

SOLAR-ERA.NET
ERA-NET ON SOLAR ELECTRICITY FOR THE IMPLEMENTATION
OF THE SOLAR EUROPE INDUSTRY INITIATIVE

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ABSTRACT: SOLAR-ERA.NET is a network that brings together more than 20 RTD and innovation programmes in the field of solar electricity technologies in the European Research Area. The network of national and regional funding organisations has been established in order to increase transnational cooperation between RTD and innovation programmes and to contribute to achieving the objectives of the Solar Europe Industry Initiative (SEII) through dedicated transnational activities (especially transnational calls). SOLAR-ERA.NET was an EU funded FP7 project running from 2012 to 2016. Through the support of the funding organisations, some 60 MEUR will have been mobilised for transnational RTD and innovation projects through four joint calls carried out. Results are presented for the transnational SOLAR-ERA.NET calls in this paper. Within the H2020 Cofund ERA-NET scheme, the network continues to work as SOLAR-ERA.NET Cofund.

Keywords: R&D and Demonstration Programmes, Photovoltaic, Funding and Incentives, Strategy

1 INTRODUCTION AND CONTEXT

SOLAR-ERA.NET is a European network of national and regional funding organisations and RTD and innovation programmes in the field of solar electricity generation, i.e. photovoltaics (PV) and solar thermal electricity (STE) and concentrating solar power (CSP). SOLAR-ERA.NET shall contribute to reaching the objectives of the former Solar Europe Industry Initiative (SEII), replaced by the European Technology &

Innovation Platforms (ETIPs) in 2015, by carrying out the coordination and support actions between national and regional R&I programmes.

The SEII was a joint initiative of the industry sector, EC and member states and was embedded in the European Strategic Energy Technology Plan (SET-Plan) which aims to increase, coordinate and focus EU support on key low-carbon energy technologies in order to achieve Europe's 2020 and 2030 energy and climate objectives in the future.

2 NETWORK AND MISSION

2.1 Network

As the largest ERA-NET (network in the European Research Area) ever in the solar power field, SOLAR-ERA.NET involves more than 20 national and regional RTD and innovation programmes dealing with PV and CSP. This high level of involvement of most relevant stakeholders provides excellent outreach and allows for a solid coordination needed for an efficient and coherent approach in the highly diverse and versatile RTD landscape.

The network is composed of 19 organisations being programme owners and / or programme managers (see list of authors). Countries and regions participating in the SOLAR-ERA.NET consortium and / or in the transnational calls are identified in Figure 1. SOLAR-ERA.NET is in principle open to other countries and programmes wishing to join in transnational calls.

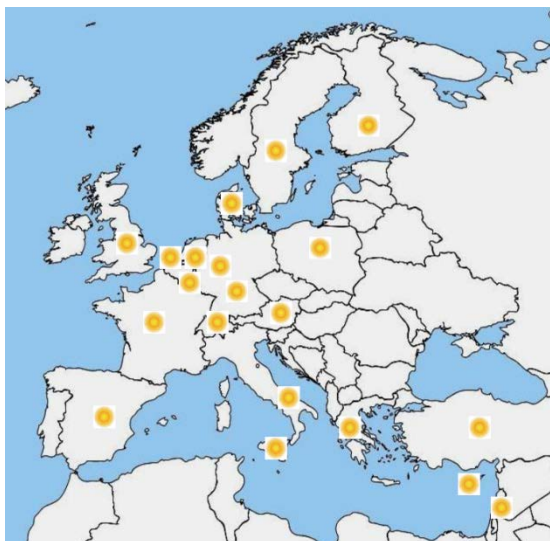


Figure 1: Countries and regions involved in the SOLAR-ERA.NET consortium and / or in the transnational calls

2.2 Missions and goals

SOLAR-ERA.NET has two fundamental missions. As a network supported by the EC within the ERA-NET scheme, the mission is to improve the coordination and cooperation between national and regional RTD programmes. In the context of the Strategic Energy Technology (SET-) Plan, the mission of the network is to implement central parts of the SET plan on a transnational level and thus contribute to achieving the goals defined in the SET plan.

The more specific and essential goals and activities of SOLAR-ERA.NET are i) to launch joint calls for RTD proposals by national and regional RTD and innovation programmes and ii) to define and support the best joint activities, strategic information exchange and use of implementation tools.

By identifying and choosing priority topics based on the Implementation Plans for PV respectively CSP for transnational calls, the SOLAR-ERA.NET network

selects and funds industrially relevant transnational RTD and innovation projects in the field of solar electricity technologies.

In quantitative, financial terms, SOLAR-ERA.NET shall result in a total funding volume by the participating national and regional programmes of up to 50 MEUR for innovative projects.

3 ACTIVITIES, FACTS AND FIGURES

3.1 Set up of transnational calls

The network started in November 2012. Four sets of transnational joint calls have been launched so far in March 2013, January 2014, December 2014 and December 2015 with the participation of up to 18 countries covering up to 8 PV and 4 CSP topics per call.

Call topics in photovoltaics (PV) and concentrating solar power (CSP) are commonly defined by the SOLAR-ERA.NET consortium and adopted by the participating programmes and countries according to their national / regional priorities. The topics can be found in Table 1.

