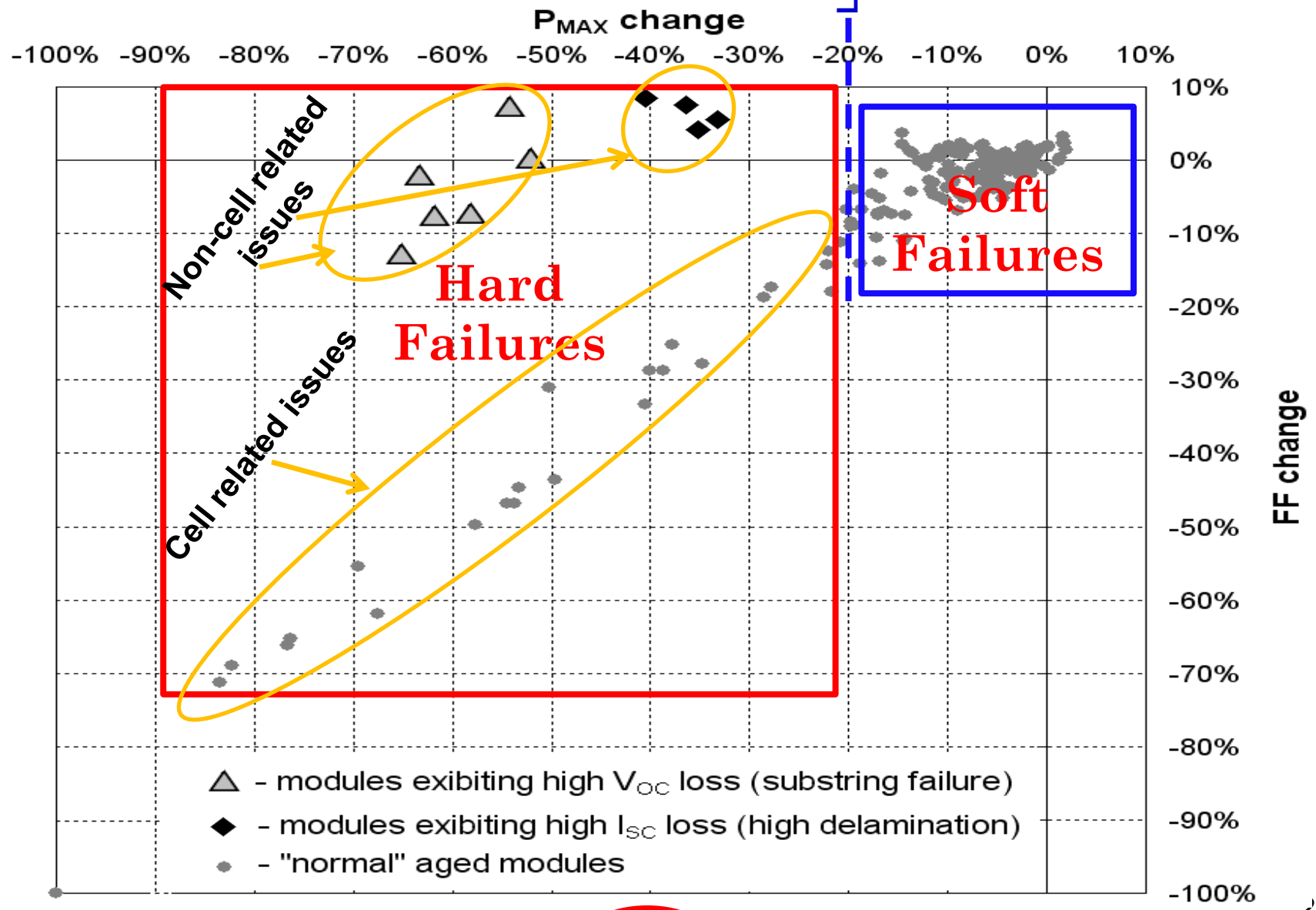


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Field Failure Classifications: Hard & Soft Failures – Some Thoughts!

~20 years in the field (204 modules; 53 designs)



18-24 Years Modules, Ispra, Italy (Source: **ESTI**)

Marking on the Product: Some Thoughts!

