


# EU-SOLARIS

The European Research Infrastructure for  
Concentrated Solar Power


**Commercial and research CST applications in Cyprus**  
**Dr Nestor Fylaktos, the Cyprus Institute**

**EU SOLARIS**



The EU-SOLARIS Project is  
co-funded by the 7<sup>th</sup> Framework  
Programme of the European Union

**EU SOLARIS**      **The Cyl and EEWRC**      The EU-SOLARIS Project is  
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**THE CYPRUS  
INSTITUTE**  
RESEARCH • TECHNOLOGY • INNOVATION

The Cyprus Institute (Cyl) was established  
in 2005 with a mission to conduct high-  
quality research **relevant to the issues of  
the region.**

**Three main research centres:**

- Energy, Environment & Water Research Centre (**EEWRC**)
- Computation-based Science and Technology Research Centre (**CaStoRC**)
- Science and Technology in Archaeology Research Centre (**STARC**)

**In EEWRC research revolves around 5 broad themes:**


- Renewable energy (mainly CSP-related research)
- Energy and sustainability in the built environment
- Climate change and impacts
- Environmental research and monitoring
- Water research and management


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26.05.2016, Athens

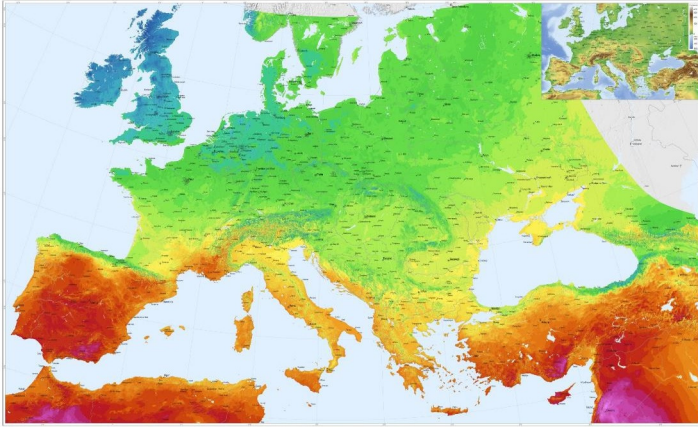
**EU SOLARIS** **Cyl in the region** The EU-SOLARIS Project is co-funded by the 7<sup>th</sup> Framework Programme of the European Union 



