

Advanced materials solutions for next generation high efficiency concentrated solar power (CSP) tower systems

H2020 NEXTOWER PROJECT & INNOTRACK

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Bologna

Project details

- Start date 01.01.2017
- Project duration 48 months
- 17 partners from 10 european countries
- H2020 Innovation action (call NMBP 17 2016)
- Technology readiness level 6 (demo construction & field testing)
- overall expenditure 5,762,801.25€, EU contribution nearly 5 milion Euros
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CSP is a major area of the energy sector demanding high-technology materials
Several CSP architectures are available. We focus on TOWER SYSTEMS

+

Maturity

-

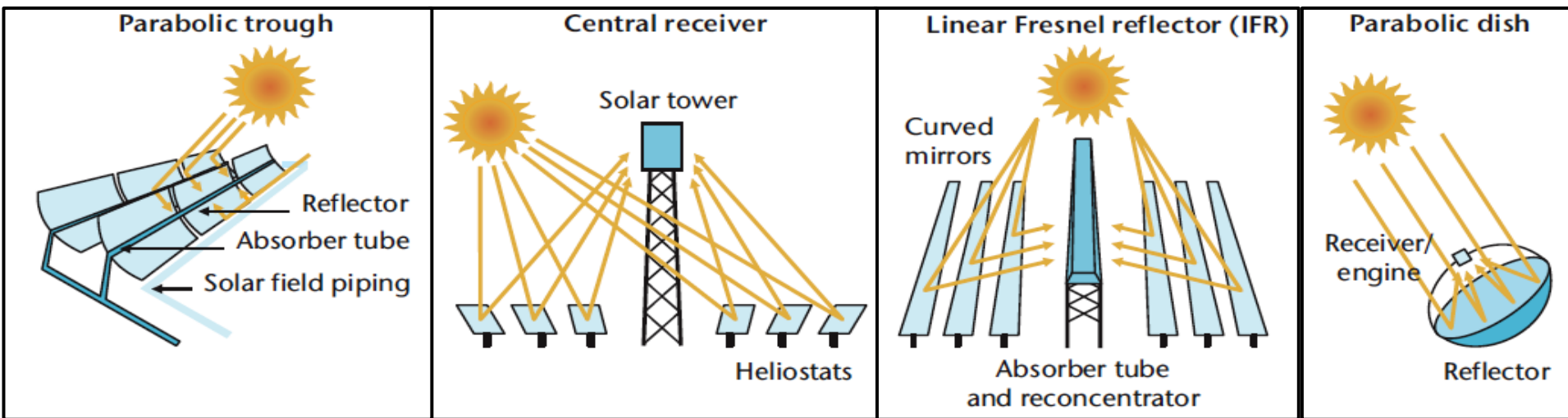


Figure 1. Main STE technologies and maturity levels

Credit IEA – ‘New Policies Scenario for STE (solar thermal energy)’

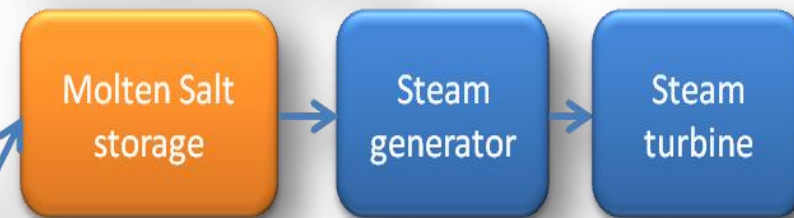
Next gen. CSP tower being dev. at ENEA



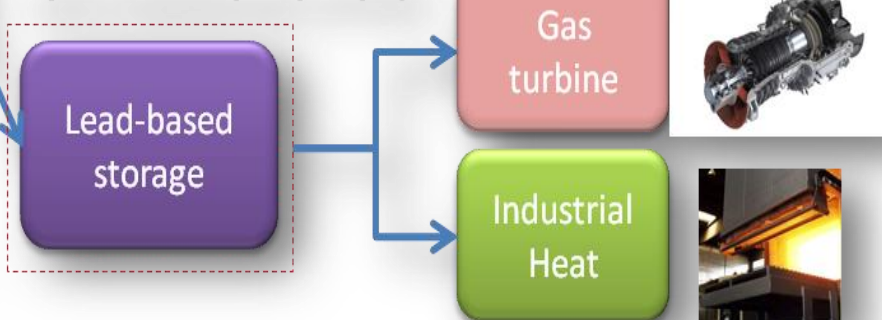
TOWER SYSTEMS suffered from insufficient “component life”, especially the receivers
The ENEA CONCEPT for next generation tower system will:

