# Benefits from on-site measurements for the purpose of evaluating solar potential

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## Abstract:

The market of photovoltaics is growing by 40% annually, which is mainly attributed to the

significant technological advancements in the past decade that improved solar module efficiency and brought their price down. But yet, solar is considered a risky investment, due to the high upfront capital needed. Just like for any other investment, one of the questions that a prospective investor needs to haveanswer for, is "In how many years will I make a return on my investment?". The answer to that question varies greatly from 5 to more than 20 years and depends on many factors. Some of them include: business model of the project, incentives and support schemes for faster adoption of renewable energy sources, LCOE (levelized cost of electricity) and etc. Every location has specific energy potential which is dependent on the climate, geographical position of the location, topology, nearby buildings or objects that may shade the modules, sunlight duration and others. To make the most out of the available solar energy, many parameters need to be optimized. The angle and azimuth of the modules are important to capture the available sunlight: fixed, seasonaly adjusted and fully dynamic sunlight tracking solutions are available and every scenario needs to be considered. Optimizing the peak power output of the modules, their technical specifications such as efficiency, type of solar cells (poly-crystalline, mono-crystalline and etc.), specifications and selection of other system components such as inverters is not an easy task.

After selecting the site, the components of the system, the business model on which it will be based on, one needs to estimate the expected power yield from the system. When calculating the expected power yield from a system, there are many uncertainties in the estimation, but the solar resource estimate is the highest driver to the uncertainty that typically ranges from 5% to 17%. Translated in plain English, how much solar energy is available to be captured at the specific site is the biggest unknown. There are mainly two types of data from which we can take insights about the solar resource variable: modeled data sources and on-site measurements.

## Biography:

Damjan Postolovski is a computer science engineer and entrepreneur. He was part of the winning team of NASA Space Apps Challenge 2017 in Macedonia, which later founded the start-up Solar Data Collector. The start-up has been awarded a grant for R&D and was a SpaceCOM Entrepreneurship summit finalist. Damjan has been actively participating in the entrepreneurship community of South East Europe, taking part in events from the region including PODIM, Web IT, EU4Tech and others. His pursuit for innovation is formalized by the European Innovation Academy, which he is an alumni.

## Publication of speakers:

1. Controlled Power Technologies Limited. Available online: http://www.cpowert.com/products/tigers/(accessed on 20 August 2017).

2. Srinivasan, K.K.; Mago, P.J.; Krishnan, S.R. Analysis of exhaust waste heat recovery from a dual fuel low temperature combustion engine using an Organic Rankine Cycle. Energy 2010, 35, 2387–2399.

3. Yamada, N.; Minami, T.; Mohamad, M.N. Fundamental experiment of pumpless Rankine-type cycle for low-temperature heat recovery. Energy 2011, 36, 1010–1017