

*creating  
sustainable  
energy*

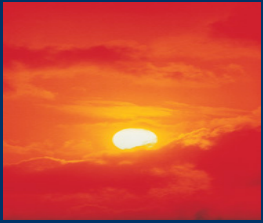


## ***BIOSTIRLING Project***

A cost effective and efficient approach for a new generation of Solar Dish-Stirling Plants based on storage and hybridization

***FP7-ENERGY-2012-1***

***ENERGY.2012.2.5-1: Research, development and testing of solar dish systems***



*creating  
sustainable  
energy*



**1**

**Concept and Objectives – Why BIOSHIRLING**

**2**

**Synergy with SKA**

**3**

**The BIOSHIRLING Prototype**

**4**

**The consortium members**



*creating  
sustainable  
energy*



**1**

**Concept and Objectives – Why BIOSHIRLING**

**2**

**Synergy with SKA**

**3**

**The BIOSHIRLING Prototype**

**4**

**The consortium members**

## Why BINSTIRLING?

- The ***dish Stirling Systems*** have demonstrated the highest efficiency of any solar power generation system. However, the aforementioned technology is not commercially exploitable to date.
- To research, develop and implement a new technology capable to allow the commercial establishment of the solar dish technology at large-scale, an interdisciplinary approach is necessary.



*creating  
sustainable  
energy*



# Project Biostirling

## Objectives (1 of 2)

*The BIOSTIRLING Project is based in the achievement of four targets simultaneously:*

- **Reduce costs:** It will be developed a new design that will enable the mass manufacturing.
- **Efficiency:** The BIOSTIRLING project will increase the efficiency by: improving the Stirling engine, developing new reflective materials and developing new designs with reduction of reflectivity loss.
- **Dispatchability:** The problem of the dependency of an external factor, the sun, will be solved using a combination of two different solutions: hybridization with biomass and energy storage.



*creating  
sustainable  
energy*



# Project Biostirling

## Objectives (2 of 2)

- **Life time:** Innovative glass coatings will be developed and new steel with improved resistance and stiffness will be used.

### **Cost**

- New designs for mass manufacturing.
- New manufacturing and O&M Strategies.
- Structures with less weight.
- Easy commissioning and maintenance.

### **Efficiency**

- Improved Stirling
- New designs with reduction the reflectivity loss.
- New reflective materials.

## DEMO SKA & New Commercial Solar Dish Technology

### **Dispatchability**

- Biomass / solar hybrid receiver.
- Storage systems.

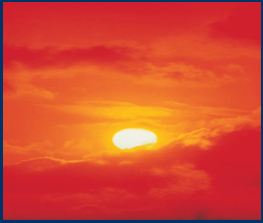
### **Life-time**

- Glass coatings.
- Improvement of steel resistance and stiffness.



*creating  
sustainable  
energy*





*creating  
sustainable  
energy*

**1**

**Concept and Objectives – Why BIOSHIRLING**

**2**

**Synergy with SKA**

**3**

**The BIOSHIRLING Prototype**

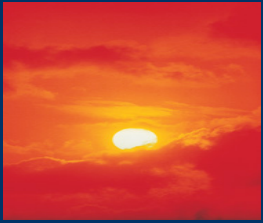
**4**

**The consortium members**



## Synergy with SKA (1 of 2)

- Energy generation at a continental scale for this facility, with different load profiles at different locations and stations, means that ***modular power generators*** are needed, which can be packed together to provide energy to the most densely packed stations, and then able by themselves to provide ***energy to the most isolated stations***.
- ***SKA***, as a radio telescope, can observe the sky 24/7, so power consumption should be maintained night and day.
- It is at this point where ***BIOSTIRLING and SKA interact***.



creating  
sustainable  
energy

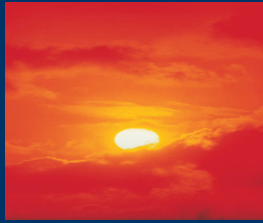




# Project Biostirling

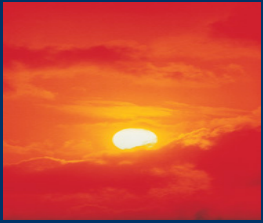
## Synergy with SKA (2of 2)

- *The **BIOSTIRLING** Project will provide the solution to the SKA power problem*, offering a renewable, reliable and isolated power system solution.
- The direct involvement in *the **BIOSTIRLING** Project of some European Partners of the SKA Project is required to achieve the expected solution.*



