

# Innovative solar thermal-driven desalination systems based on solar micro gas turbines: SOLMIDIFF project

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### Solar Micro Gas Turbine (MGT):

Legend: South Africa (blue), Morocco (yellow), China (red)

Legend for configurations:  
 SR-1.- Simple Recuperated  
 SR-2.- Simple Recuperated  
 SR-1.- InterCooled Recuperated  
 SR-2.- InterCooled and Reheated Recuperated

### PROJECT CONCEPT:

**Water treatments driven by solar MGTs:**

Electric input, 10-30 kW<sub>e</sub>  
 Seawater/brackish water  
 Treated wastewater  
 Industrial effluents  
 Heat input, 35-90 kW<sub>th</sub>  
 Air T= 250-300°C

Desalination/Conventional water treatments → ZLD

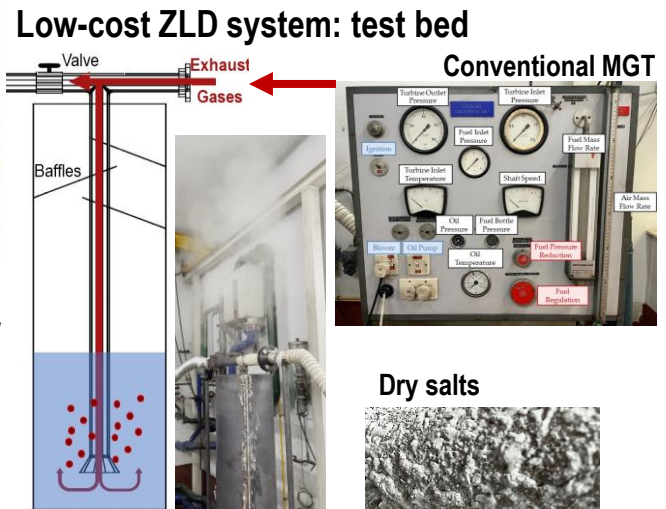
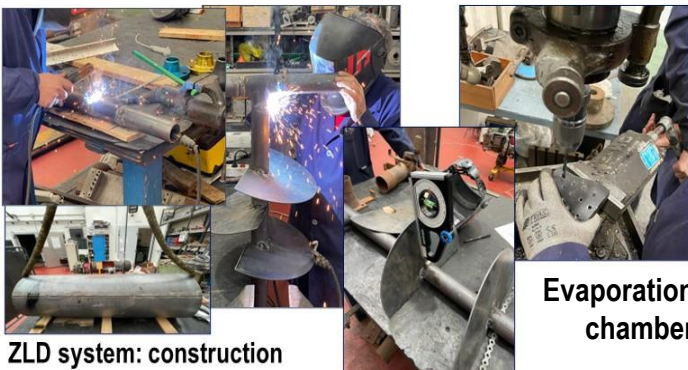
Generation of Water resources:  
 Human consumption  
 Irrigation  
 Industrial uses  
 Close to ambient T  
 Solid wastes/subproducts

**SMGTs:**

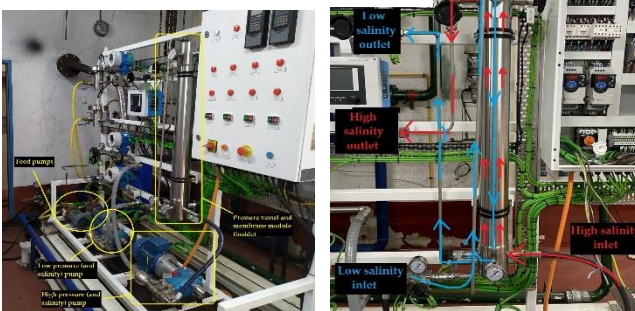
- Novel prototype assessed
- Unit output 10-30 kW<sub>e</sub> and possible coupling in parallel
- Operation with biofuels by installing a combustion chamber

## OBJECTIVES FOCUSED ON VARIABLE SOLAR INPUT:

- Conceptual development of a solar Micro Gas Turbine with optimised-design.
- Experimental development of water processes (desalination/Zero Liquid Discharge, ZLD)



## Counter-current flow RO



## ONGOING WORKS:

- Recuperation chamber development
- ZLD system: final design and scaling-up
- Optimised Reverse Osmosis (RO) process

<https://institucional.us.es/solmidiff>