



A cost effective and efficient approach
for a new generation of solar dish-Stirling
plants based on storage and
hybridization (BIOSTIRLING-4SKA)

Call FP7-ENERGY-2012-1
Grant Agreement n° 309028

BIOSTIRLING-4SKA



17th June 2013



- What is biostirling SKA project?
 - It is a prototype project to supply green energy to SKA project where some different partners included industrial companies, SME and technological centers are involved.



Horizon 2020 is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness



PROJECT STRUCTURE (PARTNERS)



INDUSTRIAL PARTNERS

Gestamp Renewables

Gestamp Solar

Renewable energy + Solar

machttechnik

toughtrough®

Glass

CLEANERGY

Stirling engine

TECHNOLOGY SUPPLIERS

LENER
Canada Energy Association

Renewable energy technology

University of Jyväskylä
Biomass

CTAER
Solar Dish and Concentrator

University of Stuttgart
Storage

Fraunhofer
Control

Logica
Renewable energy technology +
Moura

SKA

CSIC

ASTRON

Instituto de Telecomunicações

MAX-PLANCK



LOCATION OF THE DIFFERENT PARTNERS



GESTAMP G55
GESTAMP GRI
CTAER

ALENER
CSIC
US



IT
LÓGIC



MPG
MTAG
FRAUNHOFER
TT



ASTRON



CLEANERGY



JYU



WHERE AND DURATION?

BIOSTIRLING-4SKA



- Where will be located the is biostirling SKA project?
 - It will be located in Moura (Portugal) where the astronomic characteristics are the optimal, becuae of the low radio interference .



- Duration: 36 months.

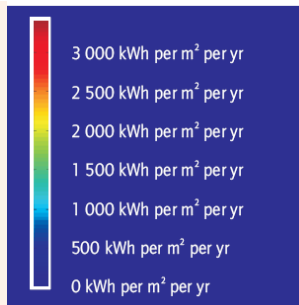
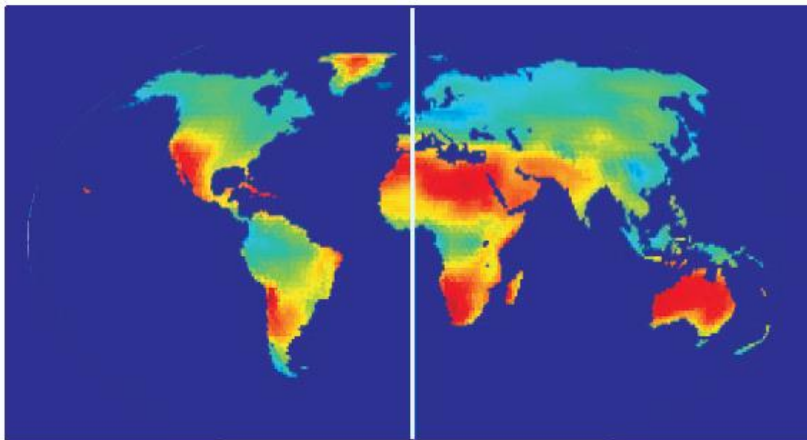


GENERAL – Main Solar Technologies



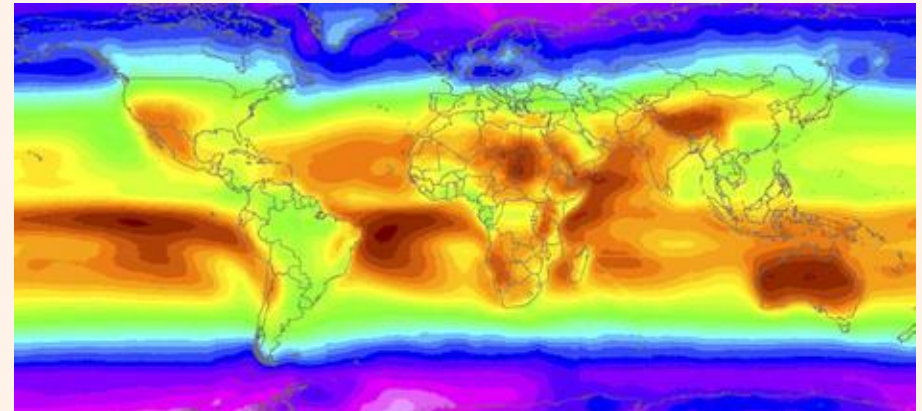
Concentrating Solar Power (CSP) can provide low-carbon, renewable energy resources in countries with strong direct normal irradiance (DNI)

