a dry continent, it has a relatively small population and a wide variety of regional climates. Water is not necessarily scarce in North Queensland, for example, and a policy which forbids Cairns from building a second dam when six times the volume of the existing dam flows over its spillway in the wet season may be quite irrational. Few Australians live in areas with very low rainfall.

## **Basic Propositions**

In making this critique of Australian urban water supply and pricing policy one may start with some basic and well-established propositions. One assumes that readers who are economists understand marginal cost pricing, sunk costs and external benefits to serviced land; and that they understand the difference between a true cost of supply and a monopoly rent. One also assumes that, like Böhm-Bawerk (1894-95; 1907-08), they understand the difference between 'capital' as a

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factor of production and ‘capitalised value’ representing the present worth of monopoly taxing power. In particular, one trusts readers are not so beguiled by the mysteries of accounting as to confuse ‘profitability’ with ‘economic efficiency’.

Readers will also understand how the optimality rule for marginal cost pricing and minimising deadweight loss in public utility pricing are parallel to the problem of deadweight losses of explicit sales or income taxes (for an overview of these issues from a practical perspective see Larkin and Dwyer, 1995). Economists understand that administered and arbitrary utility prices are really disguised taxes which impose similar deadweight losses on the community.

*Proposition A: The environment is not an absolute value.*

By this is meant that human activity is allowed to change the environment or even degrade it in some sense if it serves human interests. Were it otherwise, Sydney would be bush today, London would be a marshy swamp and Rome, seven hills. The point is that environmental costs must be quantified and set against environmental and other benefits. For example, it is absurd to count the costs of dams in stopping natural environmental flows if one does not count the benefit of dams in helping to sustain such environmental flows when there would have otherwise been no flow during a drought. Similarly, if one counts the lack of water flow at the Murray mouth as a cost, one has to balance this against having amenity in the city of Adelaide.

*Proposition B: If there is no scarcity of water then short-run marginal cost pricing for water usage represents an economic optimum.*

We assume here that capital has been invested to collect, store and deliver water and that, once done, available water supply exceeds demand. The only things to be paid for are (i) the current supply cost of water usage, and (ii) the fixed costs of water storage and supply infrastructure. This proposition that short-run marginal cost pricing (for water usage) is optimal can be traced back to Dupuit (see Hotelling, 1938) and is ably defended by Vickrey (1948). It involves the corollary that pricing water usage so as to recover sunk or fixed costs or to generate a rate of return on the replacement cost of immoveable assets is not economically efficient (on objections to marginal cost pricing and answers, see Coase, 1946 and Vickrey, 1948; 1987).

The only real objection to short-run marginal cost pricing is the financing problem. The objection is on the lines that: marginal cost is a useful concept and defines a lower price for producers facing a distressed market situation. If suppliers can find ways where sunk costs are paid by a lump sum, marginal cost also becomes a useful pricing approach. But to require it as a condition of investment or to impose it after firms have sunk their capital, means foregone investment and gradual impoverishment.

In other words, private sector suppliers have to recover sunk costs or they will not invest and for governments to use tax revenues to cover fixed costs of

infrastructure usually creates distortions elsewhere. But as Hotelling (1938) realised, financing infrastructure through land value rates or taxes does not involve deadweight losses (he was in error in thinking deadweight losses were minimal in relation to income taxes). In effect, short run marginal cost pricing for water usage combined with land value rating to cover fixed costs represents a non-distorting two-part tariff.

*Proposition C: If water does have a scarcity value, then the price of that scarcity should be determined by competitive markets and all users should pay the same scarcity price as a resource rent (with any adjustments for transmission wastage). The 'law of one price' should prevail.*

Here we assume that water demand exceeds supply. This means that in a river basin, urban users in the same basin as rural irrigators should be charged the same scarcity rent per kilolitre and vice versa. Further, if 30 per cent of water is lost in transmission downstream then a rural irrigator downstream should pay 30 per cent more than an urban or rural user water upstream. In other words, there is a natural comparative advantage to using water where it falls *ex caelis*, which should not be eroded by cross subsidisation through prescribing identical water abstraction charges.

