The Partners

Kelvion Holding GmbH
Germany
www.kelvion.com

ENEXIO Management GmbH
Germany
www.enexio.com

Kelvion Thermal Solutions (Pty) Ltd.
South Africa
www.kelvion.com

Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., Fraunhofer Institute for Solar Energy Systems ISE
Germany
www.ise.fraunhofer.de

Sapienza - Università di Roma
Italy
www.uniroma1.it

ECILIMP TERMOSOLAR S.L.
Spain
www.ecilimp.com

Stellenbosch University
South Africa
www.sun.ac.za

Notus Fan Engineering
South Africa
www.notus.co.za

Laterizi Gambettola srl - SOLTIGUA
Italy
www.soltigua.com

ENEXIO Germany GmbH
Germany
www.enexio.com

Institut de Recherches en Energie Solaire et Energie Nouvelles – IRESEN
Morocco
www.iresen.org

Steinbeis 2i GmbH
Germany
www.steinbeis-europa.de

Waterleau Group NV
Belgium
www.waterleau.com

The Project

Executive Summary

MinWaterCSP consortium will address the challenge of significantly reducing the water consumption of CSP plants while maintaining their overall cycle efficiency. Our objective is to reduce evaporation losses and mirror cleaning water usage for small- and large-scale CSP plants through a holistic combination of next generation technologies. Also, comprehensive water management plans for CSP plants in various locations will be developed. The MinWaterCSP consortium aims to make CSP more attractive for investment purposes in order to drive growth in the CSP plant business as well as job creation at European companies.

Duration

36 months (January 2016 – December 2018)

Consortium

The project consortium consists of 12 organisations from the following 6 countries:
Belgium, Germany, Italy, Morocco, South Africa, Spain

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Contacts

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Minimized water consumption in CSP plants

MinWaterCSP

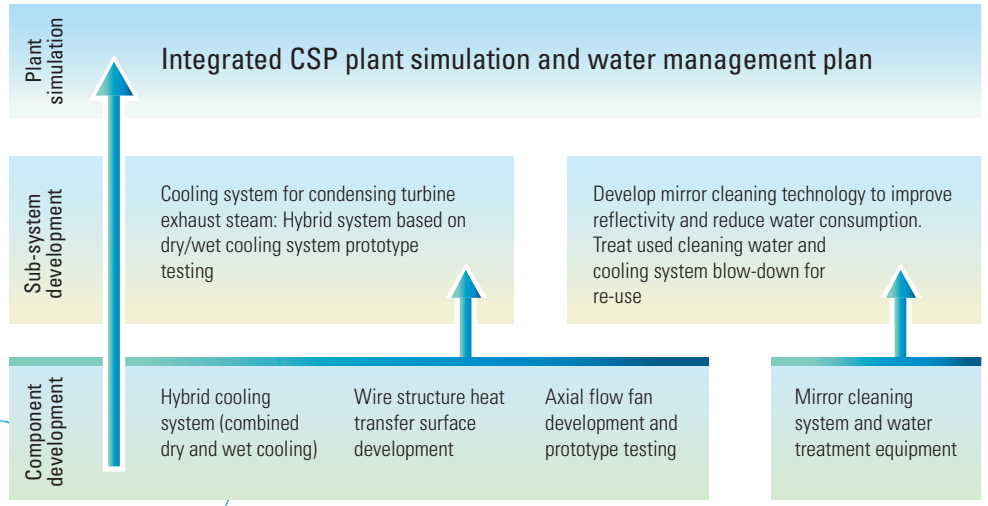
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 654443

Project Objectives and Technologies

MinWaterCSP will significantly reduce the water consumption of CSP plants through a holistic combination of next generation technologies in the fields of:

- hybrid dry/wet cooling systems
- wire structure heat transfer surfaces
- axial flow fans
- mirror cleaning techniques and
- optimized water management

The Approach



Objectives

- Reduction of water evaporation losses by 75 to 95% compared to wet-cooling
- Improving fan performance through increased fan static efficiency
- Increase of the net power cycle efficiency by up to 2%
- Reduction of water consumption due to mirror cleaning by 25% through improved cleaning processes for parabolic trough collectors
- Development of cleaning robot for linear Fresnel collectors
- Reduction of cleaning cycles enabled by an enhanced monitoring of mirror reflectance
- Development of a comprehensive water management plan

GEMASOLAR Plant, property of Torresol Energy © SENER

Cleaning Technology property of ECILIMP

Expected Impact

MinWaterCSP will increase technology performance by:

- introducing dry/wet hybrid cooling systems
- developing compact heat exchanger technology based on wire structure surfaces
- introducing treatment of used mirror cleaning water
- recycling of waste water streams

Technology performance improvement has the following impacts:

- reducing cooling system capital and operating costs
- increasing net power output and saving water
- expanding CSP technology to locations with limited water supply
- reducing dependency on fossil fuels and making CSP more attractive for investors
- reducing impact on the environment during the entire life-cycle
- saving material by using novel wire structure heat exchanger concepts