

SOCONEXGEN

(05/2022 – 05/2025)



LEAP-RE

Long-Term Joint EU-AU Research
and Innovation Partnership on Renewable Energy

Pillar-1 project



The LEAP-RE project has received funding from the European Union's Horizon 2020 Research and Innovation Program under Grant Agreement 963530.



SoCoNexGen

Consortium

Project partners:

- (1) FH Aachen University of Applied Sciences (coordinator, Germany)
- (2) IBEU - Ingenieurbüro für Energie und Umwelttechnik (Germany)
- (3) low-tec gGmbH (Germany)
- (4) CDER - Centre de développement des énergies renouvelables (Algeria)
- (5) Universidade de Évora (Portugal)
- (6) Université Mohammed Premier Oujda (Morocco)
- (7) Université de Tunis El Manar (Tunisia).

Aim of the project

SoCoNexGen aims to develop secure, reliable, easy to use and environmentally friendly solar cooking technologies for domestic use.

Four different solar indoor cookers with energy storage, powered by solar thermal collectors and/or PV panels, shall be built and tested.

Relevance vs MARs

The project “SoCoNexGen” addresses the challenge and scope of the MAR 6:

“Innovative solutions for priority domestic uses (clean cooking and cold chain)” by developing a modern and sustainable solar cooker.

➤ Scientific and/or technical objectives

- Focus on **design, construction, experimental testing** and **analysis** of **four** newly developed efficient, temperature-controlled **solar cookers with thermal energy sand storage (TES)** and/or **electrical battery storage (EBS)**
- Future target application: domestic and commercial environments.

➤ Barriers to be removed

- Acceptance by end users of solar cookers (educate about cost savings on gas and firewood)
- Funding options/financing for poorer population to buy solar cookers

➤ Intended results

- Successful preparation of traditional dishes and food products, flexibility with storage units
- Achievement of high acceptance level among the population
- Standard testing procedure for solar cookers developed
- Acceleration of RE penetration in the field of domestic and commercial solar cookers
- Talks with a company for the production and distribution of the solar cookers

➤ Results achieved

- Solar cookers 1a, 1b, 2
 - CAD design and optimisation is completed; First solar cooker under construction;