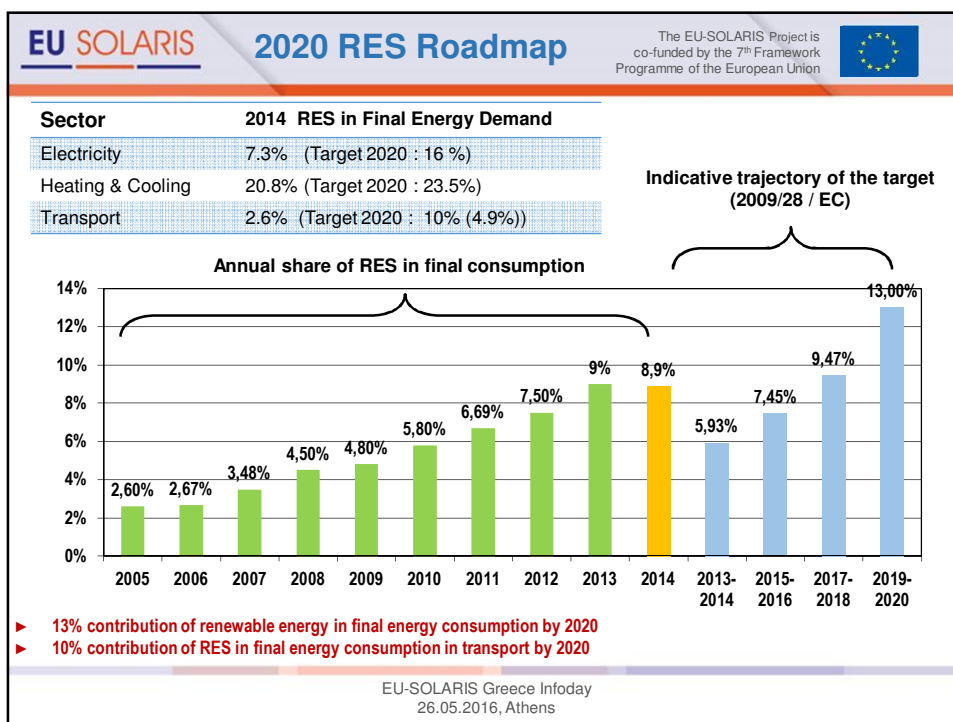
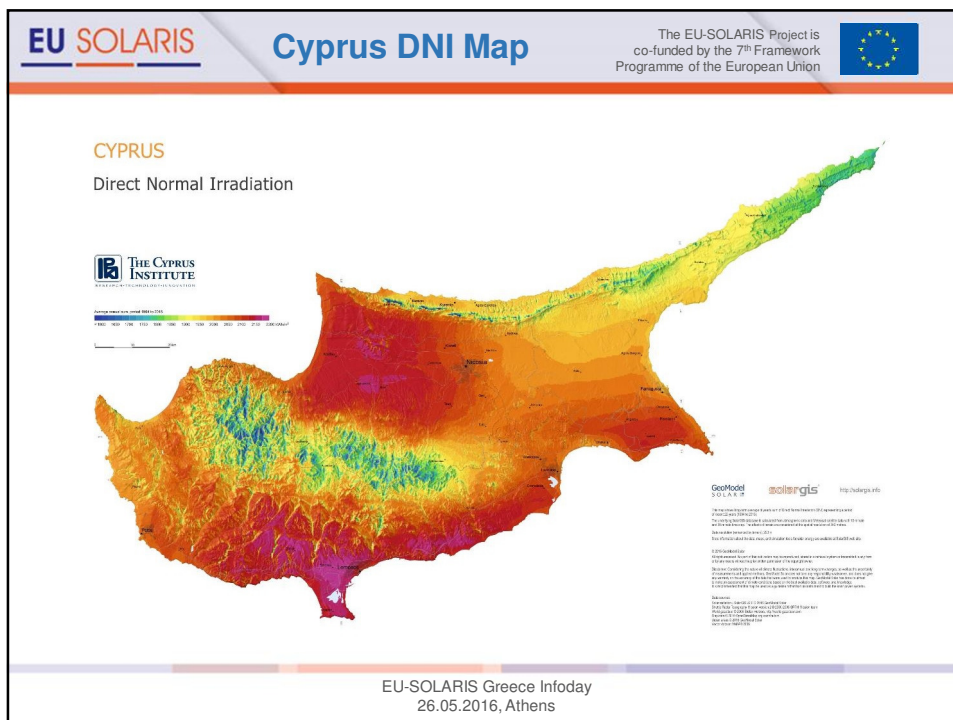
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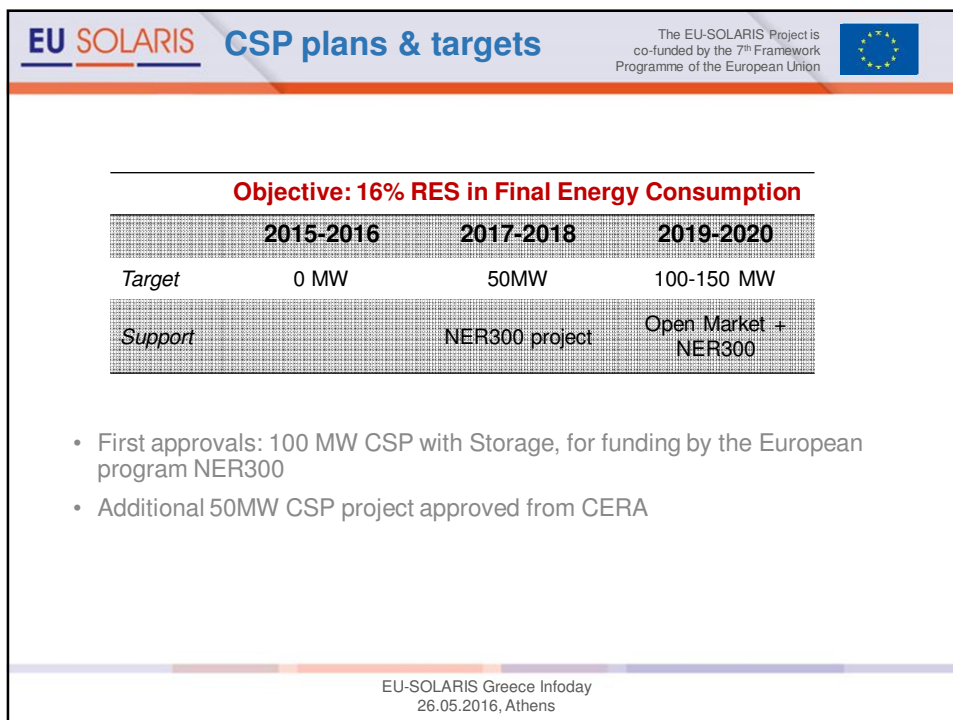
