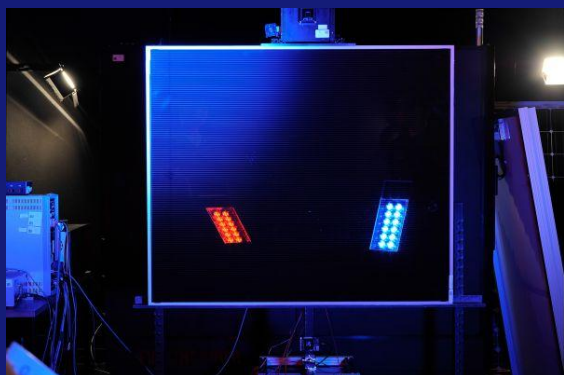
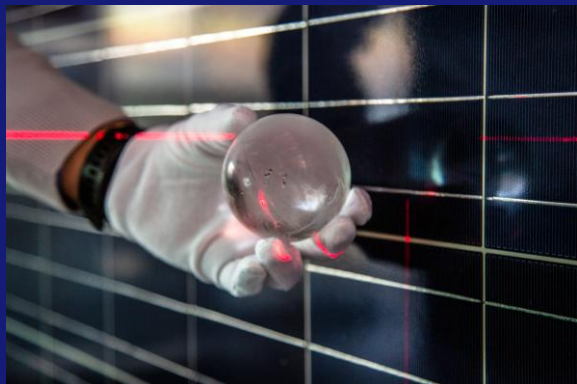


SUPSI PVLab activities



17 giugno 2026

Accelerating the energy transition

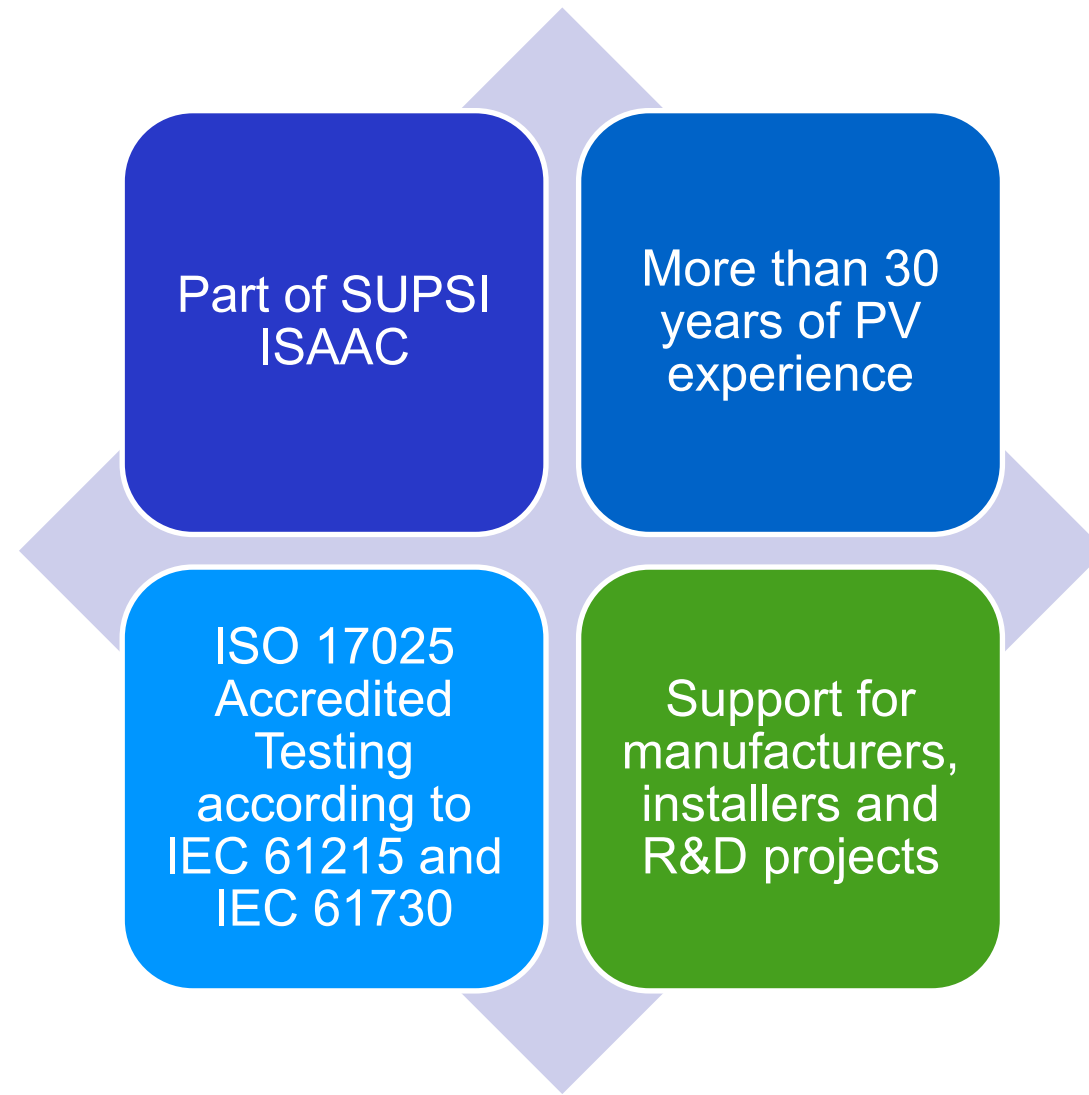
SUPSI PVLab is the only Swiss laboratory accredited for testing PV modules according to international and national standards. Further to services, we have strong research activities with focus on precise characterization, accelerated testing and outdoor monitoring of innovative technologies, in order to increase the quality of PV products and systems on the market.