*Proposition D: Investment in water storage and reticulation infrastructure should be undertaken when social benefits exceed social costs.*

Here again, we assume that water demand exceeds supply, given the *existing* storage and supply infrastructure *but that the storage and supply infrastructure can be augmented*. In deciding whether to augment, one should look at both public and private costs and benefits. For example, if one attaches a value to downstream or estuary fish habitats and a dam might adversely affect those habitats, the adverse effects have to be weighed against potential beneficial effects such as the dam supplying water downstream in a drought, and avoiding the cost to urban and rural users of a lack of water destroying or damaging parks, gardens, sports fields, crops, cattle *et cetera*. Whether such augmentation comes from new dams, from ground water or buying storage in existing dams elsewhere, are all supply options to be considered but one notes that 'water trading' cannot push water cheaply upriver or over mountains from a rural to an urban basin.

*Proposition E: Land values reflect the value of access to infrastructure.*

Land which is serviced by access to water supply will have a higher value even if no water is actually being drawn from the infrastructure. If water is available when you want it (at whatever the marginal cost of supply plus a scarcity rent, if applicable) then your block of land is more valuable than one without access. The recognition of this simple fact was the basis for the Australian system of rating 'unimproved' land values (that is, unimproved by the landholder as

opposed to society) which sought to recoup the cost of public works from the land benefited. Insofar as land value rating recoups external benefits conferred on land by infrastructure, it is not a tax nor does it result in deviations of per litre usage prices from optimal short run marginal cost. This may be contrasted with systems of infrastructure pricing which attempt to recover all fixed cost of infrastructure from 'user pays' water usage charges levied only on immediate users of what is carried over or through the infrastructure.

*Proposition F: Land values also reflect environmental costs and benefits of human activity generally.*

Environmental degradation lowers land values (for example, salination of pastures). By contrast, human efforts to conserve water and make it available for use may add value to lands. That is to say, there may be trade-offs. For example, is the increased value of cotton land upstream worth the degradation of pastures and estuary fishing areas downstream?

### **A Critique of Water Restrictions**

We are now in a position to critique Australian urban water policy. The urban 'water policy consensus' which is emerging is to:

1. block construction of new dams (although the Queensland Government shows signs of abandoning the new political and economic 'correctness' on this point);
2. rely on detailed regulations and restrictions to limit and control of urban water use (for example, no sprinkling at certain hours and no hosing of hard surfaces or windows);
3. increase water prices generally;
4. impose discriminatory block pricing aimed at punishing 'large' household water users; and
5. use water utilities as treasury cash cows through dividends, thanks to the rising cash flows generated by 3 and 4.

None of these policies can be justified by orthodox economic reasoning.

#### *The veto against new dams*

This violates Propositions A and D. What is apparently going on is that there is an implicit acceptance by policymakers (or policy dictators?) that the environment would be catastrophically destroyed by new dams in all cases.

Perhaps some will argue that new dams are not available as a policy option because of negative environmental externalities. But this does not necessarily apply everywhere. Strangling Sydney does nothing to lessen Murray-Darling salinity problems. Claimed environmental costs should be spelled out in full cost-benefit studies in each case and weighed in alongside urban users' valuations of

their living amenities, parks and gardens. Where are the cost-benefit studies proving people prefer rivers go into the sea rather than water urban parks and gardens? And is it true that Canberra's use of water takes water out of the Murray-Darling when domestic water is recycled back into the river anyway? Economics is about the revealed preferences of human beings — environmental preferences are only part of those preferences.

A nice example of the peculiar modern tendency to place other species as an absolute value ahead of human beings was displayed when Environment ACT defended ACT 'environmental flows' (*The Canberra Times* 10 May 2005:9). The argument was that a few endangered fish needed water let out of ACT dams to survive as a species. While most would not wish to exterminate fish, the idea that a few native fish need more water than some 370,000 human beings in Canberra and Queanbeyan must surely rank as bizarre. Australia's native fresh water fish have evolved to survive the cycles of drought and flood, so why do they need artificial 'environmental flows' from dams to survive? Even if one disregards evolution, one must question how any rational cost-benefit analysis could justify a policy of providing 41 gegalitres (ACT Government, 2004:43) in so-called environmental flows for a few fish while limiting the use of 370,000 human beings to a net 17 gegalitres.

