

SUPSI

Welcome to the Swiss Photonics
Workshop on
Lifetime and Reliability Issues in PV

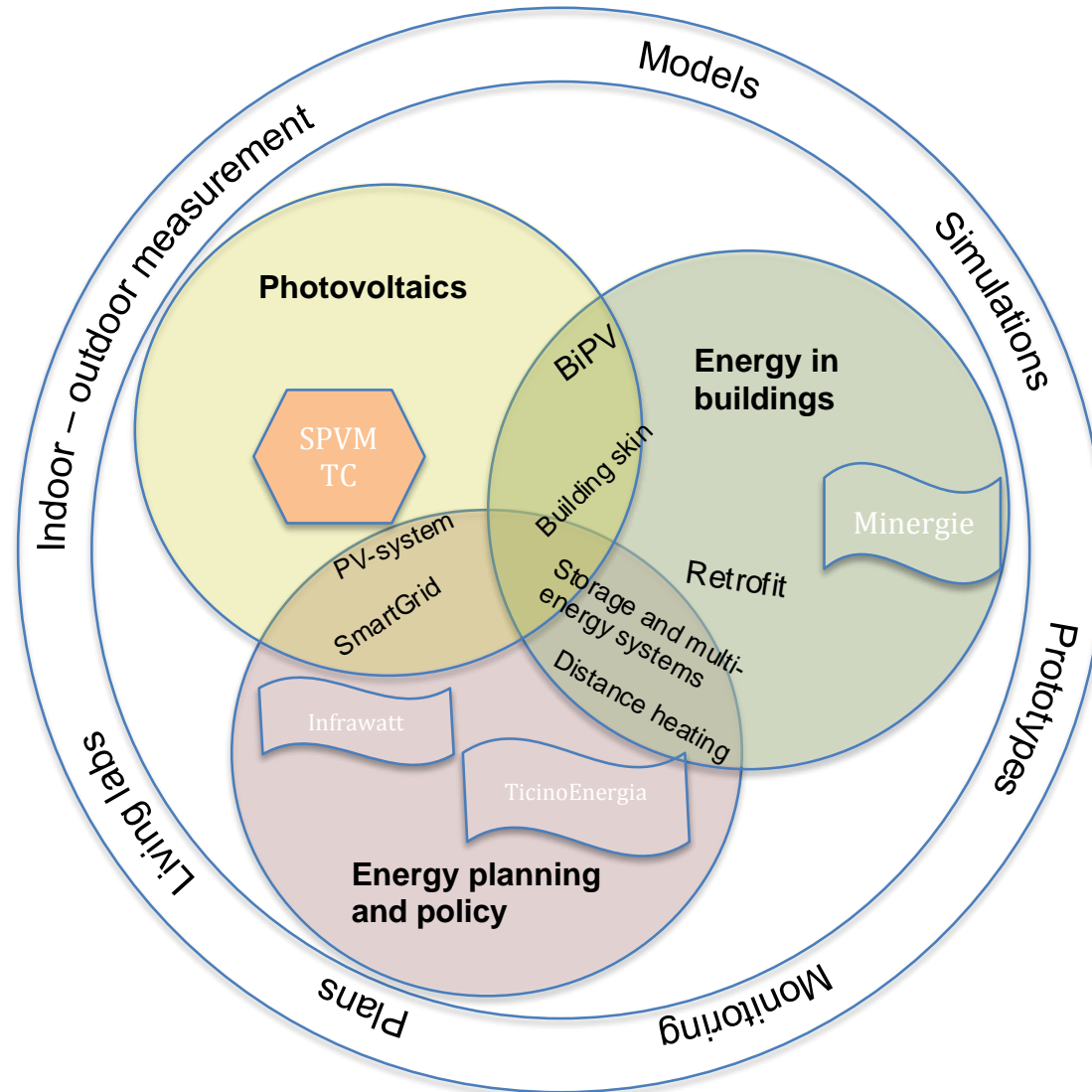
Lugano/Lamone, 10th September 2015

Roman Rudel - Head of ISAAC

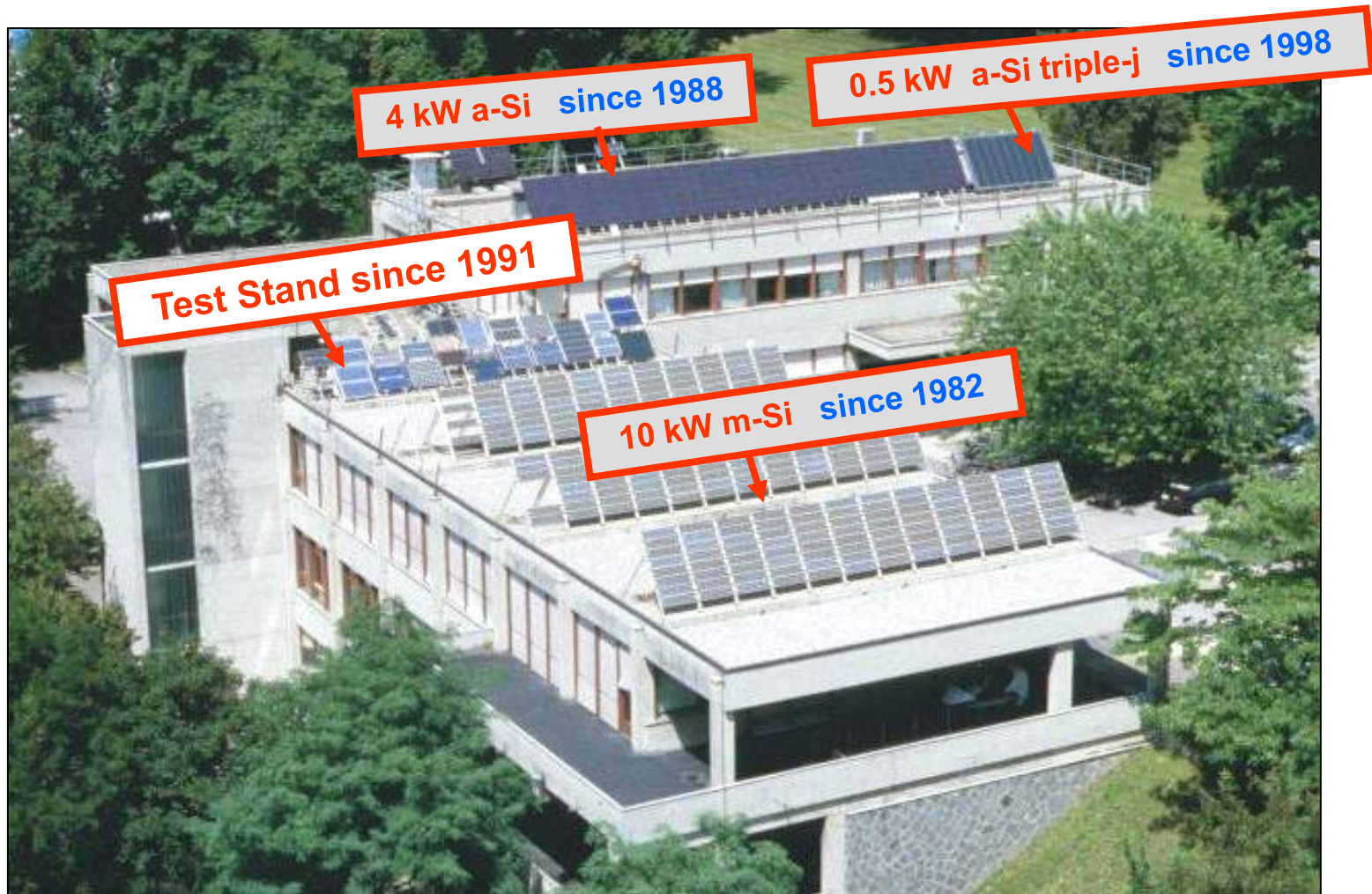
33 years of TISO – Ticino Solare



Institute of Applied Sustainability to the built environment



PV plants on the SUPSI roof



Milestones in the history of the institute

1982: TI-SO 10kW m-Si

1988: 4 kW a-Si

1991: Outdoor Test Stand

2001: Indoor Test
(ISO 17025)

