

Introducing Powder2Power



Total budget: 5,884 M€

Duration: 48 months

EU contribution: 5,274 M€

(10/2023 – 09/2027)



Consortium:

9 partners, 6 EU countries

Technology: Fluidized

particle-driven CSP

Powder2Power is a EU-funded project aiming to demonstrate, in an operational environment (TRL7*) and at a megawatt scale, an original and cost-effective particle-driven CSP technology, applicable to both electricity and industrial heat production.

Expected Impacts

Technology



Improve CSP plant efficiency and reliability through innovative solar technology, including prototype testing and engineering solutions

Science



Strengthen European research and expertise in renewable energy, fostering international collaboration and innovation

Society & Environment



Enhance environmental sustainability and EU industrial competitiveness by reducing CO₂ emissions and creating jobs in the renewable energy sector

* Technology readiness level 7: system prototype demonstration in operational environment



Interested in collaborating, partnering,
or learning more?

Contact us and get involved!



www.powder2power-project.eu



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MW-scale fluidized particle-driven CSP prototype demonstration



Concentrated Solar Technology for More Efficient and Cost-Effective Power and Industrial Heat generation

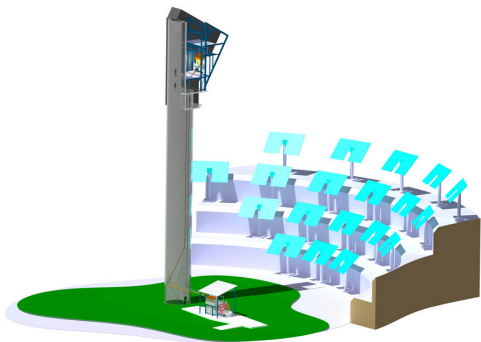
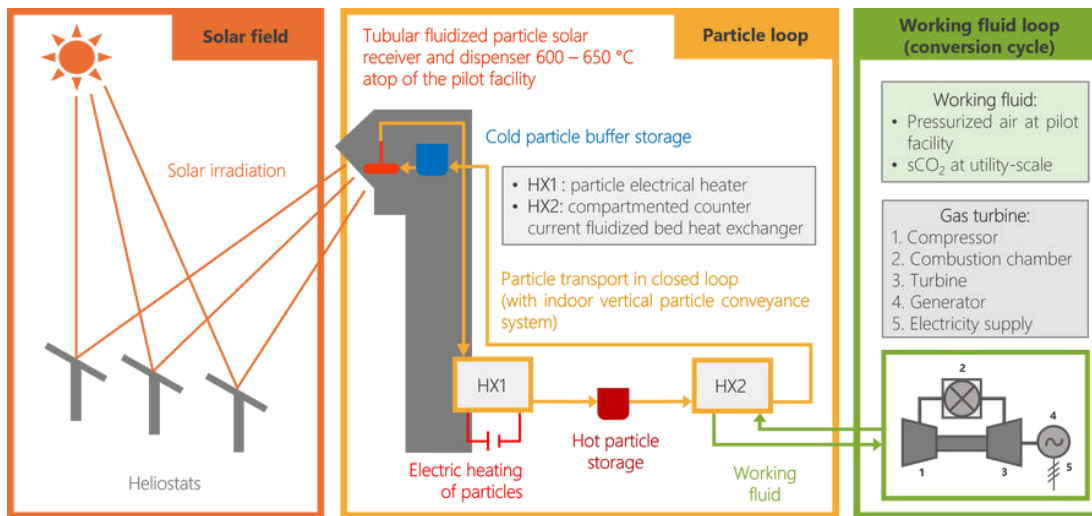


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Concept and Vision at a glance

Concentrated Solar Power (CSP) plays a key role in green energy production. While molten salt is the leading heat transfer medium, **particle suspensions offer the potential for even higher operating temperatures in CSP plants, supporting more efficient power cycles**, like the sCO₂ cycle, which operates at 700-750°C with 50% efficiency.

Powder2Power aims to advance the future of CSP with an innovative 2 MWth particle-driven CSP prototype. Building on the EU-funded Next-CSP project (H2020, GA n°727762), the project focuses on optimizing the technology by integrating a ~90m vertical particle transport system and validating electricity-powered particle superheated thermal storage, simulating a high-temperature hybrid CSP-PV concept.



The project **primary goal is to assess the techno-economic viability and sustainability of the concept for commercial use**, with a focus on a 30-60 MWe power plant. Scaling up will be based on validated models and real operational data.

This system will be tested at the Themis solar tower in Targassonne, France.

Objectives



Innovative Demonstration

Showcase cutting-edge, cost-effective CSP components and systems at a megawatt scale in an operational environment



Sustainable Energy Integration

Develop a particle-to-sCO₂ heat exchanger to enhance high-capacity energy storage



Operational Efficiency

Reduce O&M costs by integrating a particle-based storage solution and improving the sun-to-power cycle efficiency by approximately 12%



Renewable Energy Advancement

Support renewable energy growth by increasing the share of variable renewables through efficient particle-based thermal energy storage

Consortium

