

Reverse osmosis – tech favourite for the Middle East

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The Middle East is the most water-scarce region in the world. It is home to nearly 6% of the worldwide population but has only 2% of the water reserves. Nearly half of the world's desalination capacity is in the Middle East, with Saudi Arabia alone having an installed capacity of 9 million cubic meters per day.

Setate-owned offtakers have placed SWRO at the center of their near-term water procurement plans.

In our view, reverse osmosis is a proven technology at scale. SWRO has become the technology of choice for desalination, in part because it is relatively simple to operate. We consider an SWRO plant to be about as complex to operate as a simple gas power plant due to the simple processing systems and the replaceability of the membranes.

In addition, SWRO plants do not need to be built next to power generation plants. As SWRO plants become more common in the Middle East, we expect desalination assets will increasingly be decoupled from the power network. We view SWRO plants as the future of water desalination, not only in the Middle East, but also worldwide. In recent years, thermal desalination's share of capacity has started to fall.

SWRO plants have benefitted from the falling cost of membrane technology and from the downward trend in the cost of electricity in Saudi Arabia and the UAE, which now have the lowest cost of renewable electricity in the world. In recent tenders in Saudi Arabia and the UAE, we have seen water desalination prices fall dramatically, to below \$0.30 per cubic metre from nearly \$1.00 per cubic metre.

We view a plant's specific power consumption, which represents the conversion efficiency from sea water to potable water, as a key performance metric, similar to the heat rate factor in gas power plants. For offtakers, half of the water tariff is essentially the cost of the electricity used to desalinate the water. Therefore, a higher specific power consumption could weaken a plant's cash flows.

Several independent water providers (IWPs) are likely to refinance their existing debt in the capital markets by 2024. Although desalination plants are long-term projects, sponsors typically find it difficult to secure competitive long-term debt for water projects. Banks in the Middle East tend to increase capital requirements for long-term exposures. The mini-perm financing structure operates like a bridge to bond financing. Bond investors are thereby shielded from the construction risk, and although sponsors have an incentive to refinance their project debt a few years after commercial operations begin, IWPs avoid a hard obligation to refinance their debt.

Given the number of transactions that will start commercial operations within the next 2 years in Saudi Arabia and UAE, we expect a number of sponsors to bring bonds to market to refinance their initial mini-perm debt. This will diminish banks' exposure to this type of asset and create more liquidity for the upcoming SWRO pipeline.

SWRO can help meet the rising demand for fresh water, but the technology faces environmental challenges. Plant operators need to mitigate the harms by implementing appropriate measures. To ensure the brine does not damage the marine ecosystem, operators must run computer simulations to ensure water currents will spread the discharge across a wider area that isn't ecologically sensitive.



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