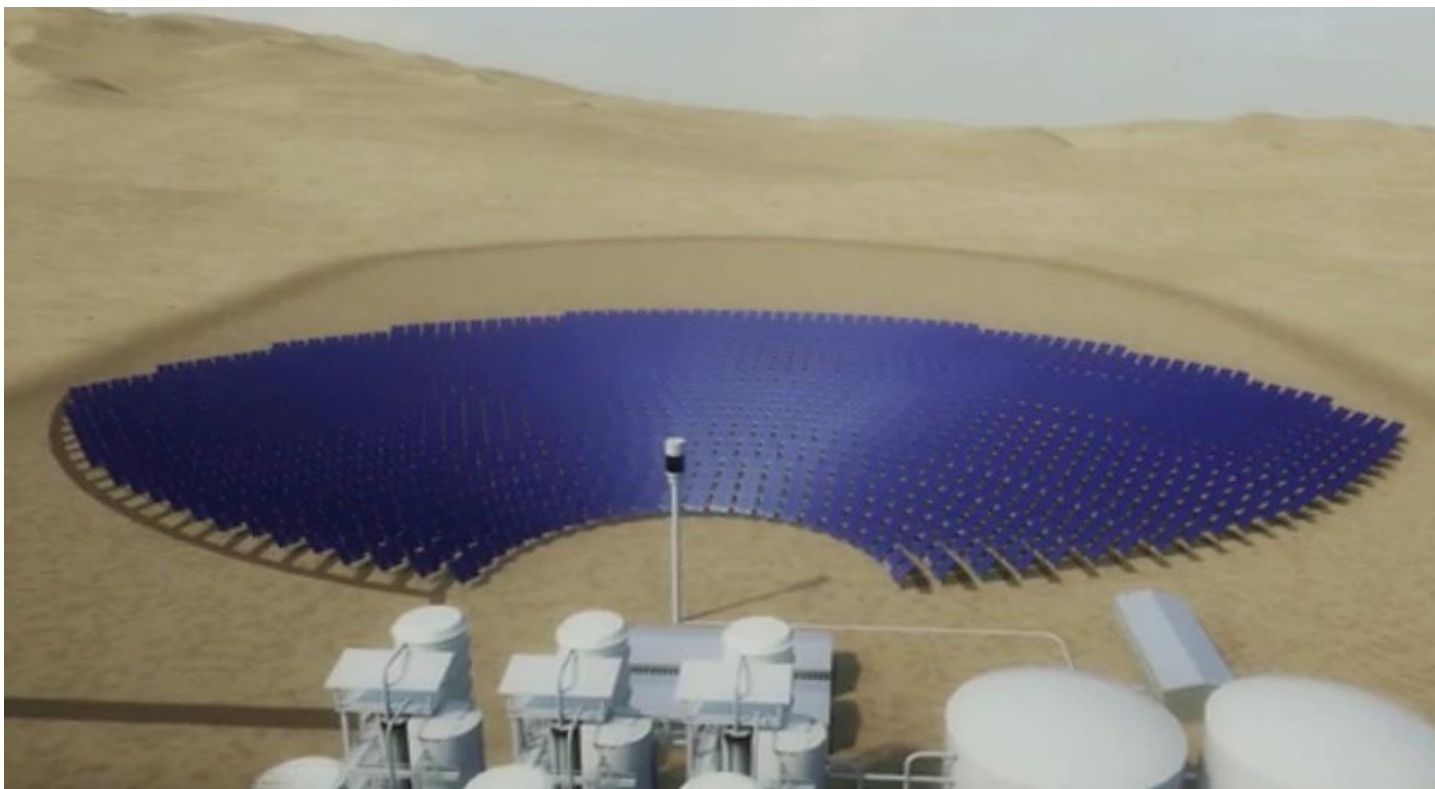
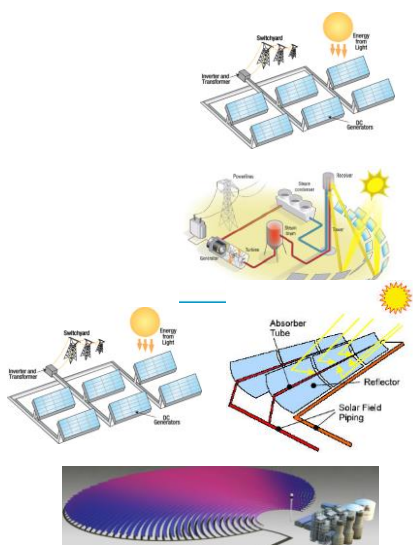


# ***BLUESOLAR*** ***a Hybrid PV-CSP system***



## LCOE comparison



Configuration	Dispatchable	LCOE range (€/MWh)	Comment
PV	No	22-27	-
CSP	Yes	70-75	Baseload
PV+CSP	Yes	62-67*	Peak-Matching
Bluesolar	Yes	42-47*	Peak-Matching

\*With electrical heating for curtailed PV or wind, a LCOE reduction of approximately 20% can be expected

