



Coordinating and integrating state-of-the-art  
Earth Observation Activities in the regions of  
North Africa, Middle East and Balkans  
and Developing Links with GEO related initiatives  
toward GEOSS

GEO-CRADLE Project Meeting 2  
16<sup>th</sup> November, 2016

## Energy application for GEO-CRADLE, overview of the pilot activity

Stelios Kazadzis

Physical Meteorological Observatory Davos, World Radiation Center



*Eratosthenes Research Centre  
Limassol, Cyprus*

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## Description of the pilot T4.4 Access to energy (Sense)

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### Access to energy (Sense), Partners: PMOD/WRC, NOA

**Sense: a solar energy now-casting system +**

**Purpose:**

- demonstrate ways to maximize value and benefits at the RoI
- Create synergies with public and private sector (solar plants, energy distributors, solar energy related end-users).

**Provision of (tailored to end-user):**

- Now-casting of solar radiation and solar energy
- Long term solar energy atlases for various areas with high temporal and spatial detail
- Solar radiation related products (real time and forecasts) related with: health (UV Index (melanoma), DNA damage, cataract, Vitamin D efficiency), agriculture (photosynthesis), scientific..

The Solar Energy Nowcasting SystEm (SENSE) pilot comes to unite the multifarious regional solar energy needs and sustainable development policies with the nowadays available capacities and state-of-the-art technologies. With the use of developed and improved EO and CAMS real time and climatology services, products and data bases, SENSE pilot aims to stimulate the interest of relevant stakeholders and decision makers like Ministries of Electricity and Renewable Energies (Egypt), Electric Power Transmission Operators (Greece) and Solar Energy investors from the private sector.

	2016												2017											
	Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
<b>400</b>	<b>Pilot towards regional challenges</b>																							
<b>440</b>	<b>Access to Energy</b>																							

This pilot activity will span a period of 15 months and based on the in-depth analysis performed in WP200 and WP300 now is totally refined and customized to the specialized regional needs.