[Virtual tour](#)

www.pvlab.solar



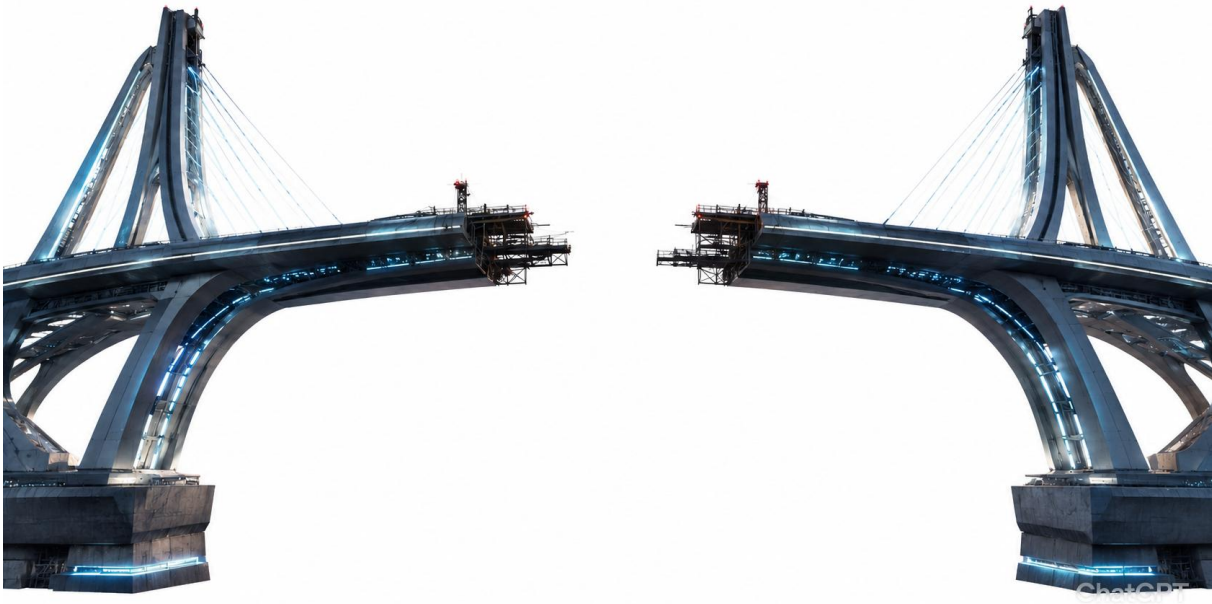
About PVLab



PVLab SUPSI – Mission: Building Trust in PV through Testing

Bridging the gap to energy transition

- **Accredited ISO/IEC 17025 photovoltaic testing laboratory**
- • Reliability, performance and safety testing
- • Research and industrial support platform



