

Latest Developments, Project Results, Lessons Learned and Outlook

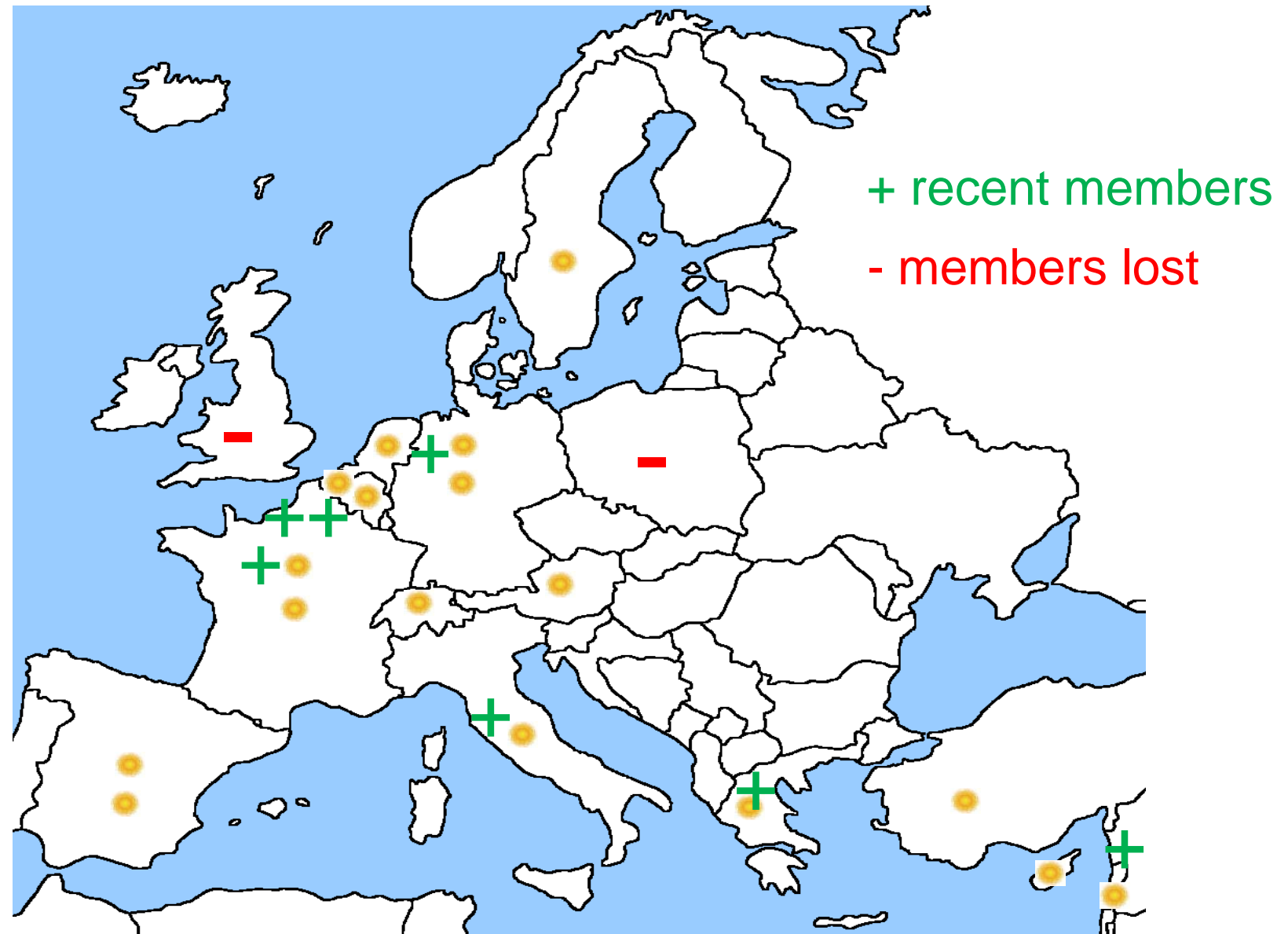
Stefan Nowak, Managing Director
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Coordinator of SOLAR-ERA.NET



