

Investigation into the impacts of pricing on recycled water uptake

Findings summary



Is price a barrier to increased uptake of recycled water?

Greater use of recycled water can help substitute our precious drinking water supplies, defer water supply augmentations and help return water to the environment and Traditional Owners. However, recycled water use in Victoria has not increased significantly over the past decade.

There are various reasons why we aren't seeing an increasing trend in recycled water use in Victoria. Recycled water pricing is often suggested as a potential barrier, alongside other regulatory and economic barriers. In other words, there is a common assumption that customers would buy and use more recycled water if its price was lower.

The Department of Environment, Land, Water and Planning commissioned a project in 2019 to investigate the role of recycled water pricing and its effect on the uptake of recycled water. The project sought input from water recycling experts in Victoria's metropolitan and regional urban water corporations. This fact sheet presents a summary of the key findings.

An evidence-based approach

To better understand the underlying issues and barriers to increasing recycled water uptake and the role that

price might play in this, ten recycling projects across Victoria were selected as case studies.

A diverse range of projects was selected to reflect the various recycled water initiatives implemented over the past decade. The case studies illustrate the types of issues water corporations face when developing recycled water schemes, examples of where recycled water schemes were considered successful, or where lessons could be learnt and the impact of pricing on the reported levels of uptake from these schemes.

A brief description of each of the ten case studies is presented in the following table.

Case Study	Brief Description
1. Goulburn Valley Water - Irrigation	Recycled water, mostly class C ¹ , used in large irrigation district with active water market
2. North East Water (NEW) – Return flow rights	NEW discharges treated water to river, in return for a 'credit' on its water entitlement, meaning it can take additional river water to reflect the discharged volume
3. Coliban Water – Epsom treatment plant	Multiple classes ¹ of water produced for multiple uses including residential, industrial and public space irrigation

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¹ Victoria's Environment Protection Authority (EPA) designates three classes¹ of recycled water quality, which align with certain allowable uses for the water.

Class A is the most highly treated, followed by Class B and Class C. More information can be found in [EPA guidance](#).

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4. Western Water – Western irrigation Network	New irrigated agricultural area using Class C recycled water from urban growth areas
5. South East Water – Boneo irrigation	Peri-urban irrigation scheme to supply market gardens
6. Barwon Water – Northern Water Plant	Recycling plant producing Class A water for industry
7. City West Water – Altona Treatment Plant	Upgraded plant for potable substitution to industry and public open spaces
8. Yarra Valley Water – Northern Growth Corridor	Class A recycled water provided for dual residential supply (purple pipe) in Melbourne’s northern growth corridor
9. Melbourne Water – Beneficial use	Treated water generating beneficial environmental outcomes in internationally significant wetland
10. Lower Murray Water – Auction	Auction of recycled water rights in large irrigated agricultural region with active water market

The investigation considered the financial and economic status of each case study and whether price was a major factor limiting greater uptake of recycled water.

Key ‘success factors’ for recycled water schemes

The case studies highlight the conditions that underpin the long-term viability of recycled water schemes. These are summarised in Figure 1.

Generally, it was found that recycled water schemes were more likely to be economically viable and considered successful where:

- other water sources are scarce,
- supplying recycled water customers with safe and suitable (fit for purpose) water is cheaper than treating wastewater to meet the standards set by EPA for discharging treated wastewater to the environment, including waterways or the bay,
- there is demand close to the treatment plant, and/or
- recycling water to meet non-drinking water demands is a cheaper than augmenting drinking water supplies to supply these demands.

These four factors are explored in more detail below.

Scarcity

Where water supplies are limited, there is generally stronger interest in reliable, fit-for-purpose recycled water.

Based on the case studies, projects responding to water scarcity (such as during the Millennium Drought) have typically focussed on providing Class A recycled water (i.e. the highest designated recycled water quality) to supply public open space, market gardens, industry and new residential developments for toilets and gardens (‘purple pipe schemes’). These provide a climate resilient source of supply which can be particularly valuable when more rainfall-dependent sources are limited during dry periods.

These projects tend to be costly because of the high level of treatment required and the need to duplicate delivery and domestic plumbing networks. However, in locations where there is increased demand and competition for water, higher customer willingness to pay for recycled water can make these more viable. This situation is likely to increase under an expected drying climate and with growing water demands.



Figure 1 The presence of one or more of these four success factors was shown to increase project viability.

Wastewater disposal costs

Some recycled water schemes are developed mainly to comply with the EPA waste hierarchy (Section 18, *Environment Protection Act 2017*), and the requirement to minimise wastewater discharges to manage risks to waterways or marine environments. In some locations, it is more cost effective for the water corporation to recycle water for safe and suitable use nearby (for example, by irrigating land) than it is to treat the water to the higher quality needed for discharging to a waterway.

The costs of treating sewage to meet required discharge standards can be recovered from urban customers

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under their sewage charges. At some treatment plants, this cost recovery covers most or all of the costs of treatment required to produce a 'fit-for-purpose' recycled water product for a recycled water customer, and thereby contributes to the scheme's viability.

Nearby demand

Where there is demonstrated demand for recycled water close to the treatment plant, the high costs of distribution infrastructure can be reduced or avoided. This most often occurs for agricultural use in regional or peri-urban areas, and also large industry in urban areas. Due to the proximity a lower price can be charged for this recycled water, making it attractive to the user if it is competitive with the price of other water sources, such as river water or groundwater. The challenge with irrigation is that it is a seasonal activity and irrigation demand varies from year to year, so other disposal or storage options are typically required during wet seasons and years when demand for this recycled water is lower.

