Project: GEO-CRADLE

Pilot: Access to Energy (SENSE)

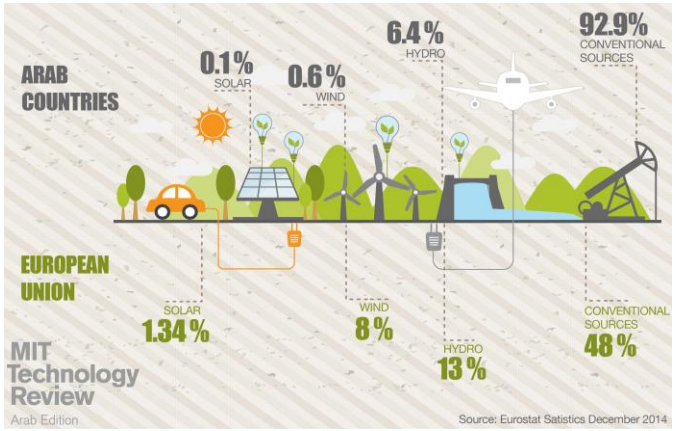
Parnters: PMOD/WRC (Leader), NOA

The **GEO-CRADLE** project has received funding from the European Union's **Horizon 2020** research and innovation programme under grant agreement No 690133

Sense: a solar energy now-casting and forecasting system + solar energy long term analysis

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.**

T4.4 Sense Pilot

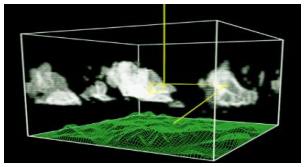
Coordination of regional EO capacities & research activities (incl. Copernicus Space & Service Segment initiatives) for an operational, satellite-driven, real-time system for solar energy now-cast.

Sense Inputs

Satellite Data

Copernicus Atmospheric Monitoring Service

Radiative Transfer models



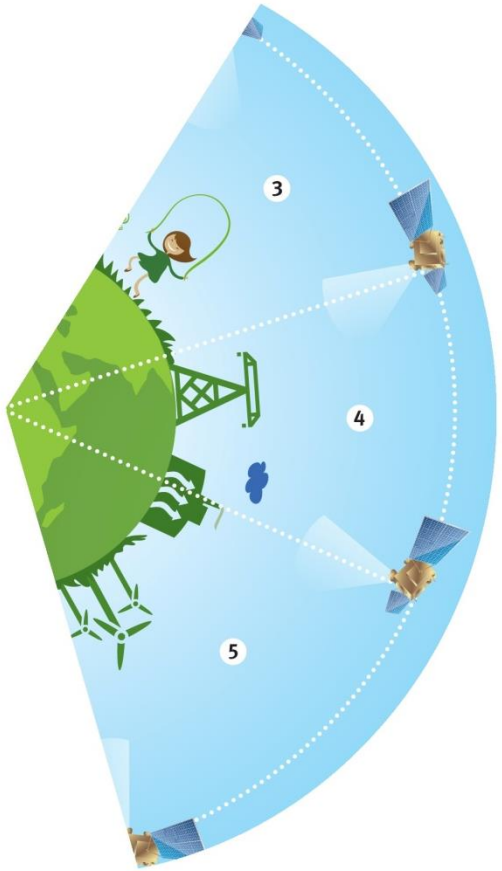
Neural networks, Multilinear functions, machine learning

Sense products use

3 PUBLIC HEALTH

4 ENERGY MANAGEMENT

5 CARBON MANAGEMENT



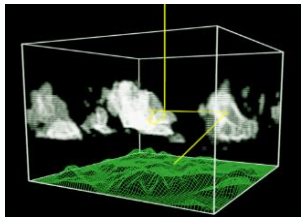
T4.4 Sense Pilot

What is SENSE?