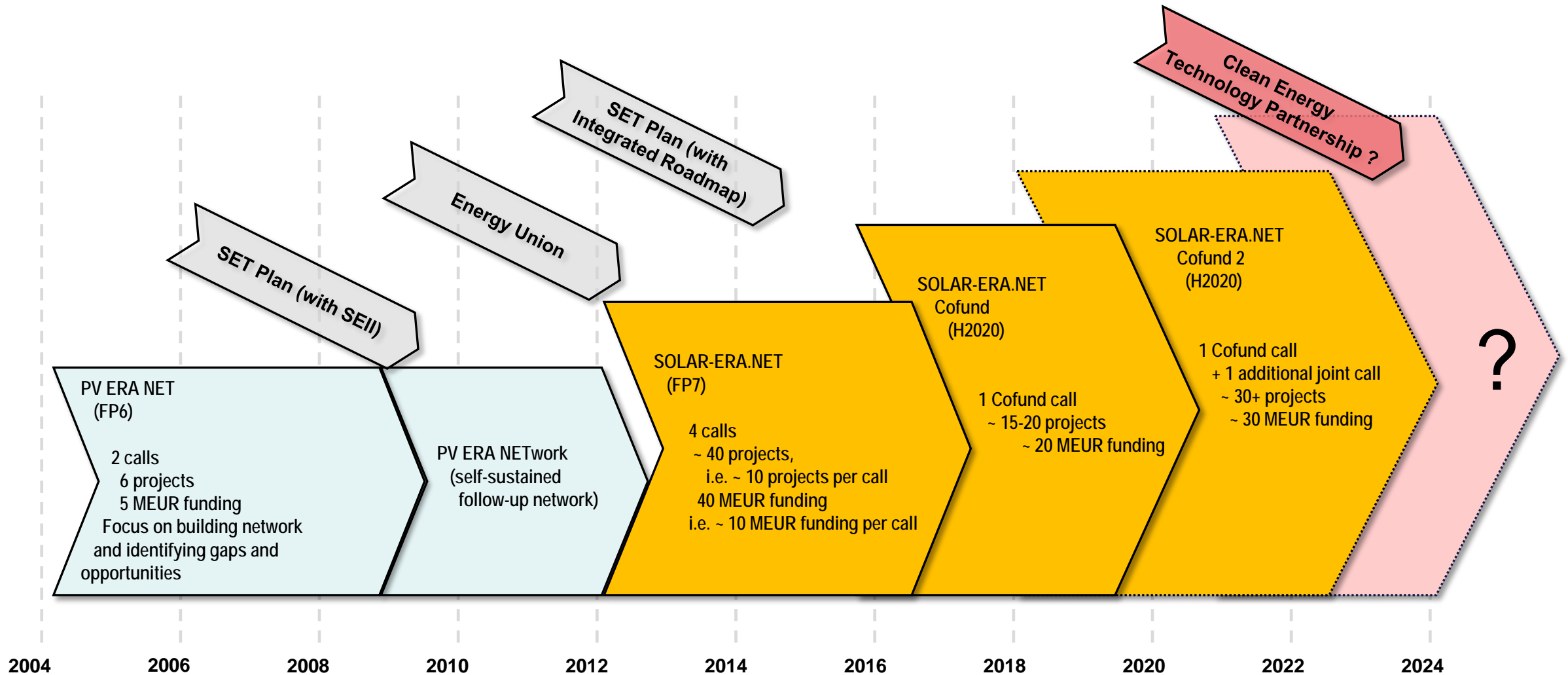
To start: Who we are and what we do

A European Network and Consortium of
Research and Innovation Agencies

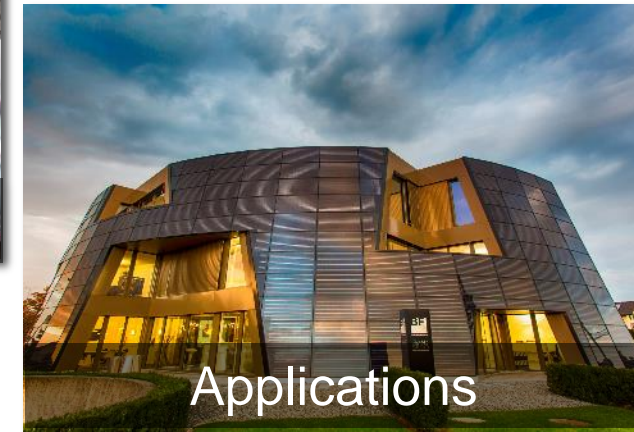
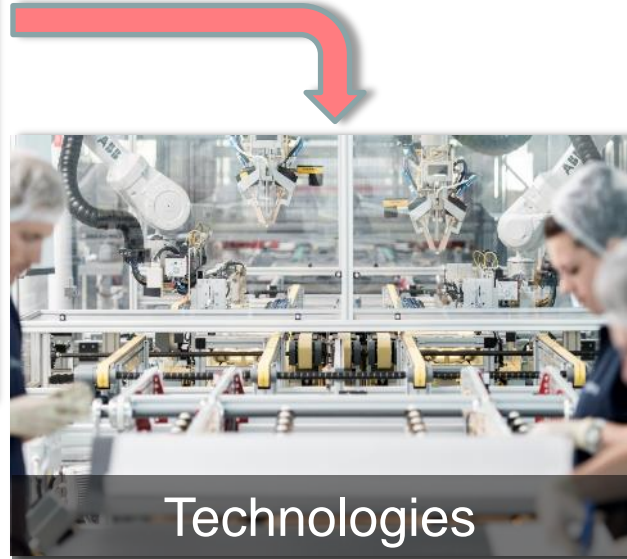
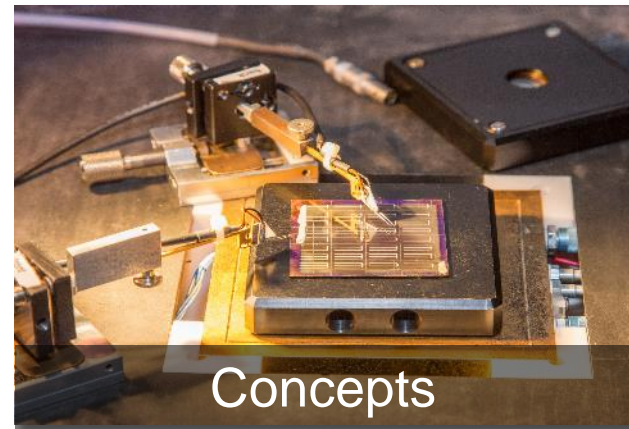
to enable and push European Cooperation
in PV RTD



