

Northern cyprus solar storage

Basking in more than 3300 hours of sunlight per year, Cyprus has the highest solar power potential in the European Union but currently imports most of its energy. An EU-funded project is helping the Mediterranean country better harness the power of the sun to meet its growing electricity needs and spur research and innovation linked to this renewable - and clean - resource.

In an attempt to make Cyprus more energy self-sufficient, the EU-funded TwinPV initiative focuses on bolstering the country's technological know-how through the sharing of expertise on the entire solar energy cycle - from cells and modules to storage and smart electricity grids.

Renewable energy experts from Austria and Denmark are joining local engineers, researchers and PhD students to address technical challenges, catalyse innovation and design strategies to put the country on track to generating a large percentage of its electricity demands domestically while creating jobs and making it a hub for solar innovation.

"Cyprus possesses the highest solar potential in Europe but the country currently imports almost all of its power, making it an ideal location for the development of solar energy," says TwinPV coordinator George E. Georghiou of the University of Cyprus. "Although some progress has been made, there is a low level of innovation and investment in solar technology and several challenges need to be overcome - including a lack of technical expertise in the entire energy cycle."

TwinPV is already producing first results, including a novel method to tackle harmful leaks of electrical currents within solar modules that degrade the performance of the cells over time. With the support of a Danish industrial partner, the TwinPV team is designing custom cells and using advanced material techniques and numerical modelling to limit so-called potential-induced degradation of photovoltaic modules.

In addition to advancing solar technology more broadly, these advanced modules are expected to form part of a major new solar park due to be built by the University of Cyprus. The park will be capable of achieving a peak output of 10 megawatts, making it the largest renewable energy facility in Cyprus and meeting all of the university's energy requirements.

"Looking for the next breakthrough in photovoltaic energy will require an innovative and holistic approach such as that adopted in TwinPV," Georghiou says, adding that 14 joint funding proposals for future research and development projects have already come in.

Georghiou predicts the initiative, coupled with Cypriot industry collaboration, will lead to a substantially higher solar energy deployment in Cyprus over the coming years, reduce environmental degradation and make the country a hub for solar innovation, technology transfer, industry start-ups and job creation.

Some of the technological developments achieved in the project could be patented and new software, such as a system for solar module failure detection and forecasting, licenced commercially, with the TwinPV results ultimately supporting the Cypriot and EU photovoltaics industries.

The project is also assisting in training the next generation of solar energy researchers and engineers. So far, three week-long training sessions have focused on photovoltaic performance and monitoring, degradation, fault detection, power forecasting, grid integration and battery storage. The results were presented at two international conferences.

Additional workshops with Cypriot industrial partners are strengthening collaboration between industry and the academic world to develop innovative solutions and products for the Cypriot solar sector - and Europe as a whole.

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