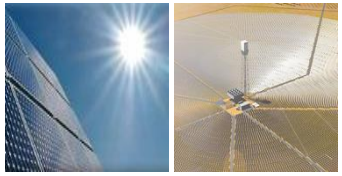
ENGINEERING SERVICES FOR ENERGY

CSP history, knowledge and experience

2016

Who we are



Solar Thermal Power Plant

Biomass and Waste to Energy Projects

Hydroelectric and Wind Power Stations

Combined Cycles, Cogenerations and Thermal Power Plants

ESE

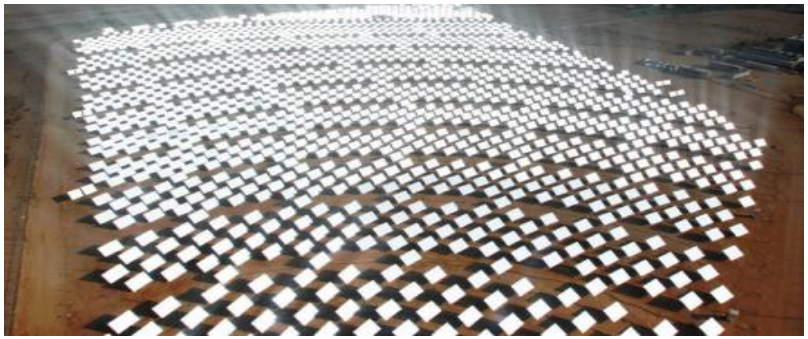
ESE was founded in 1994 by General and Technical Managers of top Italian industrial companies, driven by the desire to create **a very high-level engineering company.**

The Company structure has been designed so as to be very flexible and capable of developing works of extremely different size and commitments.

History - CSP

"Franco do you know some body that knows about boilers? "

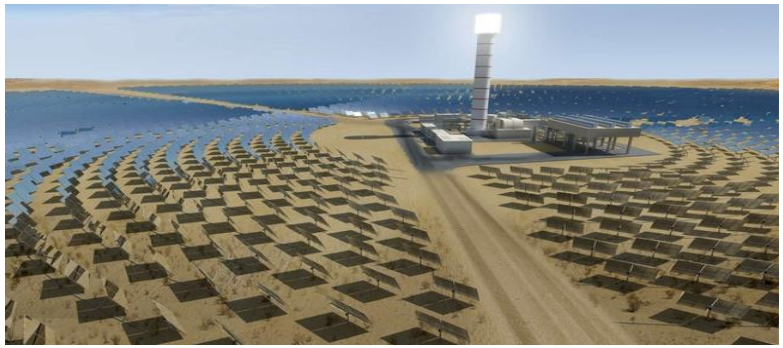
History - CSP



Rotem (ISR) 6 MWth BrighSource Solar Demonstration Facility

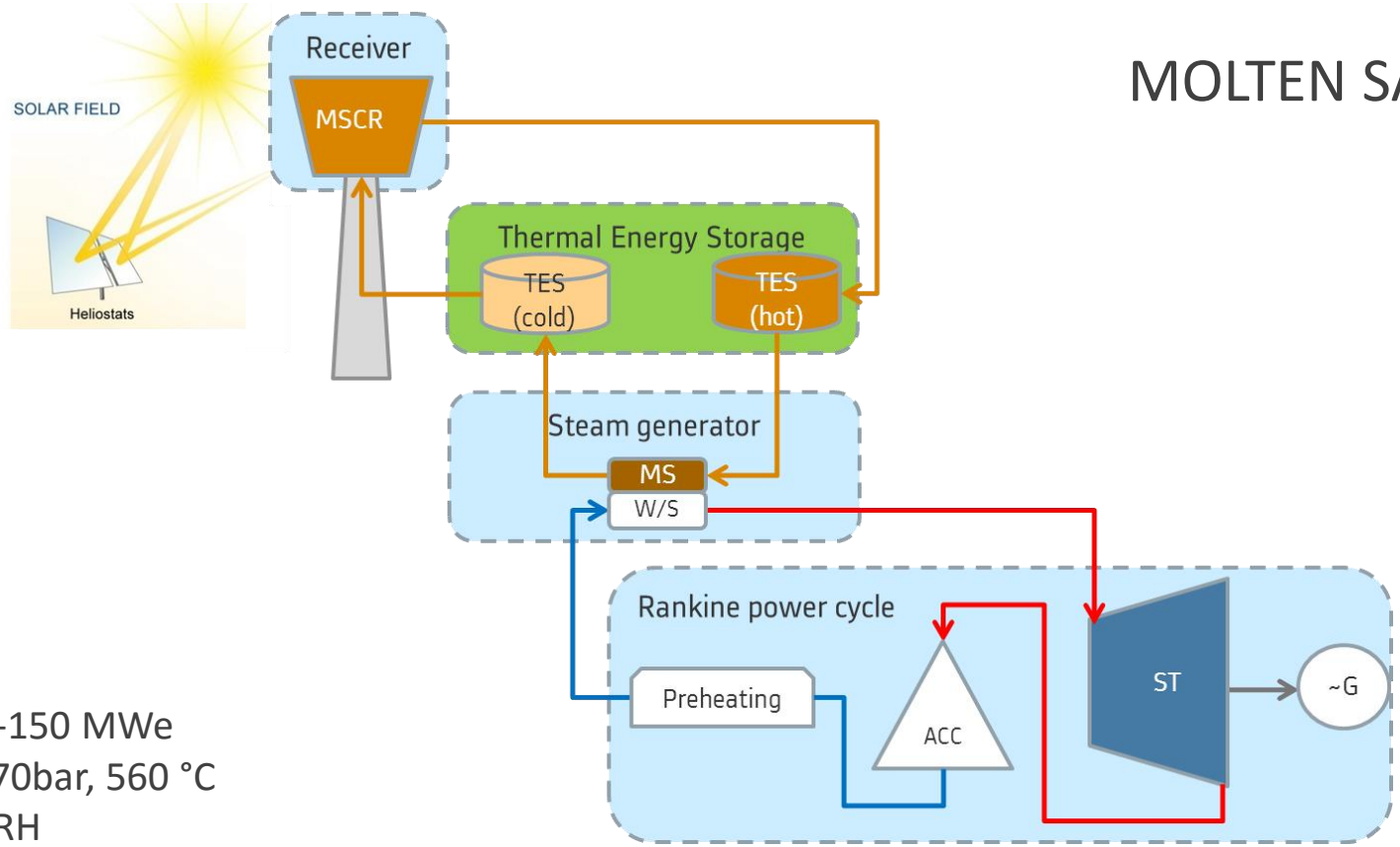
Coalinga (CA) 29 MWth Chevron-BrighSource Solar to Steam Demonstration Facility