A long track record of European cooperation in PV and CSP



Working along the value chain

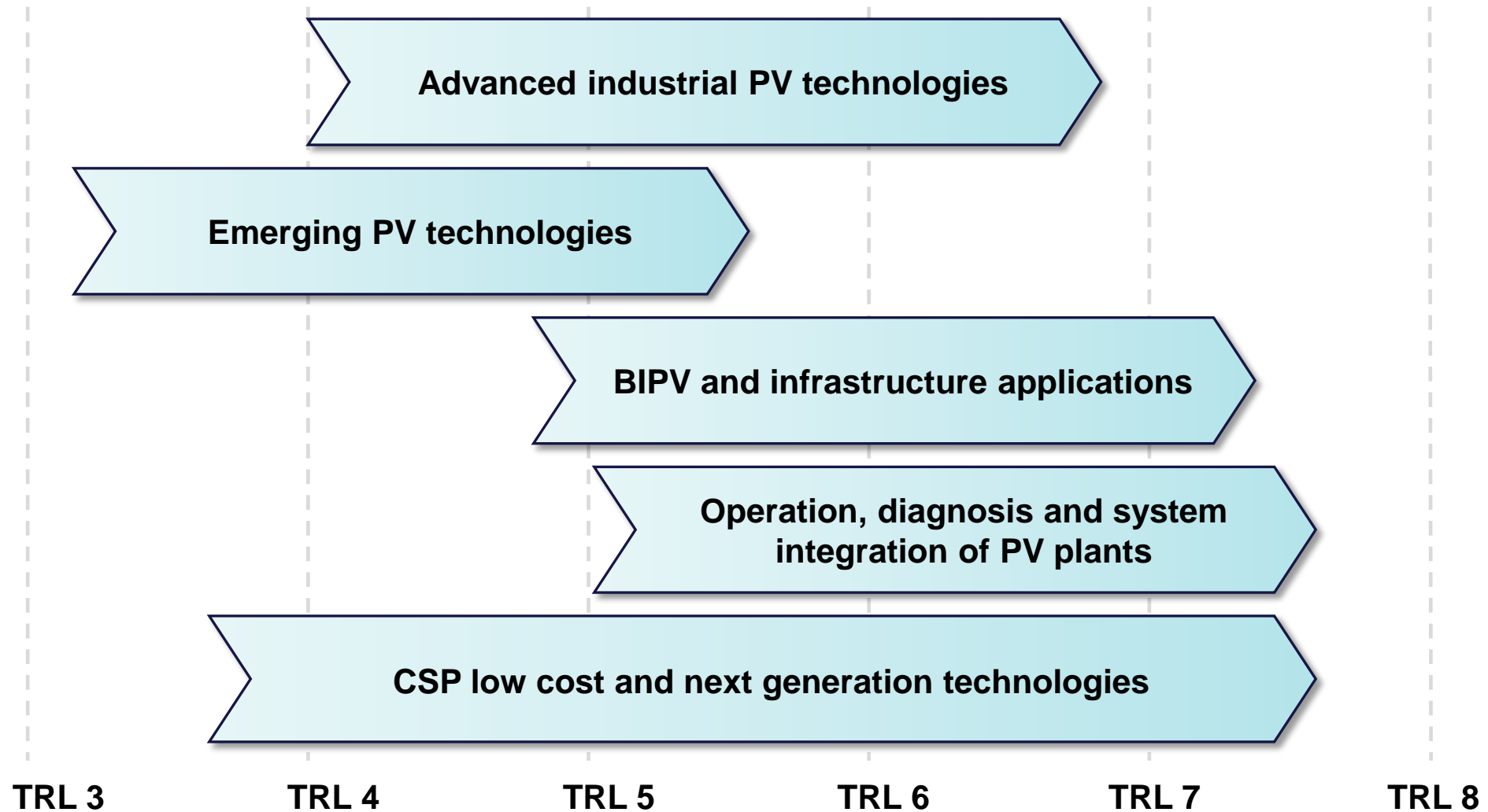


Components

Systems

Integration

Recent SOLAR-ERA.NET Topics



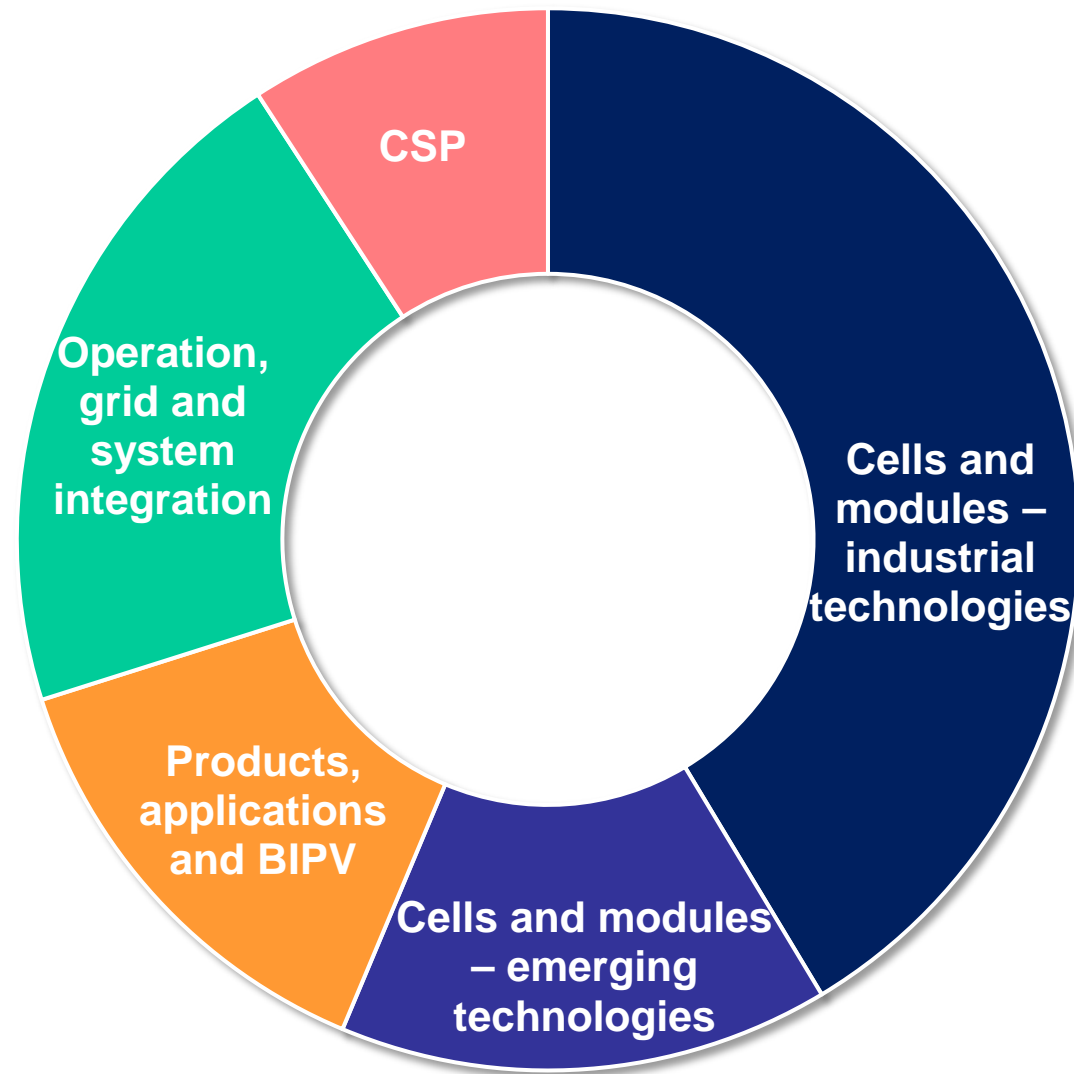
Some facts and figures

- Overall 7 joint calls over 7 years, different support schemes
- 310 preproposals and 166 full proposals submitted
- 87 projects supported
- of which 38 projects running, 38 terminated and 11 in preparation
