



IV testing of back contact and tandem modules What do our customers do?

at 11th BC workshop in Hameln
by Pepijn Veling



What I will (briefly) show you today

- **Company overview**
What are we doing nowadays?
- **Back Contact and Perovskite-Silicon Tandem testing**
What do our customers do?



How it started in 2006-2011



Today we are 65 colleagues and 16 nationalities in ONE team



Open positions:

Assemblers

Recruiter

Sales manager

Software developer

<https://eternalsunroupbv.recruitee.com/>

A photograph of a solar farm at sunset. The sky is a gradient of orange, red, and purple. The solar panels are tilted and arranged in rows, extending into the distance. A white square box is overlaid on the center of the image, containing the text "Sure about solar".

Sure
about
solar

Sure about solar in three business segments

Solar simulator equipment



Flash Solar simulators
Steady-state Simulators

Manufacturers lines and lab
Certification labs
R&D Institutes

Import test labs QA



IV and EL test services at
harbors in Rotterdam and Valencia

Project Developers
EPCs
Manufacturers

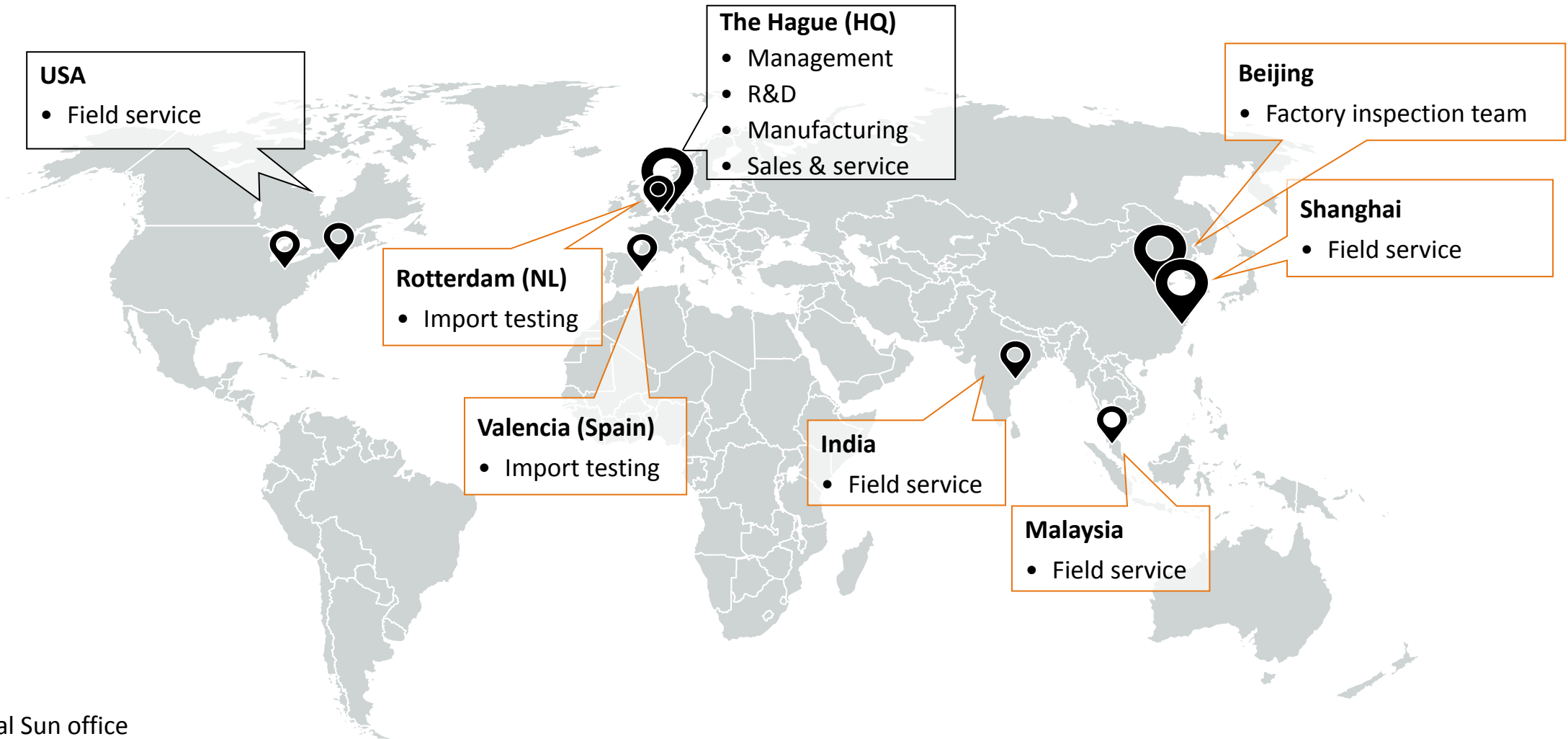
Factory inspection QA services



Audits, production witnessing and
pre-shipment tests in Asia

Project Developers
EPCs

