CSP ERA-NET has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No. 838311

Presenting the 1st Cofund Joint Call

Pre-opening information webinar 15th of October 2019

Presented by Daniel Ruiz Iruela, FECYT, and Beatriz Gómez AEI (State Research Agency, Ministry of Science, Innovation and Universities, Spain)

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Objectives of todays webinar

- Core details of the 1st CSP ERA NET Cofund Joint Call
- Timelines and Requirements
- Pitch presentation of project ideas: 3min max per panellist

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1. Main Principles

- **Strategic targets of the Implementation Plans for CSP are as follows:**
  - Short-term: > 40% cost reduction by 2020 (from 2013) translating into
    - Supply price < 10 c€/kWh for a radiation of 2050 kWh/m2/year (conditions in Southern Europe)
  - Longer-term: develop the next generation of CSP/STE technology
    - New cycles (including supercritical ones) with a first demonstrator by 2020, with the aim to achieve additional cost reductions and opening new business opportunities.
- **Minimum consortia** requirements:
  - minimum of **3 partners from 3 different countries** participating in the CSP ERANET 1st Cofund Joint Call and providing funding to the project selected, with at least **1 partner from industry** (Except topic 8) *(relevant organisations from other countries may participate with their own funding)*
- **Duration maximum 36 months**
- **National funding, criteria and priorities vary from country to country (national rules).** Some funding bodies do not participate in all topics.
- **Project partners must get in touch with their NCP** as projects are funded at national or regional levels following individual requirements.
- **Full proposals has to be submitted by the applicants via** (ESS) under CSP ERA NET
- **Centralized evaluation by international experts.**
- **Consortium Agreement between partners will be required.**

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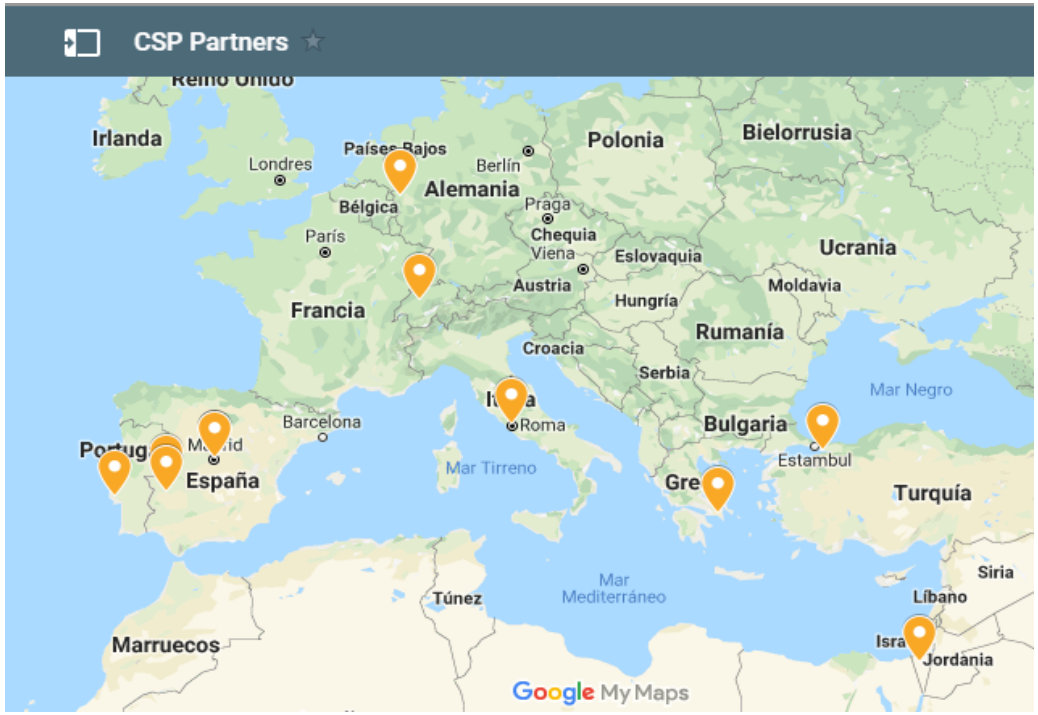
2. Participating Countries



1. Germany and North-Rhine- Westphalia
2. Greece
3. Israel
4. Italy
5. Portugal
6. Spain and Junta de Extremadura
7. Switzerland
8. Turkey

