European Commission
FP7 Grant Agreement
No: 609837

STAGE –STE IRP
General Description & Objectives

STAGE-STE Project

- **Full name**: Scientific and Technological Alliance for Guaranteeing the European Excellence in Concentrating Solar Thermal Energy
- **Coordinator**: Julian Blanco Galvez (CIEMAT-PSA)
- **Duration**: 48 months, starting on February 2014
- **Budget**:
  - Current total project budget: 21.198.352 €
  - Maximum Commission Contribution: 9.997.207 €
- **Manpower devotion**: 2.504,45 pm
- **Participants**: 41
  - European Research Centers: 23 (practically, the whole sector)
  - Large European Companies of the sector: 9
  - International (non EU) Organizations of reference: 9
- **7th FP call:** FP7-ENERGY-2013-IRP. Project achieved 15 points/15

STAGE-STE Consortium

Participant no.	Participant organisation name	Country
1 (Coord.)	CIEMAT	SPAIN
2	DLR	GERMANY
3	PSI	SWITZERLAND
4	CNRS-PROMES	FRANCE
5	FRAUNHOFER	GERMANY
6	ENEA	ITALY
7	ETHZ	SWITZERLAND
8	CEA	FRANCE
9	CYI	CYPRUS
10	LNEG	PORTUGAL
11	CTAER	SPAIN
12	CNR	ITALY
13	CENER	SPAIN
14	TECNALIA	SPAIN
15	UEVORA	PORTUGAL
16	IMDEA	SPAIN
17	CRANFIELD	UK
18	IK4-TEKNIKER	SPAIN
19	UNIPA	ITALY
20	CRS4	ITALY

Participant no.	Participant organisation name	Country
21	INESC-ID	PORTUGAL
22	IST-ID	PORTUGAL
23	SENER	SPAIN
25	HITTITE	TURKEY
26	ACCIONA	SPAIN
27	SCHOTT	GERMANY
28	ASE	ITALY
29	ESTELA	BELGIUM
30	ABENGOA SOLAR	SPAIN
31	KSU	SAUDI ARABIA
32	UNAM	MEXICO
33	SUN	SOUTH AFRICA
34	CSERS	LYBIA
35	CSIRO	AUSTRALIA
36	FUSP	BRAZIL
37	IEECAS	CHINA
38	UDC	CHILE
39	UCAM	MOROCCO
40	FBK	ITALY
41	CNIM	FRANCE
42	COBRA	SPAIN