Offices near our main customers



Production

Single-sided flashing

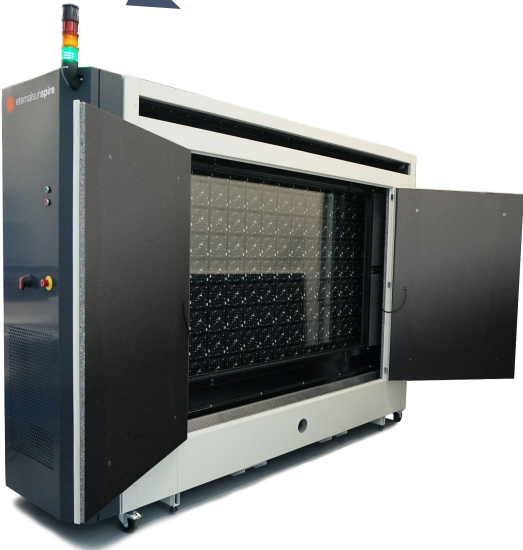
Double-sided flashing



Laboratories

Single-sided testing

Double-sided testing



What I will (briefly) show you today

- Company overview

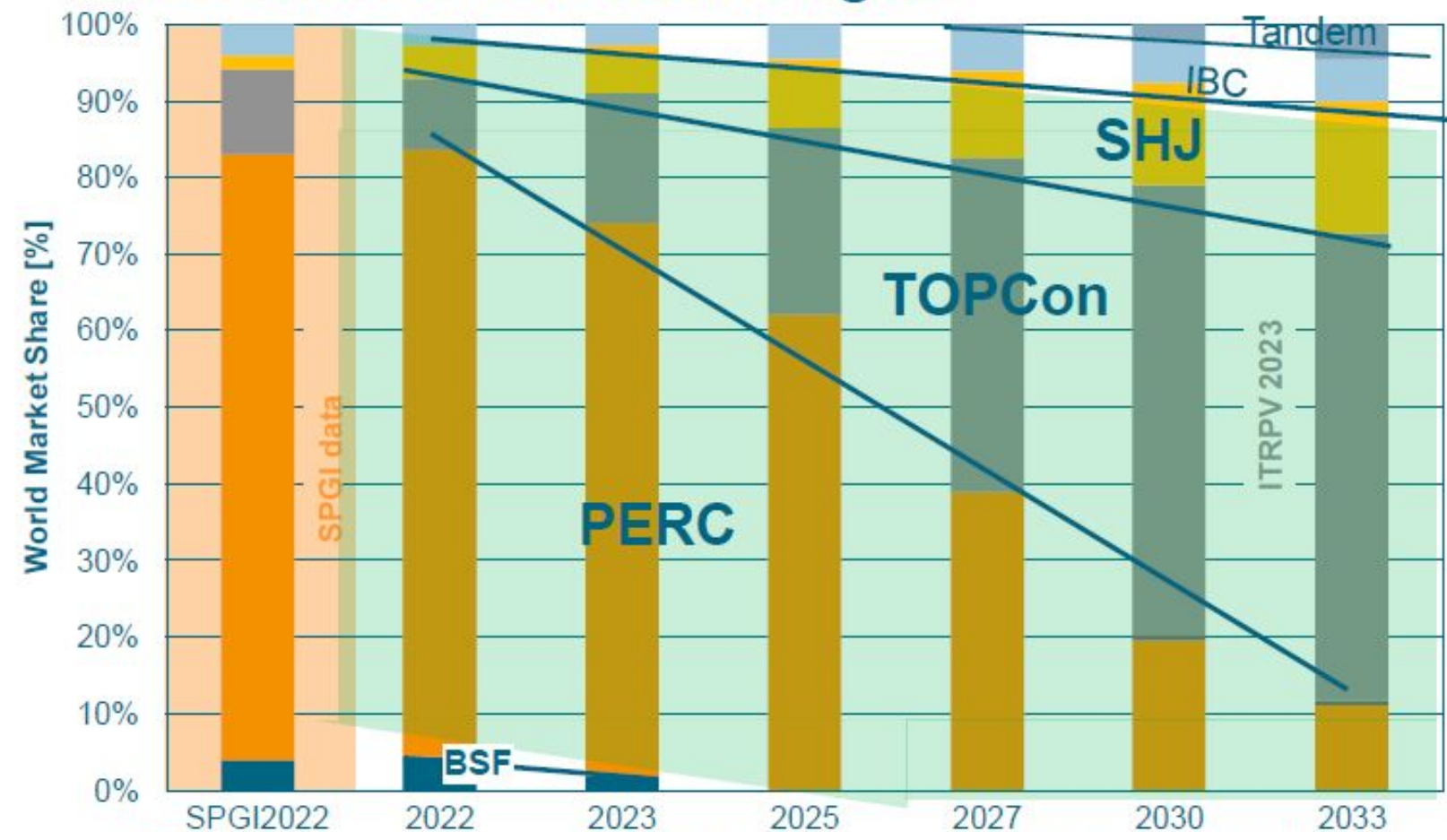
What are we doing nowadays?

- **Back Contact and
Perovskite-Silicon Tandem testing**

What do our customers do?

IBC can be flashed, Perovskite-Silicon Tandems require steady-state

Trend: share of cell technologies



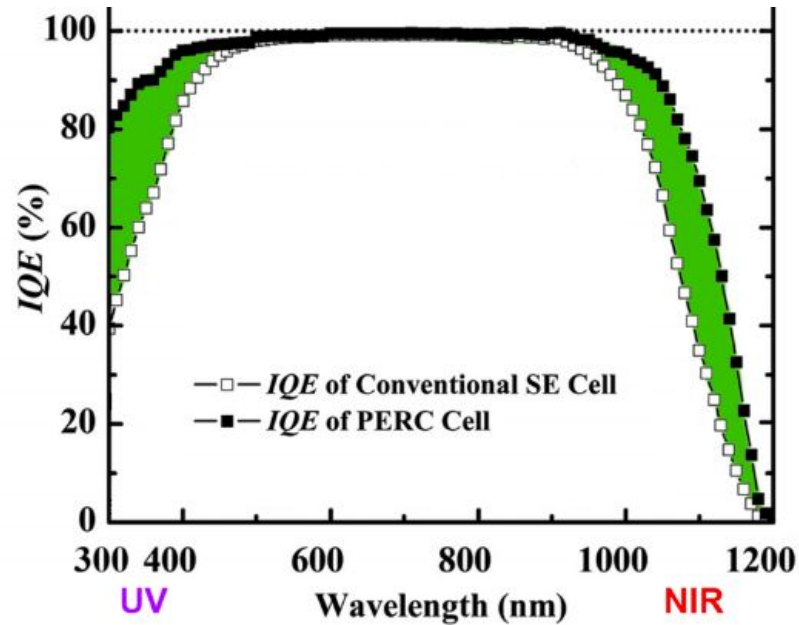
Perovskite-Silicon Tandems require wide tunable spectrum under steady-state illumination