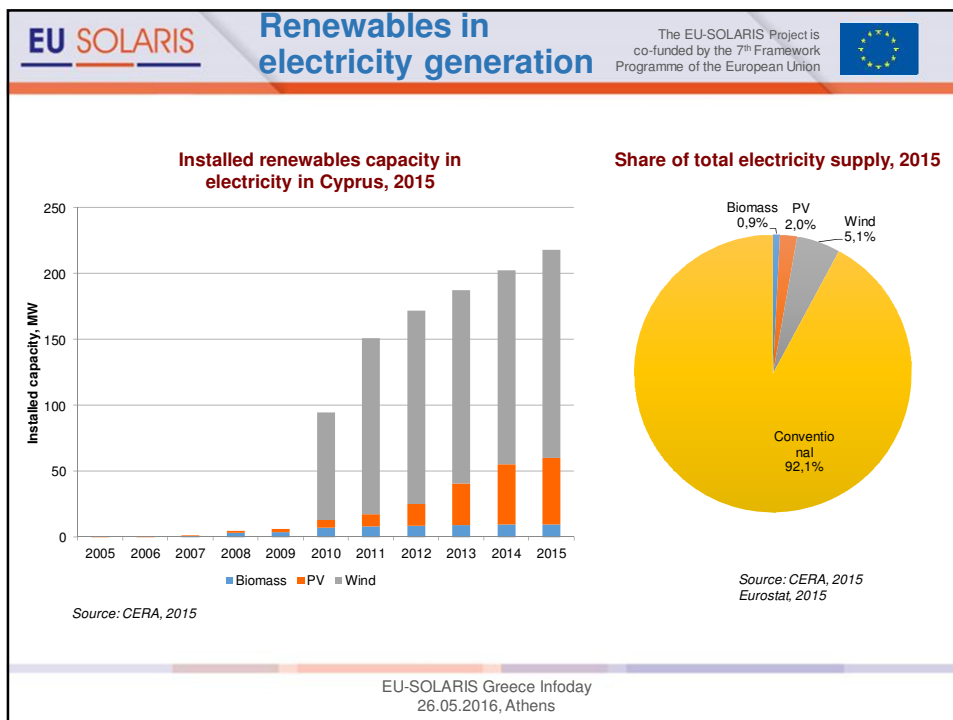
**EU SOLARIS** **DNI in Europe** The EU-SOLARIS Project is co-funded by the 7<sup>th</sup> Framework Programme of the European Union 