- Increase working temperature from 700 to 900 °C with new receiver
- Interfacing with high temperature thermal storage based on lead
- Interfacing with gas turbine

LOW TEMPERATURE OPTION



HIGH TEMPERATURE OPTIONS



There is an ongoing effort to transfer technology across industry sectors

Most immediate perspectives for synergies (from nuclear)



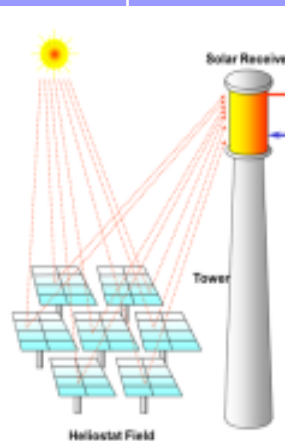
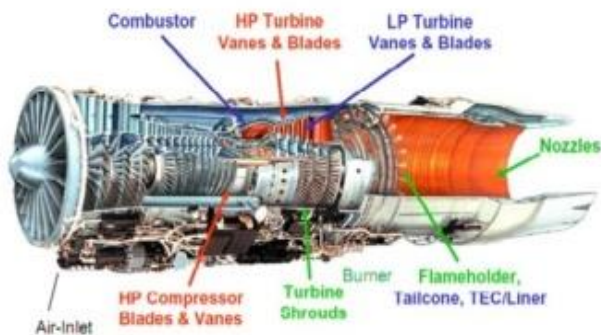
Advanced high T and extreme applications

High temperature Materials:

- heat exchanger in power plants
- Gas-turbines
- Concentrated solar receivers

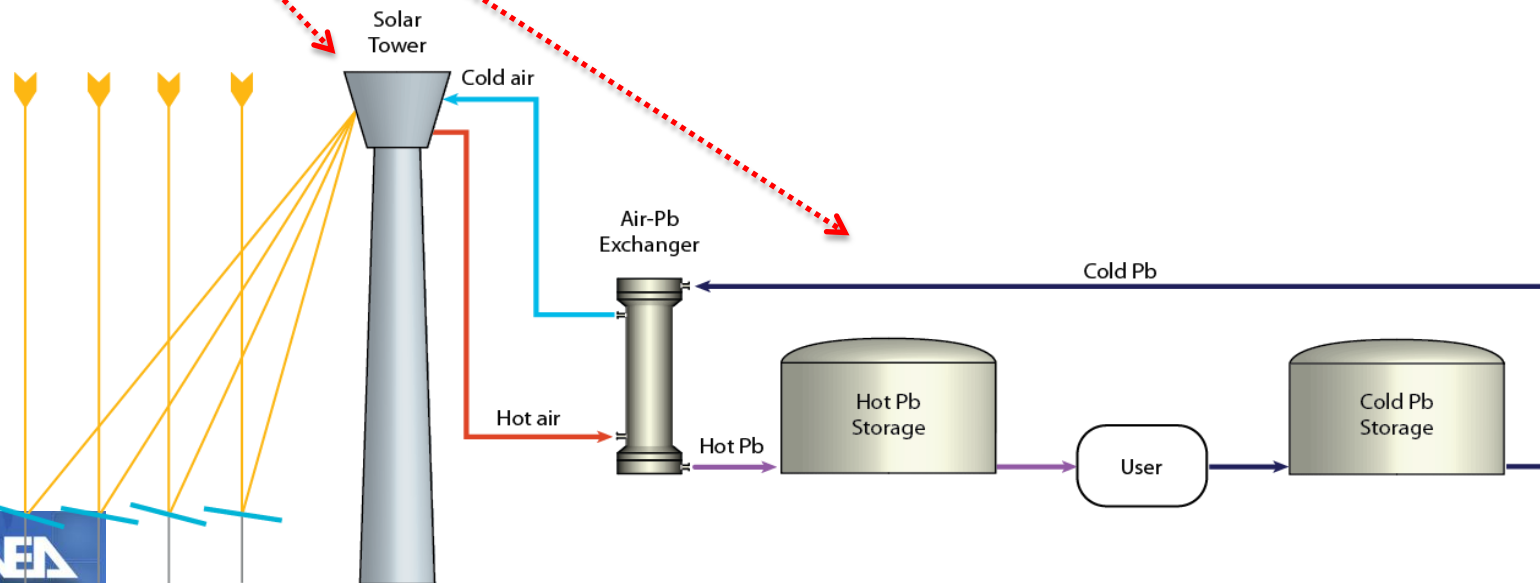
Materials for extreme conditions:

- Photovoltaics
- Barrier coatings
- Thermal storage
- Hydrogen
- Carbon dioxide capture



MAIN TECHNOLOGY ADVANCES IN TWO AREAS:

- RECEIVER: reliable best-in-class monolithic ceramic design and fabrication
- STORAGE:
 - deployment of heat exchanger derived from nuclear working at 700-900°C
 - New special steels (already available in large batch supply of several tons) for lead-resistant parts and consumables (tubes, liners, welding)



DTE-ICT-HPC

Tasks, deliverables and milestones

- Main task: T1.1 INNOVATION MANAGEMENT PLATFORM (ENEA,BEWG)M1-48
- Deliverable D1.1 (ENEA) M3 (end of March !!!)
- Milestone MS1 (ENEA) M12

other NEXTOWER activities

- T1.2 PROJECT MANAGEMENT STRUCTURE, BCS METHOD, KPIs
- T8.4 COMMUNICATION ACTIVITIES

Effort (DTE-ICT-HPC)

- 1.5 PM on the first year
- 0.5 PM for the following 3 years

Budget (55 kEuro)

- 15 kEuro DTE-ICT-HPC effort
- 5K Euro Travelling costs
- 25kEuro INNOTRACK development
- 10kEuro SW Licences

INNOTRACK : an ICT platform for innovation management

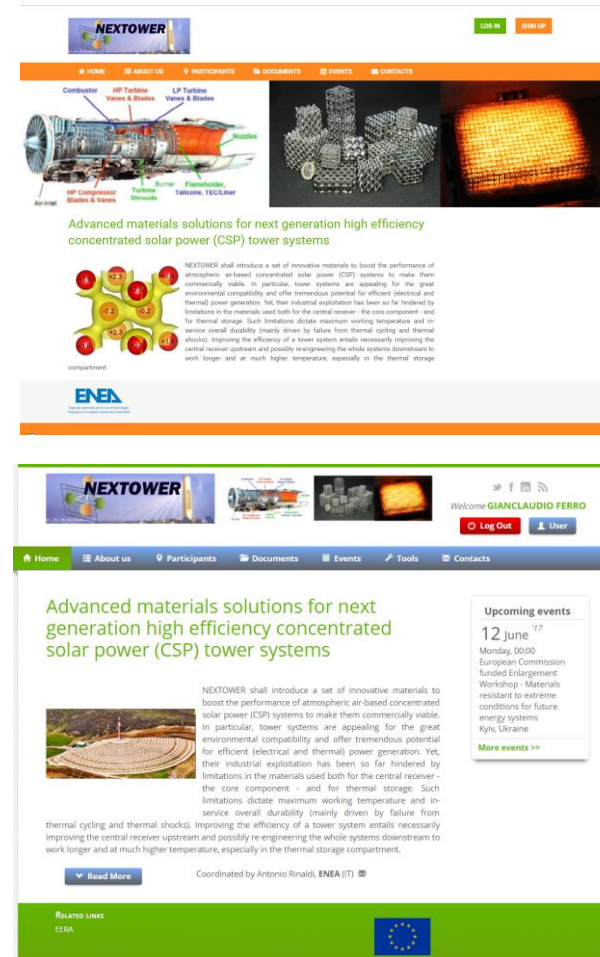
A tool to foster the research process without institutional boundaries, that could enable collaborative research activities beyond geographical barriers, an environment through which a researcher engages with, and becomes part of a research community. The innovation management tool (INNOTRACK) developed for NEXTOWER will be implemented in the project ICT platform in order to be accessible to all partners. In this way, the partners will be able to follow all the important issues related to the project as well as updated the information.