PERC, Topcon, SHJ and IBC require long pulse and wide spectrum

BSF required short pulse and basic spectrum

Everyone agrees nowadays on how to test high efficiency silicon modules

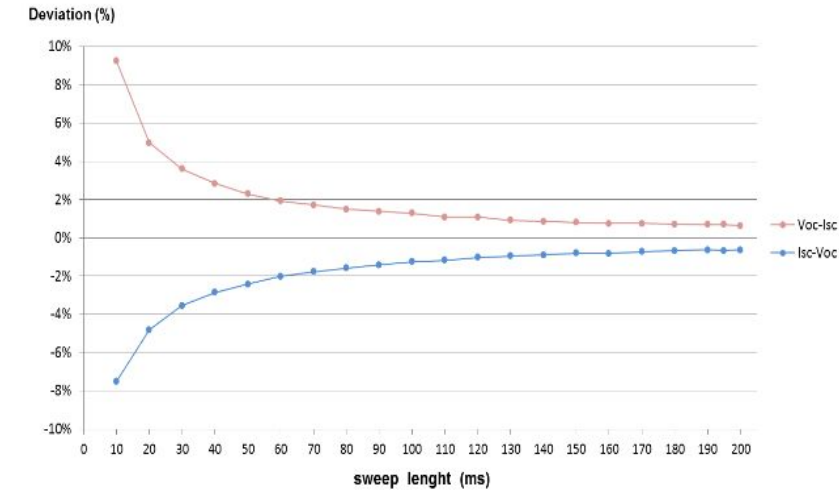
Full 300-1200nm spectrum
SPC >99%



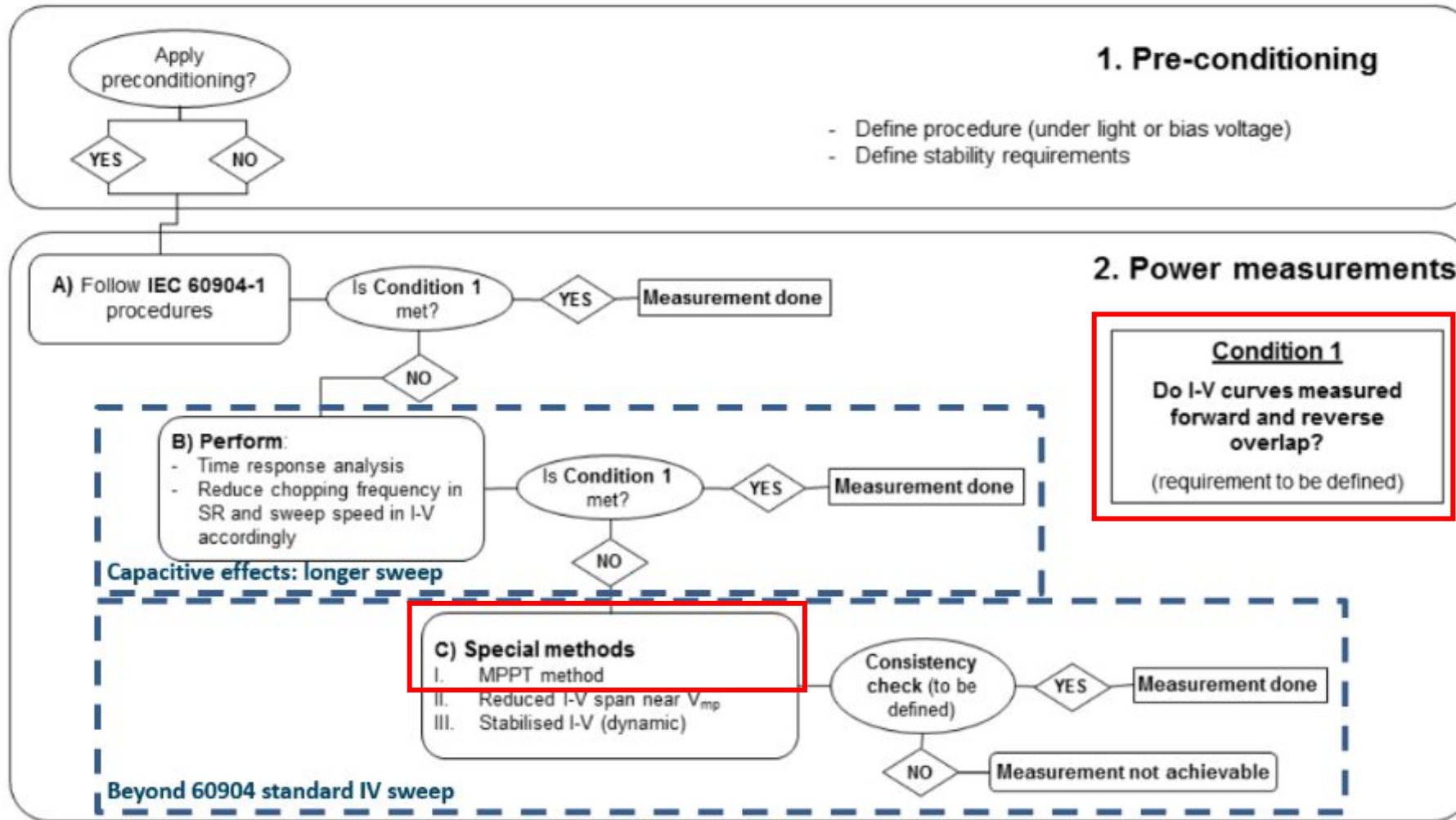