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER

State Secretariat for Economic Affairs SECO
Swiss Accreditation Service SAS

STS Directory

Accreditation number: STS 0531

International standard:

ISO/IEC 17025:2017

Swiss standard:

SN EN ISO/IEC 17025:2018

ISAAC
Institute of Applied Sustainability to
the Built Environment
SUPSI PVLab
Campus Mendrisio
Via Flora Ruchat-Roncati 15
6850 Mendrisio

Head:	Giovanni Bellenda
Responsible for MS:	Valentina Jennarelli
Telephone:	+41 58 666 62 31
E-Mail:	isaac@supsi.ch
Internet:	www.supsi.ch/isaac
Initial accreditation:	02.03.2010
Current accreditation:	02.03.2025 to 01.03.2030
Scope of accreditation see:	www.sas.admin.ch (Accredited bodies)

Motivation behind the activities @SUPSI PVLab: evolution of PV modules and technologies



1982: 35W
(efficiency
<10%)



2012: 240W



2018: 320W



2026: 800W
(efficiency
>25%)

Industry Challenges

How reliable is a PV module over 30 years?

How can degradation be detected early?

How do modules behave under extreme climates?

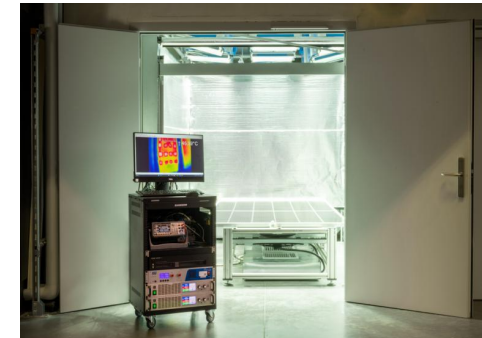
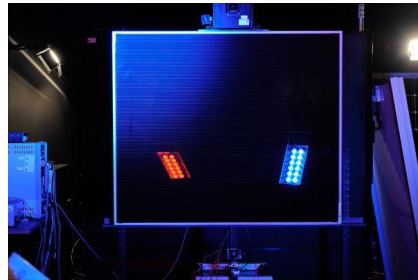
How can new technologies be validated quickly?

Activities

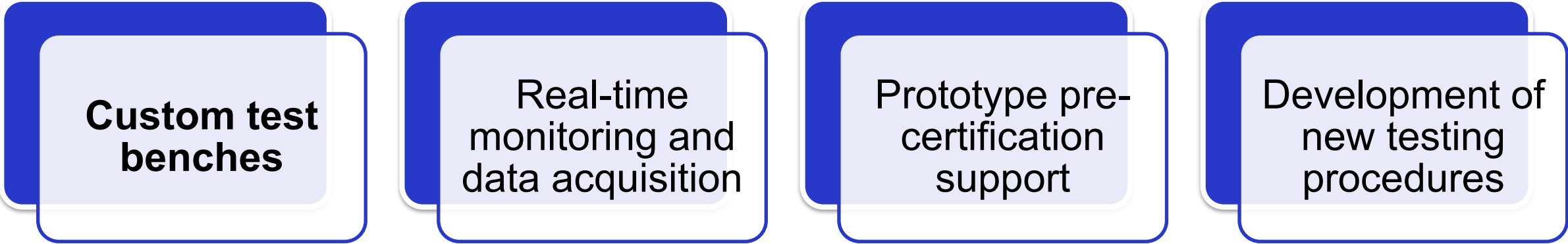
- Partial and full PV product certification according to IEC standards in the only ISO 17025 Swiss accredited test lab
- Advanced metrology capabilities on standard and new technologies (uncertainty on $P_{\max}$ +/- 1.1% thanks to international metrology projects)
- Advanced characterization of materials (multi-spectral analysis, FTIR, etc.)
- Long term data analysis at module and system level
- Accelerated testing in outdoor condition
- Participation to IEA PVPS Task 13 as reliability experts and IEC TC82 activities for developing standards.