- 456 partners involved in projects (multiple counting)
- 111 MEUR project volume with 75 MEUR funding, of which 9 MEUR from EC

Typical project:

- 3 – 5 partners from 3 – 4 countries
- 1,2 MEUR project volume (of which 0,8 MEUR public funding)

Thematic split of the 87 projects – over all 7 calls (simplified)



Added value

- Benefit for the project participants: stepping stone for international cooperation
- Complementarity between national and EU funded programmes
- Enabling targeted bi- and multilateral cooperation
- Building a more robust and consistent research landscape
- Increasing strengths and reducing weaknesses
- Flexibility and bottom-up nature, no “one size fits all” approach
- Innovative transnational research for medium-sized projects



To be more concrete: Some Examples

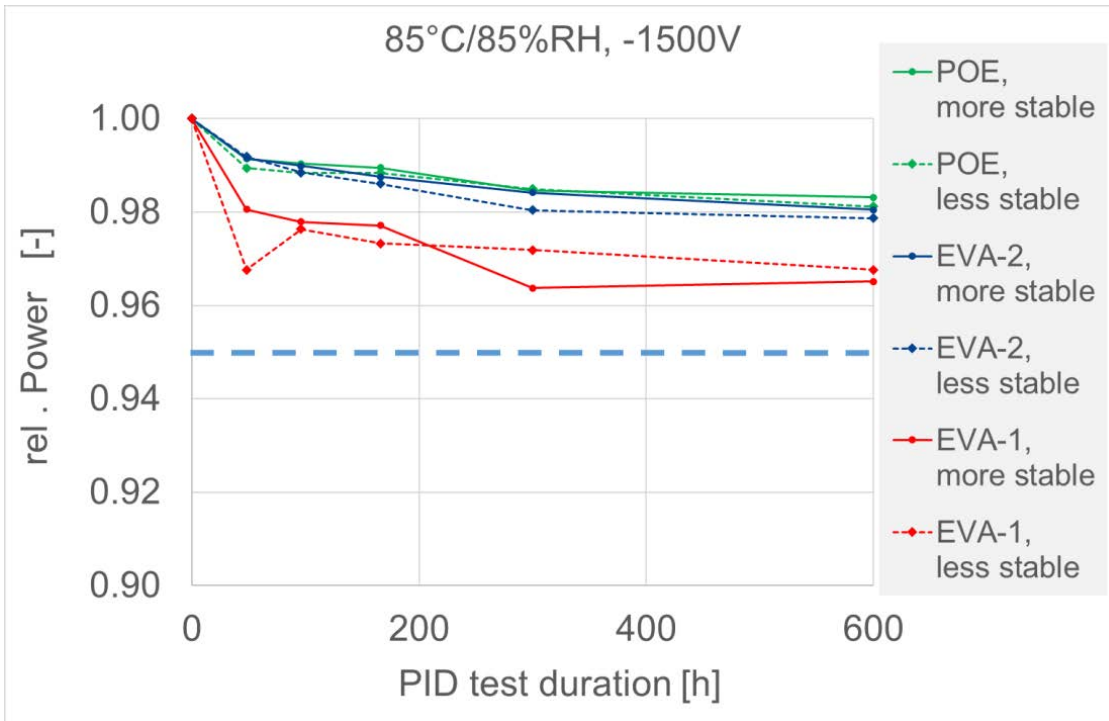
Results, Experiences and Lessons Learned

