Structural Reform of Metro Water Systems

Comments for the Public Hearing
on the
Productivity Commission's Draft Report
on
Australia's Urban Water Sector

MARKET REFORM

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Melbourne
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Introduction

We commend the work of the Commission and its staff in this Inquiry

- The process has been transparent and inclusive
- The Draft Report ('DR') reflects a good grasp of general economic and policy principles
- We agree with 95% of the DR's findings and recommendations

BUT … we think the small part of the DR dealing with structural reform and competition in large, complex metropolitan ('metro') systems:

- Mischaracterises the options and the best way forward
- Underestimates the potential importance of network effects
- Should and easily could be improved

Our credentials in structural reform in metro water include:

- 20+ years developing and applying network market concepts and processes in electricity/gas restructuring worldwide and in Australia
- 2+ years working to adapt these concepts and processes to a metro water system (using Melbourne and Coliban as test cases)

Summary of Our Views on the Draft Report

Our basic concern is that the DR:

- Essentially ignores the complex network at the heart of a metro water system that directly affects what is physically possible, and hence
- Reaches conclusions that, however sensible they might be in other situations, are at best oversimplified and may be wrong for metro water

More specifically, the DR does not recognise that, on a metro system:

- Even limited contestability, let alone market competition, can be inefficient, disruptive and ineffective unless prices reflect network and operational realities, which they cannot do unless pricing/trading is coordinated or even integrated with the central processes that plan and manage physical operations
- Reform efforts should focus early on how to integrate pricing with operations in each case enough to deal with potential network congestion – which is always greater than expected in advance

The Commission should, even "at this time", encourage the development of network market concepts for metro water

The Four Structural and One Process Options

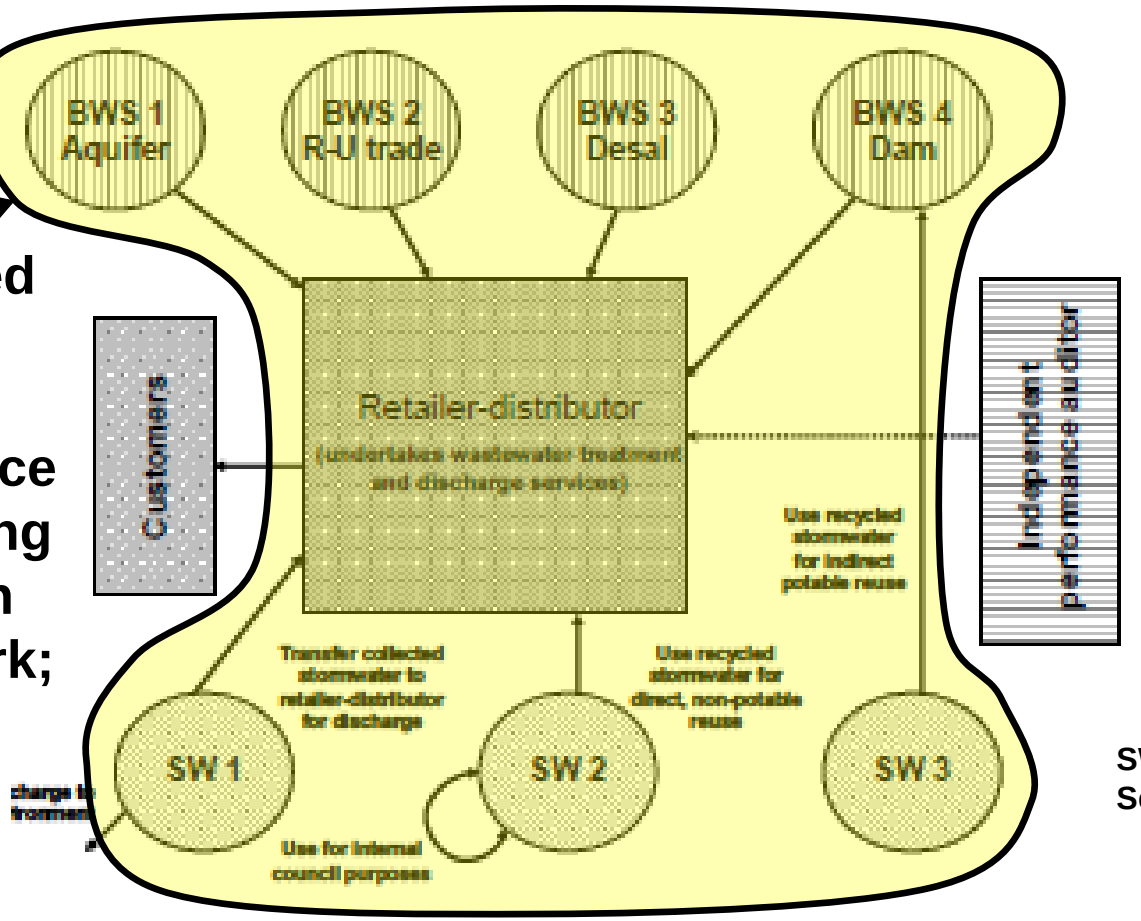
In the Draft Report, the Commission:

