

Reputation management

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Desalting seawater to use as potable water is crucial for the Gulf region, where freshwater supplies are insufficient to meet steadily rising demand.

Continuing population growth makes it unlikely that this trend will abate. A recent report by the Organisation of Arab Petroleum Exporting Countries (OAPEC) predicts that the individual share of natural water in the 21 Arab League nations will decrease to 667 cubic meters by 2025, from 1,430 cubic meters in 1990.

“Due to such low supply and the rapid population growth, all GCC countries and Yemen are expected to suffer from heavy water supply shortages in the long term and this should prompt measures to cover the deficit, including massive investments in desalination projects in the region,” reads the report.

Saudi Arabia, which already accounts for 26 percent of global desalination activity, will remain the biggest spender. Over the next 17 years, the Kingdom will spend \$14 billion on 16 desalination facilities capable of producing 2.1 billion cubic meters of potable water per day.

The importance of desalination is clear, and companies have been flocking to the region for years, and will continue to do so. But in spite of being indispensable to the development of society and the economy, the industry has been stung by media criticism relating to its environmental performance.

Lisa Henthorne, senior vice president and chief technology officer at Water Standard and former director of the board at the International Desalination Association (IDA), is keen to put the records straight.

Key to this quest are facts supporting her arguments. “We are learning that we need to collect more data, so that we can better know what any potential impacts are,” she says. “Providing data has never really been a priority to anyone, in many cases the data is there, but its on the shelf in the back of someone’s office, and not compiled in a way that anyone is interested in seeing it.”

The data clearly shows that desalination plants in the Gulf are operating within their regulatory limits, says Henthorne: “The levels that were reported by the press last year are not in fact the accurate values of what the discharges are. The discharge levels we have, and of course do put brine concentration back into the sea, are meeting the regulatory requirements that exist in the Gulf.”

The practice of taking water out of a shallow sea basin such as the Arabian Gulf while feeding the salt back in was always likely to arouse environmental concerns. But there are other issues

that sit uneasily with those concerned with the Gulf's ecosystem. Amongst those are the levels of constituents discharged by desalination plants.

But there is no cause for alarm, says Henthorne: "The concerns around constituents like copper we are finding are just not there. We have made so much progress in the Gulf in how we build our plants and the materials we build them with that we find that we are doing an incredible job compared to what we did 20 years ago. The actual constituents that are going into the Gulf are very benign."

Efficient technology

Progress is not restricted to the construction of plants, it also manifests itself in the technologies applied. While the mainstay of desalination plants use multi-stage flash (MSF) distillation technology, other means of desalting are gaining ground. Reverse osmosis (RO) and multi-effect distillation are more energy efficient, according to Henthorne, thus reducing the carbon footprint.

"MSF is still over 80 percent of the capacity in the Gulf, but if you look at the last four years there is a shift for putting in more MED (multi-effect distillation) plants, for instance," she says. Even multi-stage flash distillation has been improved over time. "If built to a high performance ratio, that is the amount of water produced for the amount of steam, MSF plants are more energy efficient."

In the Middle East, power generation and desalination traditionally have been coupled in power and water cogeneration plants. Cogeneration plants are themselves energy efficient, as they harness the heat stemming from power generation to steam water for the desalination process. They do, however, necessitate thermal technologies such as MSF.

The rise in popularity of RO has led to reverse osmosis units being added to plants, says Henthorne. "Sometimes we are also adding an RO [unit to a cogeneration plant] as it gives the facility a little more flexibility, as well as making it more energy efficient."

Green power?

For all the talk of energy efficiency, the desalination still relies heavily on fossil fuels, a fact that besmirches its green credentials. And according to Henthorne, the use of alternative energies, and renewables in particular, is still some way off.

"There have been a number of small facilities built around the world using solar energy as the driving energy, but still really in a developmental stage," she says.

The real problem is not the technical feasibility, but the financial viability of using green power for desalination. "To be commercially competitive, we have a way to go. We can do it, no problem, but can we make solar energy as cheap as we can make fossil energy? No. We'll be coupling with solar energy as soon as its as cheap as fossil energy," Henthorne concludes.