



Brackish water off-grid desalination systems for developing countries

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The REvived water project aims to contribute to overcoming the drinking water challenge through desalination technology. The goal is to produce safe and affordable drinking water with a significantly reduced energy consumption compared to the current state-of-the-art technology. The overall project comprises several systems and applications with twelve pilots in total, ranging from Electrodialysis (ED) small systems for brackish water desalination to larger scale hybrid (RED/ED-RO) systems for sea water desalination.

Specific attention is devoted to develop energy efficient and robust brackish water desalination systems for application in developing countries.

To reduce the energy consumption of the desalination process, several design parameters have been optimized, e.g., membranes and spacers characteristics, stack configurations, flow path length. To assure the system robustness, several concepts have been investigated, including pre-treatment options, capacitive electrodes, one pass flow as well as gravity driven flow. Intensive modelling and experimental validation are being carried out for the process and system design.

The first brackish water desalination results demonstrate that up to a conductivity of $\sim 4.000 \mu\text{S}/\text{cm}$ the project energy consumption target of $0.4 \text{ kWh}/\text{m}^3$ can be achieved.



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Impact of module size on solar powered membrane filtration (UF-NF/RO)

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Integration of solar photovoltaic (PV) systems and membrane filtration technologies, namely nanofiltration (NF) and reverse osmosis (RO), has been suggested as a sustainable solution to provide drinking water to the remote locations where natural freshwater resources are scarce