## User needs – Capacities – Maturity in Energy

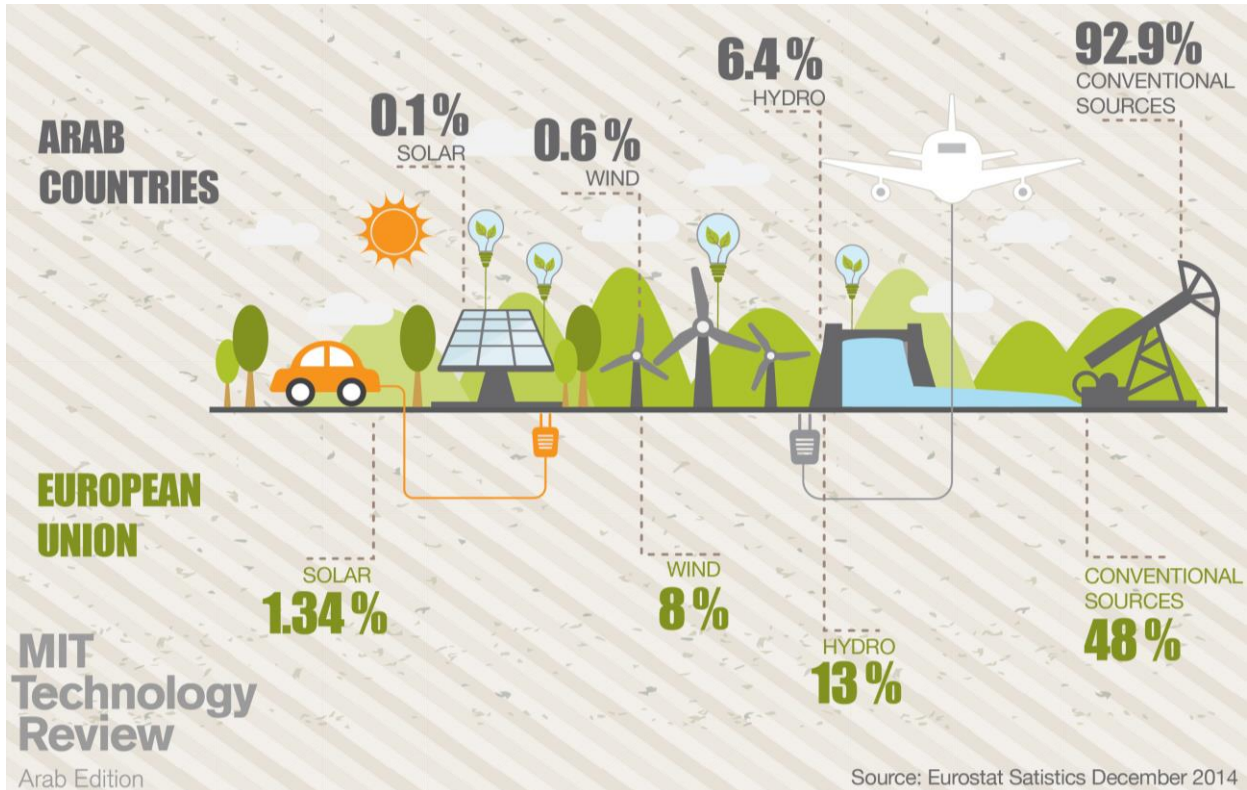
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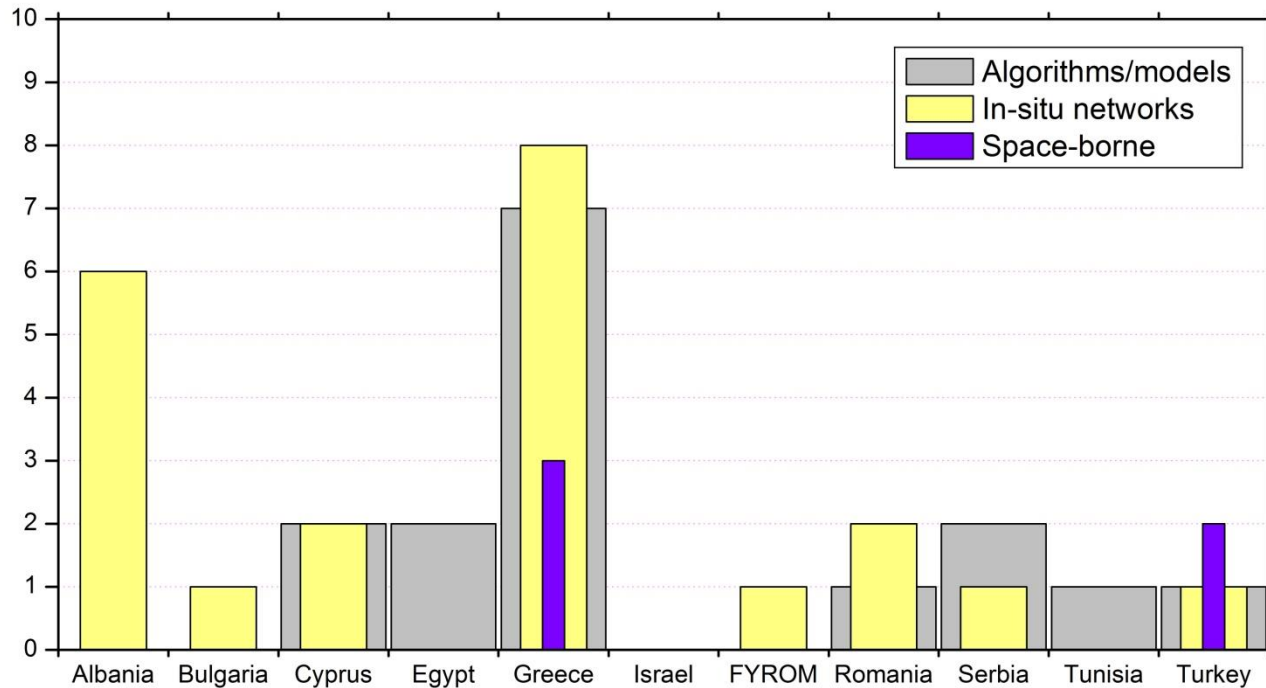
Equitable access to **energy** is a basic requisite for economic development and an important condition to galvanize economic activity. RoI: dependent on fossil fuels – coal and petroleum –

Exploitation and distribution must be closely monitored to identify investment opportunities and drive greater efficiency, and avoid pollution and damage to water and land. Balkan candidate countries that must adopt European energy standards, requiring a drastic departure from the state of the art.