PARTNERS

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3. Funding Budgets

Country, Funding Party	Funding [EUR]
Germany – PtJ	3.000.000
Germany – ETN	500.000
Greece – GSRT	1.000.000
Israel – Ministry of Energy	600.000
Italy – MIUR	600.000
Portugal – DGEG	100.000
Spain – CDTI	1.500.000
Spain – AEI	500.000
Spain – Junta Extremadura	50.000
Switzerland – SFOE	200.000
Turkey – TÜBİTAK	700.000

- **National funding budgets ~ MEUR 8,75**
- **+ EC top up ~ MEUR 4**

= Total funding budget up to ~ 13 MEUR

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4. Important Dates

~ 3 months

~ 2 months

Call open for pre-proposals (period > 90 days)	Deadline for submission of preproposals	Communica - tion on applications selected for full proposal round	Deadline for submission of full proposals	Final funding decisions communicated to proposers
7 Oct 2019	10 Ene 2020	3 Mar 2020	13 May 2020	~ Aug 2020

Around October 2020 Start of projects funded

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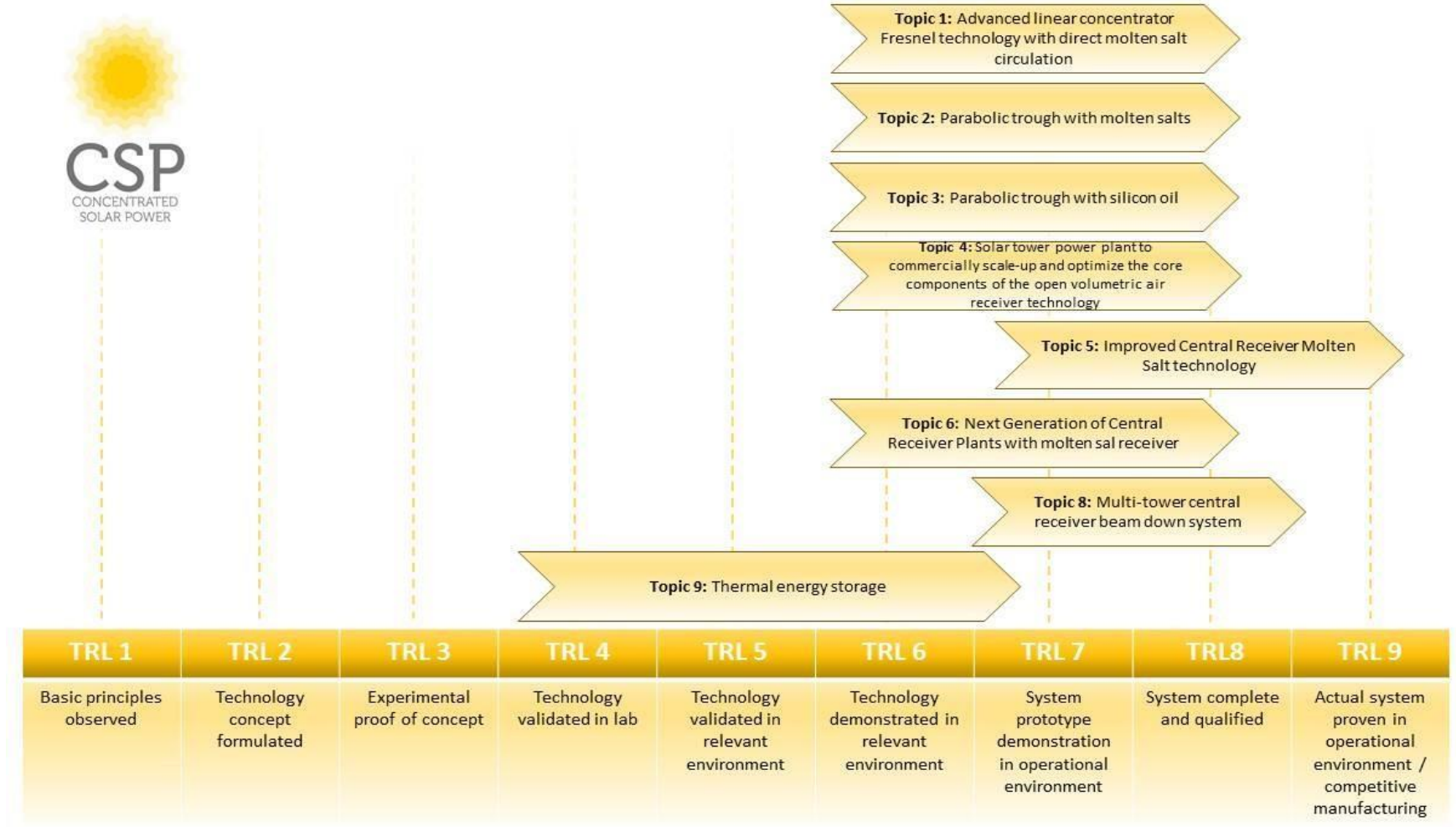
5. Topics and TRL