EUROPE Direct Normal Irradiation 



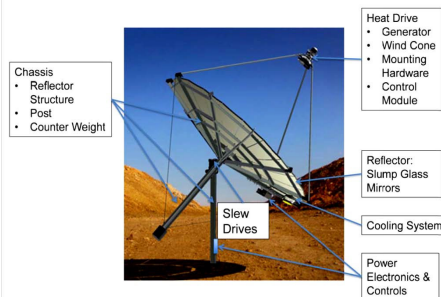
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**EU SOLARIS HELIOS POWER – NER300** The EU-SOLARIS Project is co-funded by the 7<sup>th</sup> Framework Programme of the European Union 

- Realized via the implementation of a Power Dish
- 2-axis tracking solar concentrator and Stirling generator
- Rated at 50.76 MW power capacity
- Winner of a NER300 grant (1st round)
- Supplier of equipment shut, but bought out and can perhaps go ahead

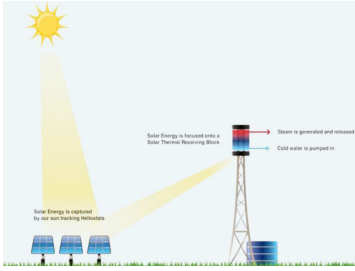



**Storage: TSO Cy requested smooth operation of the plant, and thus preliminary study to anticipated the generation profile needed was performed. Indicative: 15MWhr of Storage Requirement.**

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**EU SOLARIS EOS GREEN ENERGY** The EU-SOLARIS Project is co-funded by the 7<sup>th</sup> Framework Programme of the European Union 

- 50MW total through a network of towers
- Similar Technique and approach as PROTEAS
- Storage up to 3.2MWh at close to 800°C
- Uses a graphite storage system (still untested)
- Recipient of a NER300 grant (2<sup>nd</sup> round) for about €60m
- FiT under negotiation (plan indicated 13.75 €cents/kWh)
- Groundworks under way for 25 MW phase I

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**EU SOLARIS** Support policies in CY

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**Direct for commercial systems**

- There was a Feed-in-Tariff in place until 2012 for 0.26 €/kWh
- It was 'paused' for 2013 because the government claimed not enough applications were made to justify its existence
- Newer documents do not mention CSP or STE. There is only support for water heating and space heating/cooling in the form of upfront grants, subject to conditions.
- Any new systems likely to have the FiT (or PPA) negotiated on a per-case basis


**Support in the smart specialisation priorities**

- Renewables (in general)
- Solar thermal technology (CSP mentioned explicitly)
- Solar PV
- Technologies for Solar Heating and Cooling and
- Energy storage and transfer.



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**EU SOLARIS** The PROTEAS facility


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**EU SOLARIS** **PROTEAS facts** The EU-SOLARIS Project is co-funded by the 7<sup>th</sup> Framework Programme of the European Union 

- Situated on the coast near Pentakomo village, Limassol
- A solar field of 50 heliostats, 5m<sup>2</sup> each
- Rated power of 150 kWth
- 15-h molten salts storage practically capable of continuous operation
- Patented integrated receiver and storage (ISTORE)
- Integrated MED desalination module

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**EU SOLARIS** **The CSP-DSW experiment** The EU-SOLARIS Project is co-funded by the 7<sup>th</sup> Framework Programme of the European Union 

**Phase I**

- First technoeconomic study (2010)
- Final report published in 2012

**Phase II**

- **Validation experiment (ongoing)**
- **Experimental plant inaugurated (Oct 2015)**
- **Commissioning takes place now**


**Phase III**

- Larger Pilot Plant


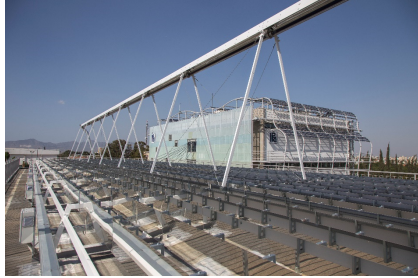
**Phase IV**

- Commercialisation

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**EU SOLARIS** **The Fresnel system at Cyl** The EU-SOLARIS Project is co-funded by the 7<sup>th</sup> Framework Programme of the European Union 