Demographic trends in North Africa and the Middle East require informed long-term planning of energy sector investments on the national level to expand existing electricity production capacities and meet growing demand.

North Africa and the Middle East have conditions for the largest production of renewable energy in the world. There has been demonstrated market traction for the region's solar power in a growing export market for clean energy.





➤ Real-time data for the first time with SENSE

➤ No data policy info

➤ Exploitation without capacities



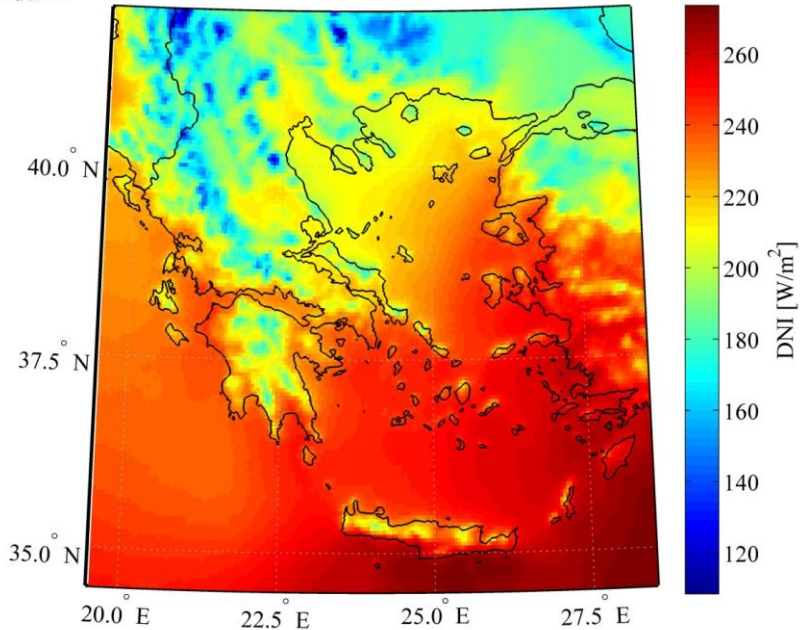
**ΑΔΜΗΕ**  
ΑΝΕΞΑΡΤΗΤΟΣ ΔΙΑΧΕΙΡΙΣΤΗΣ  
ΜΕΤΑΦΟΡΑΣ ΗΛΕΚΤΡΙΚΗΣ ΕΝΕΡΓΕΙΑΣ

➤ Control the energy demands

# Link with WP2 and WP3: user needs analysis



MEAN SURFACE DIRECT NORMAL IRRADIANCE



Optimum locations for CSP & PV installations using solar Atlas energy maps

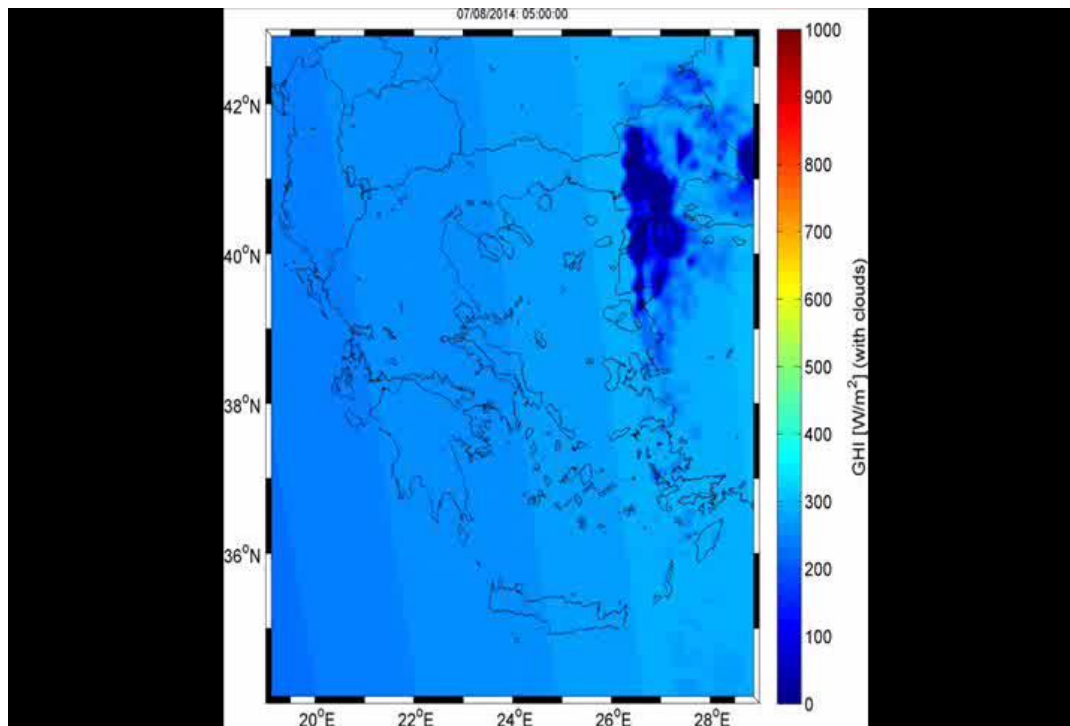


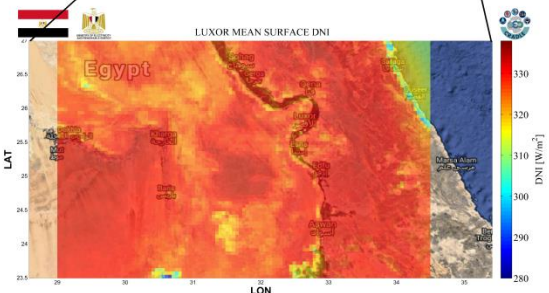
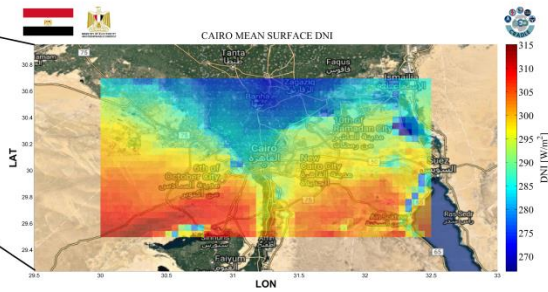
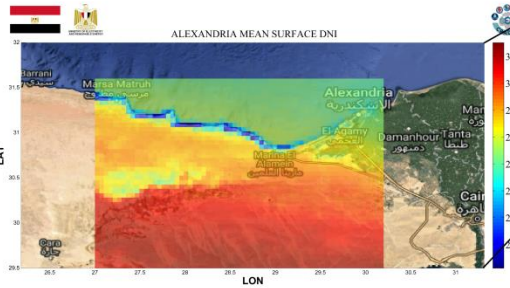
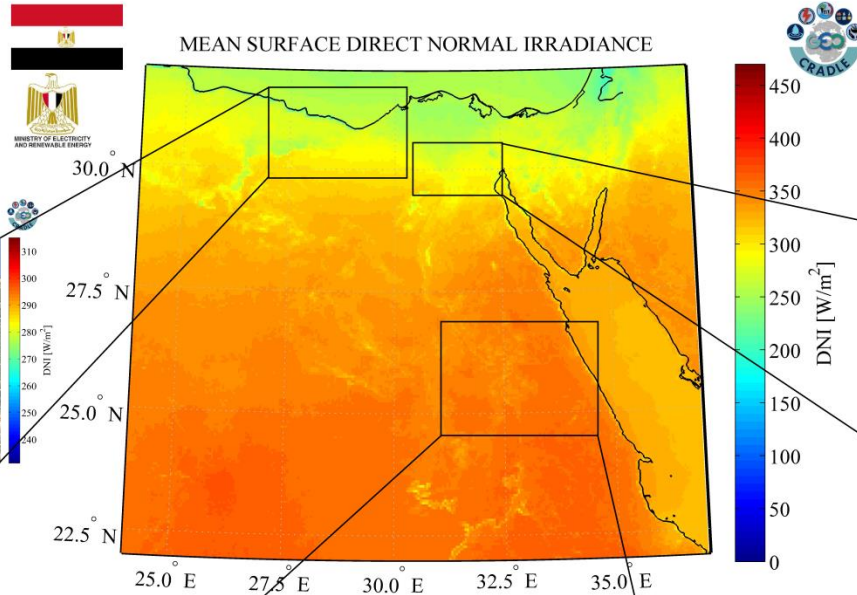
EUMETSAT: 1999-2013