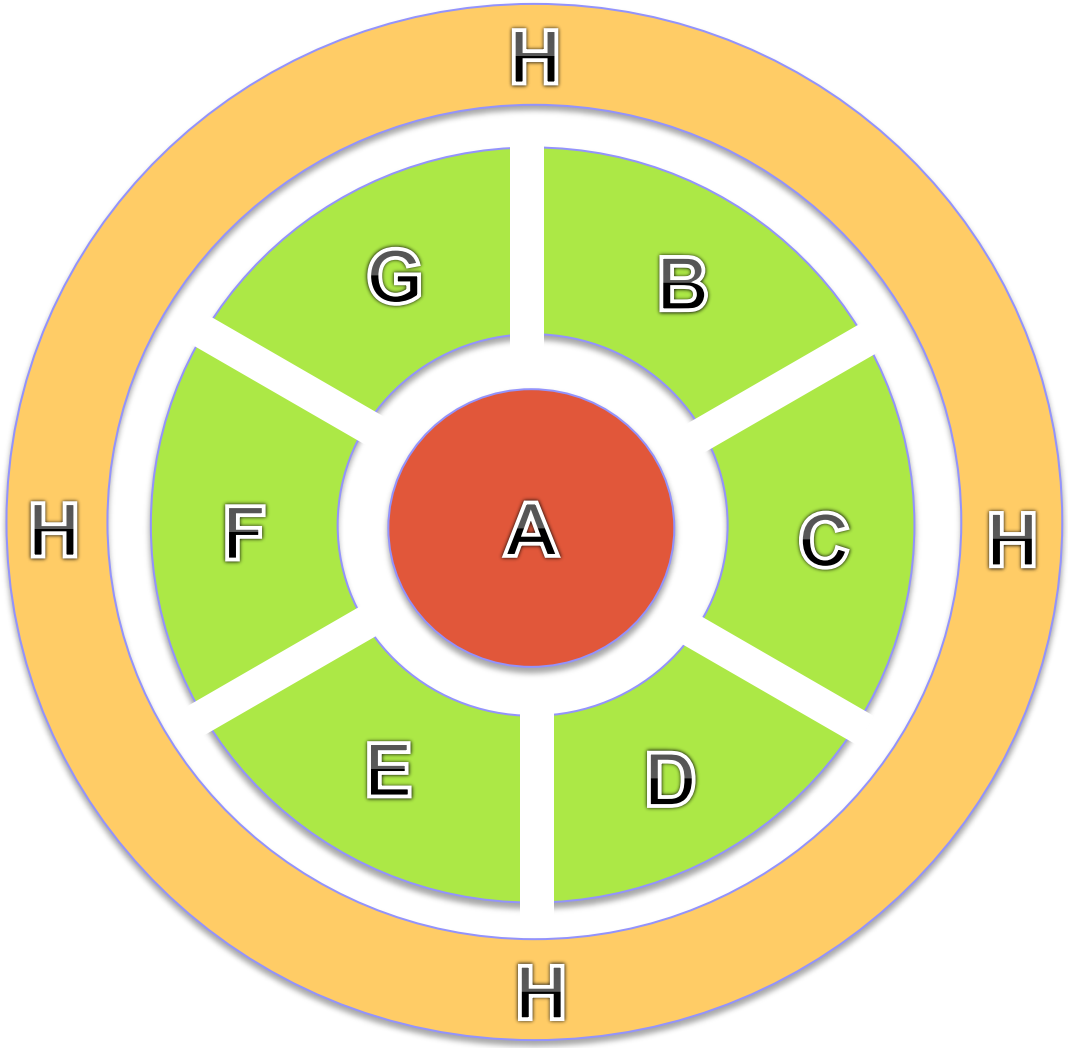
Coordination and Support Work Packages

Formed by a group of activities addressed to intensify the cooperation to more efficiently coordinate, complement and reinforce the activity of the different R&D European Research Centers on the CSP/STE field. Therefore, adding efforts and reducing overlaps, a more comprehensive portfolio of capacities and installations could be offered to accelerate the technology transfer to the European industry and to make possible the maintenance of its current world leadership.

No	Work Package name	Nature[1]	Coordinator
WP1	Consortium governance and management issues	MGT	CIEMAT
WP2	Integrating Activities to Lay the Foundations for Long-lasting Research Cooperation	COORD	CYPRUS INSTITUTE
WP3	Enhancement of STE Research Facilities cooperation	COORD	CTAER
WP4	Capacity Building and Training Activities	OTHER	CNRS-PROMES
WP5	Relationship with Industry & Transfer of Knowledge activities	COORD	CEA
WP6	International Cooperation Activities	COORD	FRAUNHOFER

*[1]: **COORD** = Coordination; **MGT** = Consortium Management, **OTHER** = dissemination activities, courses, staff exchange, etc.*

STAGE-STE Core Objectives



A. **Main core objective: increased real collaboration among EU research organizations**
B. **Cooperative technical and scientific development (WPs 7 to 12)**
C. **Research infrastructures effective sharing (strong interaction with SFERA and EU-SOLARIS)**
D. **Substantial staff exchange**
E. **Training and capacity building**
F. **Alignment of national and EC financial resources + co-sharing**
G. **International collaboration**
H. **Interaction with industry**

Detailed Project Objectives

Objectives associated to "Integrating activities to lay the foundations for long-lasting research cooperation"

- To create a suitable entity, to be operational at the end of the current IRP, for coordinating STE research in Europe and guarantee the continued excellence of European STE and associated technologies.
- To monitor national and regional RTD programmes on STE and associated technologies, foster their coordination and thus create a favourable environment for the development of joint RTD activities.
- To develop and continuously update a European research programme for STE, building up on the work of the SEII group and on previous efforts ESTELA.
- To enhance working relations between the concentrating solar thermal energy research community and national research funding agencies, to raise awareness of the importance of STE and associated technologies for the future energy mix of Europe and of the neighbouring regions.
- To develop relations with government agencies and other public stakeholders relevant to STE to foster the development of coordinated funding programmes for STE and associated technologies research.

Detailed Project Objectives

Objectives associated to "Joint activities to foster the use of existing research facilities to create a European dimension and activities to support scientific communities and industry in their access"

- To coordinate a close collaboration with other initiatives relevant to the use and development of European concentrating solar thermal research facilities (such as SFERA, EU-SOLARIS, etc) to maximize and optimize their use.
- To increase the use and efficiency of concentrating solar thermal research infrastructures by defining the European Research Agenda on infrastructure needs.
- To improve the use of concentrating solar thermal infrastructures by performing an analysis of best practices implemented in the European research infrastructures.
- To foster the increased use of research infrastructures by industry through the definition and implementation of enhanced infrastructures for qualifying concentrating solar thermal components.

Detailed Project Objectives

Objectives associated to training and exchange of researchers activities to facilitate the co-operation between research organisations and scientific communities

- To raise the level of excellence of the researchers and reinforcing the cooperation and synergies among the partners through exchange of researchers and associated knowledge transfer.
- To increase the use of research infrastructures among the partners and industry through the exchange of researchers
- To fill the gaps in existing concentrating solar thermal training programmes through the definition of training needs and mapping of the already existing programmes.
- To create a European reference course on concentrating solar thermal to be delivered to scientific communities and the industry, thus fostering collaboration of the partners by defining and exchanging a pool of high-qualified professionals to deliver the course in different countries.
- To make the course sustainable after the project to create a long-term generation of quality trained researchers.