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5. Topics and TRL

1. Advanced linear concentrator Fresnel technology with direct molten salt circulation
2. Parabolic trough with molten salts
3. Parabolic trough with silicone oil
4. Solar tower power plant to commercially scale-up and optimize the core components of the open volumetric air receiver technology
5. Improved Central Receiver Molten Salt technology
6. Next Generation of Central Receiver Plants with molten sal receiver
7. Multi-tower central receiver beam down system
8. Thermal energy storage

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6. Topics-Countries-Matrix

Table 2: Matrix of eligible topics and subtopics per country / region resp. funding agency	Germany	Germany-NRW	Spain-AEI	Spain-CDTI	Turkey	Greece	Switzerland	Italy	Israel	Portugal	Spain - Extremadura
1. Advanced linear Fresnel technology											
1	✗	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓
2. Parabolic trough with molten salt											
2	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓
3. Parabolic trough with silicon oil											
3	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓
4. Open volumetric air receiver											
4	✓	✓	✓	✓	✓	✗	✓	✗	✓	✓	✓

Check eligibility and prioritisation of (and within) topics with your funding agency

✓ All Subtopics

✓ Some Subtopics

✗ No Subtopics

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6. Topics-Countries-Matrix

Table 2: Matrix of eligible topics and subtopics per country / region resp. funding agency

	Germany	Germany-NRW	Spain-AEI	Spain-CDTI	Turkey	Greece	Switzerland	Italy	Israel	Portugal	Spain - Extremadura
5. Improved central receiver molten salt technology											
5	✓	✓	✓	✓	✓	✗	✗	✗	✓	✓	✓
6. Next generation of central receiver power plants											
6	✓	✓	✓	✓	✓	✗	✓	✗	✓	✗	✓
7. Multi-tower beam down system											
7	✗	✗	✓	✓	✓	✗	✗	✓	✓	✓	✓
8. Advanced TES (Thermal Energy Storage)											
8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Check eligibility and prioritisation of (and within) topics with your funding agency


All Subtopics


Some Subtopics


No Subtopics

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7. Evaluation Criteria

EUROPEAN COMMISSION
RTD - Energy
ENER - Renewables, R&I, Energy Efficiency
JRC – Institute for Energy and Transport
SET Plan Secretariat

- The independent international experts will set up binding ranking list for full proposals evaluated.
- 3 Main criteria to evaluate: **See Table 4 of the Guidelines*
  - **Excellence**
  - **Impact**
  - **Quality and Efficiency of Implementation**
- Check targets and indicators outlined in «SET-Plan – Declaration on Strategic Targets in the context of an Initiative for Global Leadership in Concentrated Solar Power (CSP)» (available on CSP ERA NET Webiste)

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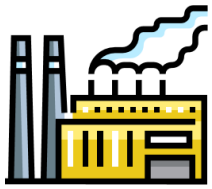
8. National Requirement

- Check national requirements listed in the Guidelines and with your funding agency with respect to:

NCP

Topics



Type of RTD

Applicants

Budget

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9. Procedure and ESS

- Check your **project idea with your national funding agency as early as possible**.
- All funding agencies concerned are to be contacted (not only the «coordinator's funding agency»).
- Use the Electronic Submission System (ESS). **Not ready yet**
- All partners have to submit some information in the ESS – involve your partners as early as possible for a smooth procedure.
- **Documents and further information.**
  - **Guidelines for proposals pdf**
  - **Example of proposals form Not ready yet**
  - **Implementation plan for CSP pdf**