Avoided augmentation

In some cases, recycled water use can delay or avoid the need for augmentation of either a wastewater system which is nearing capacity, or the drinking water supply system. Where these avoided augmentation costs can be incorporated into the business case for recycled water projects, they can increase the project's viability significantly by allowing project costs to be shared amongst broader water customers rather than only the recycled water customers.

Where one or more of these four success factors is present, the scheme either has lower costs, can share the cost amongst a broader customer base, or can viably charge higher prices to recycled water customers. This is important because the economic regulation of water corporations by the Essential Services Commission requires recycled water prices to cover the full cost of providing the service (with some caveats).

Is pricing a barrier to uptake?

The cost of treating wastewater for recycling significantly increases as it is treated to a higher quality (Figure 2).

For rural or peri-urban recycled water schemes, price is typically negotiated for each individual user, and is limited by what the customers are willing to pay. In places where there are other relatively cheap sources of water available, willingness to pay for high quality recycled water is often below the price required for cost

recovery, thereby reducing the financial viability of projects.

In some cases, the prohibitive cost of treating recycled water to a high quality means that farmers need to mix brackish or saline recycled water with other sources such as river water. This limits the volume of recycled water used.

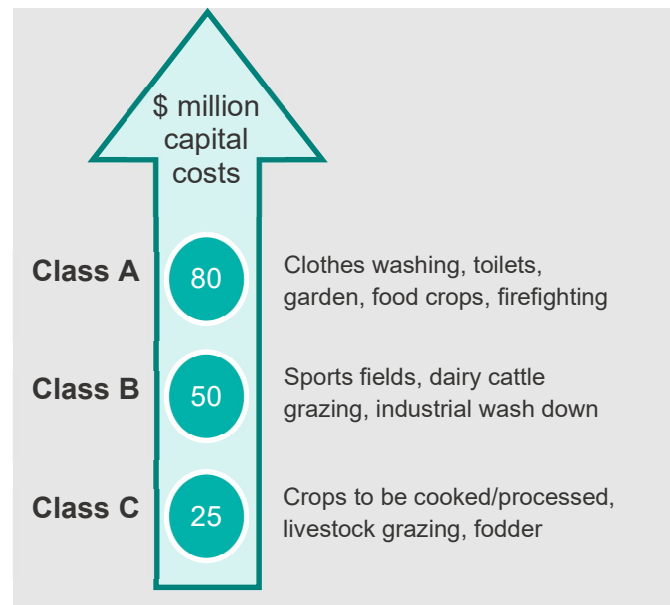


Figure 2 Indicative capital costs of treatment plants (excluding delivery infrastructure, land acquisition, operation and maintenance costs).²

Price-setting for urban Class A purple pipe schemes also needs to have regard to customers' willingness to pay, which is typically below the price of drinking water. However, with urban schemes there is often scope to discount the water to encourage uptake and still recover costs, as the costs can be spread thinly across a wide customer base. This study found that prices for Class A recycled water are typically in the order of 70-80% of drinking water prices.

Evidence suggests that these discounts do not drive a strong increase in the volumes of recycled water used, for two reasons:

- household water demand has been shown to be relatively price inelastic – meaning that customers do not choose to use significantly more recycled water in households as price decreases; and
- residential water demand for the permitted recycled water uses (for example, toilet flushing, laundry use and garden watering) is relatively low, and has

² This indicative costing is based on a standard example situation of a regional plant treating 10 ML/day of wastewater.

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decreased further over recent years reflecting the shift to water-efficient appliances, decreasing garden sizes and the use of rainwater tanks for similar demands.

Merits of current approach

The study found that the water corporations' current investment approach for recycled water has significant merit and allows viable recycled water projects to be identified and progressed.

Water corporations prepare business cases to assess potential investments as part of their normal business processes, and recycled water schemes are considered alongside all other projects competing for financial resources. If the scheme is not financially viable for the water corporation, but the public benefits (e.g. to communities or the environment) outweigh the costs, government funding (if available) can enable the scheme to proceed.

The study acknowledged that water corporations face ongoing pressures to be financially efficient and avoid water bill increases.

The main barrier, in a framework that requires financial efficiency of water corporations, is the high cost to construct and run schemes to treat and distribute recycled water, insufficient willingness to pay by customers of rural schemes and the low volumes demanded of urban schemes.

Conclusion

The investigation of case studies and interviews with water corporations has shown that price is only one factor in determining the success of recycled water

schemes. The main barrier to further recycled water uptake in rural schemes is the high cost of schemes to sufficiently treat and distribute recycled water relative to the cost of river or groundwater sources (and hence relative to customer willingness to pay).

In the case of residential purple pipe Class A schemes, the uses for this water are limited to toilet flushing, garden watering and laundry use, which are relatively price inelastic. It is not evident that the demand for household recycled water would increase if the recycled water price was further reduced.

How has this study informed policy thinking?

The investigation highlighted the varied experiences and common challenges associated with identifying recycled water projects that stack up financially and economically.

This project has reinforced a need to further support scheme proponents to develop economically viable business cases based on robust quantification of economic, social, cultural and environmental benefits to the broader community, where possible. The Victorian Government is working to enable this through a number of current projects and programs, including for example:

- supporting collaborative Integrated Water Management Forums, which enable sharing of resources and information and co-investment in projects; and
- working with the planning portfolio to protect strategic agricultural land around Melbourne's fringes, which allows recycled water scheme proponents in these areas to make confident demand forecasts.

This investigation is one of several projects in an evidence-based approach to inform policy that enables greater recycled water use to support water security, cultural and environmental benefit. Policy options will continue to be tested with industry stakeholders and the community.

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