If someone thinks fish are more important than human beings he is entitled to that view, but other human beings are not bound to respect it as a moral absolute which must force them to die of thirst, no more than Western societies must accept the ideas that cows are sacred and not to be eaten. To put the perceived needs of a few fish ahead of the conservation of trees, ovals, parks and gardens seems merely an arbitrary exercise in placing the interests of one environment (the fish one) above another environment (the one inhabited by humans). Further, *if* there were a social consensus in favour of doing so, it would follow that the costs should be borne by all taxpayers, not off-loaded onto water users alone. Presumably the fish cannot pay for their share of the dams (without which there would be zero flow in a drought anyway). But if Environment ACT (as their human proxy) wants water for fish, its budgetary allocation should be charged with that cost and water users given a refund so that they can fund a new dam for human use.

A veto on augmentation of urban water storage is an irrational dogma if there is no attempt to weigh up the social and economic costs and benefits in each case (including weighing up competing environmental claims). A veto on dams may be due to ideology, pantheist views on Nature as Deity, political pressure groups or the vested financial interests of monopoly infrastructure 'owners' such as treasuries but a dogma it remains. An economist is duty bound to point out the implied social costs of such a dogma.

Taking the ACT as an example, if the social costs of cutting consumption by quantitative water restrictions are a recurring \$71 million per annum, then at a discount rate of 10 per cent, it would pay to spend up to \$710 million to build sufficient water storage infrastructure to enable abolition of the restrictions.

The costs of water restrictions in the most recent drought have been estimated by the ACT water corporation (*The Canberra Times*, 29 April 2005:1) at \$71



million and the cost of reducing consumption by a Government-mandated further 25 per cent to 2023 (it has already been cut by 20 per cent per capita since 1993-94 pricing changes) is estimated at \$323 million. As the cost of a new Tennant Dam is estimated at \$238 million (curiously increased from prior estimates) it makes sense, even on the official figures, to build the new dam.

We thus see, in the case of the ACT a violation of Proposition D. The admitted costs of reducing consumption and imposing water restrictions are greater than the cost of a new dam.

A refusal to build a new dam seems to depend on a denial of Proposition A, an implicit assumption that the environment is an absolute value and nothing further should be done by human hands to alter it. Unless someone can explain what are the negative costs of a new dam, and show they outweigh the costs of not building a new dam, then the violation of Proposition A stands.

When prices rise, they should do more than merely ration existing supply — they call forth new supplies. A rising water price tilts the cost-benefit ratio more and more in favour of investing in a new dam. Basic economics would dictate a new dam be built in response to shortages — unless someone can show that 100,000 water tanks and double plumbing are more cost effective (ACTEW Corporation, 2004a:10, Figure 3-2, shows even the most expensive dam option is cheaper than rainwater tank rebates).

#### *Reliance on regulations and restrictions*

Water restrictions necessarily violate Proposition C. They deny the legitimacy of markets in allocating resource use and claim superior economic wisdom for the policy or regulation maker. Rationing obscures, rather than reveals, preferences, just as petrol rationing did in the 1940s. Normally, economists denounce command economy measures to control consumption outside the price signal mechanism. It is therefore surprising there has not been universal condemnation by economists of proposals to regulate in minute detail what water users are allowed to do with the water they pay for.

For example, if you choose to wash down your patio with a hose because it does a better and cleaner job than sweeping (and runs off to water the lawn in the process), who is some officious State bureaucrat to second guess your economic judgment? If you consider that watering your garden for a good soaking 8 hours every week is better than watering it for 3 hours every second night, why should you be fined? You may actually even be using less water *in toto*!