Solar Resource for CSP technologies, DNI in kWh/m²/ year



PV technology depends not only on solar direct irradiation, but also on indirect one

Solar Irradiation



That explains that countries such as Germany or Japan can be amongst the world leaders by installed capacity



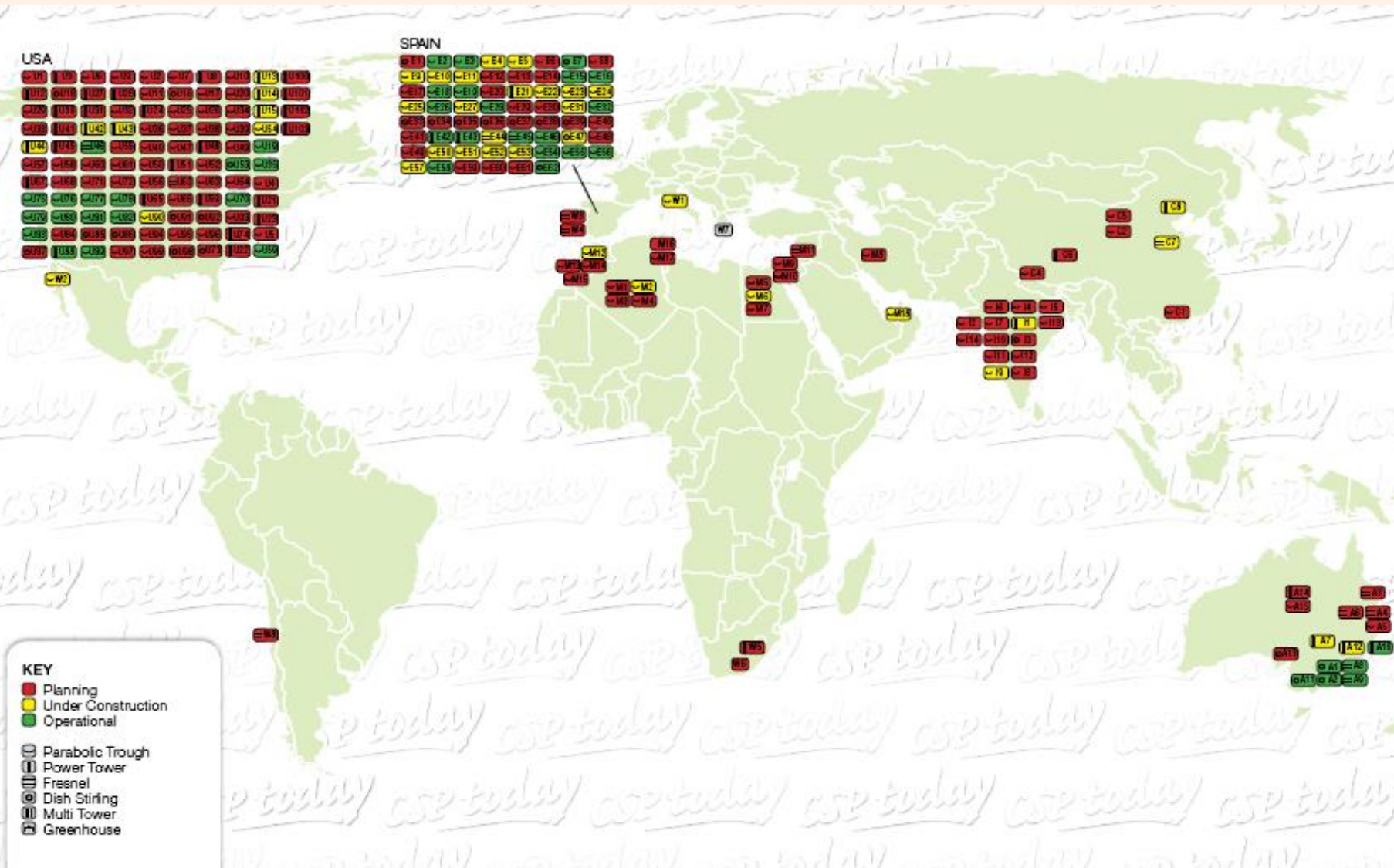
GENERAL - CSP Solar Technologies

BIOSTIRLING-4SKA





GENERAL - CSP Solar Technologies





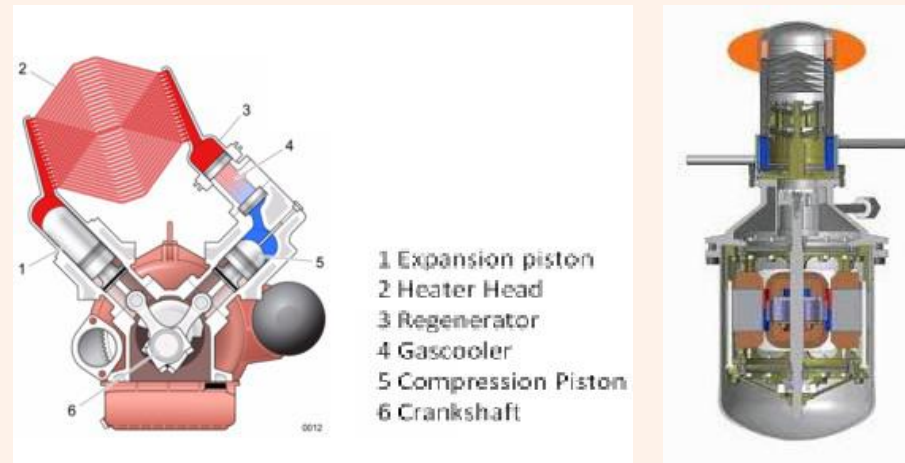
- Solar concentrators
 - The solar beams will reflect in the solar concentrators with a parabolic shape in order to resend these solar beams to the focus where is located the hot source of the stirling motor.
 - Composed by the a metal structure, mirrows, sun follow system.





- Receiver

- Heat transmission from the disc to the stirling motor.
- 2 tipos of receivers: the direct illumination receivers and the reflux receivers (Indirec)
- Reflux: high rates and uniformity of heat transfer and easy to add biogas burner



- Stirling engine

- The most effective device for covering heat into mechanical work.
- With the heat produced in the heater head, the stirling motor will produce a mechanical movement with high efficiency that will be transformed in electricity.



- Main characteristics of the Stirling Solar technology

Advantages

- Highest efficiency of any solar power generation.
- Modularity
- No water consumption