NELL: Novel Encapsulant for Long Lifetime high voltage PID-resistant PV

- Two partners:
 - Specialized Technology Resources España S.A., Spain, industrial partner and coordinator
 - ZSW Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg, Germany, research partner
- Project duration 01.01.2018 – 31.12.2019
- Total project costs € 533'734
- Requested funding budget € 417'864

Results

- new developed polyolefin (POE) based encapsulant with better performance compared to EVA under standard IEC TS 80604-1 test conditions
- less leakage current and transferred charge compared to EVA



| Item | Condition | Module/ EVA-1 | Module/ EVA-2 | Module/ POE |
|--|---|----------------------|---------------------|---------------------|
| Extreme chamber test Transferred charge for x% PID degradation | Chamber 85° C/ Al-foil @ -2500 V | 9.5 C (for -5%) | 10 C (for -5%) | 20 C (for -2%) |
| Outdoor field test Transferred charge per year | Outdoor operation @ -750 V Germany | 4.7 C/yr | 0.46 C/yr | 0.34 C/yr |
| Outdoor service time for x% PID degradation | Outdoor operation @ -750V Germany | 2.1 yrs (for -5%) | 22 yrs (for -5%) | 60 yrs (for -2%) |

Feedback of the project consortium

Success factor

- Very fast proposal procedure (less than 1 year for a 2 stage proposal)

Critical factor

- Different administrations (sometimes different starting dates for partners)