Ivanpah (CA) 377 MW BrighSource Solar facility



Ashalim (ISR) 121 MW BrighSource Solar facility

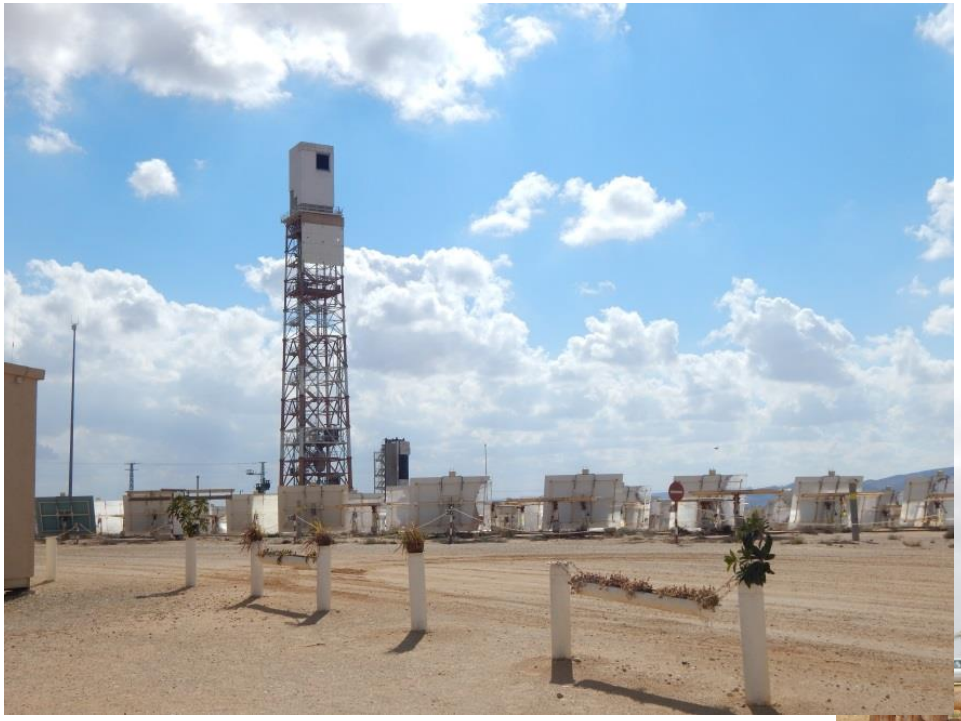
Knowledge - CSP



MOLTEN SALT

100-150 MWe
@170bar, 560 °C
SH/RH

Knowledge - CSP



MOLTEN SALT

Knowledge and future

PreFlexMS

PREDICTABLE&FLEXIBLE SOLAR POWER WITH MOLTEN SALT ENERGY STORAGE

RESEARCH AND INDUSTRY

European Commission

HORIZON 2020

Knowledge and future

Experience – ESE TODAY

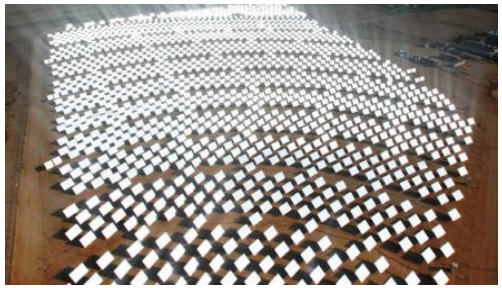
ESE has **more than 10 years** history of CSP jobs, ranging across

all kinds of technologies:

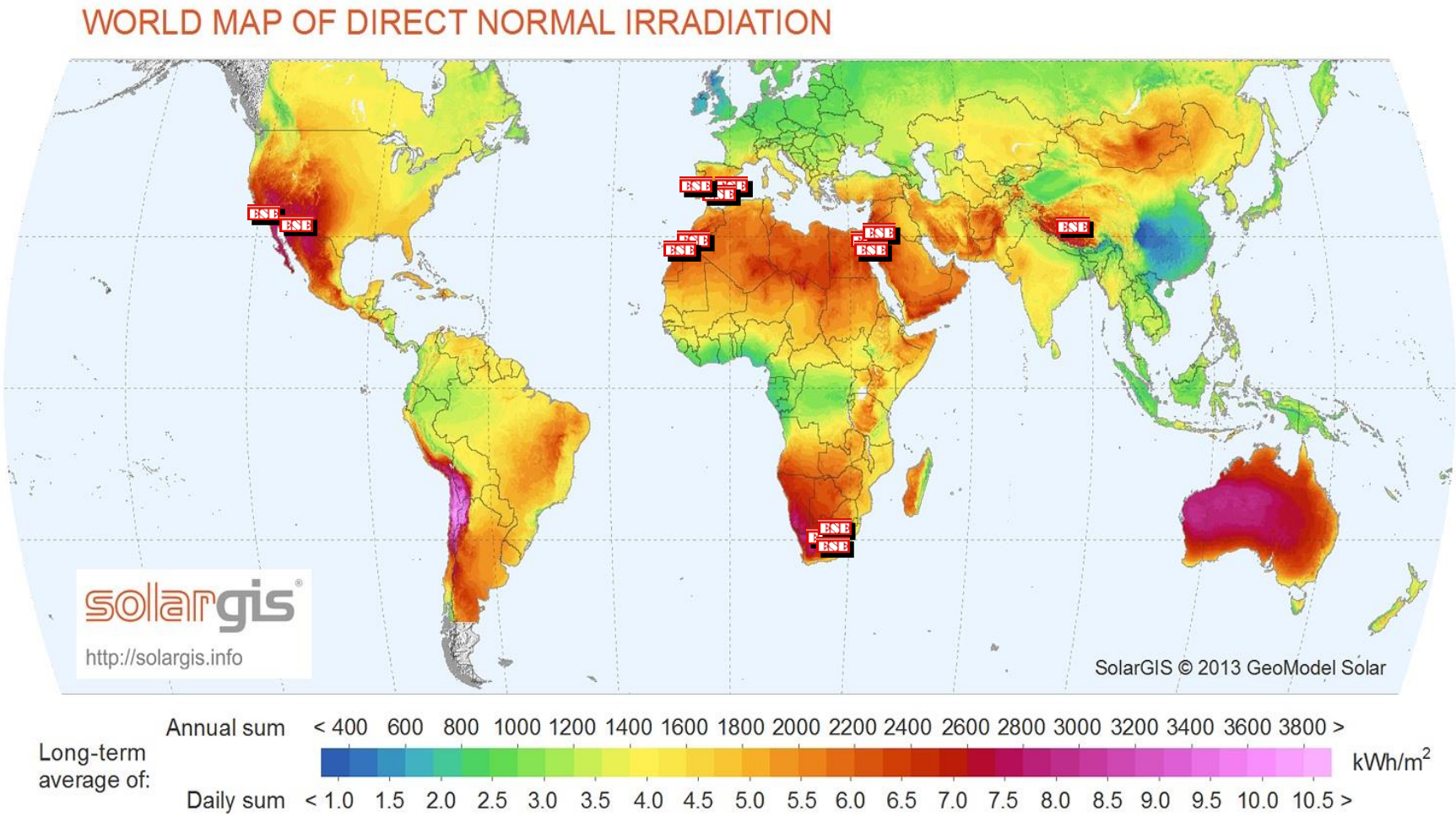
- Tower plants with steam
- Tower plants with molten salt
- Fresnel plants
- Parabolic Trough plants

all kinds of jobs:

- Feasibility studies and R&D
- Equipment design
- EPC-side engineering
- Owner-side engineering