Disadvantages

- High costs
- Limited life time
- Low stability and reliability

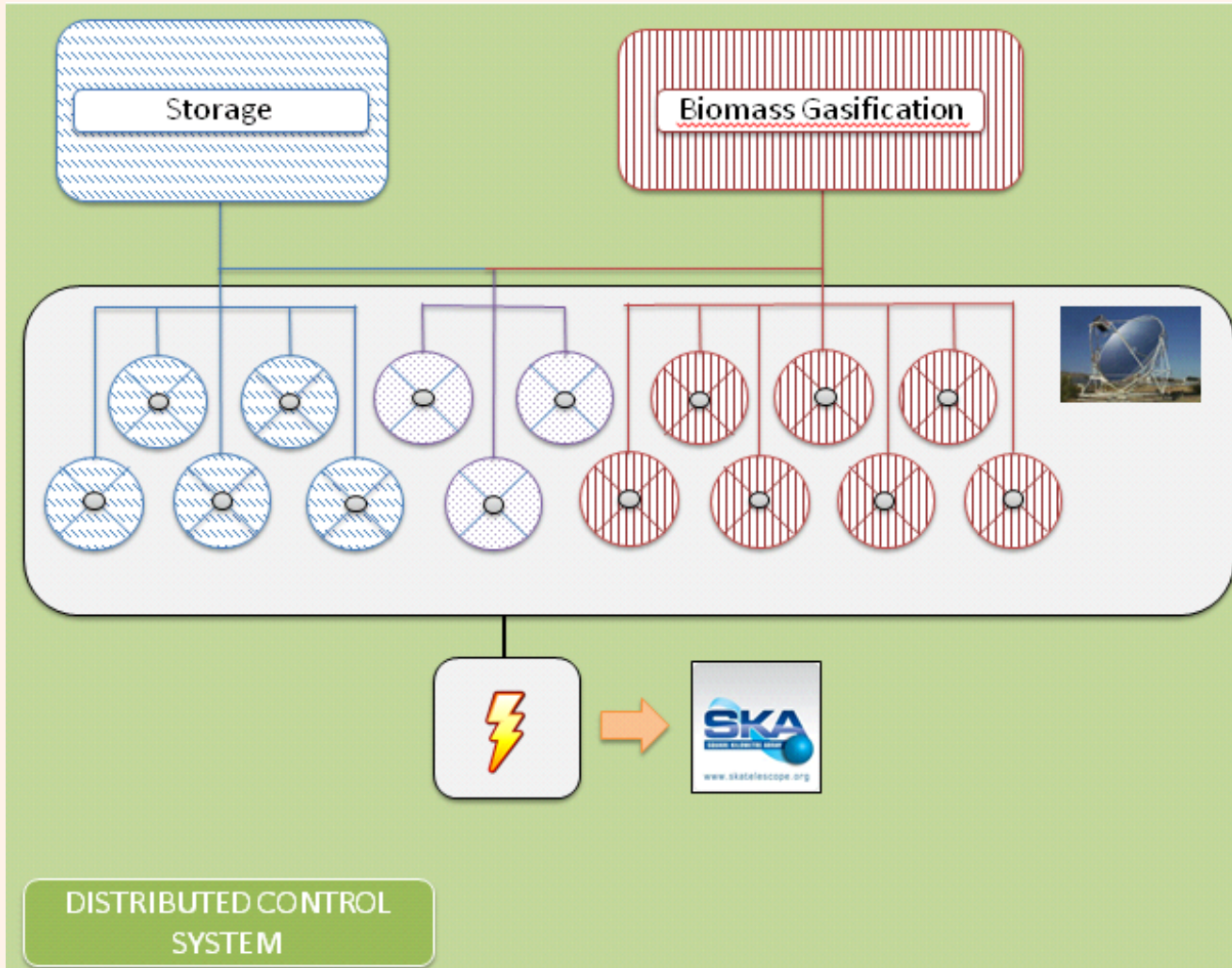


- Hibridation and Storage
 - In order to use green energy during the night, it is necessary to store the sun energy generated during the day or generate new green energy with biomass/biogas.
 - Also the difference between winter and summer are important.
 - Hibridation improve operation stability and dispatchability.





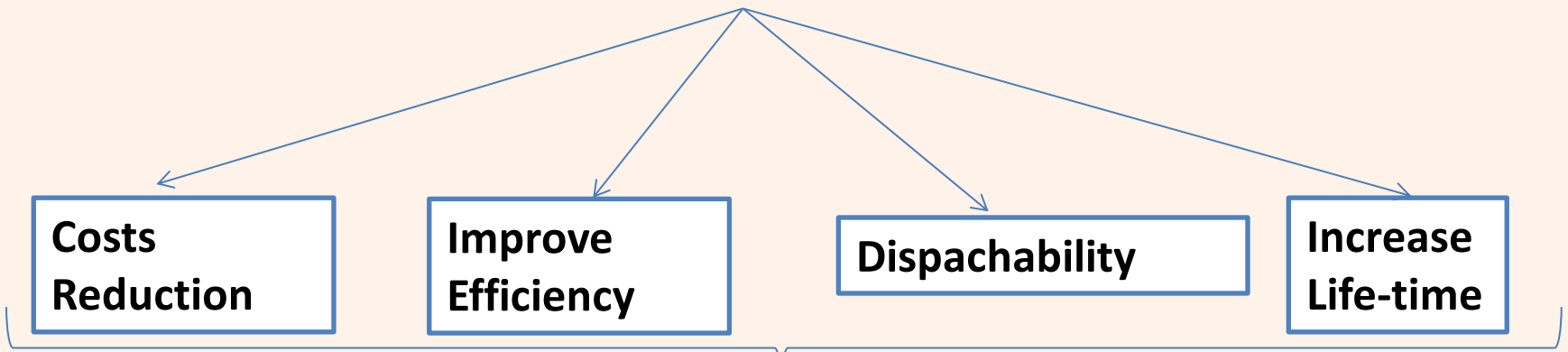
- Plant configuration





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Achievement of four targets



Energy requirements:
✓ Modular power generations
✓ Power consumption night&day



New commercial Solar Dish Technology



THANK YOU FOR YOUR ATTENTION

BIOSTIRLING-4SKA

