

Case story | Mascara

Danfoss at the heart of new **ultra-efficient** RO plant that uses nothing but solar power, **without battery backup**

20%energy savings
compared to other
ERD and pump
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Mascara NT chose Danfoss pumps and ERDs to drive an RO plant whose only energy source is the sun. Specially developed for some of the world's most arid and isolated regions, the new OSMOSUN system is designed to produce water so efficiently that it does not need energy storage. By eliminating costly battery packs, Mascara NT's solar-powered plant radically reduces total lifecycle costs and enables clean water in locations completely off the grid.

The challenge: Produce an off-grid, solar-powered desalination plant so energy-efficient that it doesn't even need battery back-up

What do some of the world's most isolated RO plants have in common besides coastal locations? Electricity costs are high because they are far from main power grids and typically rely on diesel generators. Reliability is key, as getting maintenance knowhow and spare parts to remote locations is difficult and expensive. Installation budgets are tight, and total costs of ownership are carefully examined as well. And the sun shines a lot, but not constantly or at consistent intensity.

Therefore, Mascara NT set its sights on developing an off-grid RO plant that would be efficient enough to run on solar power only. What is more, it would have to operate even without battery back-up in order to save costs and maintenance problems.

To meet these complex challenges, Mascara NT needed to develop a new way of producing predictably high pressure with variable power input. They also had to find an extremely efficient high-pressure pump and ERD combination.

The solution: The patented new OSMOSUN plant equipped with Danfoss APP pump and iSave ERD

The development process that led to the new OSMOSUN plant's power management was so innovative that it led to several new patents for Mascara NT.

It also led company engineers to the market's most energy-efficient high-pressure pump in its class, the Danfoss APP 7.2, and the thoroughly simple design of the Danfoss iSave 21 ERD, which combines a 90% efficient isobaric pressure exchanger with a booster pump and electric motor.

OSMOSUN runs 100% on photovoltaic power – without any battery backup whatsoever.

The results: An extremely clean way to produce RO water – and a place in the Masdar Initiative’s select pilot program

With electricity accounting for about half of a typical plant’s total lifecycle costs – and practically all of its CO₂ footprint, the OSMOSUN plant was a perfect candidate for Abu Dhabi’s pioneering Masdar Initiative, whose objectives include research and development of energy-efficient, cost competitive desalination technologies based on renewable energy.

OSMOSUN will soon commence an 18-month pilot project in the UAE with a test plant that produces 30m³/day.

According to Mascara NT’s CEO, Marc Vergnet, the decision to make Danfoss pumps and ERDs the beating heart of the off-grid OSMOSUN was simple.

“The APP pumps and iSave ERDs were the obvious solutions for our pilot system,” he explains. “Not only do they comprise the most energy efficient pump/ERD combination on the market, they also rely on proven technology with an outstanding track record of reliability. We look forward to analyzing the pilot results closely, and to moving the OSMOSUN solution into larger-capacity plants for a thirsty world.”



About Mascara NT: Mascara NT is a French company created in 2014 to develop highly efficient RO plants with low lifecycle costs by Marc Vergnet, who has a long and successful background in renewable energy.

About the Masdar Initiative: Masdar is on a mission to advance the clean energy industry in Abu Dhabi and around the world, and is a catalyst for the economic diversification of the emirate.
<http://www.mascara-nt.fr/>

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