SUPSI PVLab: facilities

- N.3 Pasan Flasher, class AAA, for the electrical characterisation with best uncertainty of **+/-1.1%** (non destructive spectral response measurement at module level, spectrum fine tuning with LEDs)
- N.3 continuos simulators, with visible light (2) and UV light (1), for characterisation, stabilisation and accelerated degradation of materials, covering largest modules on the market (e.g. 2384x1134mm)
- N.2 thermal chamber, 3 m³ volume, for environmental testing with humidity and thermal cycling.
- PID testing
- N.1 mechanical load test setup up to **18.000 Pa** in pressure, with optional inclination up to 30°
- N.1 hail test set up, with max diameter of hailstone of **90 mm (accredited for IEC and Swiss norms)/ 100mm (not accredited) and possibility to test inclined at 45° (for façade)**
- N.1 mechanical test machine for shear, pull test, 4 point bending test on materials and components (JB, connectors, laminates)
- N.1 megaohmmeter for dry and wet insulation test
- Bypass diode thermal and reverse breakdown testing.
- N.2 IR camera systems for electroluminescence and multi-spectral mapping up to 150 Mpixel resolution.
- Outdoor stand for the energy yield evaluation and comparison to other reference technologies
- Meteo station, with calibrated spectroradiometers, pyranometers and reference cells for a precise monitoring of composition and quantity of light, further to environmental parameters
- N.3 IV curve tracers for string performance measurements on the field (calibration with reference modules for uncertainty reduction) up to 1500 V.
- N.1 PV system performance checker (instant PR, energy yield)
- N.2 Insulation, short circuit current and open circuit voltage tester for PV system analysis



Advanced Testing Capabilities



Custom test benches

Real-time
monitoring and
data acquisition

Prototype pre-
certification
support

Development of
new testing
procedures

Reliability & Failure Analysis



Root cause analysis



Hot-spots and insulation degradation



Mechanical and environmental stress evaluation

Innovation & New Technologies



TOP-Con, HJT, BC, tandem technologies



Lightweight module concepts



PV reuse and circular economy



Building Integrated PV - BIPV



REBI PV project:

- Focus on reliability in BIPV conditions
- Heated stand



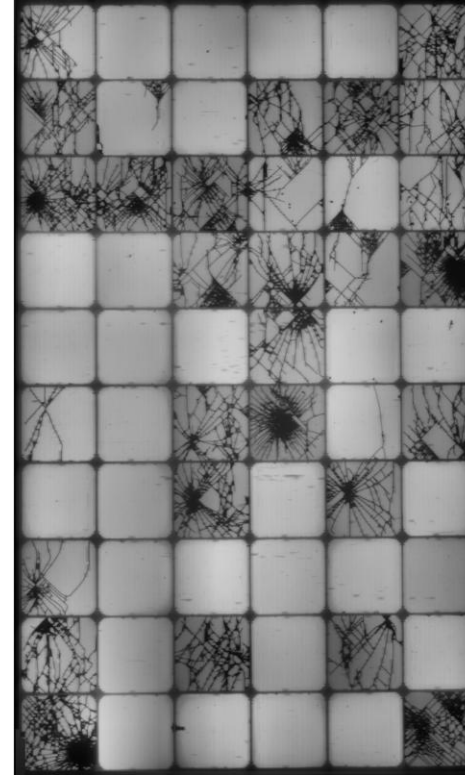
REBI PV project:

- Focus on reliability in BIPV conditions
- Shadow mask/insulated stand



BIPVBOOST/REBI PV projects:

- Focus on innovative envelope



ACHILLES/CASSANDRA
projects:

- Focus on extreme hail resistance of PV indoor vs outdoor