Funded by the European Union

INTRODUCING SHARP-SCO2:

Innovating hybrid PV-CSP-sCO2

DEAR READER,

We are excited to share insights into our innovative project, **SHARP-sCO2**, which aim to advance the development of highly efficient and flexible hybrid PV-Concentrated Solar Power (CSP) plants by focusing on innovative technologies. This includes high-temperature operation enabled by the use of air as heat transfer, sCO2 power cycles, and cost effective air to sCO2 heat exchanger, electric heater and thermal energy storage.

By integrating these advancements and validating key components in top-level laboratories spread across partner labs in Spain (**IMDEA Energy**), Sweden (**KTH**), and Germany (**TUD**), the project aims to demonstrate the viability and effectiveness of air-driven/sCO2 CSP. Ultimately, it seeks to lower both the LCOE and CAPEX for future CSP plants, contributing to the **achievement of 2030 EU targets**.

SHARP-sCO2 is a project funded by the European Union and URKI involving **10 partners** from across Europe and Morocco:

1. *KTH Royal Institute of Technology (Sweden)*
2. *RINA Consulting S.p.A. (Italy)*
3. *Università degli studi di Genova (Italy)*
4. *Fundacion IMDEA Energia (Spain)*
5. *SEICO Heizungen (Germany)*
6. *Tecnische Universitaet Dresden (Germany)*
7. *ODQA Renewable Energy Technologies Limited (England)*
8. *The Chancellor, Masters and scolars of the University of Oxford (England)*
9. *Ethniko Kentro Erevnas Kai Technologikis Anaptyxis (Greece)*
10. *Moroccan Agency for Sustainable Energy Sa (Morocco)*

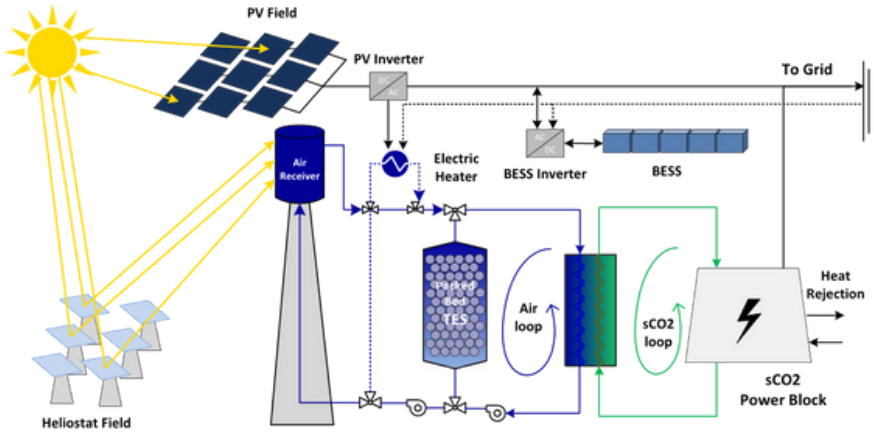
Let's delve into the key aspects of this groundbreaking initiative!

What is SHARP-sCO2?

SHARP-sCO2 stands for **Solar Hybrid Air-sCO2 Power Plants** and it's a project dedicated to advancing solar-to-electricity conversion technology.

The project's **main objective** is to develop an integrated system that efficiently converts solar energy into electricity. This project brings together core components operating in a cascade stream of conversion, as illustrated in the figure below.

The project progresses through distinct phases, validating all technologies up to TRL5, adopting a "cyber-physical" approach for the full system validation, and developing comprehensive performance modelling activities to evaluate the holistic impact of the proposed system.



The **main innovations** brought by the projects are:

- *Novel high temperature rotating air receiver*
- *Novel high temperature and medium voltage electric heater air systems*
- *Novel radial packed bed thermal energy storage based on upcycled waste materials*
- *New air to sCO2 Heat Exchanger*
- *Dynamic and techno-economic simulators of air-sCO2 PV-CSP plants*

SHARP-sCO2 gives an innovative contribution to the evolving CSP technology aiming at:

Developing future, **higher-efficency** CSP plants

Reducing the **levelized cost of electricity** of future CSP plants

Improving environmental profile of future CSP plants

Fostering a **higher shares of variable output renewables** in the energy system

Developing significant performance regarding **start-up, shutdown and load variation of** future CSP plants

Stay tuned for more updates as SHARP-sCO2 continues to revolutionize solar energy conversion.
For more information about the project, visit our **website** or reach out to us directly at **info@sharpsco2.eu**.

Best regards,

SHARP-sCO2 Team