Water restrictions, like other forms of rationing, are an inherently second-best method of dealing with shortages of supply.

#### *Increasing water prices generally to reflect 'scarcity'*

Perhaps the most intuitively appealing argument for water restrictions has been the dogma that water is 'scarce'.

But water is not necessarily scarce — contrast rainfall in Cairns with Adelaide (and even Adelaide can draw water from the Murray). Yet some

economists insist water has a scarcity value which must be paid. Fine, then where are the competitive markets to establish true scarcity prices? How else can one say water is necessarily scarce? Or is water supply being constrained by governments blocking the construction of long planned dams? (For an overview of the interaction between environmental flows and supply needs in the ACT, see McIntyre *et al*, 2003.) How can anyone talk about scarcity prices without examining the causes of scarcity? Does ‘scarcity’ mean OPEC should charge \$100 or \$200 per barrel of oil? All prices reflect scarcity but are also held in check in a free market by the costs of new supply, so how can the reality of water supply issues be ignored?

If embargos were imposed on power stations, there would be rising scarcity prices for electricity. But no serious economist would accept these were genuine scarcity rents. Economists would quantify the economic costs of distorting markets and forcing business and households to buy their own generators or use candles instead of light globes.

Saying urban water is ‘scarce’ is like saying that office rental space in Sydney would be ‘scarce’ if building codes vetoed any building over one storey high. Like office space, the abundance of ‘water’ as a delivered commodity depends on supply as well as demand — as much on capital investment as natural availability of dam sites or aquifers. Office rents per square metre can fall with new supply even as ground rents and land prices rise. If political correctness or environmental dogma says dams are an inherent evil and should not be built, water may indeed become ‘scarce’ and rationed or expensive. But, in a free market, as the price of office space or delivered water rises, new buildings are erected or old ones refurbished and new water storages are built or water recycled. Both new storage construction and recycling are natural economic responses to scarcity — neither is ‘right’ or ‘wrong’: it all depends on the cost-benefit figures for each response in each case.

When it comes to explicit scarcity pricing for water, the ACT has, in fact, purported to impose such a ‘scarcity price’ (see Independent Competition and Regulatory Commission, 2003a; 2003b; and 2003c). It is embedded in the ‘water abstraction charge’ (WAC) on water taken from rivers or dam storages.

But is urban water necessarily scarce? While one must agree that water is scarce for irrigators drawing water from over-allocated rivers in the Murray-Darling Basin, it does not follow that water is scarce everywhere. Coastal cities storing water which would otherwise flow unused into the sea might question what is meant by scarcity.

Taking the example of the ACT, the most basic criticism of the WAC is that water is not scarce in the ACT. The ACT water utility, ACTEW, states that the ACT has enough water for a million people, after meeting environmental requirements, and is only using (after recycling) about one-sixth of the amount of water available for human use. ACTEW states that some 94 per cent of ACT water goes downstream free of charge to New South Wales, which sells much of it for irrigation use. Even after allowing for mandated ‘environmental flows’ (which

claim over half of the ACT's water) gross usage in the ACT is only one-third of the water available for human use (ACTEW Corporation, 2004a).

The criticism here is not that genuine water scarcity might lead to water price increases. The criticism is that water prices increases are being allowed to be dictated solely by so-called 'demand management' imperatives where there is no genuine economic scarcity. Prices are not rising in a way which is consistent with a free market. They are being set arbitrarily by governments and regulators. In a free market, prices are allowed to respond to scarcity, both to reduce lower-valued usage and to draw forth new investment in water storage or recycling infrastructure.

So-called 'demand management' strategies are a euphemism for rationing. It is true that prices should rise when water becomes scarce but that is only the start of the economic story of demand calling forth supply and new equilibrium.