Main components :

- A public website
- A collaborative platform

NEXTOWER public website

- an information platform for partners, relevant stakeholders, industry and general public in order to disseminate as widely as possible the information about activities, main events and scientific results reached by members of NEXTOWER
- Events published and distributed also as web feeds according to the RSS standard, website easily linked to web 2.0 social media (Twitter, Facebook, LinkedIn) by means of social sharing buttons
- all relevant information about the NEXTOWER project, downloadable green open access publications and links to relevant contact persons and other relevant websites



Collaborative platform (1/2)

Internal site of NEXTOWER where the following activities might be carried out:

- Share scientific knowledge and results
The file sharing area is one of the main instruments of knowledge transfer. The output and the prerogatives of website users on this section changes according to the profile of the user. A full text global indexing and search engine on documents contents, filtered by user access permissions, will be available.

Documents

File sharing area

Filter list by name Global Search File Type

Meetings
added by Gianclaudio Ferro on Thursday, 9th February 2017 15:22:08 CET

SETPlanConf2014_Poster-MaterialsFor SustainableEnergyProduction.pdf
modified by Lorenzo Malerba on Saturday, 17th January 2015 12:16:25 CET

- Announce events of common interest, manage registrations and related documents

- Have a virtual meeting room

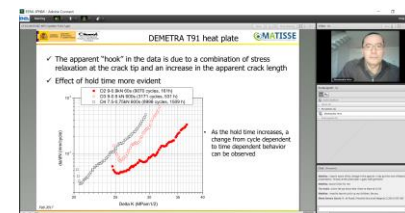
The web conferencing software service offers immersive online meeting experiences for collaboration, virtual classrooms and large scale webinars.

Upcoming events

12 June '17

Monday, 00:00
European Commission
funded Enlargement
Workshop - Materials
resistant to extreme
conditions for future
energy systems
Kyiv, Ukraine

[More events >>](#)



Collaborative platform (2/3)

Internal site of NEXTOWER where the following activities might be carried out:

- Collect and produce periodic reports on activities carried out and other common documents with a specific collaborative tool
- Consult community members
- Project management features**

♥ Very simple (SAMPLE) report		2015-11-17	👤 ⚙️ 🗑️
Description: Simple example of report for test purposes Assigned To: Gianclaudio Ferro (gianclaudio.ferro@unife.it)			
1. Introduction	2014-09-08	👤 ⚙️ 🗑️	
2. First Chapter	2015-11-17	👤 ⚙️ 🗑️	
3.1. First paragraph of Chapter 2	2015-11-17	👤 ⚙️ 🗑️	
3.2. Second paragraph of Chap. 2	2015-11-17	👤 ⚙️ 🗑️	
4. Conclusions	2015-11-17	👤 ⚙️ 🗑️	
5. Foreword	2015-11-17	👤 ⚙️ 🗑️	🔍 📄

The management board and other selected users, will be able to follow all the important issues related to the project as well as updated information in order to allow monitoring of tasks, deliverables and milestones.

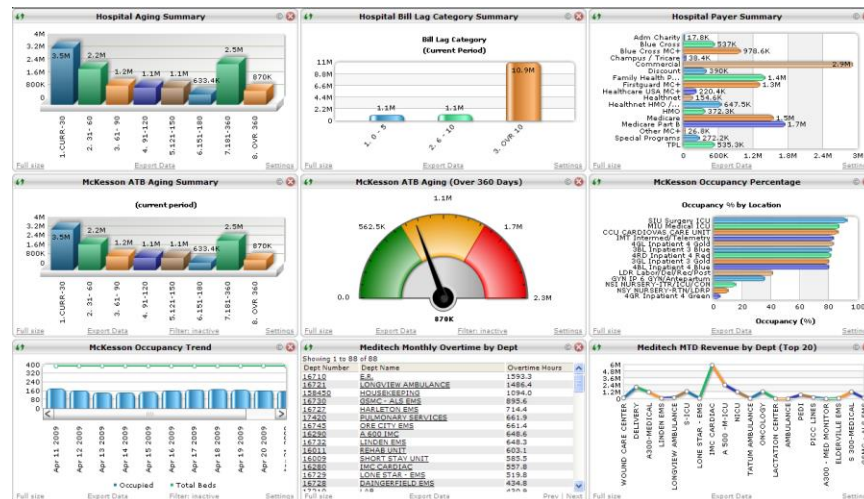
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Collaborative platform (3/3)

Internal site of NEXTOWER where the following activities might be carried out:

Project management features

- Objects of special interest within the project management are the goals, the project efficiency, the schedule, the resources/costs, the project organization, risks and the project context.
- Innovative project management practices will be adopted, such as: Strategic Map, Key Performance Indicators and Balanced scorecard methodology



Thank you for your attention
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