The transnational call is based on a 2-step/stage-procedure with i) a preproposal and ii) a full proposal stage. Preproposals are checked according to the national / regional regulations and then discussed in the SOLAR-ERA.NET consortium setting up lists of preproposals recommended respectively not recommended for stepping on to the full proposal phase.

Once the full proposals are evaluated by independent international experts as well as by national experts, a list of projects suggested for funding is established. The ultimate funding decisions are however taken by the national agencies / ministries.

The transnational SOLAR-ERA.NET joint calls are each allocated with a total public funding budget of approximately 12 million euros provided by the participating national and regional programmes and agencies. The joint call consortium is mainly composed of SOLAR-ERA.NET partners but can be extended by associate partners (like Denmark and Israel). Applicants may also come from other countries (like Ireland and Norway) but they do have to provide their own funding for their participation in the projects.

3.2 Participation in transnational calls

The four transnational SOLAR-ERA.NET calls found good interest in the solar power industry sector and research community. Some 180 preproposals were submitted with a total budget of 230 MEUR (of which 144 MEUR funding requested) involving 774 partners respectively contributions from 18 countries.

A slight majority (54%) of the organisations involved in the preproposals submitted belong to the categories of small and medium sized enterprises and large enterprises; research organizations have a share of 43%. Figure 2 shows the share of different types of organizations among the partners being involved in the preproposals submitted.



Figure 2: Share of different types of organisations involved in preproposals

83 full proposals were submitted in the four joint calls. Figure 3 shows the number of coordinators and partners in the full proposals submitted by call as well as by country / region.

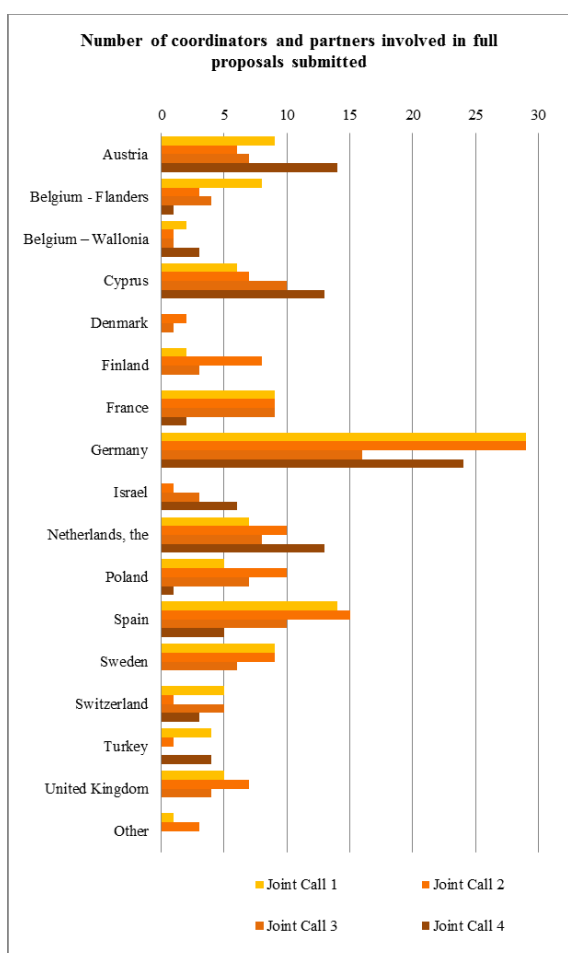


Figure 3: Number of coordinators and partners in full proposals submitted according to the countries / regions participating in the four transnational SOLAR-ERA.NET calls

4 RESULTS AND OUTLOOK

4.1 Selected results

The transnational SOLAR-ERA.NET calls found good interest and participation of the sector:

- 180 preproposals submitted with total project costs of 230 MEUR and funding requested of 160 MEUR
- 774 partners / contributions involved in preproposals
- 18 countries and regions participating in the joint call consortium
- 83 full proposals submitted
- 38 projects funded (8 projects still in negotiation phase)
- Funding committed so far (38 projects): approx. 32 MEUR public funding for a total project volume of around 49 MEUR

Table 1 shows the number of full proposals suggested for funding per call topic. Some topics have been added in the second and third call.

Table 1: Four transnational SOLAR-ERA.NET calls - topics and numbers of full proposals suggested for funding (number of full proposals per call and topic as well as total sum)

Transnational SOLAR-ERA.NET topics in calls I, II, III, IV and all four together	I	II	III	IV	Σ
PV1 Innovative processes for inorganic thin-film cells & modules	2	2	1	2	7
PV2 Dedicated modules for BIPV design and manufacturing	3	2	1	0	6
PV3 Grid integration and large-scale deployment of PV	2	1	1	3	7
PV4 High-efficiency PV modules based on next generation c-Si solar cells	1	5	3	2	11
PV5 Solar glass and encapsulation materials	1	2	0	1	4
PV6 Concentrator PV technology		0	2	0	2
PV7 Si feedstock, crystallization and wafering		1	0	0	1
PV8 Organic solar cells and other emerging concepts			2	0	2
CSP1-4 All four CSP topics together	1	2	1	2	6
Total	10	15	11	10	46

