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WATER TRADING IN THE MELBOURNE REGION

Discussion on the drivers and barriers to water trading

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ABSTRACT

The provision of water services is essential for the functioning of a city but can be a difficult and constantly changing task. Since the Millennial Drought, the Melbourne Region has moved towards a more secure water supply system through the construction of a desalination plant and the North-South Pipeline. In addition, there has been considerable progress in the use of recycled water, rainwater and stormwater.

Despite these advances, the challenges of rapid population growth and a drying climate can still put the region's water supply under stress in the mid to long term. In recent years, the concept of trading water over a highly connected water system has gained interest as part of a range of options.

This article combines a literature review with insights from industry representatives to examine the drivers and barriers to water trading in the Melbourne Region. In all, six interviews were undertaken with water industry professionals. Based on this, some insights into the drivers and barriers of water trading have been gained, and these are presented here as well as a suggested way forward.

INTRODUCTION

Since the latter part of the last century, the amounts of water that may be withdrawn from the environment by Victorian water corporations have been capped and consumptive entitlements created. With regard to the Melbourne system, bulk entitlements were initially assigned to Melbourne Water, the wholesaler.

In 2006 these were transferred to the city's three water retailers — City West Water, South East Water and Yarra Valley Water — as a pooled entitlement.

In July 2014, Melbourne's water retailers and a number of adjacent water corporations gained the right to individual delivery entitlements to the Greater Yarra-Thomson system, Victorian Desalination Project, Goulburn system and River Murray system. These reforms were intended to encourage more individualistic and competitive ways of addressing the long term water supply-demand balance for each water corporation. However, they also opened the door to water trading between these corporations.

In March 2016, the Victorian Government released its Water for Victoria Discussion Paper with wide-ranging strategic directions, one of which aims at setting up a water market for southern Victoria (Dept. of Environment, Land, Water and Planning, 2016).

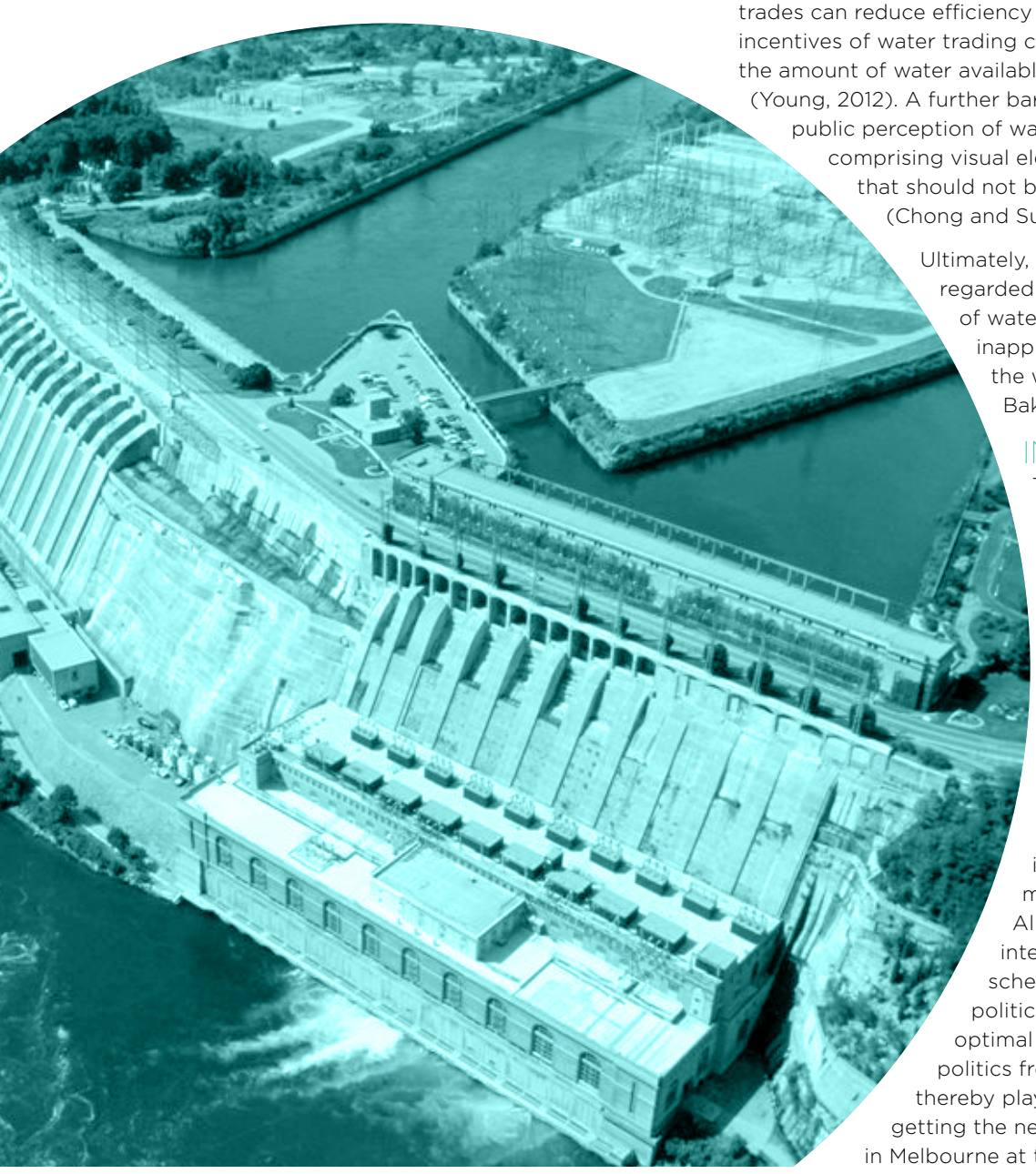
The Paper noted the high degree of interconnectedness between the Melbourne supply system with the adjacent systems of Western Water, Barwon Water, Westernport Water, Gippsland Water, South Gippsland Water and Southern Rural Water (see figure on page 3).

