

## What is a Solar Powered Reverse Osmosis?

Reverse Osmosis (RO) is a water purification process that filters out unwanted molecules and particles such as chlorine, salt, dirt or microorganisms. The technology uses a partially permeable membrane and applied pressure to purify water. Energy is needed to operate the system, mainly to power the different pumps and electronics. Conventional systems that operate off the grid, need a diesel generator to power the RO, causing high CO<sub>2</sub>-emissions, noise and operating costs. In Solar Powered Reverse Osmosis, the energy is generated by solar panels – a clean alternative to diesel.

## What are the main features?

Water from the sea, brackish water or groundwater with high salinity cannot be used directly for agriculture or human consumption due to their high content of minerals. Other water sources, such as rivers or lakes might be polluted and unsafe to use. RO can purify water from such sources and bring the quality up to drinking water standards recommended by the World Health Organization. The system installed in Northern Kenya can produce up to 20 m<sup>3</sup> of clean water per day, consuming 1.5 kWh per m<sup>3</sup>. The energy is provided by 32 panels (7.4 kW<sub>p</sub>).

## What are common uses?

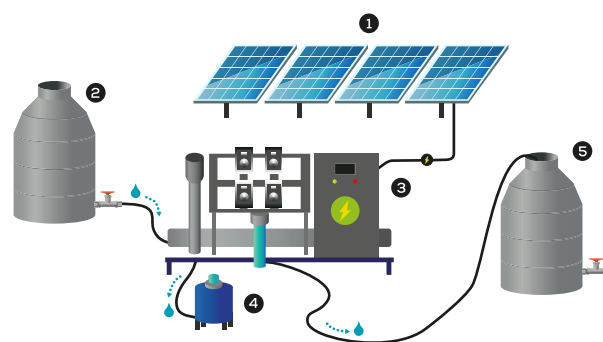
Beside treating water for human consumption, RO can be used for agricultural purposes. This includes production of fresh water for irrigation in highly efficient farming systems or the use of cleaned water for the production of ice, that can be used for the cooling of agricultural products.

## Market Development

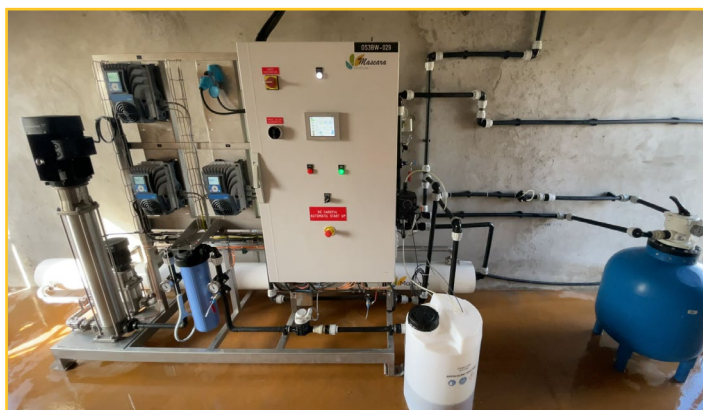
The Solar Powered Reverse Osmosis Technology is technically proven, reliable and suitable especially for remote off-grid areas that only have water of minor quality. There are several established manufacturer on the market, while a number of startups are also pushing to it. Solar Powered Reverse Osmosis Systems are adapted to different types of raw water and amount of daily treated water.

## Project overview

**Partner:** Turkana Basin Institute (TBI)  
**Type:** Grant Agreement  
**Focus:** Piloting of innovative water technologies and supporting local entrepreneurship  
**Duration:** 10.2020-12.2022  
**Country:** Kenya



- 1 Solar generator
- 2 Raw water
- 3 Reverse Osmosis System
- 4 Concentrate
- 5 Fresh water



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