

Much of the increased demand for water will come from industry, so it's best to take steps early to manage it.

Tan-Soo Jie-Sheng

The recent announcement that Singapore will build its sixth desalination plant is another reminder of how seriously the country treats water security. It is also a timely moment to confront a harder truth that often sits just beneath such announcements: the more resilient our water system becomes, the more it will cost to operate and sustain.

Singapore's water story is often told as a triumph of engineering and long-term planning. We have diversified our sources, invested in advanced treatment technologies, and built institutions that treat water security as a matter of national survival, thereby turning a vulnerability into a strength.

But as climate uncertainty deepens and demand rises, resilience will not come cheap. The real question facing Singapore is not whether these costs can be avoided, but whether the country prepares for them early, fairly, and transparently, or puts off adjustment until it becomes disruptive and far more expensive.

Singapore's ability to secure water increasingly depends on sources that are more energy- and capital-intensive. As rainfall becomes more variable, reliance on predictable "natural" supply becomes riskier. Technologies that provide reliability – wastewater treatment and desalination – carry higher operating costs as they are energy-intensive.

The sixth desalination plant fits squarely into this reality. It strengthens water security, but it also raises the system's underlying cost base. Over time, this creates a rising cost curve: the more resilience Singapore builds, the higher the marginal cost of securing the next unit of supply.

This dynamic is unavoidable. Much like insurance, robust protection costs more as risks become more frequent and severe. If Singapore wants water that remains secure through droughts, geopolitical uncertainty and climate volatility, the long-term price of that resilience will rise. Acknowledging this early allows society to adjust gradually rather than under pressure.

MANAGING THE DEMAND

Public discussion often focuses on how Singapore expands its water supply. But demand management deserves equal attention, particularly as future growth in water use will be driven less by households and more by



If industrial demand drives future growth in water usage, the centre of gravity in conservation efforts must shift accordingly. A strategy that leans mainly on household restraint will not match the scale of the challenge – and will also raise questions of fairness. ST PHOTO: LIM YAOHUI

Preparing for a future where water costs more

industry.

Singapore's total water demand is projected to almost double by 2065, with the industries accounting for more than 60 per cent of demand, up from about 55 per cent today. This is the result of deliberate economic choices, as key growth sectors – data centres, semiconductors, and biomedical and pharmaceutical manufacturing – are highly

Singapore's total water demand is projected to almost double by 2065, with the industries accounting for more than 60 per cent of demand, up from about 55 per cent today.

water-intensive.

Continued expansion will force water demand management to move from basic compliance to a core strategic concern that is actively managed, alongside land, labour and energy.

While households still matter, they cannot carry the burden of demand management alone. Per capita household water consumption fell to 142 litres per person per day in 2024, down from 149 litres in 2022, yet remains some distance from the 2030 target of 130 litres. Crucially, further progress will be slower and harder, as the easiest behavioural changes have already been made.

In contrast, if industrial demand drives future growth in water usage, the centre of gravity in conservation efforts must shift accordingly. A strategy that leans mainly on household restraint will not match the scale of the challenge – and will also raise questions of fairness.

Singapore already right-prices water more seriously than many cities. The principle is sound: water is scarce; prices should reflect the full cost of supply; and price signals should encourage

conservation.

Yet even well-designed pricing has its limits. For households, water bills still make up a relatively small share of total expenditure, dulling the behavioural impact of incremental increases. For large firms, water costs are often overshadowed by the cost of land, labour and energy. In both cases, price signals alone may be insufficient to drive deeper structural change – such as retrofitting facilities, redesigning production processes, or investing in large-scale recycling and reuse.

That is why resilience requires more than tariffs. Conservation must become the default behaviour, embedded in standards, fixtures and building design. For industry, water efficiency needs to be treated as a core competitiveness metric rather than a sustainability footnote, reflecting where the largest and most durable gains can be made.

INDUSTRIAL WATER CREDITS AS THE NEXT FRONTIER

This is where Singapore can be more ambitious. President

Tharman Shanmugaratnam has spoken internationally about the potential of water credits to mobilise financing and reward improvements in water usage efficiency.