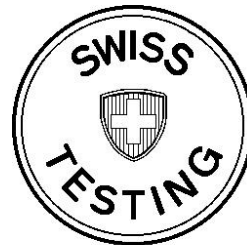
2010: PV – Module Test Center
(ISO 17025)



PV - Test laboratory



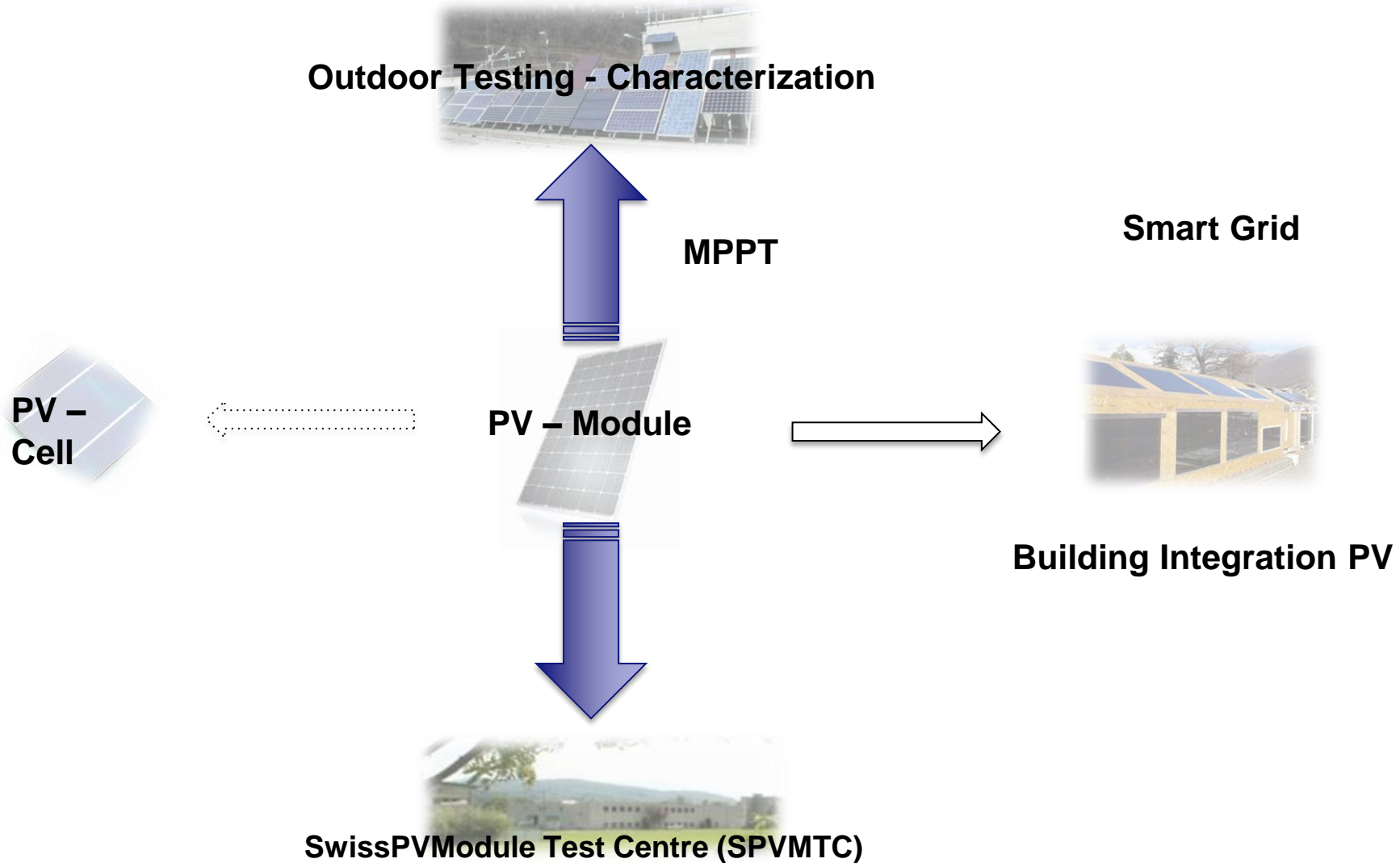
Standard IEC/ISO: 61215
61646
61730



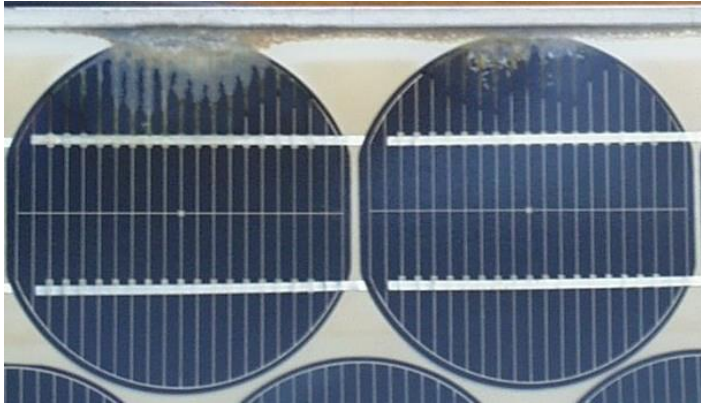
STS 531



ISAAC's PV activities and strategy



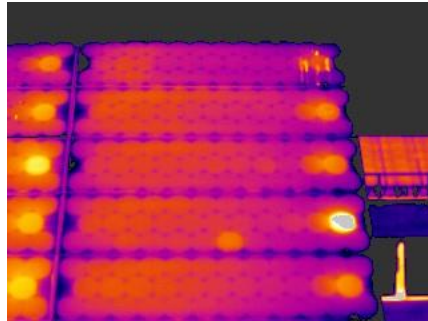