- "Sets out four structural options for [metro] systems" that it regards as worthy of consideration
  - Option 1 = a vertically integrated monopoly
  - Option 2 = Option 1 with bulk water supply unbundled into entities that 'contest' for sales contracts with the monopoly R-D entity
  - Option 3 = Option 2 with wastewater unbundled
  - Option 4 = Option 3 with R-D unbundled into geographic monopolies that buy bulk water and wastewater services subject to yard-stick competition
- Discusses but rejects an option 5, called "decentralised competition," as "not feasible or efficient … at least not at this time".

These options are illustrated in the following slides (which start with diagrams from the DR and add explanatory stuff)

Option 1 = Vertically Integrated B-R-D Monopoly

Vertically Integrated B-R-D Monopoly owns/controls everything and hence coordinates planning and operations on the (hidden) network;



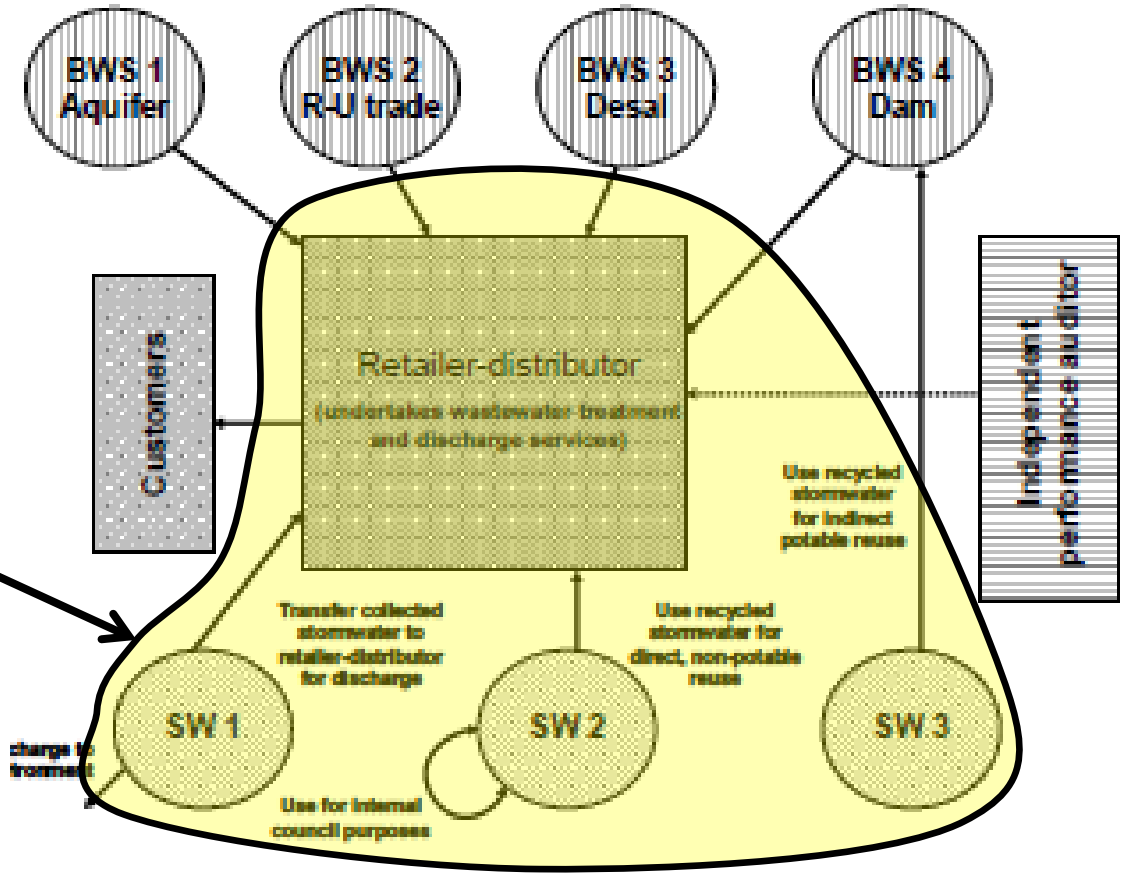
BWS = Bulk Water Supplier

SW = Storm Water Service Provider

Option 2 = Option 1 + Unbundled Bulk Supply

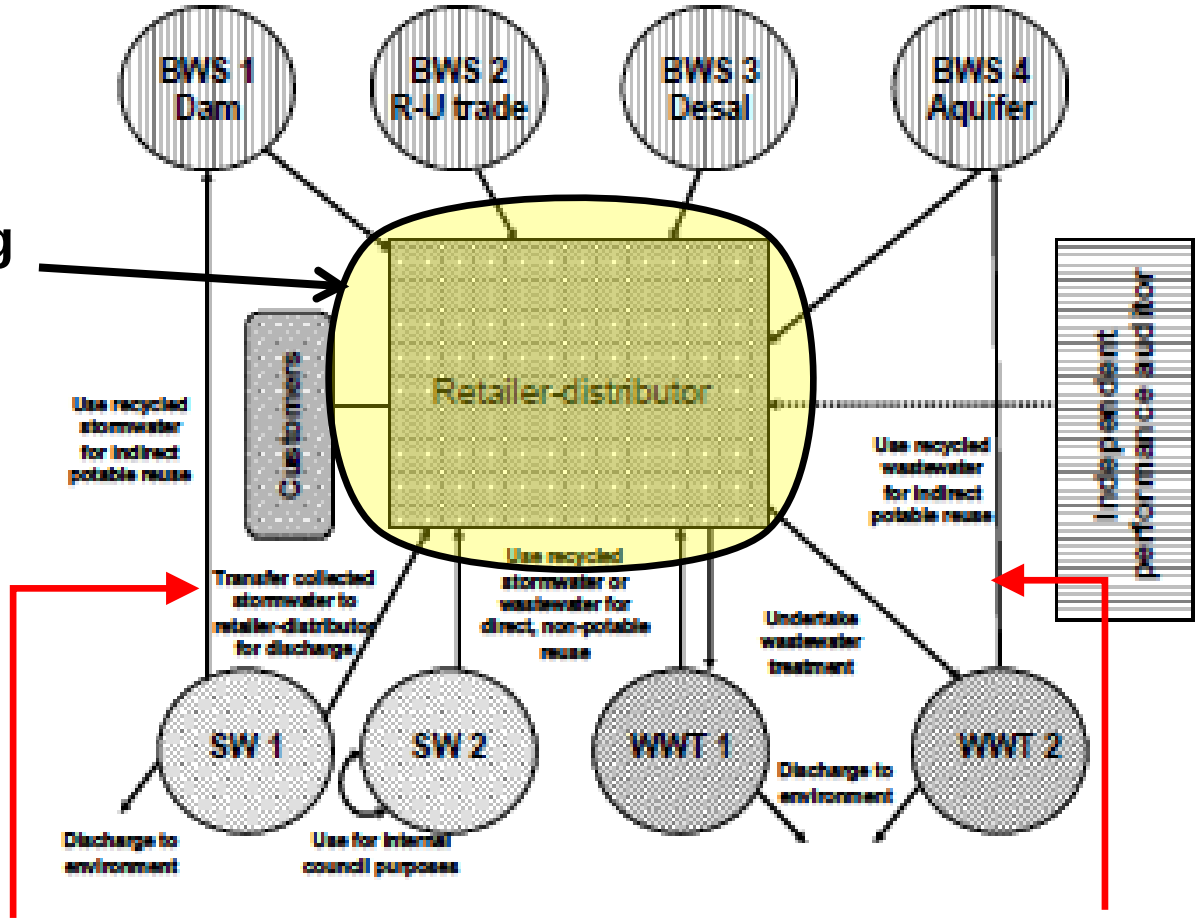
Unbundled Bulk Water Suppliers contesting/ competing for contracts with R-D Monopoly

