SOLAR-ERA.NET COFUND

EUROPEAN NETWORK OF NATIONAL AND REGIONAL RESEARCH AND INNOVATION PROGRAMMES - RECENT DEVELOPMENTS OF JOINT TRANSNATIONAL CALLS

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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 Strategic Energy Technology Plan (SET-Plan) through dedicated transnational activities (especially transnational calls). Through the support of the funding organisations, some 60 MEUR have been mobilised for transnational RTD and innovation projects through the first four joint calls carried out. SOLAR-ERA.NET was an EU funded FP7 project running from 2012 to 2016. Within the H2020, the network continues to work in the ERA-NET Cofund scheme. In this contribution, results are presented for the transnational SOLAR-ERA.NET calls.

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) / concentrating solar power (CSP). SOLAR-ERA.NET contributing to reaching the objectives of the European Strategic Energy Technology Plan (SET-Plan), by carrying out the coordination and support actions between national and regional research and innovation programmes.

The SET-Plan 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 RTD landscape.

The network has been composed of some 20 organisations being programme owners and managers. Most countries and regions belonging to the SOLAR-ERA.NET consortium also participate in most calls.

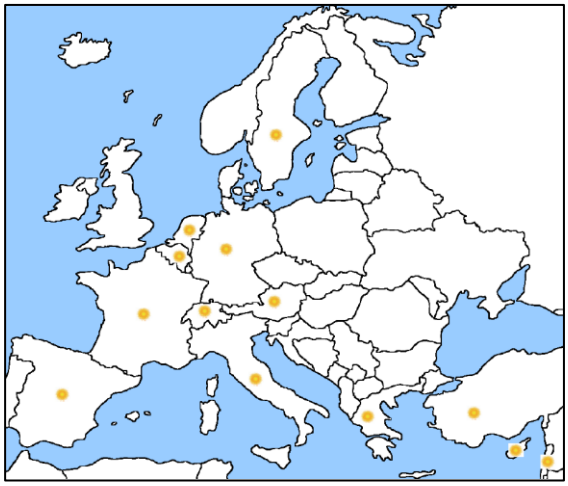

Figure 1: Countries and regions active in the ongoing SOLAR-ERA.NET Cofund 2 call.

2.2 Missions and goals

SOLAR-ERA.NET has two fundamental missions. As a network supported by the EC within the ERA-NET (2012-2016) respectively ERA-NET Cofund (since 2016) scheme, the mission is to improve the coordination and cooperation between national and regional programmes. In the context of the Strategic Energy Technology 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 10 to 15 MEUR per call for innovative projects.

3 ACTIVITIES, FACTS AND FIGURES

3.1 Set up of transnational calls

SOLAR-ERA.NET started in November 2012. Four sets of transnational joint calls were launched until 2016, with the participation of up to 17 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 first four transnational SOLAR-ERA.NET joint calls are each allocated with a total public funding budget of approximately 10 to 12 MEUR provided by the participating national and regional programmes and agencies.

Within the ERA-NET Cofund scheme, SOLAR-ERA.NET calls come along with an even higher funding budget. The ongoing Cofund Call gathers some 15 MEUR of public funding from national and regional agencies. Furthermore, the EC provides the so-called Top-Up presenting 33% of the total funding effectively used, i.e. the total funding budget for the ongoing Cofund Call amounts to some 22 MEUR. The selection procedure includes a ranking list which has to be strictly followed from top downwards.

Applicants may also come from other countries but they do have to provide their own funding for their participation in the projects.

3.2 Participation in transnational calls

Corroborated data is available for the first four transnational SOLAR-ERA.NET calls. They found good interest in the solar power industry sector and research community. Some 180 preproposals were submitted with a total budget of 227 MEUR (of which 155 MEUR funding requested) involving 804 partners (multiple counting – some partners have been involved in several preproposals).

A 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%. Looking at the 45 projects finally started, the share of small and medium sized enterprises and large enterprises climbs up to 57% (see Figure 2).

Among the 45 projects funded, 29 projects involve partners from Germany and 19 projects have partners from Spain. Figure 3 shows the number of projects by country / region as well as by call.

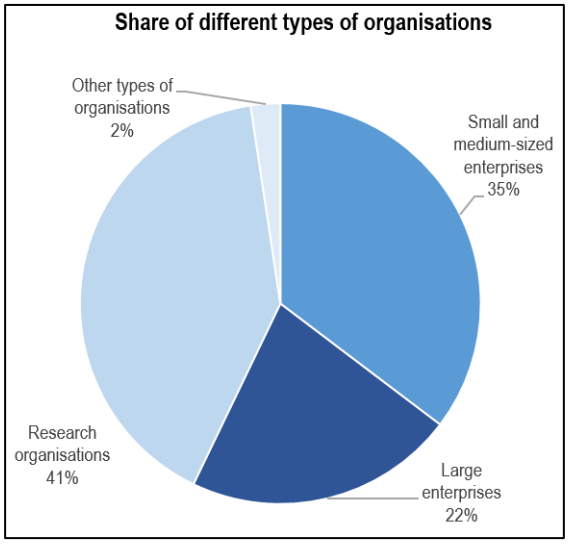

Figure 2: Share of different types of organisations involved in projects funded.

