Evaluation of performance, quality and reliability of PV modules according to standards and in customer-specific tests

- Stress by temperature and/or humidity in climate chambers
- Potential-induced degradation (PID)
- STC-Performance measurements
- Pre-conditioning for thin-film PV
- Mechanical load, electroluminescence (EL), thermography

Outdoor testing facilities for PV modules and PV systems

- Highly resolved acquisition of all relevant electrical and meteorological data
- Energy yield and performance ratio
- Real module power in outdoor operation
- Temperature coefficients, operation temperature
- Short- and long-term stability
- Outdoor PID testing

- Since 1988 in Widderstall, Southern Germany
- Since 2012 in Girona, Spain

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Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg
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Development and application of testing methods

- Precise performance and operation measurements of PV modules and systems
- Long-term stability of modules
- Accelerated ageing and test-to-failure
- Correlation of laboratory and outdoor measurements
- Input for standardisation procedures

PV storage systems and grid integration of PV plants

- Design of PV battery systems
- Characterisation of battery operation and aging
- Energy management, optimization of self-consumption
- Heat pumps for smart grids
- Strategies to minimize grid loading
- Smart grids on distribution network level

Consulting for manufacturers, investors, banks and project developers

- System measurements and acceptance tests
- Yield estimates and site appraisals
- Technical due diligence
- Troubleshooting

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