#### *Adopting discriminatory block pricing to punish large household users*

The intellectual dishonesty of appeals to water price increase as being justified by increasing scarcity becomes apparent when we examine the precise structure of price increases in urban areas. They are often notably non-uniform. For example, in an unsurprisingly titled media release, the ACT's Independent Competition and Regulatory Commission (ICRC, 2005) has announced its approval of discriminatory increases in water prices from 1 July 2005. The fixed annual (access) charge drops from \$125 to \$75. Consumers pay 58 cents per kilolitre (kl) for the first 100 kls (previously 51.5 cents); \$1.135 per kl for the next 200 kls (previously \$1); and \$1.53 per kl for annual consumption over 300 kls (previously \$1.35). These charges are separate from the ACT Government's water abstraction charge (which is supposed to represent the scarcity value of water as a resource and is also increased from 20 to 25 cents per kl from 1 July 2005).

Now an economist should ask some basic questions.

- Aren't fixed charges preferable as 'lump sum taxes' to excises on output when one is looking at excess burdens of taxation? Wouldn't even second-best Ramsey pricing dictate that the fixed charge should be as high as possible to minimise the 'access deficit' or that there be declining, not rising, block tariffs, as used to occur with gas pricing? (Berg, 1998). In fact, the ideal two part tariff charge is an access price based on a 'lump sum' rating of the value of the serviced land, as used to be the case in Australia, plus a uniform charge solely representing marginal cost, which would include a uniform scarcity rent (if there is real scarcity).
- If we are increasing prices on large users because of scarcity and the supposed 'need' to reduce consumption, why is that not reflected in the water abstraction charge for *all* users rather than in the tariff which generates a return on capital and recurrent costs for the utility which provides infrastructure? Is it really socially costlier to supply 10 large families consuming 500 kls each than 50 smaller households consuming 100 kls each?

One might have thought economies of scale operated in infrastructure supply — installing, maintaining and reading 10 connections is surely cheaper than for 50. And what about economies in consumption? A household of 6 people may use less water per capita than 6 households of one person.

- If the justification for price increases is that water is scarce (as ICRC appears to argue), then why aren't all users to be charged the same price per kilolitre for all amounts used. Is marginal water used by a small high-income household less precious or scarce than water used by a large struggling family?
- Why should ACT households pay up to \$1.53 plus a tax of 25 cents per kl when ACT water is being sent downstream free of charge to irrigators paying far less? It is curious environmental policy to turn a garden city into a desert so that rice can be grown downstream in a desert. In a free market the law of one price would prevail. Only monopolists can sell the same product at different prices to different buyers.

Thus discriminatory block pricing violates Proposition C. It also violates Proposition B, as the scarcity value of water should enter as a uniform marginal cost.

#### *Using water utilities as cash cows*

When confronted with the new (and heretical) public finance fashion that all public services should be provided on the basis of 'user pays', most consumers, in their naiveté, assume that 'user pays' means:

- that they are charged the cost of what is supplied; and
- that they will get what they have paid for.

The use of utilities as cash cows defeats these humble expectations. What has been blessed (by ignorance or wilful negligence or treasury subornation on the part of pricing regulators) is multiple charging for public works.

Once upon a time, dams were constructed and financed by the perfectly sensible system of rating land values to amortise Water Board loans incurred to service the land. Land developers often had to contribute infrastructure free of charge to the water authorities. It made, and still makes, economic sense for the fixed costs of network infrastructure to be charged against the land values being benefited. Then the flow of water through the system can be charged at its low marginal cost, ensuring optimal use.

Thus, suppose a town was built over 90 years and dams and water works and pipes were financed by levies on ratepayers. A normal person, and a genuinely rational economist, might think that these capital works had been paid for and therefore should not be charged for again.

Yet 'reform' has meant water users are being asked to pay again for costs already recovered or never borne by State Treasuries. To take just one example,

the Queensland Government has sought to charge a rate of return on the Burdekin Dam which was paid for by the Federal taxpayer. As Professor Bob Walker (1993) noted some years ago, there are not many businesses where you can get your assets given to you by taxpayers or consumers and then turn around and demand a return on money you never had to outlay.

The conventional wisdom underlying the Council of Australian Governments and National Competition Policy water reforms is:

- (i) Water authorities in Australia were unprofitable and delivered a low return on the 'investment' governments had made in them.
- (ii) Hence, they should be made to deliver a rate of return to their government 'owners' equal to the rate of return on private sector equity investments.