## Solar Energy now-casting

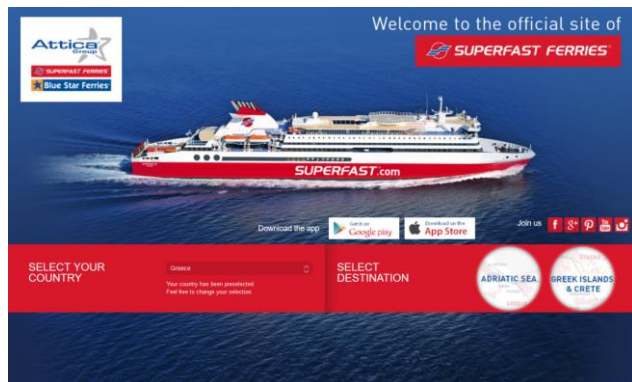




- Real-time solar energy
- Support the local authorities

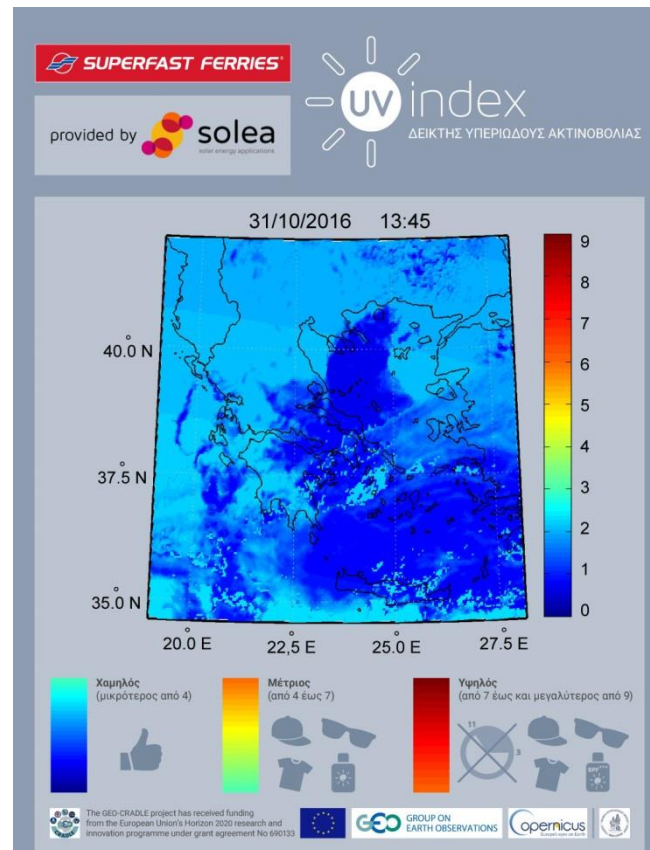
- Solar Atlas
- Specific locations for PV & CSP investors