Through the North-South Pipeline, the Melbourne system is also connected to the Goulburn-Murray Irrigation District north of the Great Dividing Range. There is also further connectivity between the systems of Barwon Water and those serving the towns of Ballarat and Bendigo in the north.

All the above are urban water utilities with the exception of Southern Rural Water and Goulburn-Murray Water which supply farmers. With the entire network described as a Grid, the Discussion Paper proposes to develop clearly defined water market trading rules and to facilitate open, efficient and transparent markets. To this end, it proposes to set up a five-year trial of the southern market.

LITERATURE REVIEW

The literature investigated highlights the role of markets in supporting efficient water use, including: allocative efficiency whereby water is transferred to its highest value uses (Olmstead, 2010); productive efficiency that serves to provide an incentive to carefully consider what inputs to use (National Water Commission, 2011); and dynamic efficiency that encourages innovations and investment through competition (Frontier Economics, 2008).



As a result of increased efficiency, water security benefits are shared while costly water supply augmentations may be delayed or avoided.

Against this, allocative efficiency is not without its detractors, with Kiem (2013) cautioning that water moving to "high-valued" may not take social and environmental aspects into account as these values tend not to have funds or actors to represent them. Hodgson (2006) noted that the transactional costs associated with transacting and transferring water trades can reduce efficiency gains, while the monetary incentives of water trading can potentially reduce the amount of water available for the environment (Young, 2012). A further barrier can be found in the public perception of water being a public good, comprising visual elements and cultural values that should not be subject to market forces (Chong and Sunding, 2006).

Ultimately, water trading can be regarded as a kind of privatisation of water flows which may be inappropriate for some areas in the world (Swyngedouw 2004; Bakker 2010).

INTERVIEWS

The interviews highlighted efficiency improvements as a major driver in setting up a market and in using a revealed water value for benchmarking investment alternatives. Moreover, it was argued that trading opportunities promote capability among the Melbourne water authorities, and that the incentive to make a profit may stimulate innovation. All in all, as one of the interviewees argued, a trading scheme would remove the politics and the unavoidable sub-optimal outcomes associated with politics from water management, thereby playing an important role in getting the next necessary augmentation in Melbourne at the right time and scale.

The potential for a water trading scheme to benefit the environment was also recognised in the interviews, whereby revenue from the sale of excess water in one system could be used to purchase water for another system that is experiencing a shortfall.

However, interviewees also saw many barriers to water trading in the Melbourne Region, the obvious one being the limited number of potential traders and the lack of heterogeneity amongst them. Others mentioned the need to overhaul Melbourne water authorities' approach to supply security as a prerequisite to trades as it would be difficult to take reasonable positions.

This is exacerbated by the current lack of a market value of water because of the very small number of trades occurring, which in turn inhibits the establishment of the market that would reveal such a value.

One interviewee was of the opinion that regulated customer prices make the fiscal rewards of trade less compelling and another felt that the Environmental Water Holder could come under pressure to sell off water in the event of a scarcity.