Experience – ESE TODAY



Some references

Reference: Pilot Direct Steam Receiver

Design and manufacturing follow-up of 6 MWth pilot receiver

activities:

- Design and engineering of the pilot receiver
- Follow up of manufacturing
- Follow up of construction and erection
- Customer: Brightsource
- Year: 2006-2008

Reference: 126 MW Ivanpah CSP plant

Design follow-up of direct steam receiver

activities:

- Main equipment specification and selection
- Consultancy for the Receiver design
- Follow up of Riley Power design
- Customer: Luz II
- Year: 2008-2009

Some references

Reference: 121 Ashalim CSP plant

Multidisciplinary basic and tender engineering of power block

activities:

- Multidisciplinary engineering
- Tender process for equipment
- MTOs
- Overall system cost estimate
- Customer: Dalkia
- Year: 2009-2010

Reference: 29 MWth Chevron EOR plant

Receiver and main equipment design and follow-up

activities:

- Basic design of receiver
- Basic design of other main equipment
- Follow up of manufacturing
- Customer: Luz II
- Year: 2010

Some references

Reference: 2 MWth Puerto Errado Fresnel Plant

Troubleshooting of existing Fresnel power plant

activities:

- Survey of plant status
- Expert judgement of operating problems
- Consultancy for corrective measures
- Customer: Poyry
- Year: 2010

Reference: 50 MW Aznalcollar plant

Tender engineering for parabolic trough 50 MW plant

activities:

- Process/mechanical design of power block
- Process/mechanical design of HTF system
- Tender process for power block and HTF equipment
- Customer: Luz II
- Year: 2007

Some references

Reference: Karoshoek 100MW CSP plant

Basic design & cost estimation for a Fresnel direct steam CSP

activities:

- Reference plant design
- Karoshoek plant optimization
- Power Block cost estimation
- Thermal cycle optimization
- Preliminary equipment spec.
- Customer: ABB Renewables
- Year: 2012-2013

Reference: 140 MW reference Molten Salt Plant

Conceptual plant design and thermo-economic optimization

including:

- MS Storage System (8 hours)
- MS Steam Generator System

activities:

- Definition of different plant concepts and schemes
- Performance comparison
- Thermoeconomic optimization
- Customer: Alstom
- Year: 2013

Some references

Reference: 140 MW Upington Molten Salt Plant

Design and costing of molten salt system for 140 MW tower plant

including:
- MS Storage System (8 hours)
- MS Steam Generator System

activities:
- Multidisciplinary engineering
- Tender process for equipment
- MTOs
- Overall system cost estimate
- Customer: Alstom
- Year: 2013

Reference: 110 MW SOLIS Molten Salt Plant

Tender engineering of molten salt system for 110 MW tower plant

including:
- MS Storage System (8 hours)
- MS Steam Generator System

activities:
- Multidisciplinary engineering
- Tender process for equipment
- MTOs
- Overall system cost estimate
- Customer: Alstom
- Year: 2013

Some references

Reference: Heat Exchange Technologies Assessment

Assessment of heat exchange technologies for molten salt

involving worldwide recognized top manufacturers; evaluation criteria:

- Heat exchange performance
- Manufacturing technology
- Thermal cycling suitability
- Materials and corrosion
- Cost
- Customer: Alstom
- Year: 2014

Reference: Noor III 150 MW Plant

Technical alignment and evaluation of heat exchangers offers

activities:

- Technical alignment of offers against specifications
- Visit of heat exchangers manufacturers workshops
- Customer: Alstom
- Year: 2014

Some references

Reference: Molten salt OTSG feasibility study

Feasibility study of molten salt once-through steam generator

activities:

- Conception of process scheme
- Conception of preliminary operation and control concept
- Assessment of cost saving potential
- Customer: Alstom
- Year: 2014

Reference: Delingha direct steam receiver

Basic engineering of direct steam receiver for 135 MW tower plant

activities:

- Mechanical design of steam generator panels, including header design
- Arrangement of boiler main equipment and interconnection piping
- Customer: Brightsource
- Year: 2014

Some references

Reference: Reference: Rotem Molten Salt Pilot Receiver

Erection/commissioning supervision of 6 MWth pilot receiver

testing the molten salt central receiver technology

activities:

- Supervision of erection;
- Consultancy for technical issue during erection;
- Supervision of cold commissioning
- Customer: Alstom
- Year: 2015

Reference: Molten Salt OTSG Design

Design of innovative Molten Salt Once-Through Steam Generator

developing an innovative molten salt steam generator, tested on a pilot scale (5 MWth)

activities:

- Steam generator design;
- Test plan development
- Commissioning and test operation
- Customer: EU – H2020
- Year: Ongoing

PreFlexMS

Website: www.preflexms.eu

ENGINEERING SERVICES FOR ENERGY