At their core, industrial water credits should be grounded in measurable performance. For instance, sector-specific benchmarks could be set for water intensity, recycling, or

The next chapter of Singapore's water story must therefore be explicit about the role of industry – what is expected, how performance is measured, and how the burden is shared.

reuse. Firms that outperform these pathways – through process redesign, closed-loop systems, use of non-potable water, or technological upgrades – would earn credits based on verified reductions in water use or improvements in water outcomes. Firms that fall behind would face rising costs, whether through tighter standards, higher tariffs, or the need to acquire credits.

At the same time, credits could also serve a broader function by directing private capital towards water-saving or water-augmenting investments that strengthen the overall system. These might include large-scale reuse infrastructure, reductions in system losses, or projects that free up potable water for higher-value uses. In this sense, water credits would not simply reward efficiency within a business, but help finance resilience across the wider water system.

The objective is not trading for its own sake. It is to sharpen incentives, accelerate investment and make persistent inefficiency increasingly costly – while preserving flexibility in how firms respond. Singapore's strong institutions, reliable data systems and existing sectoral standards make such an approach credible in a way that few cities can replicate.

Limiting water credits to industry also makes practical and political sense. Industrial water use is large, measurable and concentrated – and this is where future demand growth will come from. Households can continue to be guided by clear targets, efficient design standards and fair pricing, without being drawn into complex trading schemes.

This would build naturally on recent policy moves. Since January 2024, new large water users in selected water-intensive sectors are required to meet mandatory efficiency and recycling standards.

Water credits would represent a next step: moving beyond regulation alone towards a system that rewards leadership, penalises laggards, and aligns private incentives with long-term national water security.

LESSONS FROM ABROAD

Singapore would not be charting unknown territory.

In Israel, large-scale investment in desalination has been complemented by strict water pricing and extensive wastewater reuse, especially in agriculture and industry. By recycling the vast majority of its wastewater, Israel has effectively expanded usable water supply and reduced vulnerability to climate variability, treating water efficiency as a source of economic resilience rather than a binding constraint.

Melbourne's experience after the Millennium Drought underscores that water resilience is as much about expectations as infrastructure. By treating scarcity as a structural condition rather than a temporary shock, the city paired investment in

CONTINUED ON PAGE B2

Fairness matters because water resilience rests on public trust

FROM B1

desalination with sustained demand management through pricing, restrictions and public communication. Importantly, many conservation behaviours and institutional settings remained even after rainfall recovered. The lesson is clear: resilience is strongest when supply expansion does not dilute conservation norms, and when early adjustment is locked in

before crisis fades from public memory.

After its “Day Zero” crisis, Cape Town showed that water use can fall sharply when faced with imminent scarcity – but also demonstrated the high social and political costs of delaying adjustment until crisis hits.

The lesson across these cases is consistent: cities that manage water stress well pair long-term investment in supply resilience with sustained, credible demand

management. Delay makes adjustment sharper, costlier and harder to manage.

RECOGNISING REALITIES

Fairness matters because water resilience ultimately rests on public trust. If households are repeatedly reminded to conserve while industrial water demand grows quietly in the background, resentment will build and conservation norms will weaken.

The next chapter of Singapore’s water story must therefore be explicit about the role of industry – what is expected, how performance is measured, and how the burden is shared. A well-designed industrial water credits system would not replace pricing, regulation, or conservation campaigns, but could align them into a clearer national logic: water is scarce, resilience costs money, and those who use more must lead the way

in doing more with less.

Resilience in water is ultimately a social contract. It reflects a shared acceptance that water security requires sustained investment – and that the costs of that investment must be transparent and fairly distributed. Normalising the idea that water will become more expensive to secure is not a sign of failure. It is recognition that climate uncertainty is rising and that the technologies which keep our taps

running are costly to operate.

The choice facing Singapore is clear: thoughtful but costly preparation in water management now, or far more disruptive and ultimately costlier adjustment when scarcity forces our hand later.

• Dr Tan-Soo Jie-Sheng is director, Institute for Environment and Sustainability at National University of Singapore’s Lee Kuan Yew School of Public Policy.