2000-2002: European Project Mean Time Before Failure: Detailed degradation analysis of the TISO 10kW plant



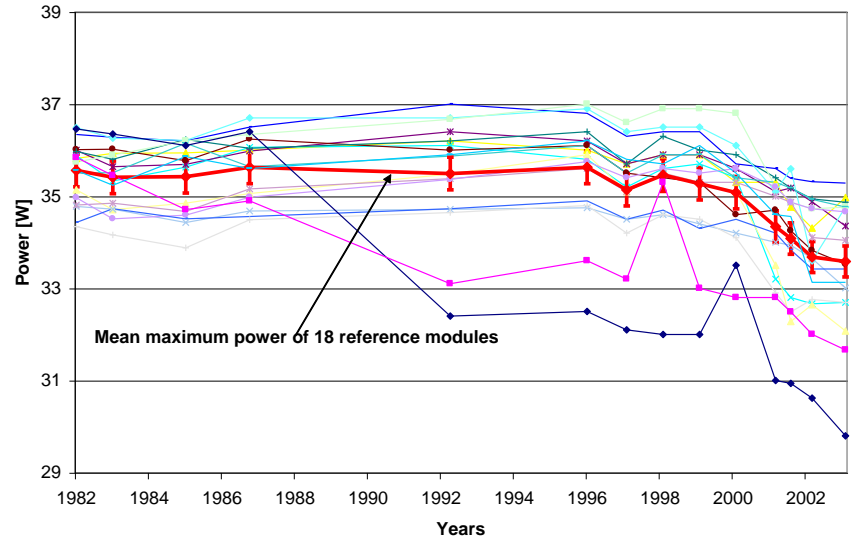
Infiltration of humidity



Detachment of first Tedlar layer on the backside



Hot-spot on different modules

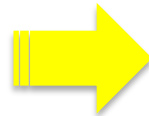
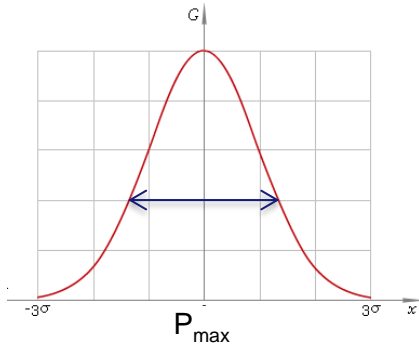