Those assertions, constantly repeated, have assumed the status of urban legend, if not the status of self-evident truths. Both assertions are wrong.

Leaving aside whether water schemes were undertaken as 'investments' or were created as public utilities for public benefit, as Walker and Walker (2000) and Walker (1993) have pointed out, public sector accounting for water authorities has often employed techniques which result in misleading figures showing low profitability when the reality is that water authorities have been more profitable than most listed industrial companies.

Walker and Walker (2000:87-88) point out that

many of those GTEs [government trading enterprises] were highly profitable by private sector standards, but had only *reported* low levels of profitability. This occurred because Australian GTEs were required to adopt radical methods of accounting — methods not used anywhere else in the world ... there are some important differences in the way private sector and public sector entities value their assets. It is not widely recognised that since the late 1980s, Australian GTEs have used a system of accounting which is radically different from that used in private sector accounting. This has produced radically different financial results. (emphasis in original)

Walker and Walker (p. 97) go on to observe that

the major omission [of the Steering Committee *Guidelines on accounting policy for valuation of assets of Government Trading Enterprises*] was a failure to recognise that recent advocacy of the use of current replacement prices was that for consistency, the amounts by which asset values were increased should be brought to account in the operating statement as revenues (or unrealised gains). Adoption of this model of 'clean surplus' accounting would have meant that poor rates of return would have been converted into good rates of return. As it happened, the end result of the Working Party's ill-informed activities was that Australian GTEs were told to adopt a system of accounting

which produces figures for 'profit' and 'rate of return' which differ substantially from the figures which would be produced by private sector firms using private sector accounting methods. ... The Steering Committee had set out to ensure that the accounting methods used by GTEs would enable comparisons to be made between the government-owned businesses and 'comparable' private sector firms. They ended up promoting a system that ensured exactly the opposite'

It was also forgotten that (Walker and Walker, 2000:104-05):

A significant proportion of the assets of water authorities has been acquired through compulsory 'donations' from property developers. ... From an accounting perspective, the receipt of these 'donations' meant that water authorities had to record an increase in their assets — but most authorities recorded the receipt of these assets as an increase in 'reserves' rather than a source of revenues — the treatment indicated by the accounting profession's statements of accounting concepts. Having recorded increases in assets, water authorities then wrote-off those assets through depreciation charges (which were treated as expenses, and hence reduced reported profits). The combination of these treatments meant that the more donated assets received by those GTEs, the lower their reported profits.

The net result is that, after adjusting for revaluations and placing accounts on a common historic cost basis 'water authorities were far more profitable than listed industrial companies.' (Walker and Walker 2000:106). Yet, increasingly, a mantra of the need for 'forward-looking' prices is invoked to justify charging consumers on the basis of what it would cost to replace these assets in their current state. Hence consumers should be charged on the basis of 'depreciated optimised replacement cost' (DORC). (For other critiques of DORC, see Johnstone and Gaffkin, 1996; Johnstone and Wells, 1998; King, 1996.)

DORC may lack economic merit but it has wonderful features for infrastructure owners, such as State and Territory treasuries. One can blithely ignore the past history of who financed and contributed to public works and proceed to write up their value and claim a required rate of return on the capitalised value. To reap where he never sowed is the dream of every landlord, as Adam Smith observed. To charge for use of an asset you never paid for must rank alongside it as the dream of treasury officials and infrastructure monopolists.

The effect of such artificial and contrived accounting is to enable water utilities to generate astounding cash surpluses on cash actually invested while showing apparently low rates of return (which are used to justify claims for ever-higher prices). The net effect is the State and Territory treasuries can look forward to higher 'dividends' and pretend that this is 'user pays' financing 'reform' rather than the elaborate monopoly tax farming which it really is.