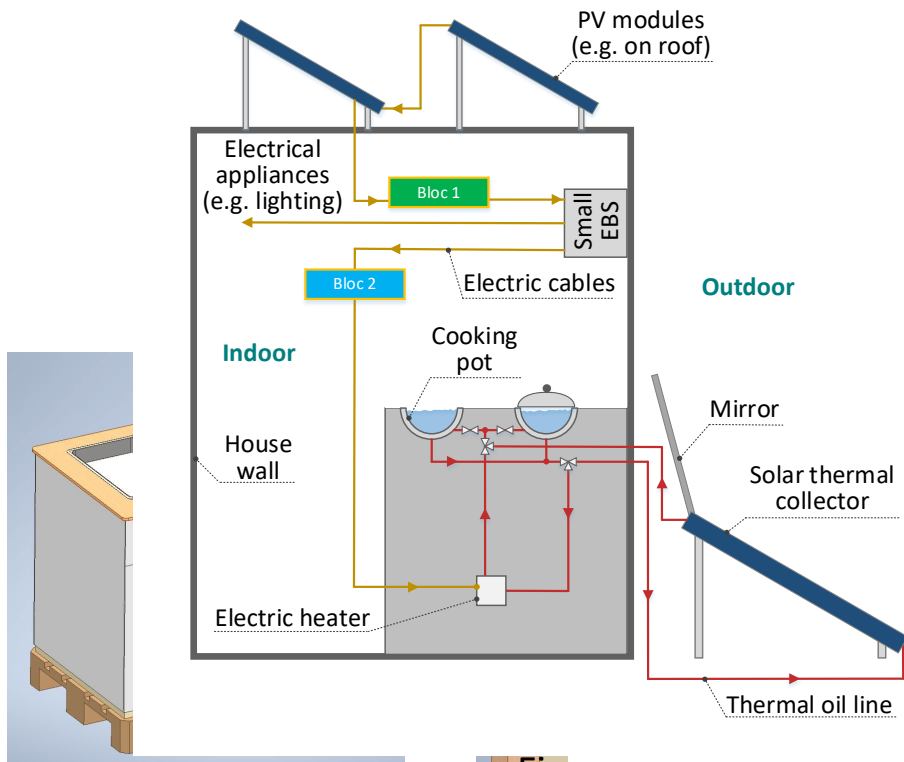


Figure: CAD draw

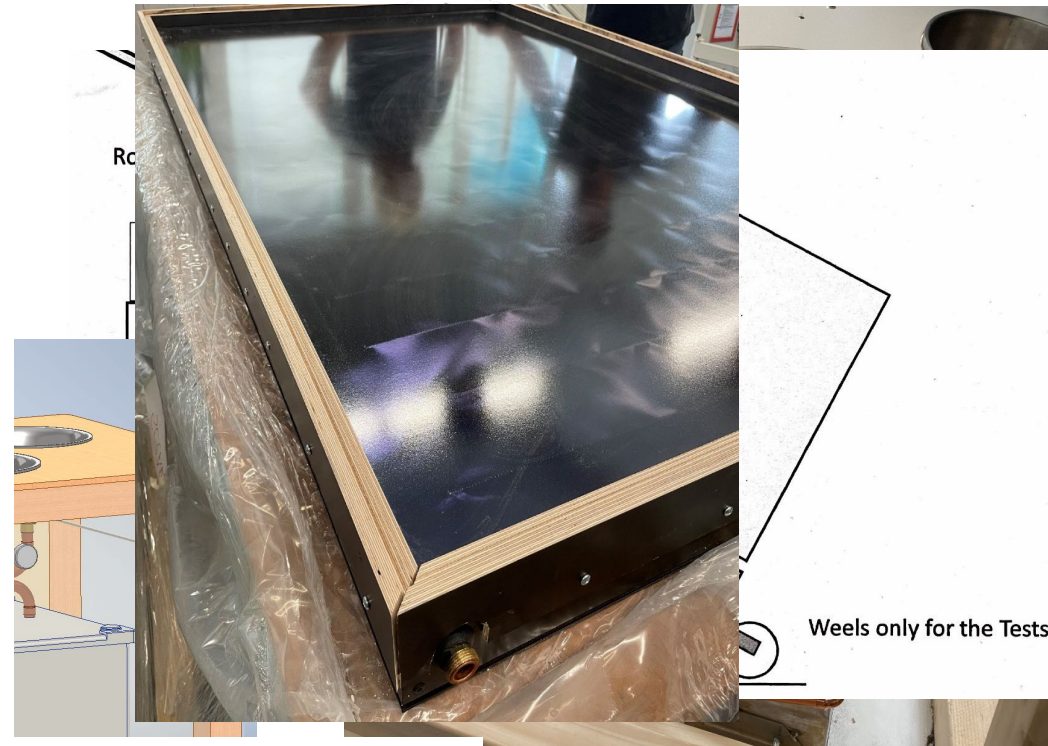


Figure: Solar cooker 2 © SIJ, IBEU

cooker 1b © SIJ