# Private Sector



- More than 4.5 M passengers
- Health-based pilot service

## UV-index



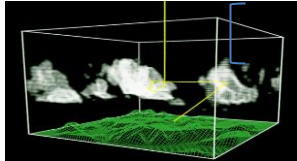
Satellite Data



Copernicus Atmospheric Monitoring Service



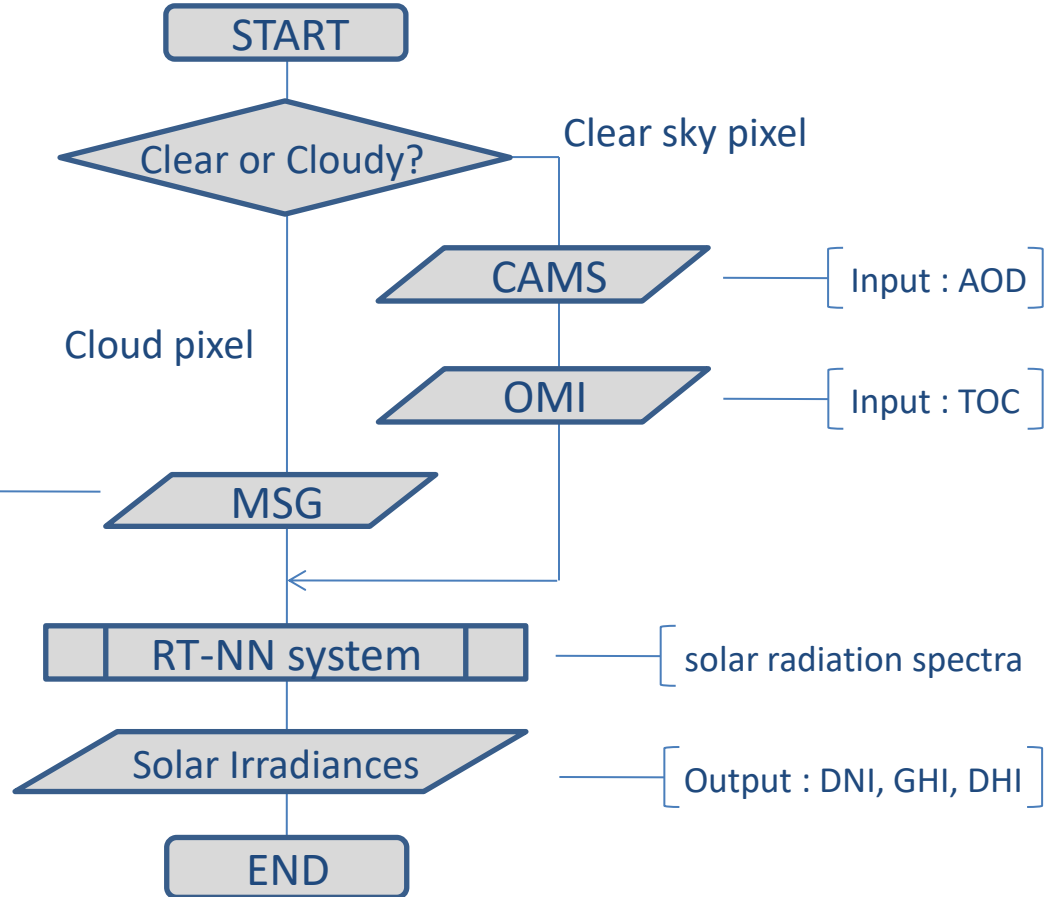
Radiative Transfer models

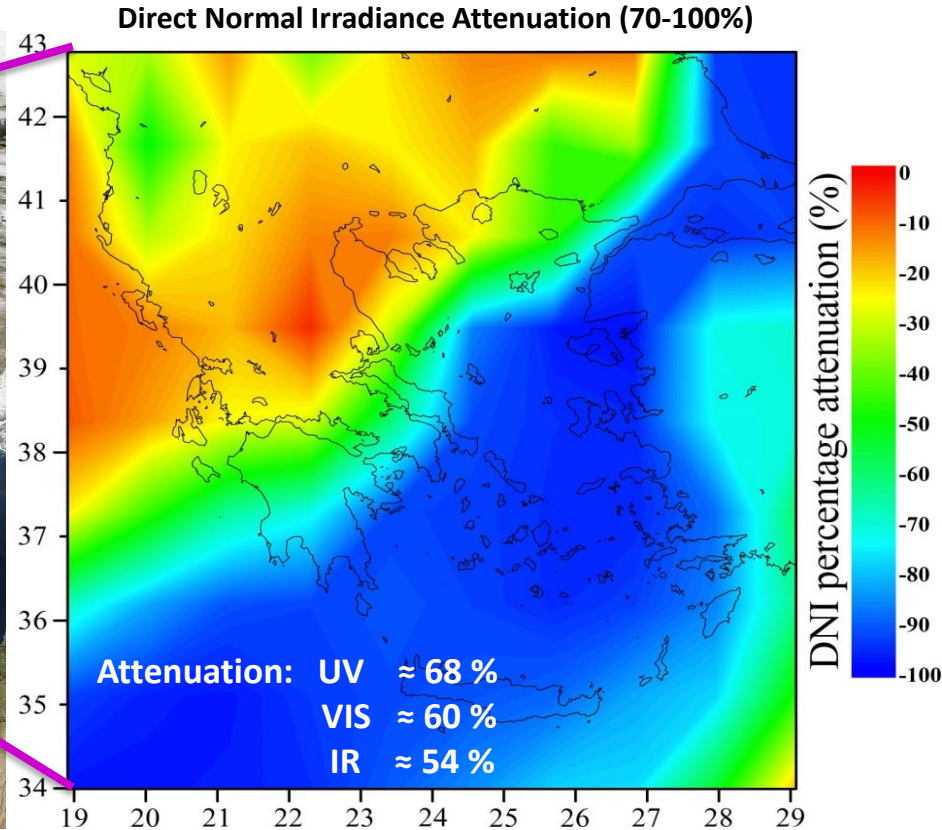
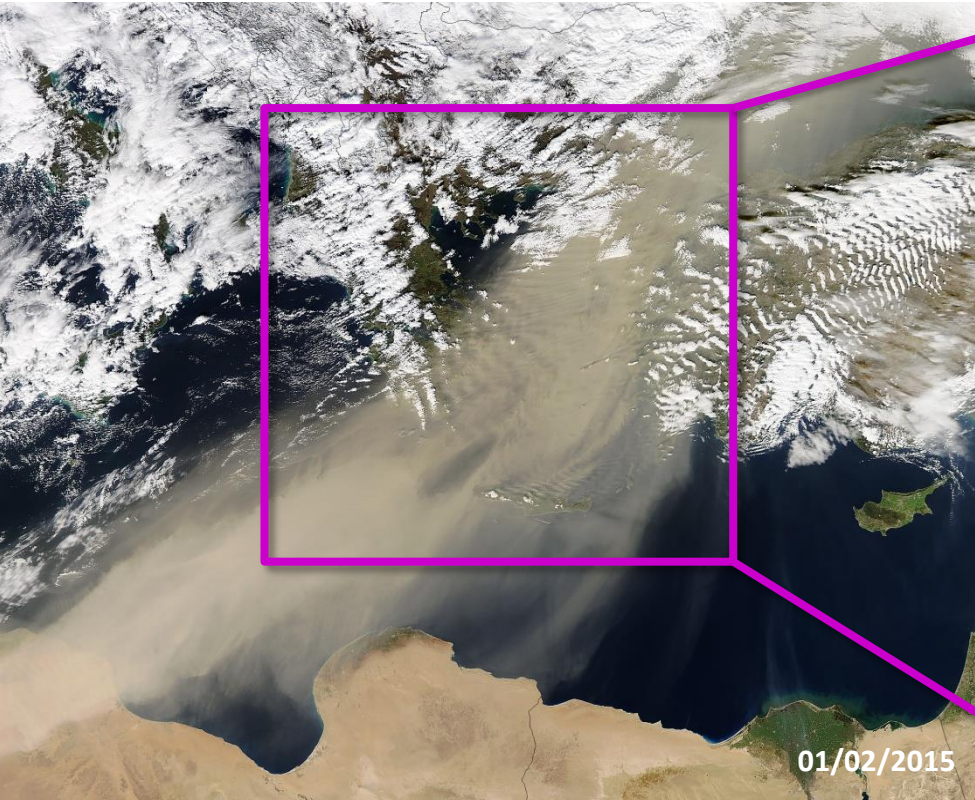


Neural networks



Cloud Input  
MSG





➤ The inclusion of cloud and aerosol effects means that this approach is ideal for correct assessments of solar power operational loads.



## Regional needs related to Energy

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North Africa, Middle East and Balkans are places with a serious amount of solar energy potential and its exploitation is critical for their national sustainable development through an efficient energy planning and a gradual independence from fossil fuels.