Solar Water Heaters

- **Certification:** OG-100 of SRCC (Collector)
OG-300 of SRCC (System)
- **Warranty:** ≥ 10 years on solar collector
 ≥ 6 years on storage tank
 ≥ 2 years on controls
 ≥ 1 year for piping and parts
- **Solar Factor:** $\geq 50\%$



Solar Photovoltaics

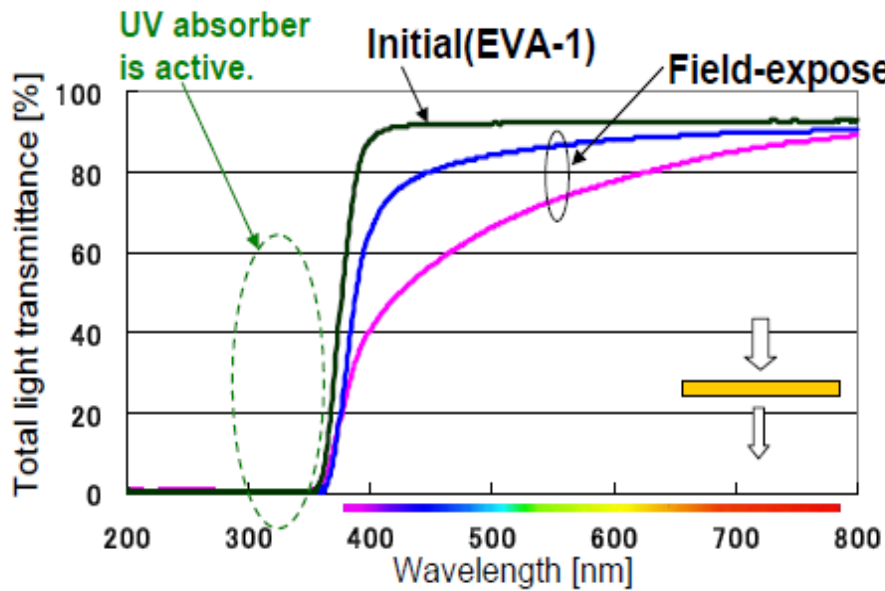
- **Certification:** Design Quality (*IEC 61215/61646*)
Comparative Quality (*Extended/Sequential Testing?*)
Manufacturing Quality (QA Guideline with HASA)
Predicted Energy Yield (*kWh/kW based on IEC61853*)
- **Warranty:** ≥ 20 years on PV module
 ≥ 10 years on BOS



Mark?

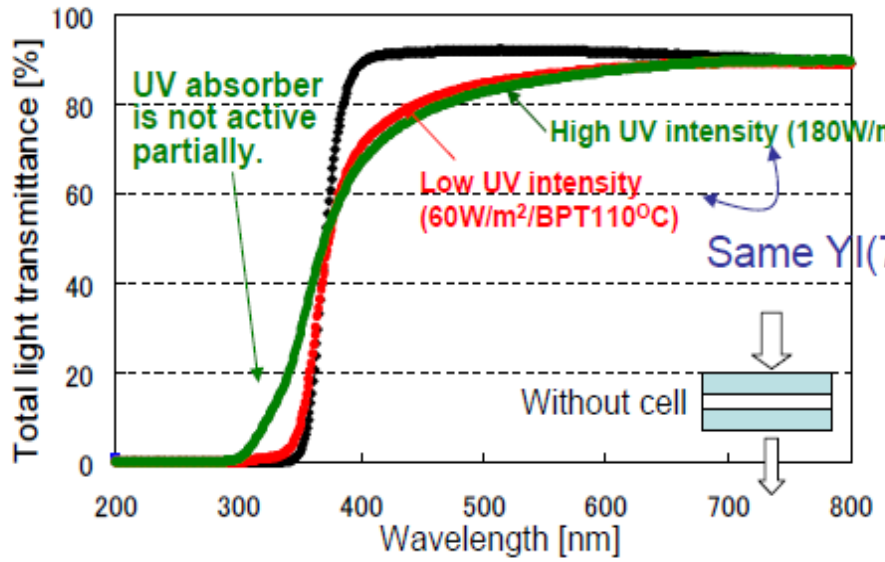


Difference of transmittance spectra change



Transmittance spectra of EVA of modules **outdoor-exposed at Miyakojima for over 20y.**

This difference indicates that high UV intensity irradiation is not suitable for reliability test of lifetime prediction



Example of Transmittance spectra of EVA-1 exposed using XWOM with high and low intensities of UV rays.