R-D Monopoly is the "Single Buyer/Reseller" of water on the (hidden) network and hence can coordinate planning and operations



Option 3 = Option 2 + Unbundled Wastewater

R-D Monopoly can coordinate planning and operations on the (hidden) network only if it is a party to, or otherwise knows about and can control, all deals

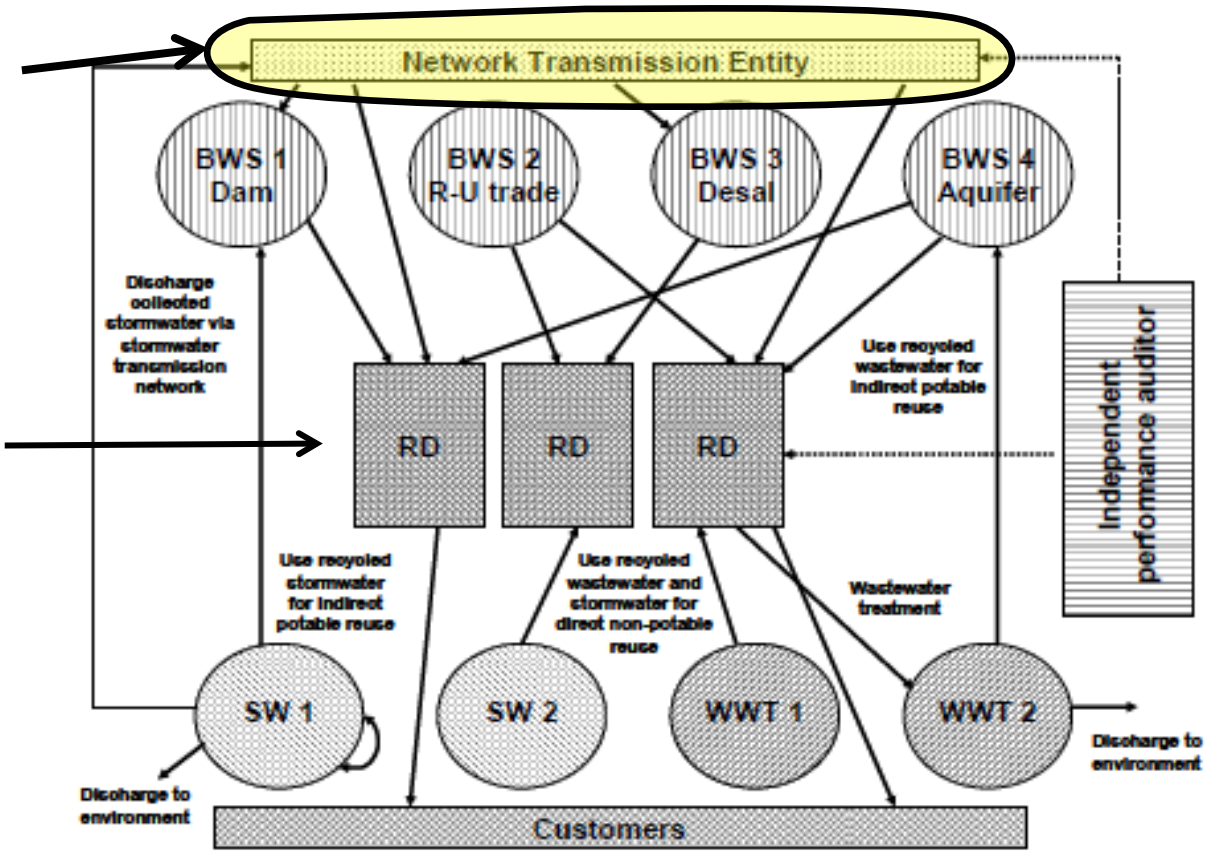


These deals must be coordinated with the others on the same network – but by whom and how?