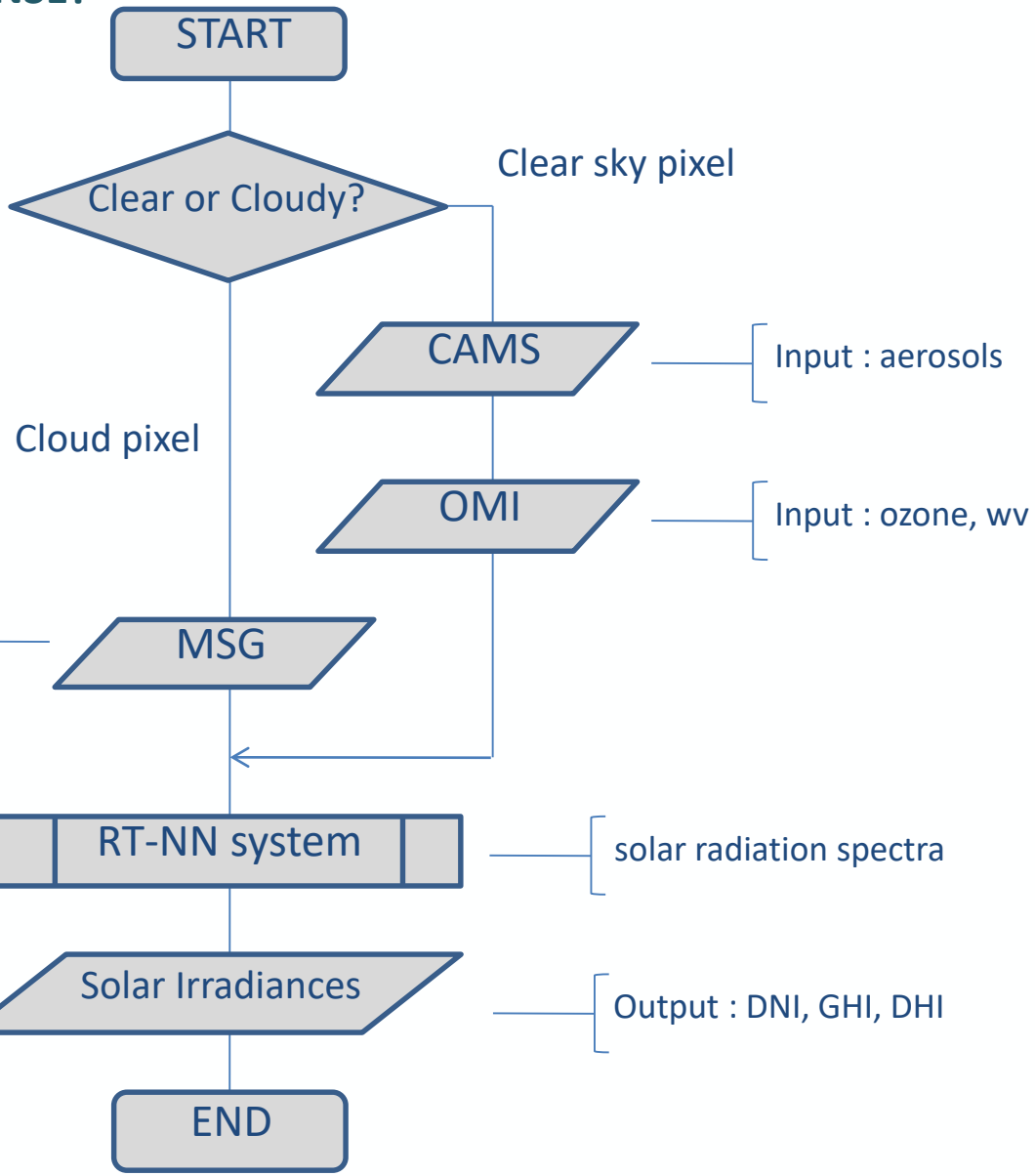
Satellite Data

Copernicus Atmospheric Monitoring Service

Radiative Transfer models



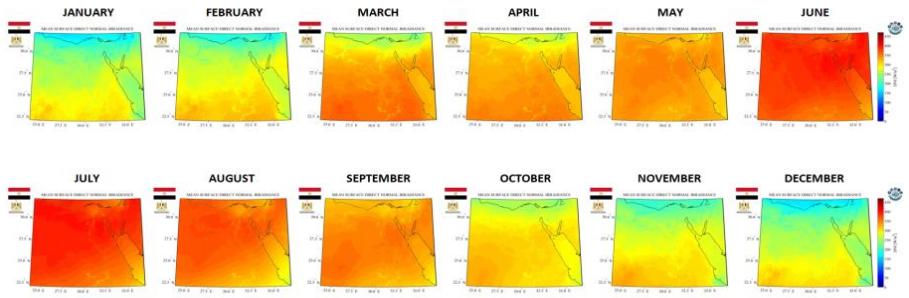
Neural networks

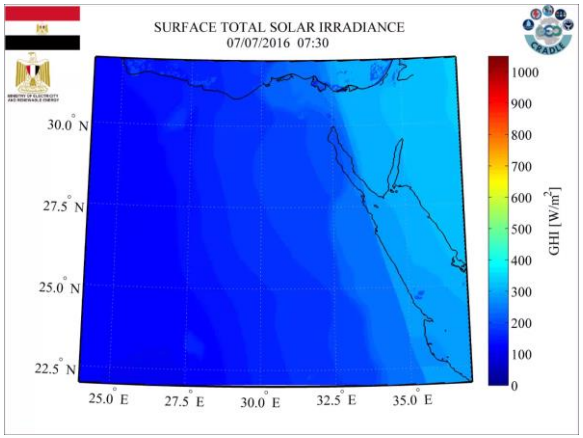


Collaboration and extensive cooperation with the following end-users:

- **Egyptian Ministry of Electricity and Renewable Energy**: a common website was developed in which the real-time and climatological solar energy products of SENSE are disseminated. An analytical Egyptian solar atlas was presented in the regional workshop in Cairo (May 2017).

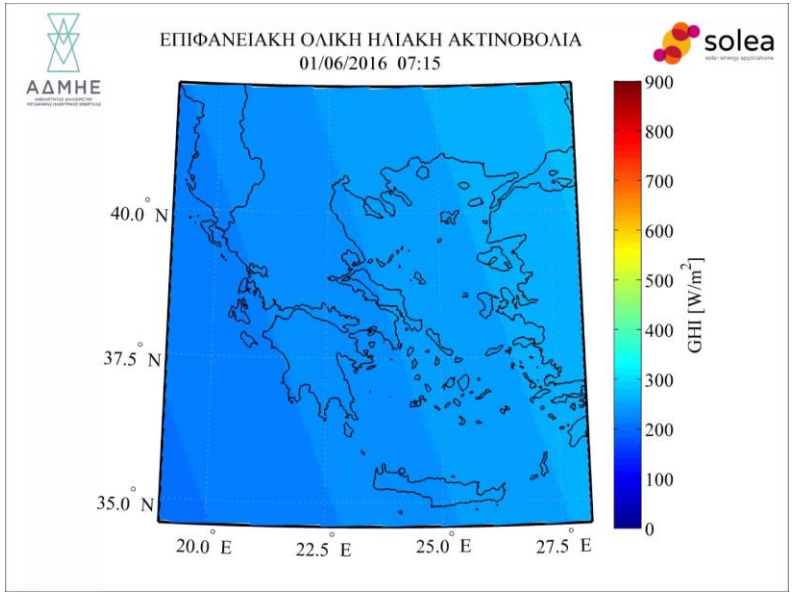
MINISTRY OF ELECTRICITY AND RENEWABLE ENERGY





Collaboration and extensive cooperation with the following end-users:

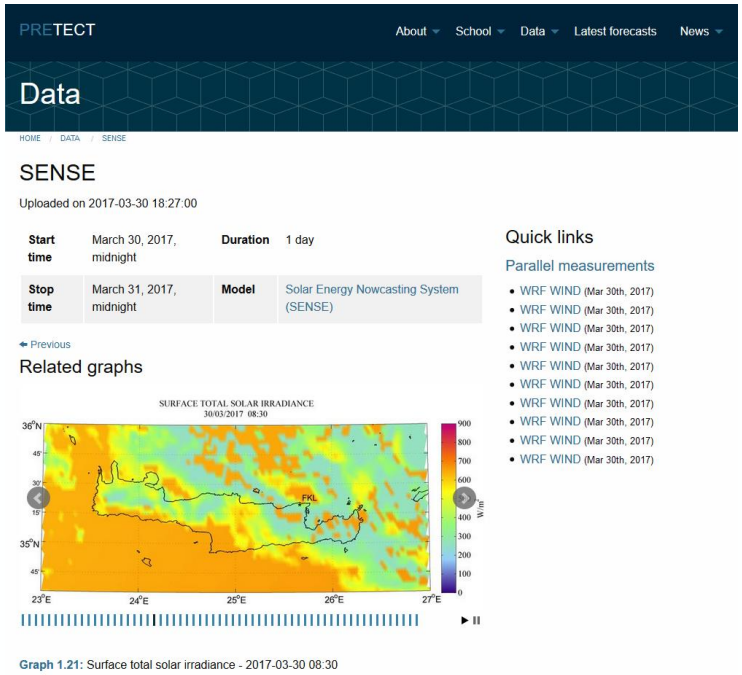
- **Greek Independent Power Transmission Operator**: a close collaboration in order to update their nowcasting and forecasting power systems with the SENSE's state-of-the-art methods. They exploit the real-time solar energy maps and data (60K pixels/integrated energy values every 15-minutes) by comparing them with real solar farms and controlling the local energy demands.