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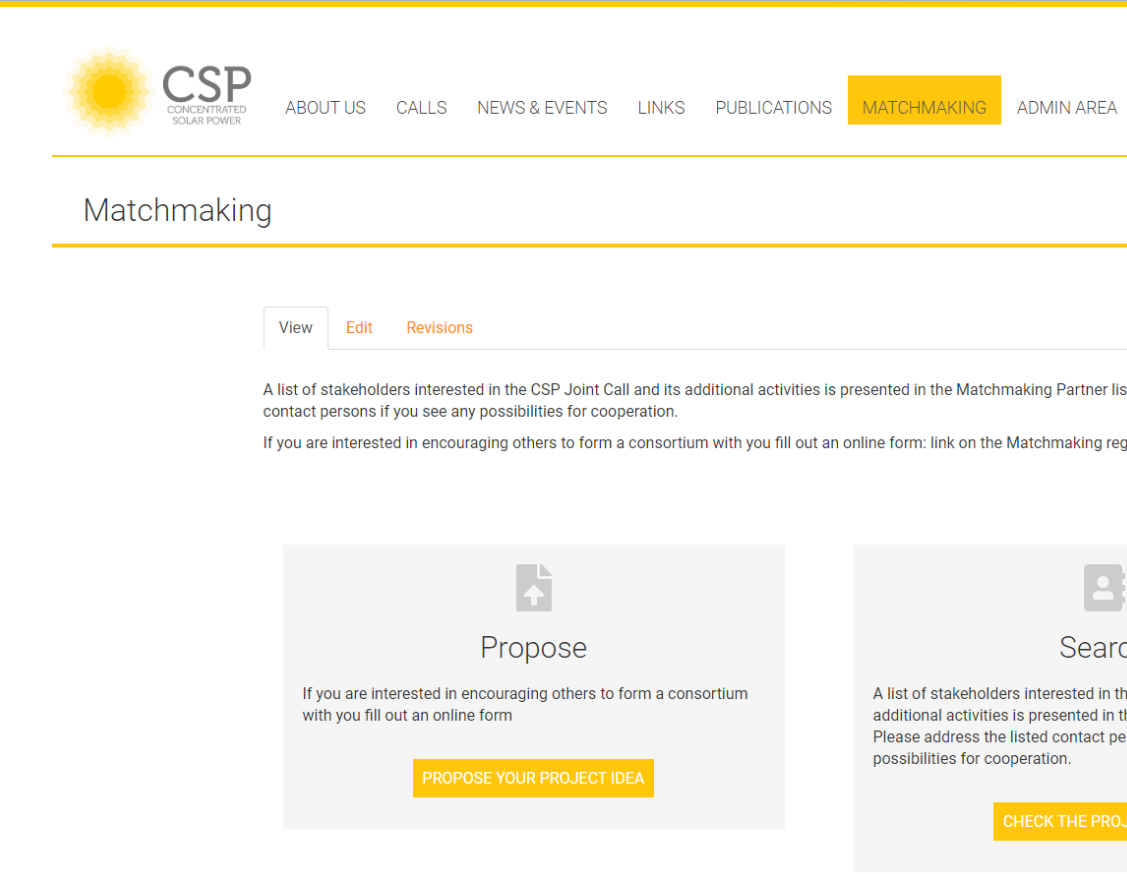
10. Matchmaking Tool



A list of stakeholders interested in the CSP Call and additional activities is being gathered by use of this form.

Please fill it out if you wish to join the network and withing 48 hours your institution/organisation/company information will be available on our online matchmaking website.

https://csp-eranet.eu/matchmaking

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11. Information & Contact

- **Inform your funding agency / national contact point on your project idea (if applied)**
- **Get informed by your funding agency / national contact point**

agencia extremeña de la energía

Ministry of National Infrastructure, Energy and Water Resources
www.energy.gov.il

GSRT
GENERAL SECRETARIAT FOR RESEARCH AND TECHNOLOGY

MIUR

MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD
CDTI Centro para el Desarrollo Tecnológico Industrial

JUNTA DE EXTREMADURA

AGENCIA ESTATAL DE INVESTIGACIÓN

ptj Projektträger Jülich Forschungszentrum Jülich

ETN PROJEKTTRÄGER Forschungszentrum Jülich

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Federal Office of Energy SFOE

TÜBİTAK

Direção-Geral de Energia e Geologia

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Thank you!!