Evolution of the power of 18 reference modules

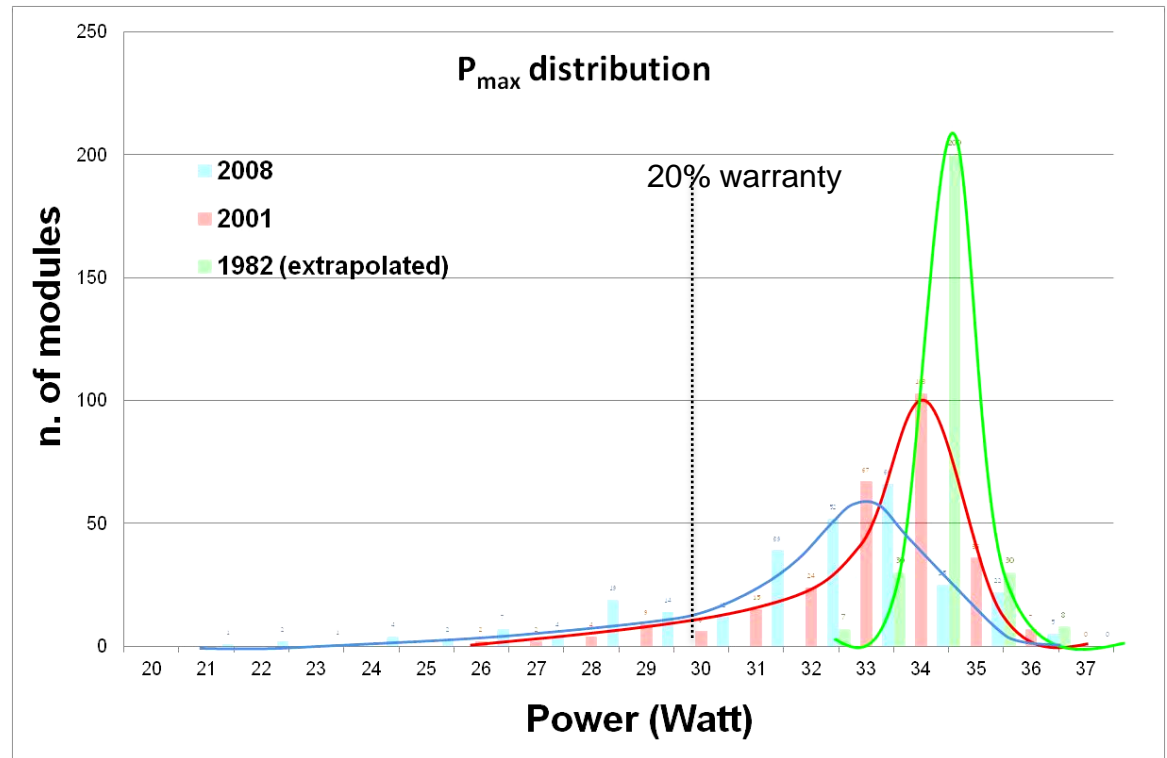
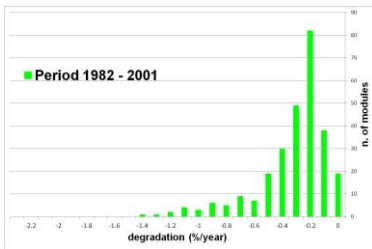


P_{max} distribution of TISO modules in 1982 – 2001 - 2008

Initial Gaussian distribution of P_{max}



Distribution of module degradation



The Gaussian distribution of the initial power and the different degradation rate of the single modules cause the **broadening** and **shift of the distribution** with time

Planet Solar: Reliability under special conditions





Thanks for participation