<1% Uniformity



>100-200ms true pulse length



With testing Perovskite Silicon Tandems, testing protocols are being developed



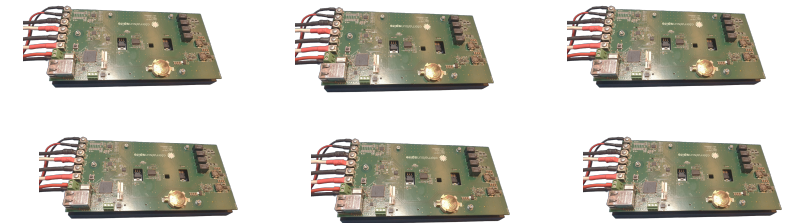
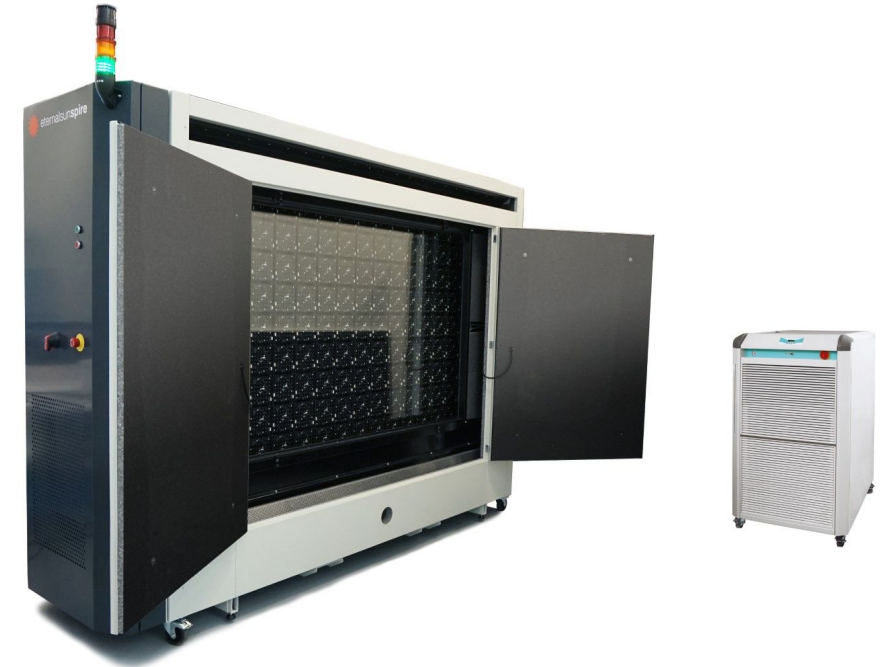
Stabilize through light soak (electrical bias is not where industry norm is going)