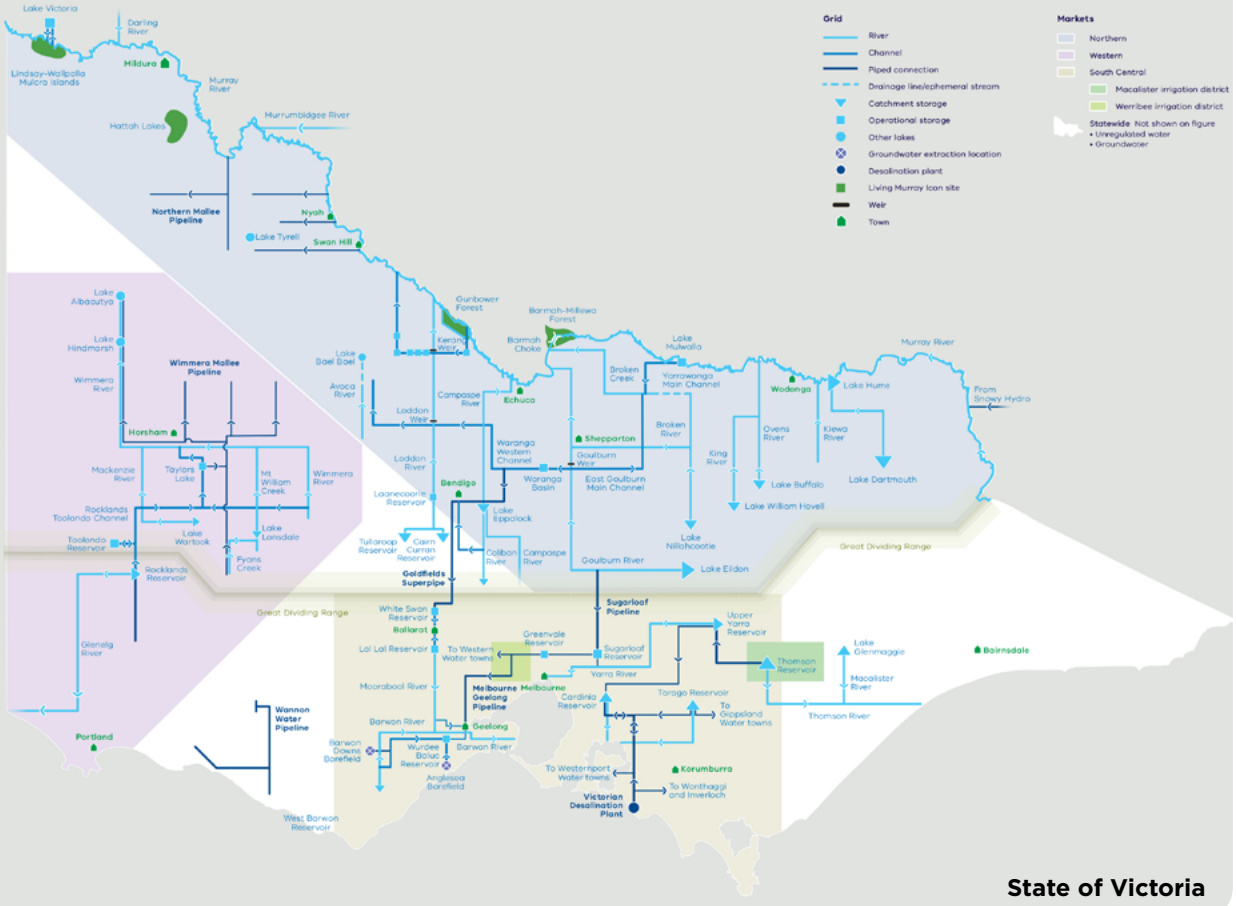
The Victorian Environmental Water Holder was set up in 2011 as an independent statutory body responsible for holding and managing Victoria's environmental water entitlements. It makes decisions on the best use of these holdings, including release, trade or carryover; and authorises catchment and waterway managers to implement these decisions.

DISCUSSION

While the drivers and barriers to water trading elicited from the literature and from interviewees are applicable to the Melbourne Region, their interactions need to be evaluated.

Figure 9.1

Victoria's water grid and markets A schematic



The current dearth of trades suggests that the barriers are stronger than the drivers during times when water is not in short supply. The requirement of Ministerial approval for trades constitutes a significant administrative burden while individual water authorities with entitlements to the Melbourne system are likely to maintain their default positions in the absence of clear supply security criteria. The lack of antecedent trades also makes it difficult to adopt price positions. This unfortunate situation may not change in the event of a drought due to the fact that any climate-related water scarcity is likely to be experienced concurrently by all potential traders in the southern market.