Presented by Daniel Ruiz Iruela, FECYT, and Beatriz Gómez AEI (State Research Agency, Ministry of Science, Innovation and Universities, Spain

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ERA CSP Co-funded Joint Call for research projects

Contact details

- **Organisation: CRS4**
- **Contact name: Dr. Erminia Leonardi**
- **Country: Italy**
- **Email: ermy@crs4.it**
- **Telephone: +39 0709250328**

CRS4, Center for Advanced Studies, Research and Development in Sardinia, is an interdisciplinary research center, founded in 1990 by the Autonomous Region of Sardinia. The center promotes the study, development and application of innovative solutions to problems stemming from natural, social and industrial environments.

Challenge areas of the CSP-ERA.NET Cofund Joint Call:

- ***Next generation of central receiver power plants***
- ***Multi-tower beam down system***

Project idea: apply our models to investigate multitower systems in non-planar regions

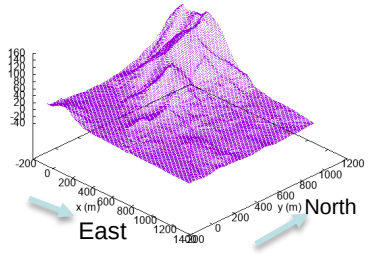
Solar field optimization with topographic rilief

In southern Europe, planar regions are rare and precious and solar tower fields doesn't need them, while could take advantage of hills with a favorable exposure.

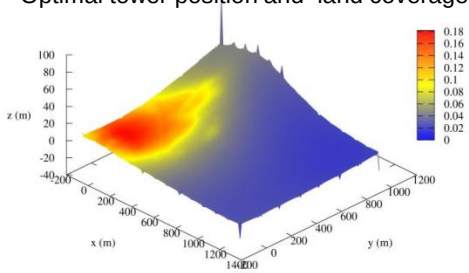
We have developed **a fast and effective technique to optimize heliostat fields on territories with arbitrary profiles**. As an example, we have optimized tower position and solar field in the hilly area around our laboratory, getting the target yearly energy with 2% less heliostats than in planar ground.

90 GWh/y plant characteristics	
Location	39° 0' 46.7460'' N, 9° 0' 5.0400'' E
Receiver position (m)	0,0,100
Heliostats n.	9808
Heliostat's area (m^2)	8

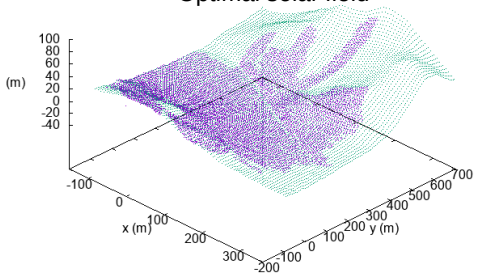
Topographic rilief



Optimal tower position and land coverage



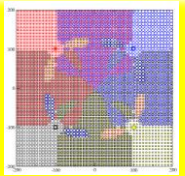
Optimal solar field



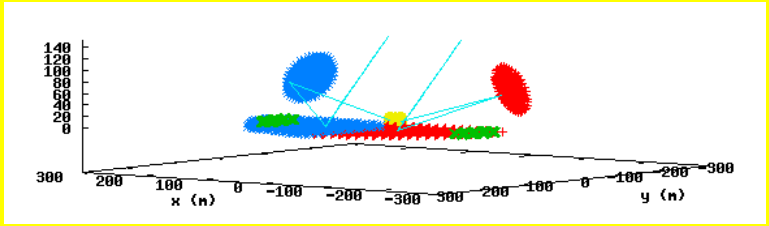
Multitower systems

Optimization of multi-tower systems (included beam-down types) presents further difficulties with respect to single-tower ones because heliostats should be able to reflect the solar radiation on different receivers depending on the sun position.
In this context, we have also developed **models for dynamic optimization**: from time to time, each heliostat chooses as reference receiver that which minimizes overall losses (cosine, shading, and blocking).

Example of dynamic optimization for a four-towers system. The heliostats have the same color of their reference tower. Towers 30 m high, coverage 90%. Azimuth=0º, Zenith=0º



Example of a 2-hyperboloids beam-down system with a central receiver at ground level . Heliostats are plotted with the same color of their reference hyperboloid. The shadow of the hyperboloids on the solar field is green. Zenith=45º , azimuth=0º.



