

# The service life of the second-level photovoltaic panel

What is the lifetime of a PV module?

Therefore, in the manufacturers' context, the lifetime of a PV module is often defined as the time required for a PV module to lose its initial STC power by 20% (so-called degradation limit). For outdoor degradation evaluations, statistical methods are commonly used.

When does the working life of a PV module end?

The working life of a PV module ends if a safety problem occurs or the PV module power drops under a certain level, which is typically defined between 80% and 70% of the initial power rating. Figure 3.4 shows the defect rate of some special PV module types after 15 years of operation and more [Schulze12].

How to reduce the cost of photovoltaic systems?

One key factor of reducing the costs of photovoltaic systems is to increase the reliability and the service life time of the PV modules. Today's statistics show degradation rates of the rated power for crystalline silicon PV modules of 0.8%/year [Jordan11].

How to predict the service lifetime of PV modules?

To evaluate and predict the service lifetime of PV modules in real-world operating conditions, mathematical approaches are usually utilized. Physical and statistical methods have been commonly used and recently machine learning approaches are being applied.

Are service lifetime and degradation models suitable for PV modules?

The latest scientific work shows that service lifetime and degradation models for PV modules are of specific use if they combine different modelling approaches and include know-how and modelling parameters of the most relevant degradation effects.

How long should a solar energy module last?

Thus, the modules' service life of for energy generation should be longer than 15 years, which leads to considerations of module operation reliability. A shorter service life would be acceptable only in the case of extremely low investment costs to keep the product IC.f (n;e) acceptably low.



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