➤ Results achieved

- Solar cooker 3
 - Protot
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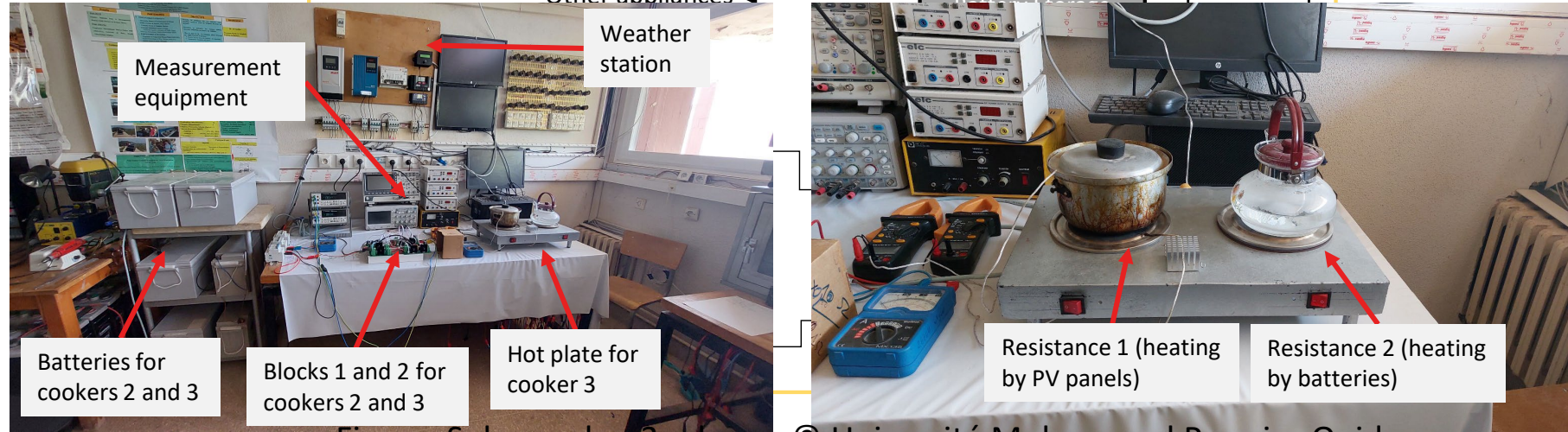
