29 July 2008
Ref: Melb Water Supply Enq - Harrison Letter 29jul08.odt

The Hon. John Pandazopoulos, MP, Chair
& Executive Officer
Environment and Natural Resources Committee
Parliament House
Spring Street
East Melbourne VIC 3002
via enrc@parliament.vic.gov.au

Dear Sirs/Mesdames,

Underpinning Logic re Water Demand-Supply Matching Policies

I've served as a Harvard Consultant to The White House, a senior consultant for Deloitte-Touche, an expert in competition policy both in US and Australian courts, and an expert in financial modelling on many large projects, ranging to well over $1b. I have formal qualifications in Engineering, IT, Accounting and Business Management. In my 20s I was made the youngest-ever Fellow of the Australian Institute of Management. My first paper in the mid-1970s was on utility demand forecasting, following on from my being awarded the Thesis Prize at Sydney University for my work in that area. I was also on the team of five which developed the first electronic spreadsheet at Harvard Business School in 1978 and I set up the electronic lodgement for the 200m prescriptions per annum of the Pharmaceutical Benefits Scheme (as founding director of Amfac, the supplier of computer systems to then 78% of all pharmacies in Australia). I also wrote the Senate submission that killed the Australia Card Mk1; and was the lead author for the Alternative EIS for the Badgerys Creek second airport site for Sydney, which killed that project – both because there were far better alternatives to each project.

Sydney's decision to build a desalination plant for a city in a c1400mm annual rainfall area will forever stand as one of Australia's craziest public policy decisions. People directly associated with the preferred contractor donated to NSW State Labor approximately 0.0001 of the value of the contract and the contract was awarded in circumstances contrary to those committed by the government to the people. When the NSW state government realised that the whole idea of what Bob Carr called “bottled electricity” was contrary to the wishes of the vast majority of the people of NSW, the Iemma government gave clear assurances that the contract would only be let AFTER dam levels fell below 30%. However, after the donations, the contract was let when the drought had broken, dam levels were considerably higher, the Southern Oscillation index had shifted and the long term outlook was predicted to be 5-7 years of above-average rainfall. Clearly the contractors knew that if it did not get the go-ahead then, the project would languish for many years in a 'pending state' – though that wait would have saved NSW taxpayers $1-2b in interest and depreciation.

That project will cost $50-100m pa in standby payments to the operator in years in which not a drop is needed, on top of the interest cost on $1.7b capital cost. It also effectively took off the electricity grid the totality of all non-hydro green power in NSW, as all wind and other generation for some time will be 100% committed to meeting the increased electricity demands of this one plant.

OK, so NSW Labor are idiots... but what is the lesson for Victorian Labor. The lesson for Melbourne is that the experts within any utility function are NEVER to be relied upon. Those closest to the decision consistently make the worst decisions. What seems to be expertise is simply 'dyed-in-the-wool old-school thinking'. And the problems are not simply limited to government bureaucracies. The US auto industry has just announced that it will face huge losses and capital re-machining costs to NOW change from gas-guzzlers to small efficient cars. But with executive salaries in the millions (per exec) one wonders just who WAS doing the forward strategic thinking for the industry. Everyone outside Detroit (and the further away the better) knew that the writing was on the wall for such old-style solutions, and that changes were needed... but somehow within the industry, the emperor was seen as having wonderful clothes!

So it is with any of the grid-based (ie reticulation) utility services we have. No expert within the power industry in Australia thinks green energy can supply enough of our power needs, and that new coal-fired plants are needed, or that we must embrace nuclear energy. But ask any expert OUTSIDE that industry, and you'll find almost universal belief that the future is with a mix of conservation and alternative/green energy solutions. The 'low-hanging fruit' are insulation for buildings, solar hot water systems, LED lighting, gas space heating, etc and those changes will put off any new power station needs for so long as to allow wind and photovoltaic sources to be cheaper than coal, once carbon-trading costs are incorporated. Yet in NSW, the government is pushing the idea of needing new investment in coal-fired plants, and trying to sell its existing coal-fired plants just prior to carbon-trading implementation (ie at the worst possible time with a predicted $10b discount for uncertainty).

