

Technology Overview

RENEWABLE ENERGY IN WATER MANAGEMENT

Growing demand for potable water and limited availability of fresh water reserves in the Kingdom emphasizes a strong need to implement renewable energy in water management, especially for desalination systems.



RENEWABLE DESALINATION THROUGH SOLAR THERMAL, SOLAR PV AND WIND ENERGY TECHNOLOGIES

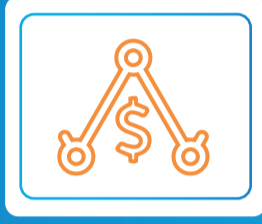


RENEWABLE ENERGY IN WATER TREATMENT AND WASTE WATER RECYCLING

Renewable Powered Desalination: The water demand in Saudi Arabia is expected to increase steadily due to population growth, rapid industrialization, and agricultural and commercial development. Energy accounts for about 50% of the total cost of potable water. Use of solar PV, solar heat or wind offers great cost reduction by reducing the amount of diesel currently being used for production of desalinated water.

Renewable Energy in Water Treatment: Traditional water treatment processes can be intensive, in terms of energy and chemical use. Renewable energy based water treatment systems have the potential to lower costs, increase efficiencies, and reduce environmental impacts.

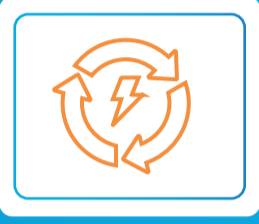
THE BENEFITS



Reducing fossil fuel consumption and energy related operational expenditures



Ensuring energy sustainability of water and waste water treatment



Increase efficiencies



Reduce environmental impact

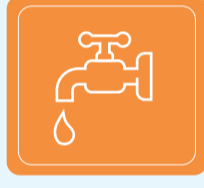


Improving financial viability of off grid/distributed scale desalination plants

WHAT IS DRIVING ADOPTION?



Declining costs for solar panels and other renewable energy technologies



Growing demand for potable water



Need for decentralized water production and treatment



Need to reduce operational expenditures associated with water production and waste water treatment

PATENT AND INNOVATION TRENDS – KEY AREAS OF RESEARCH

Some of the important areas of patent filing include:



Solar energy for desalination using distillation or evaporation methods



Solar thermal or PV powered desalination



Optothermal distillation membrane for solar desalination



Hydro-Thermal Exchange Units (HTEUs) for desalinating saline feed water

PROMINENT COUNTRIES/ TECHNOLOGY PROVIDERS



KEY APPLICATION AREAS



Utility scale desalination plants



Packaged modular units for off grid settlements



Centralised installations for residential or commercial consumers

OPPORTUNITIES FOR KSA LOCALIZATION

Manufacturing of the following technology components:



Heat Exchangers



Piping, spiral tubes and coil



Storage tanks



Aluminium support structures



Valves, flanges and fittings



Pumps and pumping systems

CHALLENGES TO SCALING IN KSA

1

Technical and financial risks associated with innovative renewable based desalination technologies

2

Competition from proven effective technologies such as thermal desalination using fossil fuels

3

High initial investment (CAPEX) requirements

4

Absence of policy and regulation mandating efficient operation of water and waste water treatment processes