# Bluesolar TECHNOLOGY CONCEPT

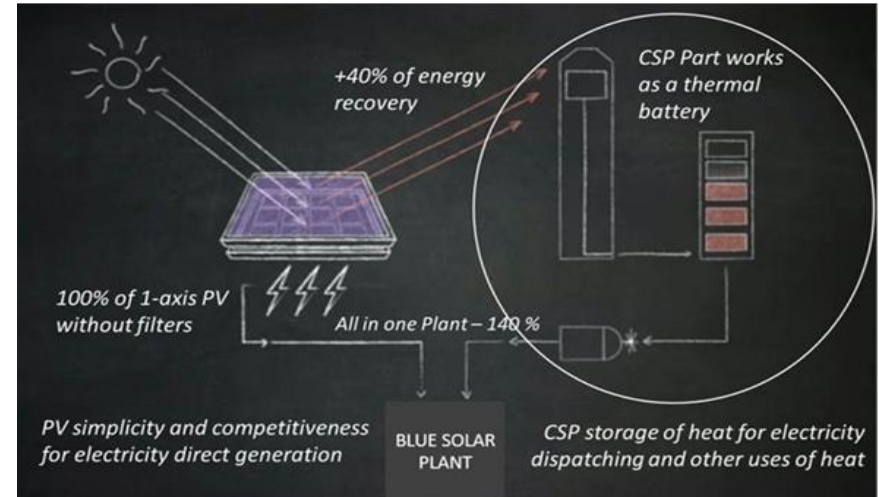
*BLUESOLAR Technology (\*) is the **first worldwide concept about a Photovoltaic Plant with Thermal Cogeneration.***

*The mirrors in typical solar thermal plants are substituted by **PV panels with an integrated light optical selective filter.***

*The filter transmits only useful light to the PV cell while reflecting 40-45% of light to the thermal receiver to generate heat.*

*The **heat can be stored at a fractional cost of electrical batteries** and can be dispatched in form of electricity via turbine or direct heat whenever is needed.*

*Two major markets: PV plants with storage, PV plants with a co-generated heat quite valuable for many Industrial Processes.*

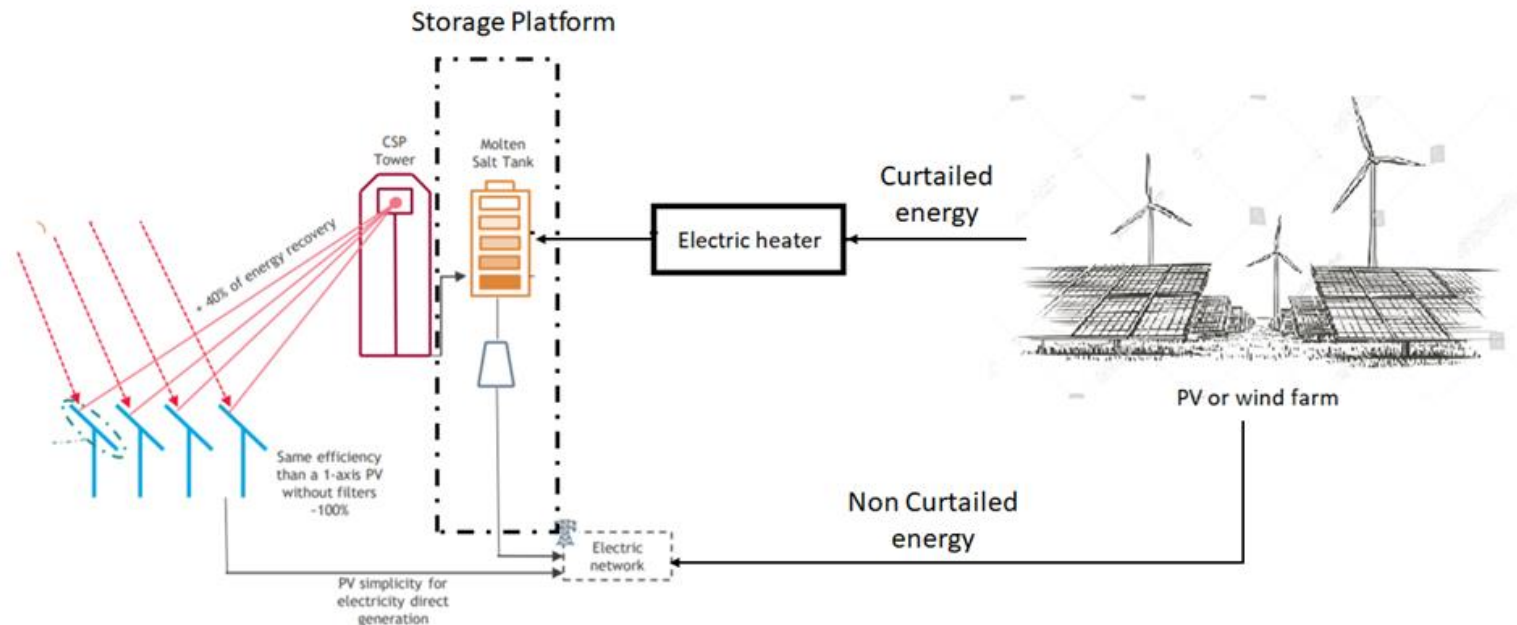


## BlueSolar Key Features

- Technology tested in major European institutions such as Fraunhofer, CSIC and PSA.
- Optical light selective filter adaptable to any PV manufacturer and cell.
- No degradation of filters and fully protected by the glass.
- Optical reflectance range: 40 – 45 %
- PV performance: same electricity production than standard 1 axis PV with equivalent nominal power.
- **In development upgraded PV panel with over 55% reflectance and minimal PV losses**
- Ratio Production / Area up to 80% better than standard CSP
- Hemisphere solar field configuration / multitower & multi-axis configurations
- Better performance with PV Bifacial on a dual axis tracking system.
- Possibility to store electricity via Joule effect from other renewable technologies 5x more cost effective than current batteries
- BlueSolar is based on bankable technologies.



## Thermal storage as back up for curtailed PV or wind



- Roundtrip efficiency Electricity-Heat-Electricity ~ 40%.
- Minor extra cost to accommodate more hours of storage (extra cost of Molten salts).
- System ideal to provide value to curtailed energy that is no needed and thus has zero market value.
- In high penetration PV-Wind scenarios where they cover approximately 40-45% of annual capacity factor, curtailments in the 20-25% range are expected



THANK YOU