The lesson is that the answer is so often non-grid based, yet all of the bureaucracies associated with grid-based utility supply can only think in terms of things they can meter. Hence, electricity generators are dismissive of roof-top photovoltaics etc, whereas warehouse roof sites are the most common location for city-based photovoltaics in the world... it does not have to be somewhere called 'a power station'. Similarly, the electricity industry in Australia has resisted fair (marginal producer) credits to effectively purchase power from consumers. This was introduced into California thirty years ago and is known to be a pre-requisite for customer-location power generation. Arguably the major difference is that with state governments owning the monopoly producers, the state has acted contrary to the wishes of the people, in the long-proven theorem that bureaucracies always seek to act solely in their own interests.

For Sydney's water, over the past two years, the NSW government had three clear choices:

a) Significantly subsidise domestic roof tank installations;

b) Build the Welcome Reef Dam (proposed for some decades) on the Upper Shoalhaven River; or

c) Build a much-hated desal plant proposed by some friends (donors) of Labor.

The costs of (a) and (b) were far cheaper on almost all measures (capital and cost/Ml/yr) than (c) but the desal plant went ahead. The prediction in NSW is that this decision alone, to secure about $150k of donations, will be the straw that broke the camel's back in terms of making the Iemma government absolutely unelectable at the next elections.

A $1.4b capital cost could have supplied a reasonably-sized domestic rainwater tank for all buildings that could fit them on site in Greater Sydney, if government tenders were let for such quantity of tanks, thereby dramatically reducing the 'retail' price. Perhaps they would have to be collected from one of a few sites on the periphery of Sydney, but the tanks would have been cheap. And with availability of cheap tanks, most households will gladly pay for the necessary installation... and it is those site-specific costs that no government should seek to cover. The plumbing done in NT homes as part of the Feds NT intervention is being done at about 6-8 times

the cost of having such plumbing done by locals, as the Feds are flying in plumbers from other states.

If you look at a typical home with a roof area (horizontal cross-section) of c100 square metres, in a 1400mm rainfall area, one is going to get 140,000 litres/year of water "for free"for the use of just that household. That equates to 383 litres/day, which is enough for the first three people in that household. Now, of course to be fully-self-sufficient, like most farm houses, you need a large tank, so you can go for 18 months or so with little rain. However, in a metropolitan location, one is not needing to cater for such 'rare' events as multi-year droughts. That IS what a dam should be used for. If one can get a lot of a household's supply from its own roof, then it is best to use the dams and reticulation for drinking water supply and 'topping up' in drier times.

Indeed the ultimate proof of the cost-effectiveness of roof-top collection is that most state and local governments proscribed such tanks for many decades, as they were seen as unfairly competing with the dams and reticulated water supply systems the state or local government was providing.

With a decent rainwater tank rebate or loan scheme, one could 'wipe from the water map' almost all the houses in any of Australia's capital cities. One would also effectively remove 1-2 storeys from multi-storey buildings. If you model that, you get very significant savings. A large proportion of people live in houses or apartment buildings which are 'walk-ups' (ie three or fewer levels excluding car parking). As to commercial buildings, most of the lower-rise ones could also be incentivised to install rainwater tanks, thereby removing most non-CBD commercial water load (as people don't shower or wash clothes in most commercial premises). That really leaves 'industry and the CBD' as the load on the dams. This higher-density component of the problem will always be far more heavily dependent upon reticulation, but it really doesn't matter if it is, if all of suburbia is effectively shed from the reticulation and dam planning requirements.

The ONLY problem with this approach is getting the bureaucrats to appreciate what the people want. The bureaucrats will always look on water rates as another form of taxation, and incentivising people to look after themselves will be seen as heresy. Yet, that is precisely what we have done with superannuation, private health insurance, aged care deposits and so many other spheres of life in Australia. Making people more responsible for their actions is part of what our climate change challenge will be about.

NSW has committed the $1.7b to desal, yet offers only a $150 rebate for a typical $2k domestic rainwater tank installation. The desal cost will come to many thousands of dollars per household over the decades, yet the low-hanging fruit remained ignored. And it does not need to be a rebate. Low cost loans can also work very well... as long as people see the savings on their water bills to offset the payments over time. The test is that it has to provide real incentive.