*creating  
sustainable  
energy*





*creating  
sustainable  
energy*

**1**

**Concept and Objectives – Why BIOSHIRLING**

**2**

**Synergy with SKA**

**3**

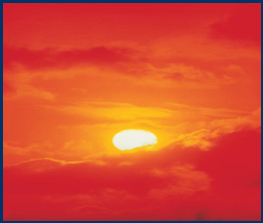
**The BIOSHIRLING Prototype**

**4**

**The consortium members**



## The Biostirling Prototype (1 of 2)



*creating  
sustainable  
energy*

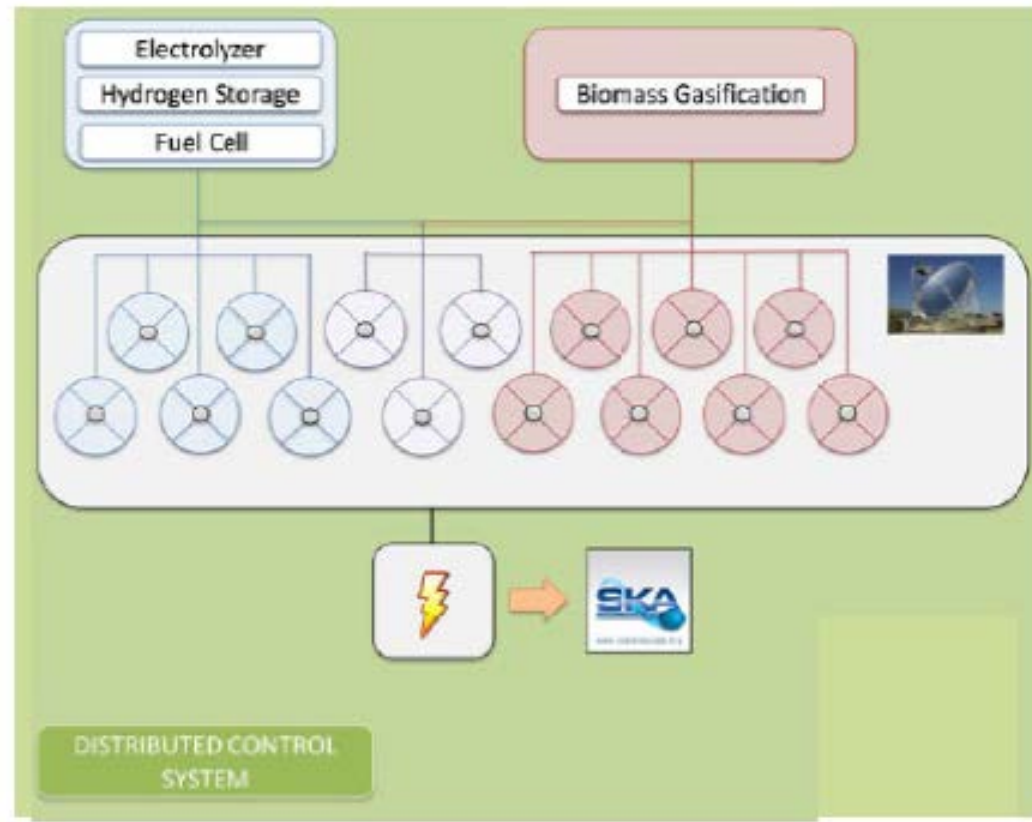
- The SKA project has the site of Moura to place the prototype because it is the place in Europe with the least radio interference. In this manner, ***the BIOSTIRLING prototype will be the power source of the SKA prototype in Moura.***
- ***15 prototypes of 10 kW dishes will be installed in Moura***, in order to implement the 150 kW Solar Plant using the different configurations that will be developed in the project:
  - 7 prototypes with hybrid (solar-biogas) dish/Stirling system.
  - 5 prototypes with Stirling with storage system.
  - 3 prototypes with hybrid (solar-biogas) dish/Stirling system with storage systems.



