ENGINEERING TOMORROW

Case story | VACON® 100 X

Bringing **clean drinking water** to rural Kenya with **100% renewable resources**

The situation

Nestled just east of Nairobi is Kitui, the capital city of Kitui County in Africa. The drought-stricken region faces regularly high temperatures—and the Kitui community, like many others, lacks clean drinking water and the infrastructure to support it. That is, until Finland-based Solar Water Solutions, a frontrunner in renewable-powered water desalination technology, brought their proprietary modular reverse osmosis system to them.

The desalination system in Kitui—a pilot project laying the foundation for 200 more to be installed across Kenya in 2023—gives the community affordable, clean, and sustainable drinking and irrigation water based entirely on solar power.

Discover how the Danfoss VACON® 100 X drives, Danfoss APP pumps, and DrivePro® Remote Monitoring system power Solar Water Solutions' innovative technology.

The challenge

Kitui, a rural town without a municipal water or electrical supply infrastructure, cannot support traditional water treatment systems—or on-site control and monitoring. Plus, water temperature, salt, and other solvents fluctuate and affect a treatment system's pressure—demanding constant adjustment for optimal performance.

Solar Water Solutions (SWS) identified the opportunity to leverage their 100% solar-powered SolarRO desalination solution in Kitui—and all across Kenya by taking action together with water infrastructure investor Climate Fund Managers. To achieve this goal, however, they needed the right technology backed by a collaborative partnership.

The solution

- The containerized and decentralized SolarRO water purification units from SWS operate in remote locations based on 100% off-grid renewable energy. Using reverse osmosis (RO)—the most efficient and reliable desalination process—SWS' ANVS® system maintains consistent pressure with the lowest energy consumption.
- SWS has long used the Danfoss APP high-pressure pumps that enable the SolarRO system to run at varying speeds with high accuracy. For Kitui, SWS and Danfoss co-developed a new electrical infrastructure using the VACON® 100 X drives with Solar Pump application as the driving force behind the system.
- With the tailor-made and cloud-based Danfoss DrivePro® Remote Monitoring solution—SWS specialists can adjust system parameters while preventing and resolving issues quickly and remotely.

The outcome

The SolarRO desalination system provides Kitui with a sustainable and reliable clean water supply, delivering 1,200 liters/hour of affordable drinking water. Plus, the newly adapted system featuring VACON® 100 X drives, Danfoss APP pumps, and DrivePro® Remote Monitoring, takes brackish water desalination technology and performance to a completely new level. Plus, together with Danfoss, SWS has started a research and development project focused on maximizing the water production efficiency of the reverse osmosis process.

Based on the success in Kitui, Solar Water Solutions, together with its partners, plans to install an additional 200 desalination units in Kenya—which will ultimately provide drinking water for approximately 400,000 citizens in 2023.

"The ease and reliability of controlling the RO process with VACON® drives, Danfoss APP pumps, and DrivePro® Remote Monitoring together with our ANVS® technology is a perfect match for off-grid desalination."

Tommi Kari, Head of Engineering
at Solar Water Solutions

SOLAR WATER SOLUTIONS

AE428735720760en-000101