NSW did the worst of all possible sequencing – it approved the desal plant then told the voters that ther water bills would need to increase by $140pa for just the desal plant – say $1000-2000 per household on a discounted Net Present Value basis. Had the government simply put the price of water up, it would have caused more conservation more than offsetting the 10% of supply that the desal plant is capable of supplying. So the answer in an economics sense was to simply do step 2, and then not bother with step 1.

However, NSW committed the worst of all sins. It refused to put up the 'water usage' component of the water bill, preferring to put up the fixed 'supply charge' costs. Now, Sydney Water could easily do the modelling – all it needed was $1.7b over time, plus another $1b in operating costs. So why NOT put the increase on the usage component, thereby making water more expensive? With a Harvard MBA, and many years doing forensic accounting work for large legal cases, I can confidently say that the ONLY reason why the increase was not applied to the usage rates was because Sydney Water did not want to see the water conservation that this would have caused.

The bureaucracy must protect its income stream! There is no other possible explanation. This has the effect of cancelling out the benefits of people putting in rainwater tanks, as the payback as seen by a householder climbs from 8 years to 16 years. Indeed a recent letter to the editor of The Sydney Morning Herald noted that the effect is that those households who did put in a rainwater tank now find that they are effectively paying for both their tank installation AND the desal plant that they never wanted.

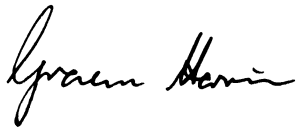
So, of the choices, please be aware that my expert advice is (in order):

1. Don't trust anyone from the bureaucracies involved – their motives are never good public policy nor sustainability. Be very sceptical of 'the experts' if they have come from a background in the utility/supply side of that industry, as they simply cannot think "small is beautiful", but tend always to large projects, of the type/scale they are used to building.
2. Put the price of water (usage rates not access fees) UP, and reap that benefit.
3. Implement scarcity pricing, as is proven from basic economics, to cut consumption during prolonged droughts. Pricing is always the surest form of conservation. If necessary adjust pensioner support, but be assured that the poorest pensioners are not big users of water.
4. Resist the urging to put the 'monopoly rent' of access fees up, as routinely requested by the bureaucracy to maintain their monopoly position.
5. Have smart meters installed for all apartments, so people are billed on actual home/commercial usage, rather than some share of a larger shared bill.
6. Do a GREAT ("must have") rebate (or zero-interest loan auto-repaid via water bills) for rainwater tanks, up to quite large sizes for large buildings. Simply make it a huge fine if on any subsequent visit the tank cannot be inspected at the nominated site (to stop use for other purposes).
7. Increase that rebate/loan if the uptake is not sufficient after year three, as some will grab at the opportunity ('early adopters'), whereas others will be reluctant to invest, or have difficult sites, in terms of where to locate a tank, or how to integrate with plumbing.
8. Do large scale stormwater harvesting in preference to new dams – better to have large capacity pumps at bottom of creeks and ocean run-off areas even if only used 1% of the time, than large bio-diverse valleys swamped for new dams, or worse-still desal plants consuming power 24x7.
9. Announce strict 'contingent minimum dam level threshold conditions' to approve any additional dam or reservoir catchment capital improvements... as those wanting the project to go ahead are just 'itching to press the start button'. However, realistic timeframes are needed.
10. Consider even the proposed pipeline of water from Tasmania in preference to desal, as desal is suited to the Arabian Gulf etc, but not areas of high natural rainfall. Keep in mind the basic physics that it takes a lot of energy to remove salt from water. Better to use Memtec super-fine membrane technology to clean stormwater than start with salty water.

Melbourne does not need to follow Perth and Sydney down the environmentally-ruinous path of desal. It may be 'flavour of the month' but as electricity costs start reflecting the true cost of the carbon used, it will become even less pragmatic in years to come. Further, there are far better solutions, and you simply have to visit any farmhouse to see what you do to live within your means when it comes to water. Especially with desal now being deployed in other states, Australians will start seeing the cost of water provided to your house via reticulation as far more expensive than we have been used to paying... and that in itself will trigger new conservation.

Thank you for your time, and good luck for the future. Feel free to include me in any on-going feedback to contributors, by adding my email address of prof@post.harvard.edu to your mailing list.

Yours Faithfully



Graeme Harrison