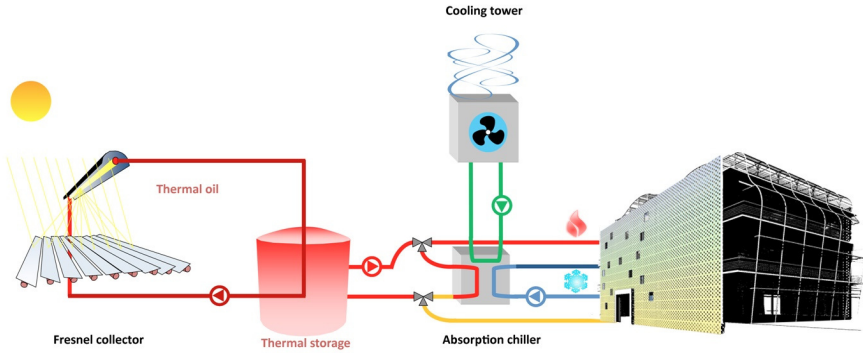
- Integrated into HVAC of Novel Technologies Laboratory Building (inaugurated in 2014)
- Building is the first zero energy building in Cyprus
- At technology's cutting edge: Passive heating & cooling, solar PV and active solar cooling

- Installation on roof of opposite building
- Great dissemination potential: Building underneath houses a school

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**EU SOLARIS** **Simplified diagram of Cyl system** The EU-SOLARIS Project is co-funded by the 7<sup>th</sup> Framework Programme of the European Union 

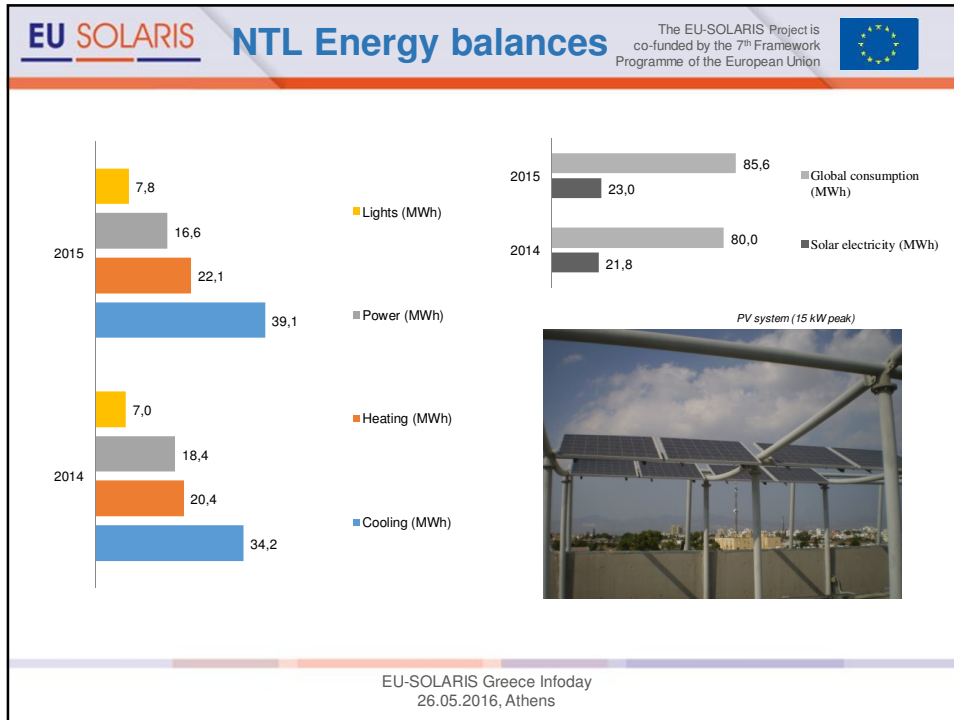


The diagram illustrates the energy flow in the Cyl system. It starts with a **Fresnel collector** that captures solar radiation and heats **Thermal oil**. The heated oil is stored in a **Thermal storage** tank. From there, the oil flows to an **Absorption chiller**, which provides cooling to a building. The absorption chiller is also connected to a **Cooling tower** that dissipates heat to the atmosphere.

Source: Cyl internal documents

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**EU SOLARIS** **PROTEAS installation**

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**Thank you**  
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