*Condition 1 check:
Sweep IV fwd & bwd
Criterion IV curve overlap <1%
(can take minutes)*

*If condition 1 NOT met:
MPPT method recommended
for Perovskite PV*



This is what we currently sell to PST players

- **Stabilization & long IV Sweep**
 - A+A+A+ steady-state (hours) for initial Power stabilization
 - AAA class for >30.000 hours for stability tests
- **Temperature control**
 - 25C - 85C range
 - +/- 4C temperature uniformity
- **Tandem material compatible**
 - Full and adjustable spectrum
- **Module IV system**
 - MPP tracking (Perturb and Observe with adjustable parameters)
- **Mini-module testing for fast R&D cycles**
 - Multiple Mini-IV systems
 - Mini module mounting rack



We share our knowledge through webinars with guest speakers

Who are you listening to?



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WEBINAR
CALIDAD DE PANELES FOTOVOLTAICOS (FV)



Dr. Aaron Sanchez Salas
LANEFV-IER-UNAM

Mtro. Elias Garcia Gomez
ETERNALSUN

Mtro. Jose Ortega Cruz
LANEFV-IER-UNAM


12:00
(GMT-5)

Jueves 30
de Abril



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Who are you listening to?




PI

Paul Grunow
Board of PI Berlin
email

Tjibbe Nicolai
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Pepijn Veling
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Host and moderator:
Evangelia Miliou
Sales manager
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Bifacial Modules Webinar: Insights in Data, Modelling and Test Methods

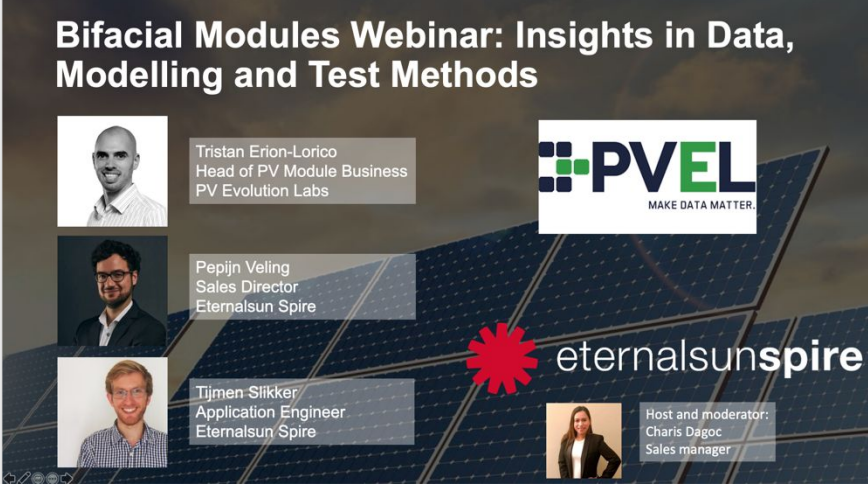



Tristan Erion-Lorico
Head of PV Module Business
PV Evolution Labs

Pepijn Veling
Sales Director
Eternalsun Spire

Tjimen Slikker
Application Engineer
Eternalsun Spire

Host and moderator:
Charis Dagoc
Sales manager



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In summary

- How to test IBC is clear
- How to test PST is being developed, our customers are using steady-state LED
- Horses for courses
- Our goal: our customers to be sure about solar
- And now off to the Christmas market!

Connect to us on [linkedin](#)!!



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sure about solar