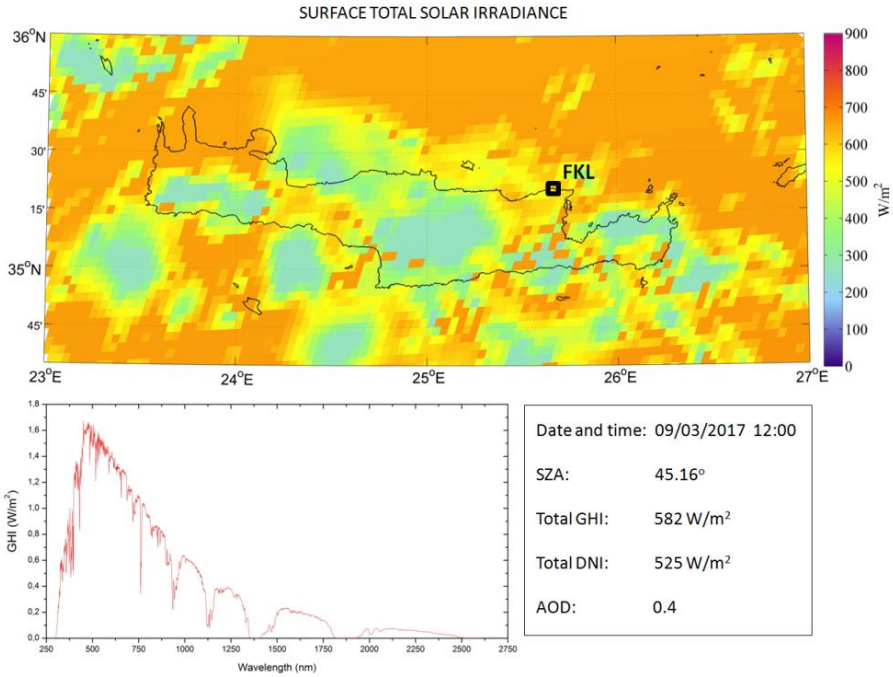
Collaboration and extensive cooperation with the following end-users:

- **Pre-tect international campaign**: the solar energy maps of Crete were provided in real-time for the purposes of the campaign (April 2017) and spectral comparisons with a high precision solar spectroradiometer (PSR) will be made to further validate the SENSE under high-aerosol loads.

PRETECT

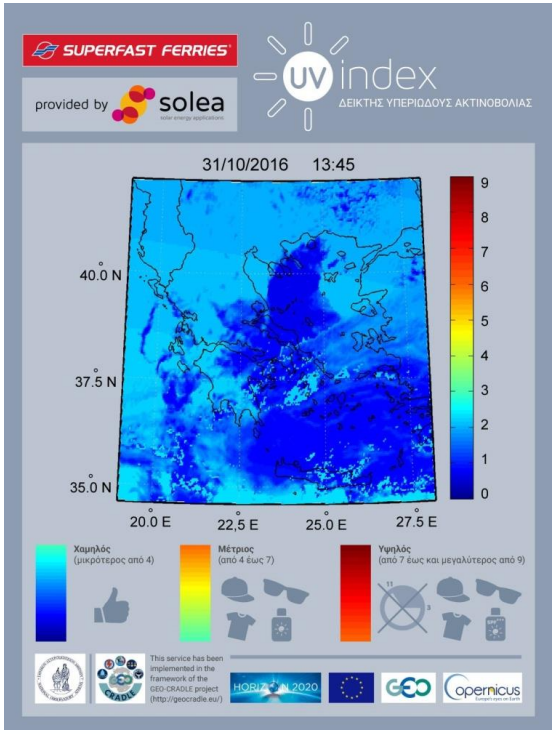


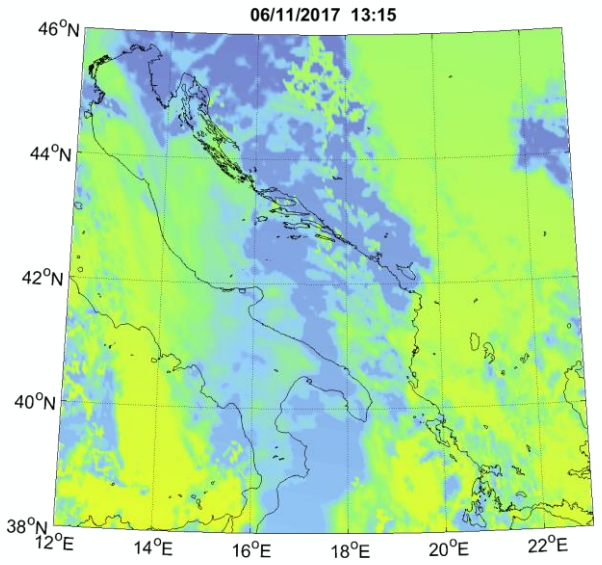
Graph 1.21: Surface total solar irradiance - 2017-03-30 08:30



Collaboration and extensive cooperation with the following end-users:

- **Attica group with Blue Star and Superfast ferries**: for the pilot period they are going to attract relevant ads in order to efficiently advertise the real-time UV-index service from SENSE through the monitors of their ships with routes to the Aegean and the Adriatic seas.