We would like to have the opportunity to collaborate with industrial partners and share our expertise with other centers of research (PSA, CENER, Fraunhofer Institute, Weizmann Institute, Laboratorio Nacional de Energia e Geologia)

Project Template CSP Cofund Joint Call

Contact details

- **Organisation: Çukurova University (www.cu.edu.tr)**
- **Contact name: Halime Ö. Paksoy**
- **Country: Turkey**
- **Email: hopaksoy@cu.edu.tr**
- **Telephone: +90 533 2727373**

Organisational profile

- **Established in 1973 consists of 18 faculties, 3 graduate institutes and 32 research centers**
- **More than 2100 academic staff and over 55000 students**
- **Represents Turkey at International Energy Agency Implementing Agreement on "Energy Conservation Through Energy Storage" (IEA ECES IA) executive committee and has been actively involved in various annexes since 1995**

What challenge area is your project idea focused on for the CSP-ERA.NET Cofund Joint Call:

Our project idea is focused on Topic 8: Thermal Energy Storage to reach the strategic target of reducing cost by >40% through development of sustainable, low cost & maintenance thermal energy storage materials

Sensible Thermal Energy Storage Materials Using Demolition Waste Products

MOTIVATION

Cost-effective thermal energy storage (TES) systems are needed for efficient use of CSP

Packed bed is a viable technology for high temperature TES applications

Sustainable packing as TES material with favorable thermal properties and compatible with different heat transfer fluids

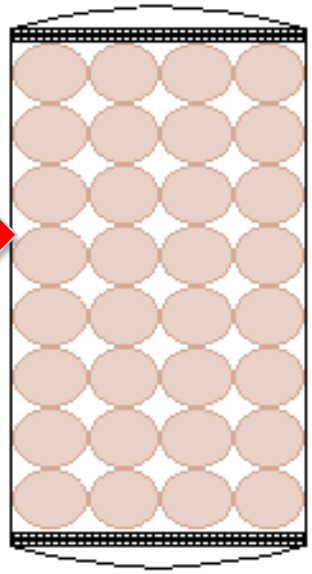
Demolition wastes are potential sensible TES materials in packed bed for CSP applications up to 750°C

Volarizing waste increases CO_2 reduction potential

Crushing
Sieving
Drying
Mortar Formulation
Molding

Abundant material at zero cost and simple manufacturing

TES material with high specific heat capacity



Packed bed storage efficiency reaching 98.5%

TEKFEN ENGINEERING

Contact details

- **Organization: TEKFEN ENGINEERING**
- **Contact name: Hasan Cavit Tuncer**
- **Country: Turkey**
- **Email: cavit.tuncer@tekfen.com.tr**
- **Telephone: +90 212 357 03 03 – 1248**

TEKFEN ENGINEERING

Organisational profile

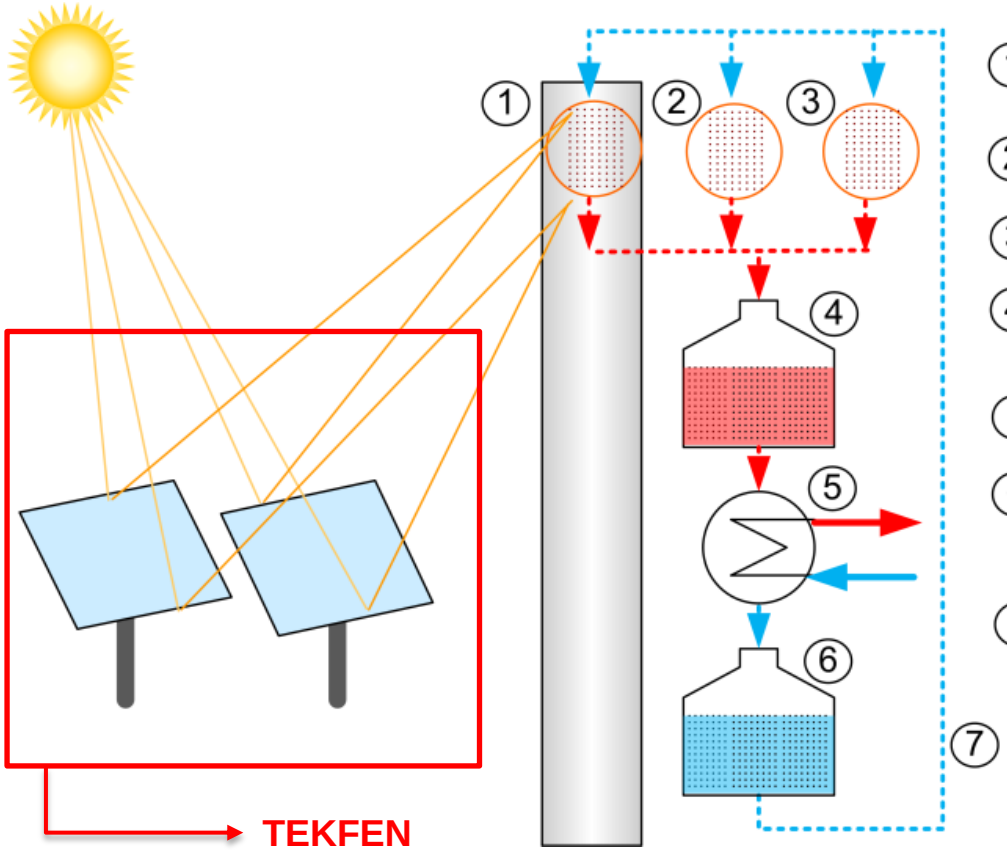
Tekfen Engineering was founded in 1984 to handle the engineering side of the EPC triangle for turnkey projects. TEN has also been contracted out of the group in particular because of its experience in industrial plants and infrastructure projects. Main areas of expertise could be summarized as follows: Industrial Plants, Power Plants, Pipelines & Infrastructure, Harbor & Offshore Structures, Motorways, Bridges and Viaducts. TEN is continuously developing its organization and equipment and, whenever required, it broadens its know-how and experience through collaboration with companies with relevant experience. To this end, process department was created in 2009 with the purpose of strengthening the Company for the ultimate goal of Tekfen Construction becoming a full EPC contractor.

