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RESEARCH TOPIC

Photovoltaic Systems

We study and improve the quality, performance and reliability of modules and photovoltaic systems

Photovoltaic Systems

We focus on:

- Performance and reliability of photovoltaic modules and systems
- Architectural and electrical integration of photovoltaic systems in buildings
- Integration of renewable energy plants in the electrical grid

Detailed Description

Photovoltaic (PV) system experts from Eurac Research are carrying out R&D to improve the quality and reliability of PV products, solutions and technologies. We work on PV and inverter modules, study free-field or building-installed systems and improve architectural and energy integration in electrical distribution networks.

Our researchers help manufacturers develop high-quality components. We assist installers to build long-life PV plants and help public and private owners and investors to enjoy a low-risk, long-term economic returns. We also encourage policymakers and administrators to use reliable technology. Our cutting-edge modelling tools and ad hoc laboratories support the R&D projects of companies and other institutions.

Some of our latest achievements:

Our researchers have developed methodologies that calculate the economic impact of frequent faults and problems with photovoltaic fields, whether they be component-related or due to a non-ideal design. We have also created interactive maps that show the PV potential of an entire region from the perspec-

tive of a single roof. Working with a local energy distributor, our researchers have formulated advanced algorithms to forecast the total electrical production of 2,000+ PV plants scattered around the region. We have studied typical degradation performance values in various categories of photovoltaic systems. Finally, our experts have, on numerous occasions, supported the initial phases of PV system design, both on a single building and at district level, to identify areas that are best suited for installation of the modules.

The services we offer:

- Consultancy to analyse the technical risk of investments in photovoltaic systems
- Development of long-term strategic analyses for the use of photovoltaic technology at the regional and national level
- Optimisation of the use of solar resources at a building and district level
- Laboratory tests allow for:
 - measurement of the electrical performance of photovoltaic modules through a solar simulator
 - performance monitoring of accelerated ageing cycles in a climatic chamber
 - measurement of the efficiency of inverters and batteries
 - the study of the architectural integration of photovoltaic modules
 - the study of the integration of photovoltaic systems in distribution networks