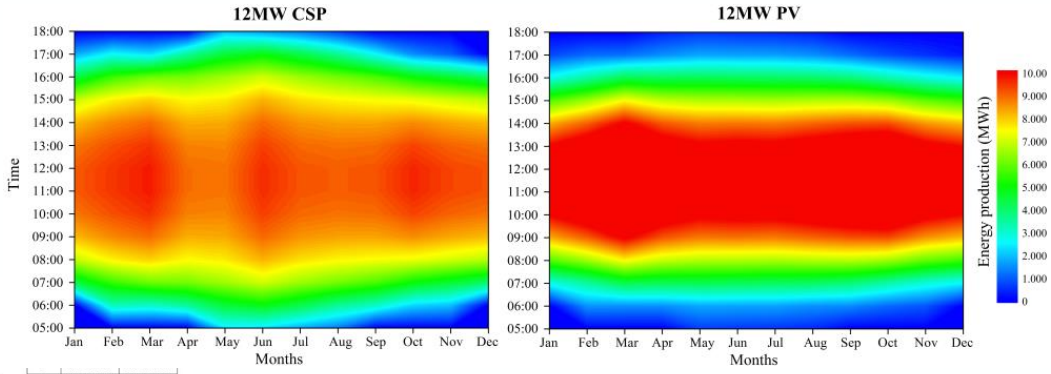


Collaboration and extensive cooperation with the following end-users:

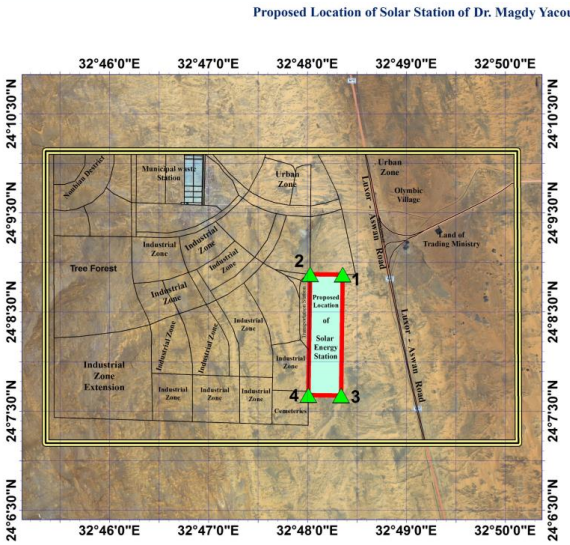
- **Magdy Yacoub Medical center in Aswan**: Solar energy model and plan.

MAGDI YACOUB HEART FOUNDATION
ASWAN HEART CENTRE

Aswan yearly solar variability



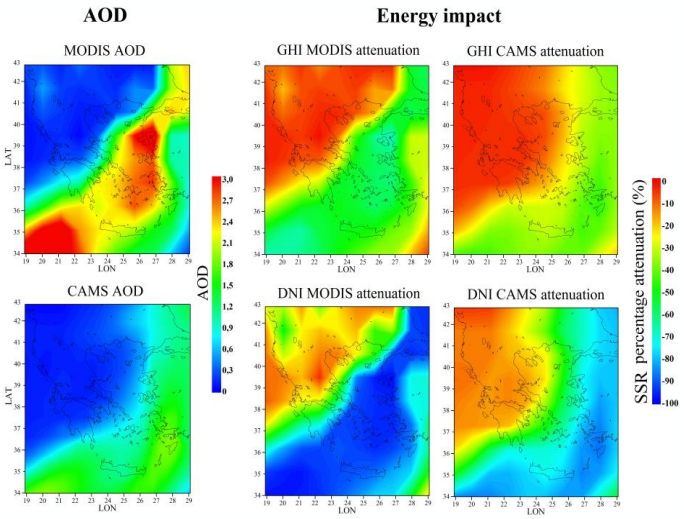
Medical center proposed location



Area = 1260000 m2 (300 Feddan)

T4.4 Solea validation

Dust events
Aerosol and solar energy validation



Long term validation using surface solar radiation measurements