

Case story | TEMAK S.A.

TEMAK S.A. relies on **Danfoss** in **solar-powered seawater** reverse osmosis plant on remote Greek islet

**95%**cost savings on
fresh waterhpp.danfoss.com

People in remote island locations with no electricity face costly choices when looking for fresh water. They can ship water to fill local tanks, or they can ship diesel to drive electric generators for a Sea Water Reverse Osmosis (SWRO) plant. Both are expensive.

With recent improvements in photovoltaic cell technology, however, solar-powered SWRO plants in isolated places have moved from the realm of dreams into reality. TEMAK S.A. designed a fully autonomous solar-powered SWRO plant for a remote Greek islet that has run for four years without a hitch – and won the prestigious Mohammed Bin Rashid Al Maktoum Global Water Award along the way. The heart of the energy-friendly system? A Danfoss APP pump and APM energy recovery device.

The challenge: Design a fully autonomous SWRO plant that runs on solar power and requires minimal maintenance

Strongili is a small islet located in the eastern Aegean Sea. The Greek government had for years shipped fresh water there, as the islet is not served by electricity and a diesel generator combined with an SWRO plant would require frequent maintenance which would be challenging in an isolated location like this. The cost of the shipping was high (approximately EUR 20/m³), so as photovoltaic cells became better and cheaper, the idea of a solar-powered 20 m³/day SWRO plant became feasible.

Energy efficiency was a key criterion and so were reliability and portability. The plant would have to run in a harsh environment for most of the year without any regular maintenance and as the islet lacks basic infrastructure (i.e. ports, roads etc.) containerized plants were a no-go. Everything would have to be carried ashore by hand, then hauled to the site.

The solution: Energy efficient Danfoss APP pump and APM ERD

TEMAK S.A. was familiar with Danfoss's APP energy-friendly technology and quickly short-listed the APP 3.5/APM 2.5 model to provide the pressure. "We knew from other installations that APP pumps are among the most energy-efficient available" says sales engineer Erika Ntavou, "but it was also critical that the pump is so robust that it could run with long service intervals due to lack of permanent residents, so reliability and simple service routines were essential. Component size and flexibility also were important factors. The APP has a much smaller footprint and weight than plunger pumps with similar capacity, so this is a definite advantage, as we couldn't just lift a container from the ship to a truck and drive it to the site".

TEMAK then chose the highly efficient APM ERD to complement the pump and reduce energy consumption by 42%.

The results: Four years of problem-free operation – and a prestigious award

TEMAK S.A. built the autonomous SWRO plant in its production facilities in 2012, then disassembled it and shipped all components to Stronglli where it was rebuilt and went online in 2013.

Since then, it has run for approximately five hours per day (or over 6000 hours) without any pump maintenance whatsoever. As the produced water costs less than 5% of the shipped water, payback for the plant is expected to be complete in five years.

The fact that a permanent solution for fresh water supply was offered to the islet has been the most important reward for TEMAK S.A. However, the company also received international

recognition when the application won the Mohammed Bin Rashid Al Maktoum Global Water Award for innovative small-scale projects among 137 applicants from 43 countries worldwide in April 2017.

“Our mission for over 40 years has been to develop and apply technologies for low-cost production of fresh, potable water from sea or high salinity ground water, accessible for all people. This award makes us proud and creates a strong commitment for us to keep on working with greater passion and enthusiasm, to offer the precious fresh potable water to even more people with the lowest possible cost,” comments TEMAK S.A. President Mr. Irodis G. Mitsopoulos.



Solar-powered SWRO plant located on Stronglli



The SWRO system with a Danfoss APP 3.5 pump and APM 2.5 ERD

About TEMAK:

TEMAK S.A. is a Greek company with over 40 years of water treatment experience. A market leader in Greece with considerable international expertise, TEMAK S.A. develops, designs and manufactures a broad range of water treatment systems using filtration, ultra-filtration, reverse osmosis, softening, deionization and other technologies. TEMAK S.A. has installed hundreds of systems for sea or brackish water treatment in Greece and abroad in the industrial, hospitality, municipal, hospital, marine and residential sectors.

Visit www.temak.gr

Danfoss A/S High Pressure Pumps . Nordborgvej 81 . DK-6430 Nordborg, Denmark

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without consequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.