The 38 projects (33 PV projects, 5 CSP projects) funded are:

- SLAGSTOCK: Low-cost Sustainable Thermal Energy Storage Systems Made of Recycled Steel Industry Waste

- LIMES: Light Innovative Materials for Enhanced Solar Efficiency
- INTESEM: Intelligent Solar Energy Management Pipeline from Cell to Grid
- NOVACOST: Non vacuum based strategies for cost efficient low weight chalcogenide photovoltaics
- NovaZolar: All-non-vacuum processed ZnO-based buffer and window layers for CIGS solar cell technology
- InnoModu: Leadfree modules with low silver content and innovative busless cell grid
- AER II: Industrialization and System Integration of the Aesthetic Energy Roof Concept
- PV4FACADES: Photovoltaics for high-performance building-integrated electricity production using high-efficiency back-contact silicon modules
- BLACK: Black silicon and defect engineering for highly efficient solar cells and modules
- PV2GRID: A next generation grid side converter with advanced control and power quality capabilities
- THESEUS: Tandem High Efficiency Solar Cells Utilizing III-V Semiconductors on Silicon
- APPI: Atmospheric Pressure Processing for Industrial Solar Cells
- SNOOPI: Smart Network Control with Coordinated PV Infeed
- SPRINTCELL: Sulfide-based Ink for Printable Earth Abundant Solar Cell
- IPERMON: Innovative Performance Monitoring System for Improved Reliability and Optimized Levelized Cost of Electricity
- ACCESSCGIS: Atmospheric Cost Competitive Elemental Sulfo Selenization for CIGS
- PV me: organic PhotoVoltaic systems integrated in manufactured building elements
- U-light: Ultra lightweight PV modules and their applications in innovative PV systems achieving lowest levelized cost of electricity (LCOE)
- inGRID: High efficiency PV modules with cells interconnected by a novel conducting encapsulation layer
- MONOSCRIBE: Roll-to-Roll Monolithic Interconnection of Customizable Thin-film Solar Modules
- HighCast: High Performance Silicon Casting and Wafering
- EDITOR: Evaluation of the Dispatchability of a Parabolic Trough Collector System with Concrete Storage
- FunGlass: Multi-Functional Glass for PV Application
- SITEF: Silicone Fluid Test Facility
- PROOF: Competitive Industrialized Photovoltaic Roofing
- SolFieOpt: Optimal Heliostat Fields for Solar Tower Power Plants
- SPRINTCELL: Sulfide-based Ink for Printable Earth-Abundant Solar Cell
- DINAMIC: Dilute Nitride Based Concentrator Multijunction Solar Cells, With Efficiencies Over 47%
- IPERMON: Innovative Performance Monitoring System for Improved Reliability and Optimized Levelized Cost of Electricity
- HVolt-PV: High voltage IBC photovoltaic i-Cells and modules

- CNT-PV: Carbon nanotube hole-transporting and collecting layers for semi-transparent, flexible and low-cost solid-state photovoltaic cells
- HIPPO: High-efficiency poly-Si passivated contact solar cells and modules
- Liquid Si 2.0: Polysilane materials for liquid phase deposition of functional silicon layers for cost-effective high efficiency solar cells
- FrontCIGS: Re-designing front window in flexible CIGS modules for cost-effective moisture protection
- SIMON: Silicone Fluid Maintenance and Operation
- DURACIS: Advanced global encapsulation solutions for long term stability in industrial flexible Cu(In,Ga)Se₂ photovoltaic technology
- Enhance: Enhanced rooftop PV integration through kinetic storage and wide area monitoring
- PEARL TF-PV: Performance and Electroluminescence Analysis on Reliability and Lifetime of Thin-Film Photovoltaics

4.2 Outlook

SOLAR-ERA.NET will likely result in some 46 projects with a total project volume of around 60 MEUR of which around 40 MEUR comes from public funding. This means that the EC funding for SOLAR-ERA.NET (1,2 MEUR) will be multiplied by a factor of around 50 resp. 30.

The successful projects demonstrate i) potential commercial impact / relevance to industrial and market needs / contribution to the Solar Europe Industry Initiative and added transnational value, ii) scientific and technological excellence and iii) high quality and efficiency of the implementation and the management. Further information on running projects from the transnational joint calls can be found on the solar-era.net website.

Within the Horizon 2020 Cofund ERA-NET, the network continues its activities and launched another joint call - allocated with a funding budget of 20 MEUR - in December 2016. The SOLAR-ERA.NET Cofund call addresses 4 topics, i.e. innovative and low-cost PV manufacturing, advanced PV products and applications, PV system integration and CSP cost reduction and system integration, and support successful projects aiming at Technology Readiness Levels of 5 to 7. By the time of writing this text, full proposals are being evaluated and ranked by independent international experts.

News on the future SOLAR-ERA.NET Cofund, will be channelled through the solar-era.net and funding agencies involved.

REFERENCES

Further information is available on the project website www.solar-era.net.

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