Detailed Project Objectives

Objectives associated to "Transfer of knowledge activities"

- To reinforce the partnership with European industry in the context of the SET Plan European Industrial Initiatives including the input of industrial needs into the research priorities.
- To accelerate the transfer to the market of knowledge and new results developed by the project partners and other external organisations by defining a Plan for the Use and the Dissemination of the Background and Foreground.
- To define mechanisms for sharing the access among the partners to their own relevant IP assets (foreground and background) and for laying the grounds for pooling of complementary IP assets among the partners, in order to favor the promotion and the exploitation of more complex research results.
- To set guidelines for standardisation of STE components and plant commissioning, in close cooperation with European industry.
- To promote the STAGE-STE research results towards targeted audiences via different dissemination tools and to foster the collaboration and support of the services offered by the KIC InnoEnergy.

Detailed Project Objectives

Objectives associated to "International Cooperation activities"

- To coordinate the R&D efforts on an international level, avoiding the development of parallel structures and repetition of research projects internationally and thus leading to a faster innovation and to reinforced cooperation and synergies among the partners through multilateral cooperation notably within the SolarPACES framework.
- To increase the level of awareness for cultural, economic and climatic differences affecting the implementation of STE projects
- To support increased bilateral cooperation among international institutions on specific R&D topics relevant to the region to create synergies
- To create a knowledge pool on different regional framework conditions for STE implementation, local economical and climatic needs as well as support measures and regulations

Research Work Packages

It is formed by 6 additional Work Packages which are addressing *Coordinated Research Activities* that cover the whole spectrum of topics related with Concentrated Solar Energy and addressing, within the 4 years of project duration, the considered as most urgent activities to be done.
In addition to the multiple and specific technical objectives of the different activities, the whole research component of STAGE-STE project intends to demonstrate and start to run the feasibility of deeper and effective integral European collaboration and coordination.

No	Work Package name	Nature[1]	Coordinator
WP7	Thermal Energy Storage for STE Plants	RTD	ENEA
WP8	Materials for Solar Receivers and STE Components	RTD	DLR
WP9	Solar Thermochemical Fuels	RTD	PSI
WP10	STE plus Desalination	RTD	CIEMAT
WP11	Linear focusing solar concentrating technologies	RTD	CIEMAT
WP12	Point focusing STE Technologies	RTD	CENER

*[1]: **RTD** = Research and Technical Development*

Research Work Packages

WP7: Thermal Energy Storage for STE Plants (Walter Gaggioli, ENEA)

- Task 7.1: Advanced fluids and materials for high temperature heat storage
- Task 7.2: Aging of components with MS, High Tech Systems and Materials (HTSM) and PCM
- Task 7.3: Advanced thermal storage systems
- Task 7.4: Integration/hybridization of TES in STE plants

WP8: Materials for Solar Receivers and STE Components (Peter Heller, DLR)

- Task 8.1 Development of an integrated methodology for accelerated aging of reflectors
- Task 8.2 High temperature absorbers and materials
- Task 8.3 Performance of CSP components in desert environment
- Task 8.4 First surface mirrors with high reflectivity

WP9: Solar Thermochemical Production of Fuels (Anton Meier, PSI)

- Task 9.1: Solar fuels from carbonaceous feedstock
- Task 9.2: Solar fuels from thermochemical cycles
- Task 9.3: Innovative materials for next generation solar chemical reactors
- Task 9.4: Technology assessment of solar thermochemical fuel production

Research Work Packages

WP10: Concentrated Solar Power and Desalination (Diego Alarcón, CIEMAT)

- Task 10.1- Low temperature desalination processes for integral power & water production
- Task 10.2- STE cooling issues and desalination
- Task 10.3- Model development and simulation of STE+D configurations

WP11: Linear Focusing STE Technologies (Loreto valenzuela, CIEMAT)

- Task 11.1- Small scale and low cost installations for power and industrial process heat applications
- Task 11.2- Methodologies for dynamic testing and predictive maintenance of large solar fields

WP12: Point Focusing CSP Systems (Marcelino Sanchez, CENER)

- Task 12.1: Development of low cost heliostat fields
- Task 12.2 High concentration optical systems and new receiver concepts for next generation solar towers

Relevance of STAGE-STE Project

- As the project achieved the involvement of, practically, the whole European sector and significant participation from all over the world, this could be a very good opportunity to internationally reinforce and consolidate the relevance of CSP/STE technologies.
- As IRP projects are a new Commission tool (and STAGE-STE achieved the max. possible score) many people in Europe will be closely following and paying attention to our project evolution.
- Therefore, the success or failure of this project could have implications far beyond the own technical project objectives.