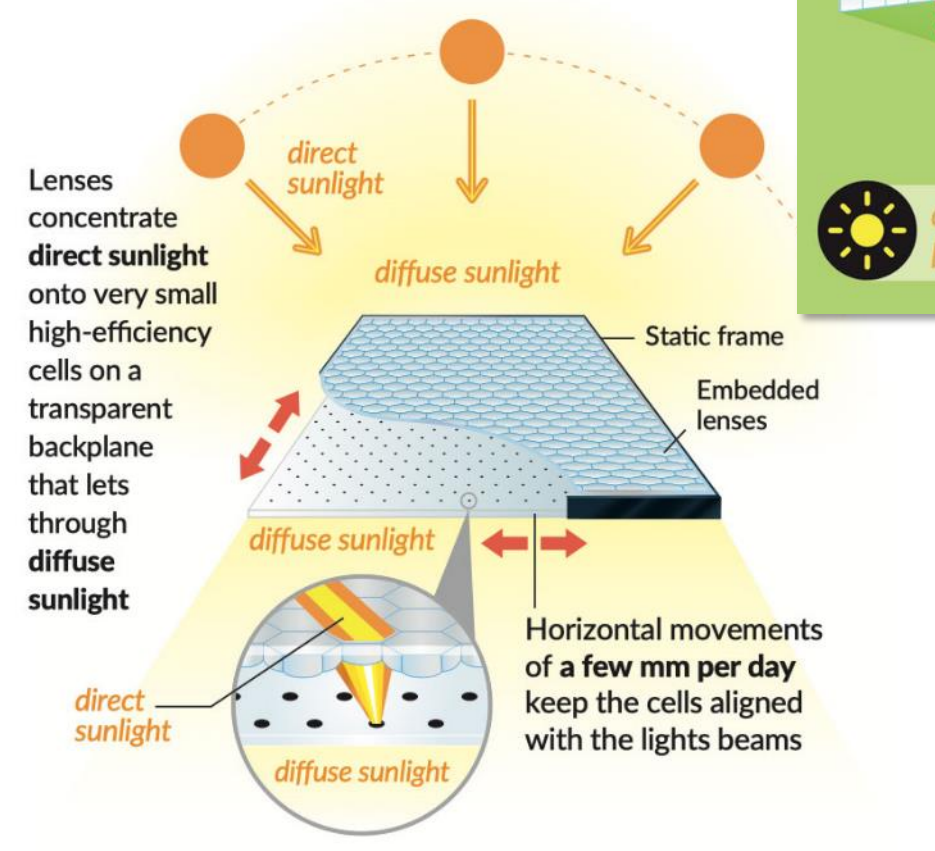
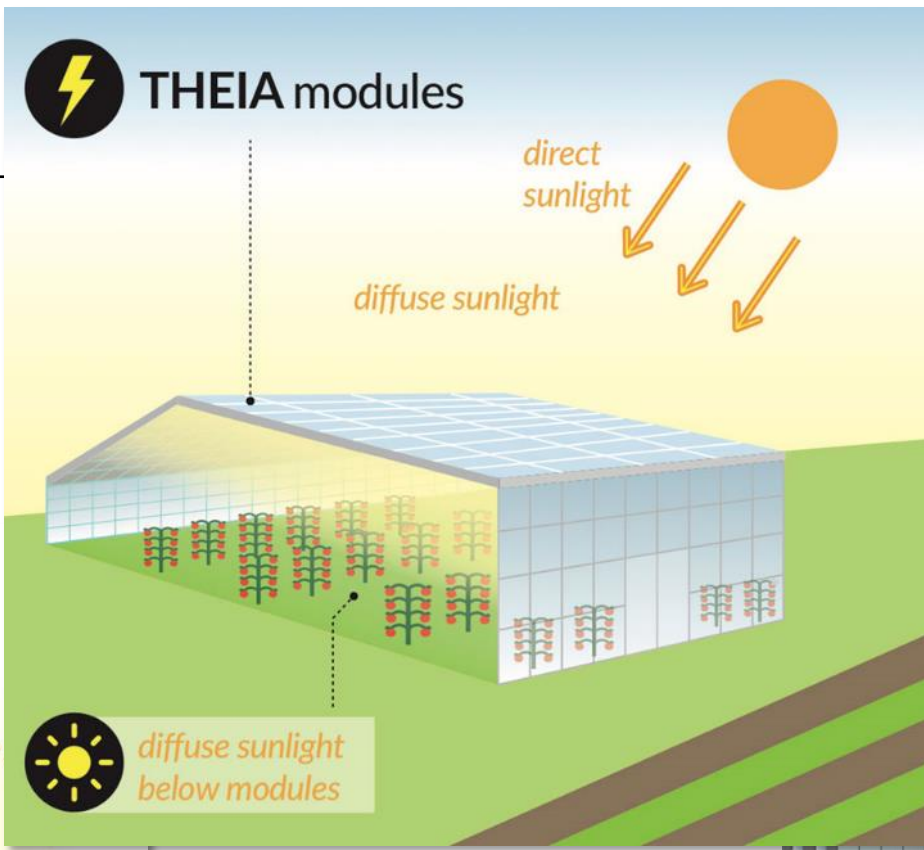
Lessons learned

- Small consortia can be very effective and more flexible to cope with unforeseen events in contrast to big EU consortia
- Restrict the number of topics in your project