Worse still, unlike normal competitive industries, none of the new-found 'profitability' of water authorities is leading to a rush of new investment in much-

needed water storage infrastructure. Quite the contrary, State governments are trying to find reasons for forcing a massive and uneconomic duplication of water infrastructure, as each home has to fund its own mini-reservoir. (It may be socially more efficient to build a new dam and save the community the potential health and financial costs of millions of tanks, but high private costs are not borne by State Budgets.)

If none of the excess profits are ever ploughed back into additional infrastructure, of course water prices must rise towards infinity. But this is the result of State government policy. It should not be blamed on Nature — *'Accuse not Nature, she hath done her part; Do thou but thine'* (Milton, *Paradise Lost* VIII:561).

## Conclusion

There is no economic justification for spurious water pricing 'reforms' which strip excess profits from urban users, block increased supply, discriminate arbitrarily and push up business and living costs in the process.

Urban water pricing in the ACT and other places is not being determined by genuine economics. It is a form of thinly-disguised excise taxation enforced by a blockade of new supplies. Urban water pricing reflects abuse of monopoly power and lucrative monopoly rents, rather than true resource scarcity rents. It is as trivially beside the point to say that urban water pricing should reflect scarcity as to say the price of bread in Berlin in 1918 reflected scarcity rather than the Allied blockade.

The real hidden issues in the new urban water 'political correctness' are the blockade of new supply and arbitrary rationing of existing supply. Those willing to defend this situation are at odds with orthodox economics. While one can understand the revenue desires of treasuries, the self-interest of would-be private water infrastructure owners, the ideology of environmental Puritanism and the love of politicians for redistributing income, none of these amount to a valid *economic* consideration in pricing urban water. Urban water supply and prices should not be set by an Australian 'water OPEC' of State governments acting like the monopolists justly despised by Adam Smith (1776-1784) when he wrote:

The monopolists, by keeping the market constantly under-stocked, by never fully supplying the effectual demand, sell their commodities much above the natural price, and raise their emoluments, whether they consist in wages or profit, greatly above their natural rate.

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## Letters to the Editor

> [letters.editor@canberratimes.com.au](mailto:letters.editor@canberratimes.com.au)

# Worries mount over changes to ACT water-use limits

On Friday, May 23, a fascinating event occurred.

The ACT Government agreed to cut water available for human use in Canberra and Queanbeyan from the present average maximum limit of 222 gegalitres (out of 494GL annually) to an annual 40GL net.

Allowing for returns to the river, this means that, by a stroke of the pen, the ACT Government cut ACT water potentially available for human use from 222GL to about 70GL – an enforced cut of 68 per cent.

The total water resources of the ACT are 880GL on average when one includes the Murrumbidgee.

Hence, the ACT Government has agreed that the people of Canberra cannot use more than 5 per cent of available water.

What does this mean? First, even if it rained in the catchments every week and even if the dams overflowed, water will inevitably be priced to ACT residents at man-made scarcity prices and water rationing will inevitably become permanent.

Second, it means that the ACT Government has given away water rights to 182GL for nothing.

That represents a gift to downstream users such as rice growers worth roughly \$273 million on current water prices.

Nor is the ACT Government asking downstream users to help pay for the cost of ACT dams storing the water they will receive.

But there is "good news".

The people of the ACT are now graciously permitted to buy water back

from the downstream irrigators who are being given the ACT's water for free.

When governments start fooling around with resource economics, consumers should start being afraid – very afraid.

Terence Dwyer, visiting fellow, Crawford School of Economics and Government, Australian National University

# With no rain and no sensible policies, water woes won't ease

The Chief Minister (Letters, June 16) does not dispute that the ACT's permitted water use is being cut by 68 per cent to a net 40 gegalitres (less than 5 per cent of annual average available water) or around 70GL after returns to the river.

He has indeed confirmed the extraordinary extent of the cut.

However, he says it does not matter because ACT usage was only 26GL last year, that we have credits of 100GL and the 40GL cap will increase by 75 per cent of any population growth.