In fact, the barriers may become even stronger because public perception would be adverse to any sale that could place customers at risk of restrictions while delivering them no immediate financial benefit. As there is a strong case for uniform water restrictions over the whole of Melbourne whenever they are imposed, any water trading that results in substantial supply imbalances amongst the three retailers is likely to require artificial corrective measures.

A situation could arise in the future whereby differential population growth results in some urban water authorities having excess entitlements while, simultaneously, others suffer shortfalls.

In those types of circumstances, trades that occur are likely to be once-off rather than ongoing, which means that the result would merely tweak at the margins prior to the next major supply augmentation for Melbourne.

This issue arises because the Melbourne system is really an integrated system that has been artificially divided in terms of jurisdiction. It therefore makes sense for the relevant water authorities to undertake joint planning in order to determine the feasibility of a centralised supply augmentation.

Such an undertaking requires transparency while water trading presumes a minimal level of disclosure. This is a contradiction that may be difficult to resolve. Trading between metropolitan and rural water authorities is currently prohibited by the Government except for Metropolitan authorities selling their entitlements into areas north of the Great Dividing Range.

A relaxation of the regulations to allow purchases that enable the reverse transfer of water would enhance the market but the social and political barriers appear to be insurmountable for the time being.

The strength and vigour of the water trading market in northern Victoria rests largely on the differential needs of rural irrigators at any one time and their ability to be flexible. In some years, it could be more profitable for farmers to sell their allocations rather than engage in production.

The southern market is composed largely of urban water authorities that have neither heterogeneity nor flexibility within a shared climatic regime. In times of water surplus, no authority wants to buy; in times of shortage, no authority wants to sell. Hence, it is difficult to expect the development of a dynamic market. However, the likelihood of an effective market may be enhanced by the removable of administrative barriers, the development of clear trading rules and the adoption of firm security criteria governing supply. Against all this, it would be advisable to gauge community expectations.

A WAY FORWARD

In order to address any vulnerabilities in the current water trading setup, including the relevant rules and legislation in Southern Victoria, it will be worthwhile to engage with the relevant stakeholders through trial by simulation. One possible approach involves gaming, a learning by doing experimental simulation that involves people acting in roles within an appropriate representation of reality, in this case the Southern Victoria Water Market.

The most sophisticated simulation involves agent-based modelling, a methodology using computer software to explore the interplay of the relevant factors in a complex, adaptive and dynamic system.

It attempts to represent human as well as organisational decision making by applying more behavioural science, game theory and empirical behavioural data to the decision making of agents and generates possible futures resulting from the interplay of these decisions. In the context of water trading, the actors would be the buyers and sellers, such as water companies and the Environmental Water Holder, water users and Government regulators.

The actors would respond to a set of conditions like trading rules, infrastructure, growth rates, the weather and Government policy. The decisions made by actors may either be automated based on rules, or made manually by humans in a participatory setting. The results of simulation would include the financial positions and water holdings of the actors over the period of simulation.

The simulation process allows for exploring what-if scenarios, such as how the market and the system respond to shocks, including severe damage to catchments due to bushfire or extended drought situations. The aggregated outcome of numerous simulations will help initiate the conversation on how best to set up the market.

We believe that water trading ultimately impacts on customers of water companies, especially in relation to balancing supply security against costs, recognising that there are trade-offs and interaction effects when trying to achieve the two goals. For example, higher supply security is likely to incur higher cost for customers and vice-versa.

This may occur in the event that a water company sells off some of its water holdings and passes the financial benefit to its customers; but may eventually result in a need to introduce water restrictions or purchase expensive water from the local desalination plant when, for unexpected reasons, demand outstrips supply over a longer period of time.

Hence it is advisable for water companies to canvass the views of their customers in regard to their willingness to pay, appetite for risk and willingness to accept water restrictions in terms of severity, frequency and duration. Therefore customer consultation is a valuable input to the development of water trading policies and strategies.

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His current research includes developing scenarios for the future of cities in Australia, as well developing Agent-Based Modelling for behavioural economics to understand the uptake of new technologies in the water and energy sectors.

Magnus research also includes failure prediction models for pipelines, as well as extensive research into various aspects of sustainable urban water management, such as rainwater harvesting.

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