Solar energy research and development greece

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Solar energy applications | solea is a research group of the Institute for Environmental Research and Sustainable Development (IERSD) of the National Observatory of Athens in Greece that deals with energy transition, solar plants exploitation and penetration into society. Solea provides operationally and in real-time solar radiation and energy data in terms of historical (>10 years), nowcasts (0 – 6 hours ahead) and forecasts (1 – 5 days ahead).

Our research effort has been geared toward developing and providing a complete suite of solutions and applications for the calculation of surface solar radiation spectra at high resolution using Earth Observation technologies.

Within the IERSD/NOA’s APCG group and in the framework of the action THESPIA under the call KRIPIS and the project Aristotelis-SOLAR, an ultra fast radiative transfer system has been developed for solar irradiation estimations at the Earth"s surface. The result is analytical spectral information of the solar power and energy, whatever the weather and conditions.

Within the IAASARS/NOA’s BEYOND Center of Excellence, advanced technical capacities of Earth Observation based services in combination with the scientific knowhow of previous projects including solar measurement, radiative transfer models and machine learning techniques, laid the groundwork for the next projects on solar energy exploitation and promotion.

The nowadays nowcasting and short-term forecasting techniques have been evolved further through the EuroGEO e-shape project as the so-called nextSENSE pilot. The e-shape supported the development of an holistic solar energy management service useful for the European and North African solar energy producers and handling entities. See here some frequently asked questions.

In the framework of the COST’s action inDust, the impact of dust aerosol on solar energy management and planning has been studied through the short term scientific mission called “Finding“, focusing on the North African region.

With support from the ERAPLANET SMURBS project, the modern solar energy production management and modeling approaches have been highlighted with the SOLEATHENS service promoting the urban renewable solutions adaptability (e.g. rooftop photovoltaics), in terms of optimum and viable ways for shifting from current cities to smart renewable cities.

In the framework of the Excelsior project, a complete knowledge transfer from NOA and PMOD/WRC to CUT will be performed in solar radiation and energy science (satellite and ground-based measurements,

modelling and forecasting) introducing the Cyprus Solar Radiation Laboratory.

With support from the Eiffel project, a 3D solar energy representation for the city of Athens is under development simulating the ray tracing and shadow casting by exploiting advanced real-time 3D graphic creation platforms, fast radiative transfer models and ultra-high resolution tri-stereo digital surface models.

To diminish the carbon footprint of cities, green energies shall be more and more integrated into the power grids of cities. This video is part of the Eurisy’s Space for Cities workshop (27 October 2020) and presents two emerging applications based on satellite data that could support cities to increase the use of solar energy.

The nextSENSE pilot of the eshape project was presented at the 15th International Conference on Meteorology, Climatology and Atmospheric Physics at Ioannina (Greece).

The User and Technology Talks of PARSEC aim at creating connections between the satellite Earth Observation SME community and potential end users who can benefit from cutting-edge solutions. Several representatives of the energy sector were invited to join a discussion panel and identify and share sector related needs and challenges. Alongside, our Earth Observation (EO) expert presents the status of the use of EO in this sector and suggests possible solutions.

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