However, using a savagely water-restricted drought year (the lowest on record) as a benchmark, only demonstrates the new 40GL cap depends on permanently restricting

water use – as does a limited 75 per cent growth factor which implies a 25 per cent cut in per capita usage will be imposed.

As for credits, they are temporary and will be used up.

ACTEW's *Future Water Options* report in December 2004 stated that under the previous figure of 222GL the ACT had enough water for more than a million people.

A gross cap of 70GL therefore means we now only allowed enough water for perhaps a bit more than 315,000.

But the population of Canberra and Queanbeyan is already more than 360,000.

Canberra and Queanbeyan have already exceeded 40GL of net water use three times since 1989 when the population was lower.

The ACT Government has therefore chosen to make permanent water rationing inevitable, regardless of the need to do so or the costs or benefits of

doing so. A 25 per cent forced reduction in water usage in Canberra and Queanbeyan will contribute perhaps 16GL to the Murray Darling – a miniscule 0.3 per cent of the 5303GL taken from the Murray Darling Basin in last year's drought (largely by irrigators).

Mr Stanhope's reply seems to prove that ACT Government's water policy lacks both economic and environmental logic.

Terence Dwyer, Visiting Fellow, Crawford School of Economics and Government, Australian National University

## ACT Govt abusing its water monopoly

Half truths are dangerous — no more so than in economics.

While John Fallon and John Zeitsch (CT Opinion, November 3, p17 "Pricing of water does not reflect its scarcity") are correct to point out the economic damage done by water restrictions as opposed to correct pricing, it needs to be also understood that current pricing is irrational and nothing more than barely disguised excise taxation.

First, in a free market, when prices rise they do more than merely ration existing supply — they call forth new supplies.

Basic economics would dictate a new dam be built in response to shortages (unless someone can show a 100,000 water tanks and double plumbing are more cost effective).

Current charges are virtually sufficient to finance a dam but are being effectively diverted to the ACT Treasury.

Second, why should ACT households pay up to \$1.35 plus a tax of 25 cents per kl when ACT water is being sent downstream free of charge to irrigators paying far less? It is curious environmental policy to turn a garden city into a desert so that rice can be grown downstream in a desert.

In a proper economic market the law of one price would prevail.

Only monopolists can abuse the public by selling the same product at different prices to different buyers.

If the people of Canberra are willing to be thus abused, so be it.

Smart investors will happily invest in politically safe water monopolies.

But let no-one pretend this has

anything to do with genuine economics (as opposed to the economics of masochism).

Terence Dwyer  
Visiting Fellow, Asia Pacific School of  
Economics and Government, ANU

# State abuse of monopoly power in water

As an economist and a lawyer, I am professionally appalled at the utter nonsense being peddled as conventional wisdom on water pricing. John Maynard Keynes was wont to observe vulgar opinion is often wrong. So it is with those who say Australian businesses and families must pay more for water.

The truth is that Australia's potential water supplies per capita are higher than for many countries.

What is really happening is that state/territory governments are turning water into a taxing mechanism. They are stripping

exorbitant dividends out of government-owned monopolies while refusing to invest in additional infrastructure. Academic Bob Walker observed years ago that the Industry Commission was quite wrong in thinking water authorities were not fully recovering costs.

If none of the excess profits being gouged from water users are ever ploughed back into additional infrastructure, of course water prices must rise towards infinity. But this is the result of state government policy. It should not be blamed on a niggardly creator.

In a free market, when prices rise they do more than merely ration existing supply — they call forth new supplies. What we are witnessing with water is a gross abuse of monopoly power — state governments are blocking new water supplies as thoroughly as a medieval warlord might cut off a besieged town's water. States are really levying disguised excise taxes and calling them water "prices". Inevitably, declining water supply security and rising water costs will drive industry and jobs offshore.

If business groups, trade unions

and the federal Treasury are content to see living and business costs rise, with jobs and tax bases going offshore, while the states evade both the constitution and the GST inter-governmental agreement, so be it.

But, please, do not let anyone be heard to say that this has anything to do with proper economic thought or logic.

**Terence Dwyer,**  
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of Economics and Government,  
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