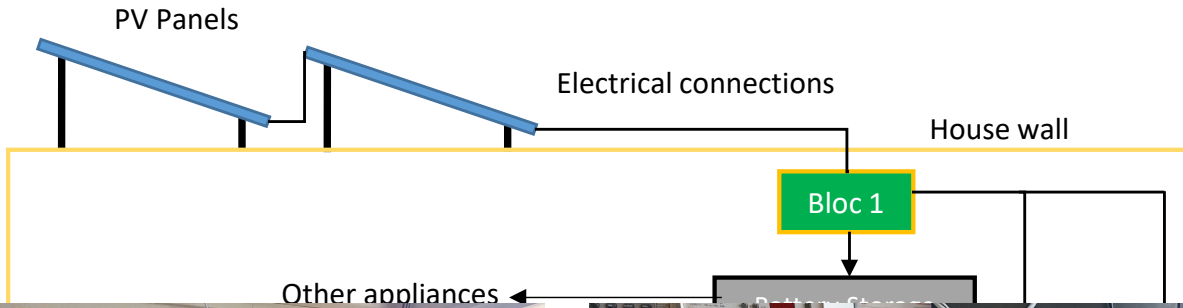
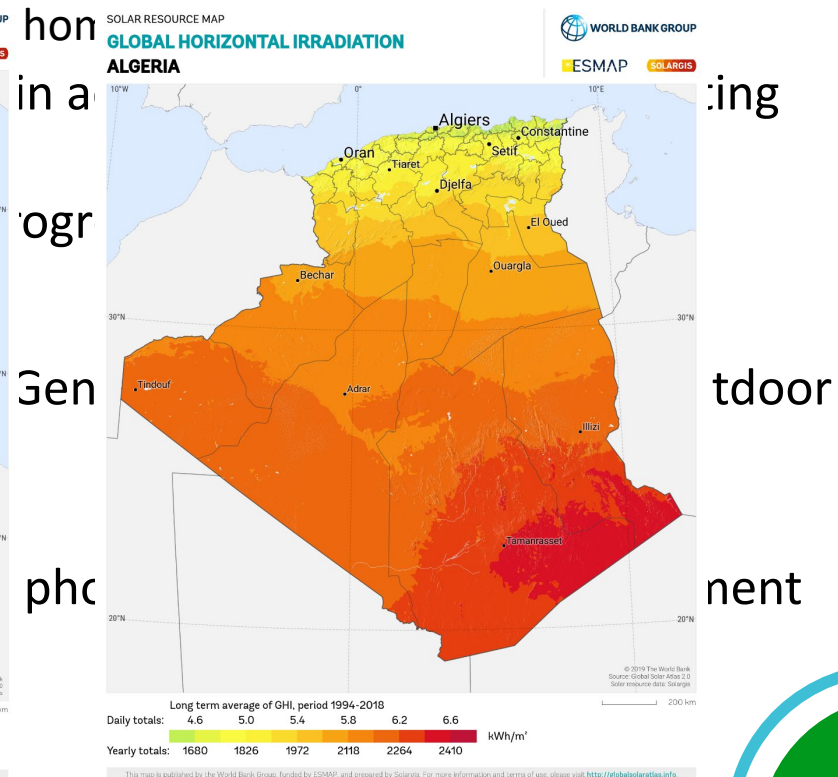
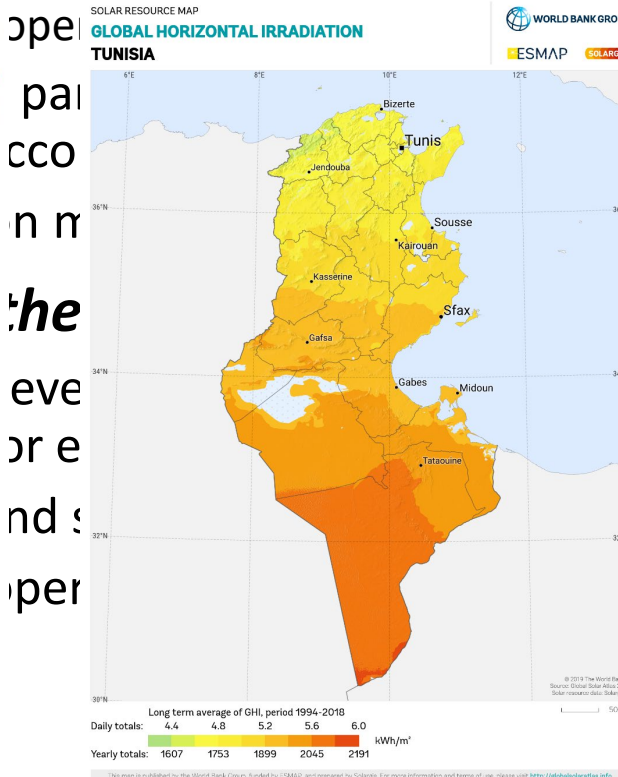
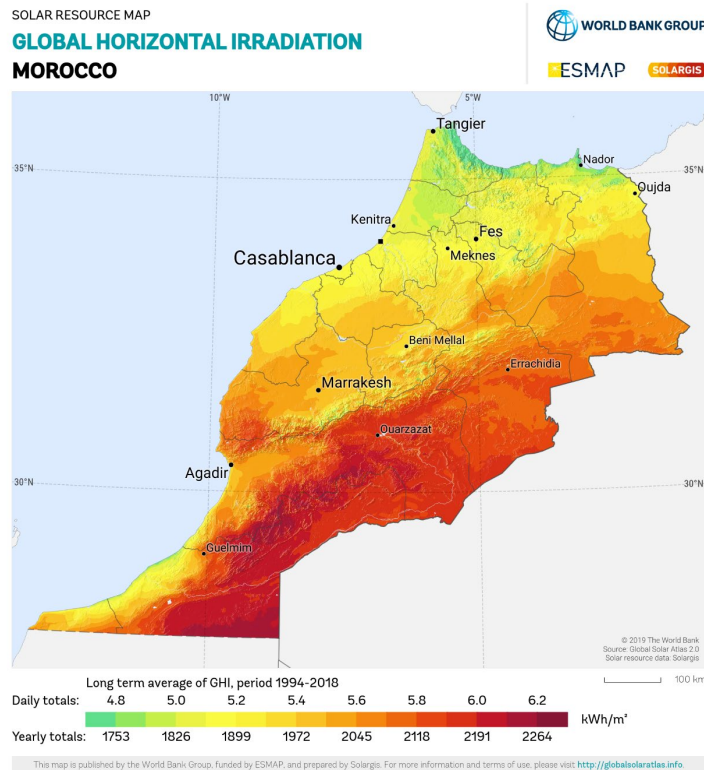