What challenge area is your project idea focused on for the CSP-ERA.NET Cofund Joint Call:

Concentrated solar power tower plant with particular technology

INTRODUCTION

- Solar tower with particle technology
- High Temperatures for high efficiency
- New heat transfer media
- High temperature receivers
- Improved operation for increased revenues
- Include weather and market forecast
- Process heat, water desalination etc..
- Solar fuels for long term storage, transport and mobility



1. Direct absorption particle receiver with solar tower and heliostat field
2. Electric particle heater
3. Backup particle heater (e.g. with gas)
4. High temperature particle storage
5. Heat exchanger (to gas/steam)
6. Low temperature particle storage
7. Particle transport system

TEKFEN Engineering Responsibility

PARTNERS

- DLR [DE]
- Kinetic Technology [IT]
- Doosan/Skoda [CZ]
- CMI [BE]
- Sugimat [ES]
- HelioHeat [DE]
- IndygoTech Minerals S.A. [Po]
- Lointek [SP]

WHAT WE DO ENGINEERING

Electrical & Telecommunication

- Power System Configuration Development
- Short Circuit and Load Flow Analysis
- Transient Stability Analysis
- Single Line System Design
- AC / DC and UPS design
- Cable Routing and sizing calculations
- Load List and Cable List Development
- Weak Current Systems Design
- Hazardous Area Classification

Process

- Process Simulation of new and existing units
- PFD and PID Preparation
- H&MB Preparation
- Process description and philosophy
- Hydraulic study and line sizing
- Process Equipment DS development
- Consistency Checks
- Control philosophy and Cause & Effect Chart Development
- Reverse Engineering
- Root cause analysis and optimization studies

Instrumentation & Control

- I&C System Specification
- Control Systems Design
- PLC/DCS/EDS/SCADA Specification
- Control Panel Design
- Input/Output List Development
- Logic Diagrams
- Shutdown Logic and Interlock Diagrams

Static & Rotating Equipment

- Revamp/ Modification Studies
- Thermal & Mechanical Design
- Existing Equipment Assessment and Re-rating
- Material Eng.
- Inquiry Documentation
- Tech. Bid Evaluation
- Vendor Follow-Up

Structural Engineering

- Static & Dynamic Analysis
- Earthquake Engineering
- Time History Analysis
- Strengthening Assessments
- Soil Structure interface analysis

Commissioning and Start Up

- System commissioning experience
- System turnover sequence
- P&ID review
- SLD review
- HAZOP review
- Model review
- Cause & Effect Diagram review
- Spare Part Order support
- Commissioning Plan

CSP
CONCENTRATED SOLAR POWER

ABOUT US CALLS NEWS & EVENTS LINKS PUBLICATIONS MATCHMAKING ADMIN AREA

TEKFEN

TEKFEN ENGINEERING

THANK YOU VERY MUCH..