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Solar Irradiation from the Energy Production of Residential PV systems

DURATION
15/12/2014 - 15/03/2017

BUDGET
149.998 €

PROJECT DESCRIPTION

Knowledge of local solar irradiation is essential for many applications. Traditionally, solar irradiation is observed by means of networks of radiometric stations. Cost for installation and maintenance of such station are very high and national networks count only few stations. Consequently the availability of observed solar irradiation measurements is spatially inadequate for many applications. Mapping the solar radiation by interpolation of measurements is possible but leads to large error. Accurately depicting the spatial extent and time-dependent characteristics of the solar resource requires alternative methods.

Over the last decades satellite-based retrieval of solar radiation at ground level has proven to be valuable for providing a global coverage of the solar irradiance spatial distribution at the Earth surface. However satellite retrieval is a snapshot over a large area (i.e. the satellite pixel size).

To overcome such a limitation, we propose to take advantage of the very dense network of residential photovoltaic (PV) systems implemented in Belgium to use the energy production registered at PV systems as solar irradiation sensors.



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This innovative approach requires (1) to derive solar irradiation from the energy production of PV system and (2) to transpose solar irradiance on a tilted plan to that on the horizontal plane. Operational data from a representative sample of 6000 installations will be used to assess the feasibility and relevance of our proposal. Finally, different merging strategies will be investigated to determine how to best exploit the additional information derived from PV system in the generation of high resolution solar products over Belgium.



CONTACT INFORMATION

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