# Project Biostirling

## The Biostirling Prototype (2 of 2)

- The configuration of *the industrial scale demonstrator* is:



creating  
sustainable  
energy





*creating  
sustainable  
energy*

**1**

**Concept and Objectives – Why BIOSHIRLING**

**2**

**Synergy with SKA**

**3**

**The Biostirling Prototype**

**4**

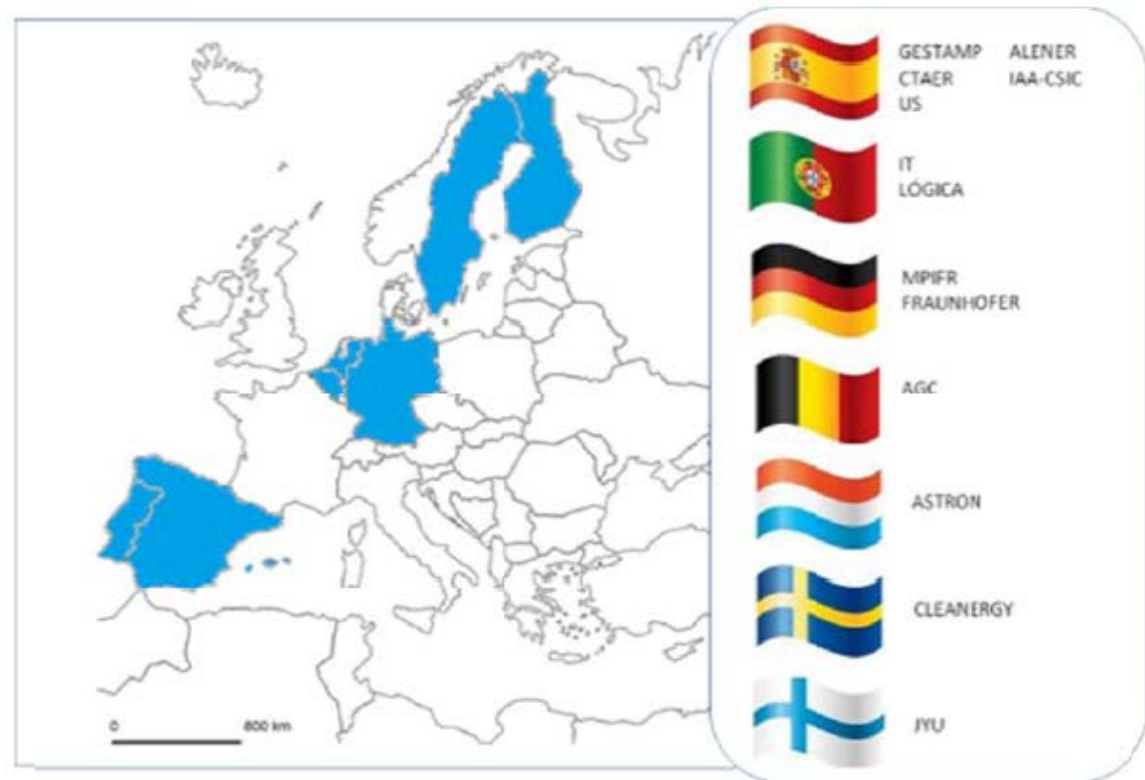
**The consortium members**



# Project Biostirling

## The Consortium members

- The BIOSHIRLING project gathers thirteen partners from seven European countries in strong collaboration in order to achieve ***the objectives in an estimated time of 36 months.***

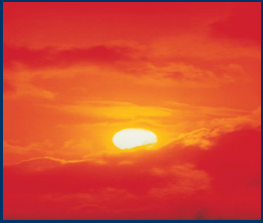


creating  
sustainable  
energy



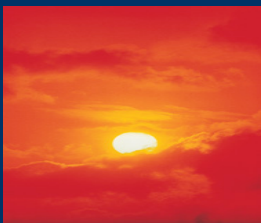
## The Consortium members

- The BIOSTIRLING project has a ***total budget of 6.191.682 € along the 36 months of duration.***
- The requested contribution from EC, ***taking into account the type of organisation and activities is 3.955.429 €.***



*creating  
sustainable  
energy*





*creating  
sustainable  
energy*



*creating sustainable energy*

***Thanks for you attention***

Avenida de la Esclusa 11, Edificio Galia Puerto  
410011 Sevilla (Spain)

Contacto: Carlos Blanco Cacho  
E.: [carlos.blanco@alener.es](mailto:carlos.blanco@alener.es)  
T.: +34 954 996100



© 2012 ALENER

Este documento es confidencial y propiedad de ALENER, y no puede ser utilizado para propósito distinto de la presentación de la compañía. En ningún caso, el documento o cualquiera de sus partes deberá ser distribuido a terceros sin el consentimiento explícito y por escrito de ALENER.