Figure: Solar cooker 3 scheme © Université Mohammed Premier Oujda

Figure: Photographs of solar cooker 3 test laboratory and PV roof system, © Université Mohammed Premier Oujda

➤ Results achieved

- Extensive potential study in Morocco, Algeria und Tunisia
 - Climates of the three African countries are very favorable to the use of the different types of cookers under development



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➤ ***Increase in TRL (if relevant for the project)***

- Aim: TRL 6 – technology demonstrated in relevant environment (cookers 1a, 1b & 2)
- Aim: TRL 7 – system prototype demonstration in operational environment (cooker 3)

➤ ***Possible evolutions of the objectives in progress of the project (explain), problems encountered during the project***

- Currently there is no change in the objectives
- Development phase of solar cookers 1a, 1b and 2 took several months longer than anticipated
- Construction time of an oil-operated solar cooker prototype is longer than anticipated

➤ ***Specify whether the project has resulted in new products or developments (instruments, methods, software, etc.)***

- An online interface for (remote) monitoring relevant measurement data during experiments was co-developed by the Moroccan and Tunisian partners

➤ ***End of project expected results (2025)***

- ***Planned follow-up work, new pathway to explore...***

- Within the project, the partners will receive user feedback for the solar cookers
- Ranking of the four developed solar cookers based on scientific evaluations within project SoCoNexGen
- It would be interesting to explore a scaled-up solar cooker system for testing

➤ ***What becomes of the consortium after the project?***

- Consortium members should keep in contact to explore future collaboration opportunities
- Identification of possible optimisations for the developed solar cookers (at the end of the project) and perhaps opportunity for a follow-up project

➤ ***End of project expected results (2025)***

- ***New collaborations initiated thanks to the results of the project (following publications, conference presentations, etc.)***
 - The first results of solar cooker 3 are of interest to decision-makers and local elected officials in Morocco
- ***New collaborations planned for the future (to answer what problem? Industrial or other perspectives?...)***
 - A company from Paris, France, is following the development of solar cooker 3
- ***New funded projects and/or funding applications (what type(s) of funding?)***
 - No new funded projects or funding applications about the solar cookers have been submitted

Expected outcomes in case of success of the project (2030)

What could be the impact of the project at 2030 on the economy and/or society in case of scaling up the results of the project ?

1. Long-term savings in fossil fuel costs and reduction of GHG
2. Relief for the population in remote dry regions of North Africa
3. Education and relief of daily life
4. Creation of an infrastructure for the construction and sale of solar cooking technology
5. Relief to rural communities regarding reduction in pollution from stoves and reduction in danger of burning skin
6. Relief to nature (less deforestation, expansion of deserts and air pollution)
7. Reduction in time and effort primarily for women and children for collecting firewood



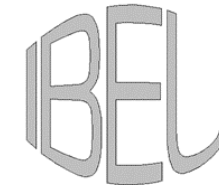
SoCoNexGen

Contribution of the project to AU – EU R&D partnership

1. In the long term, creation of jobs
2. Education of people, knowledge transfer and capacity building
3. Strengthening of collaboration between involved universities and companies
4. Dissemination workshops can lead to further collaborations
5. Expansion of knowledge about the use of solar cookers in Africa and Europe

Interest of Consortium members in participating in LEAP-RE clustering activities

The SoCoNexGen consortium is interested to hear about the topics of the other LEAP-RE projects.



UNIVERSITÉ DE
TUNIS EL MANAR



UNIVERSIDADE
DE ÉVORA



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LEAP-RE

The SoCoNexGen consortium sincerely thanks the funding bodies and funding agencies for supporting the project:



Federal Ministry
of Education
and Research



Fundação
para a Ciência
e a Tecnologia



Ministère de l'Enseignement supérieur
et de la Recherche scientifique (Algérie)



Royaume du Maroc
Ministère de l'Enseignement Supérieur,
de la Recherche Scientifique et de l'Innovation

THANK YOU

CONTACT US FOR MORE INFORMATION



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