Option 4: Option 3 + Unbundled/Disaggregated R-D

Network (N) Monopoly is separate from water trading

Geographic R-D monopolies contracting for bulk water and waste (& storm?) water services, subject to yardstick regulation



How and by whom are planning and operations coordinated on the independent network when all these separate entities are making bilateral deals among themselves?

Option 5: Decentralised, price-coordinated decisions

The DR contains no diagram of option 5, but describes it as:

"Decentralised supply and demand decisions, coordinated using market prices."

This does not describe a ***structure*** at all, but a ***process*** – in fact, with a broad view of "market prices", it is the basic coordination process in any structure with any degree of disaggregation, including any of those set out in the DR.

However, the discussion in the DR makes it clear that option 5 is meant to represent the kind of process used in electricity markets, in which a spot market plays a central role.

Thus, what the Draft Report is rejecting ("at least at this time") is:

- Not any specific ***structure*** of a metro system, but
- Any coordination ***process*** based on a spot market

Does the Commission really mean to reject, even if only "at this time", an entire class of proven market processes?

A Better Way To Describe the Options

Perhaps the Commission means something along these lines:

- There is a spectrum of ***structural*** options, ranging from vertically integrated monopoly (option 1) to multiple competing/contesting entities in all parts of the system except the network (option 4).
- There is also a spectrum of ***coordination process*** options, from command-and-control through bilateral contracting to a 'NEM-type' process, i.e., what the DR (incorrectly) calls ***structural*** option 5..
- The Commission thinks that, ***at this time***, any of its four ***structural*** options is feasible but a 'NEM-type' ***process*** option is not

We agree with the first two statements, except we think that, without a 'NEM-type' process (meaning a process with a spot market and financial contracting) any structure that allows significant independent trading (e.g. option 4 and probably option 3) will be at best inefficient and probably infeasible on many/most metro systems

Some Implications

Spot-market-based (i.e. 'NEM-type') network markets were developed to allow independent entities to trade on a complex network, so if such markets are not feasible/acceptable 'at this time':

- The Commission's structural options 4 and probably 3, and any form of retail competition, are also not feasible at this time
- Melbourne, which has already created a structure similar to option 4, with an independent network, three parallel R-Ds with bulk entitlements, multiple bulk water sources, etc., will continue to be stuck with its entitlements pooled and managed by Melbourne Water, i.e., about where it has been for the past 10 years.

Anybody who wants to move beyond a single buyer/reseller-system-operator monopoly should be advocating, not disparaging, development of the network market concepts and processes that are necessary to make that possible

Where Is the Network, What Does It Do, and How ???

To somebody who has spent 20+ years designing and analysing network markets, the most striking thing about the DR's four "structural options" is the invisibility/passivity of the network.

- Options 1-3 do not mention or show the network at all, presumably because the integrated utility or monopoly R-D:
  - Owns and operates the network internally, for its own purposes
  - Considers network capacity when deciding which bulk supplies to build/contract in advance and which to 'dispatch' during operations
  - Has no need to explain its actions to disappointed suppliers
- In option 4, the network is described/shown as a separate entity, but plays no role in water trading; this network entity presumably:
  - Contracts transmission service bilaterally to each bulk supplier and R-D without regard to the water contracts between them
  - Moves water from source to sink as instructed by the contract users, with no concern that these instructions will conflict with one another on the network

Why Worry About the Network?

If the network has so much capacity and flexibility that it is never 'congested' – i.e., if it can handle any plausible combination of requested storages, flows, pumping, treatment, etc.

- The network can be ignored in contracting, trading and pricing
- The parties using the network can make independent bilateral deals, instruct the network to take and deliver the water, and bear no risk that the network will not be able to fulfill all the instructions simultaneously

But if there is any significant risk that uncoordinated bilateral deal-making will result in total demands on the network that it cannot handle, the network cannot be ignored.

- In simple situations it may be possible to define a few stable bottlenecks and sell or allocate tradeable 'capacity rights' to these
- But in many cases, there may be no ***practical and efficient*** solution except to consider all proposed deals and network constraints simultaneously and select an optimal set of deals.