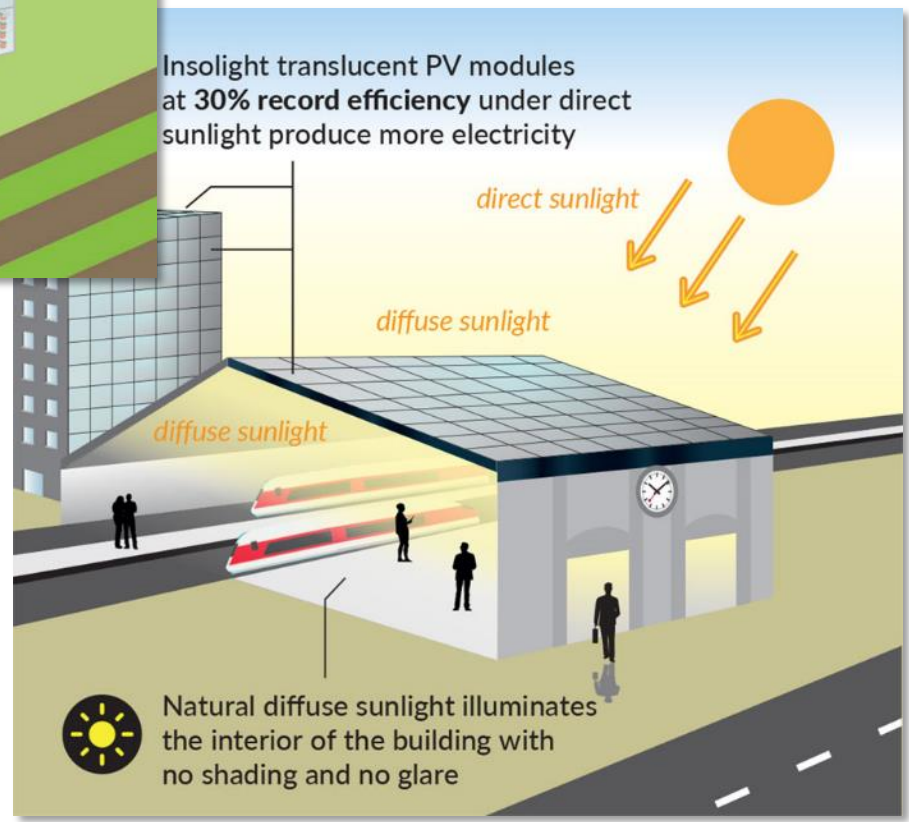
ENMESH:

ENabling Micro-ConcEntrator PhotovoltaicS with Novel Interconnection MetHods

- Three partners:
 - Universidad Politécnica de Madrid, Spain, research partner and coordinator
 - Dycotec Materials, UK, industrial partner
 - Insolight SA, Switzerland, industrial partner
- Project duration 01.02.2018 – 01.02.2020
- Total project costs € 801'799
- Requested funding budget € 513'979



Insolight translucent PV modules at 30% record efficiency under direct sunlight produce more electricity



Results, impact and lessons learned

- 29% module efficiency reached early 2019
 - 2019 follow up in HIPERION project under Horizon 2020 with 16 partners
 - Funding volume 10.6 Mio €
 - Series-A funding round with a volume of 5 Mio CHF in 2020
- interesting approach first funded by SOLAR-ERA.NET
- SOLAR-ERA.NET as first international instrument to work on new ideas
- first industrial production planned in 2021

1500-SiC:

Develop a new photovoltaic inverter with SiC for full power operation at 1500V

- Three partners:
 - Gamesa Electric S.A., Spain, industrial partner and coordinator
 - Infineon Technologies AG, Austria, industrial partner
 - ETH Zürich, Switzerland, research partner
- Project duration 01.03.2018 – 30.06.2020
- Total project costs € 1'592'439
- Requested funding budget € 712'267

SOLAR-ERA.NET open to changes within a project

- Due to further developments within the semi-conductor industry the consortium performed a comparative simulation in early 2020
 - Result was a change in the originally planned layout of the power module
 - Main focus of the project was on the development of the inverter module, which was achieved
- Therefore no problem, SOLAR-ERA.NET even supporting that decision and project officially completed
- Development of a new power block compatible to the developed inverter module now in a follow up project under H2020

To summarize and conclude

Overall Observations and Impact

- Networking and collaboration between countries and agencies across Europe – building trust and enabling coordination
- Good practice for supporting projects on transnational level
- Sizable project portfolio (87 projects, 111 MEUR project volume)
- Common initiatives and implementation activities
- New industry-led innovation opportunities and partnerships
- More transnational cooperation bottom-up / «cut to measure»
- Flexibility in dealing with project requirements and changes, including Covid-19

Conclusions and Outlook

- PV in pole position to become a backbone of the future clean energy system
- European collaboration in PV RTD and implementation must and will go on
- Ongoing collaboration in the different dimensions is needed
 - from research to industry to implementation and end-users
 - from national to international (transnational and EU)
- New bold initiatives are needed
- New partnerships are developed under Horizon Europe:
European Partnership for Clean Energy Transition
- Build on the wide experience and good practice gained over the past decade
- Keep the momentum, improve on efficiency and accelerate the efforts

A large crowd of people is running a marathon on a green field. The runners are wearing various colored athletic gear, and the scene is captured from an elevated perspective. The background shows a large crowd of spectators and a building in the distance.

PV – the race goes on!

Thank you for your attention

www.solar-era.net

Partners



Netherlands Enterprise Agency



Ministry of Energy
www.energy.gov.il