The current solar energy EO capacities in the RoI are degraded and as a result this field needs a complete and comprehensive revision and promotion in order to be established as a main contributor to national portfolios.

The SENSE pilot comes to fulfill these regional needs for optimum solar energy exploitation and for active and effective integration of these technologies to the national sustainable development economies and strategies.

The quantification of the clouds' and aerosols' impact on the solar energy potential guarantees the reliability of the SENSE pilot. Simultaneously, the synergistic inclusion from models, ground-based and satellite-based databases can be applied to the real time pilot services as well as to the solar Atlases requested from major regional end users.

# Long term funding: Science towards applications



**Private sector (direct, indirect)**

**Public sector (energy operators, public information sectors e.g. weather and meteorology related bodies)**

**Government based initiatives**

**EU projects (Scientific development, user oriented products, case studies)**

**Bilateral calls**

**Copernicus related calls**



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market uptake

Energy Efficiency Info Day 19 September 2016: Save the date!

Why not plan ahead and get informed on Energy Efficiency funding opportunities for 2017? With more than €100M available in the Horizon 2020 Energy Efficiency Call 2017, with deadlines in January and June 2017, there are opportunities to fund market uptake projects through Coordination and Support Actions.



# Open Discussion

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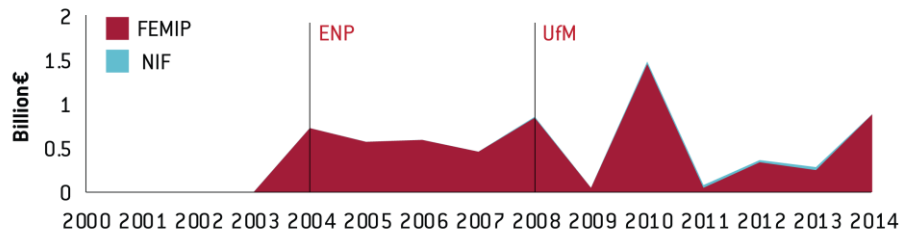




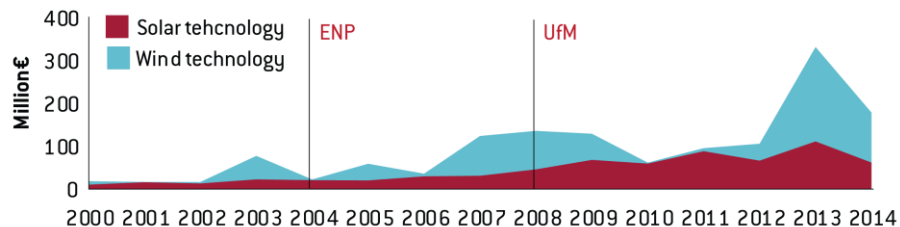
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EU grants to energy projects in SMCs



EU export of wind and solar technology to SMCs



ENP: EU Neighborhood Policy

UfM: Union for the Mediterranean

After almost two decades of unproductive regional cooperation attempts, the EU should reshape its energy cooperation efforts in the Mediterranean through new bilateral approaches. In concrete terms, we propose the establishment of Sustainable Energy Funds with selected SMCs.

This would allow support to be provided to sustainable energy projects in partner countries, making them more economically stable and safeguarding the EU's gas security of supply. This might also represent a significant business opportunity for the EU energy industry, especially in the context of the sluggish EU energy outlook.



## Update



- Very brief description of the task at hand in WP4 (pilot activities).
- Acknowledgement of inputs from previous WPs, namely the inventory of capacities and user needs analysis from WP2 and the gap analysis, indicators and priorities from WP3.
- Bridge outputs of WP2/3 with WP4.
- Propose your pilot project idea in detail – but don't obsess too much with the technical part.
- Describe **how** your pilot project addresses the needs of the RoI.
- Focus on the sustainability of your pilot project and its long term prospects.



## T4.4 SENSE



Insert a Gantt chart or a timetable briefly outlining the key milestones of your pilot activities.

DO:

Provide a high level abstract description of the key inputs / outputs

Set feasible milestones

Have internal skype meetings to keep everything on track

Discuss with the regional coordinators and the project coordinator

DON'T:

Overanalyze

Discuss technical details in the timetable