A potentially congested network cannot be (safely)ignored in any reform proposal involving competition or even contestability

But We Never Have Congestion Here, So Why Worry?

The network of an integrated monopoly never appears to be congested.

- System operators know when and where the system constraints are, so they plan and operate to avoid them, letting the higher costs flow into the monopoly's total cost pool where they are soon forgotten if they are ever identified at all.
- Operators, if asked if the system has much congestion, are likely to answer proudly "of course not; we know how to operate the system well within its constraints." If asked how large congestion costs were last year, they are unlikely to know or even to understand the question.

Things change fast when independent entities start using the system, because they will:

- Soon want to do things the system was not designed for
- Not pass up a chance to make a dollar just for the good of the system.

In every network restructuring we know, congestion was said to be a non-issue beforehand but became an issue when independent entities began using the system.

"Decentralised Competition" in the Draft Report

The DR rejects a NEM-type process option "at least at this time" because of some "concerns" that suggest some misconceptions about the operations and role of such a market. The most important of these misconceptions are stated and addressed below:

Misconception 1: A spot market reflects only the instantaneous supply-demand balance and hence cannot deal with a storable commodity

- Even in a single-period spot market, market participants can and do make bids and offers that reflect their expectations about the future (whether or not the commodity is storable); and
- The balancing market in a storable commodity can clear more than one period simultaneously, e.g., six 4-hour periods in a 1-day optimisation in the Victorian gas market, 52 weekly periods in an annual optimisation Market Reform has built for Coliban Water (a 'market like' tool rather than a 'spot market')

With appropriate treatment of end-of-period storage, 'spot markets' can – and do – handle storable commodities

“Decentralised Competition” in the DR (Continued)

Misconception 2: A spot market that deals only with imbalances is different from, and more acceptable than, one that deals with the entire volume of trading.

- On a network, every molecule of the commodity has the same effect in the system whether it is traded spot or under contract, and hence must be reported to and managed by the system operator the same way. The entire amount of commodity put into the system is used to meet the entire demand, with the balance determining prices and operations.
- Commodity being traded under contract may be ‘netted out’ for settlement purposes, but this is purely a matter of money flows (and credit risks) that has nothing to do with operations or pricing. i.e. the market is ‘net’ in settlements only; ‘gross’ in pricing/operations.
- Even if all commodity is priced and scheduled in the spot market, most will be covered by financial contracts that are substantively the same as ‘physical’ contracts (whatever that means in a market with a transparent and universally accessible spot price).

“Decentralised Competition” in the DR (Continued)

Misconception 3: With a spot market, investment is driven entirely by the spot price, making it hard/impossible to justify and stimulate long-term investment; for example, there are “concerns” whether the NEM is stimulating inadequate investment in generation.

- Most supplies in a spot-market based system are traded under contract, whether the market is ‘net’ or ‘gross’; the incentives and mechanisms for taking and hedging investment risks are unaffected by the existence of a spot market, except that the greater flexibility and efficiency of a spot market reduces risks.
- If making a R-D responsible for supply can assure adequate investment in the absence of a spot market (as assumed/recommended in the DR), the same strategy can work at least as well with a spot market.
- A recent report on carbon policy says: “The [NEM] has worked well to ensure secure, reliable and efficient generation of electricity and has delivered timely and efficient investment in new generation capacity.” Carbon policy may (or may not) be discouraging investment, but this has nothing to do with a spot market per se.

Suggestions for the Final Report

In its discussion of metro water, the Commission's Final Report should:

- Clarify the difference between and relationships among structural options and process options, as suggested above.
- Make the network and the required coordination processes visible and important parts of its structural options.
- Avoid suggesting that any coordination process based on a spot market is a bad idea, and instead endorse efforts to start adapting and applying network market ideas even "at this time".
- Either drop or improve the discussion of how and how well a coordination process based on a spot market might work.
- Recognise that a sophisticated/complex structure will not work well (at all?) without a correspondingly sophisticated/complex coordination process; in particular, the Commission's structural options 4 and probably 3, and any form of retail competition, require some type of spot market and financial contracting.