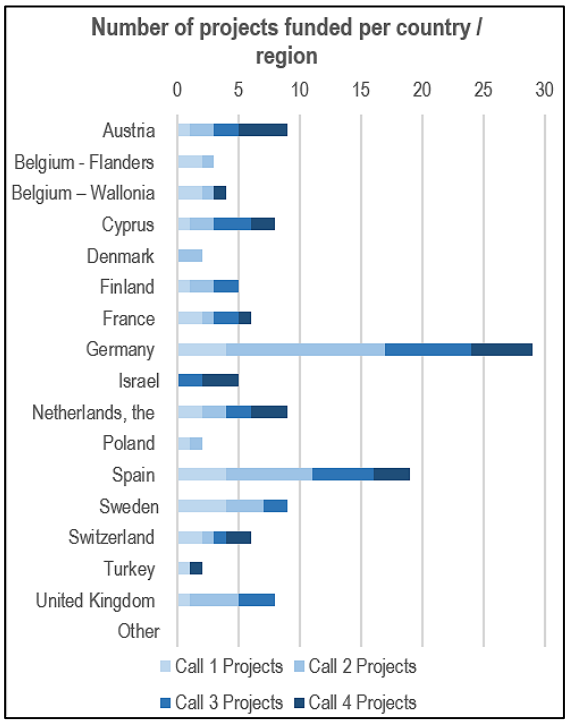

Figure 3: Number of projects by country / region as well as by call resulting from the first four SOLAR-ERA.NET calls.

The 45 projects funded have a total volume of 60 MEUR including 39 MEUR of public funding. The funding share per country / region is displayed in Figure 4.

The success rates of preproposals vary strongly between countries and regions, reaching from around 10% for projects with participants from Poland to 60% for projects with participants from Finland. Reasons are manifold. To quote a few: consulting for parties interested, availability of funds and quality and industrial relevance of proposals.

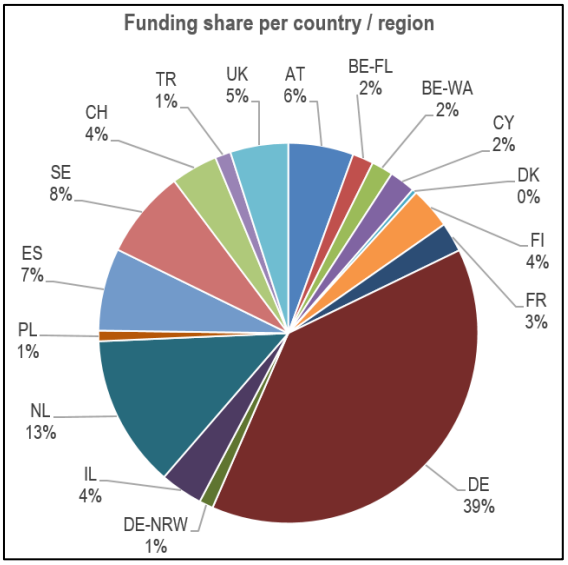

Figure 4: Funding share per country / region for the first four joint calls carried out by SOLAR-ERA.NET.

Figure 5 shows the different success rates (preproposals being finally funded as projects) by countries and regions.

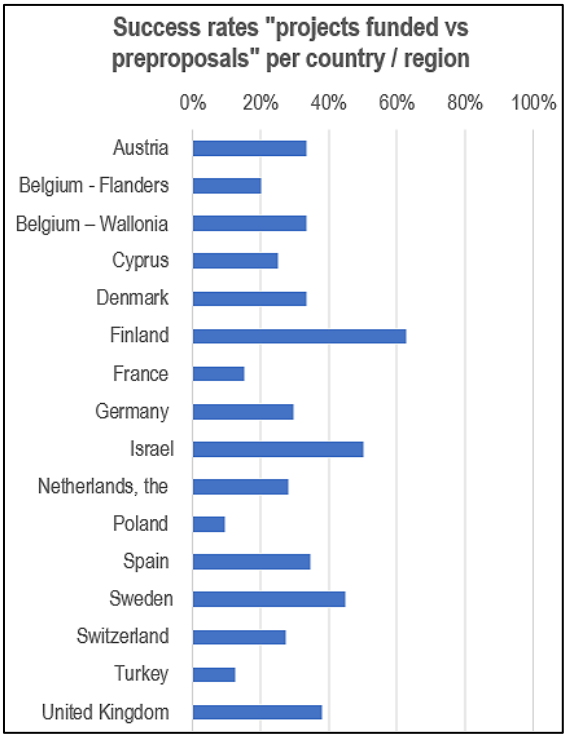

Figure 5: Success rates (i.e. preproposals being finally funded as projects) by countries and regions.

4 RESULTS AND OUTLOOK

4.1 Selected results

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

- 180 preproposals submitted with total project costs of 227 MEUR and funding requested of 155 MEUR
- 804 partners / contributions involved in preproposals (multiple counting)
- 17 countries and regions participating in the joint calls
- 83 full proposals submitted
- 45 projects funded
- Funding committed: approx. 39 MEUR public funding for a total project volume of around 60 MEUR

Table 1 shows the number of projects funded 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 projects funded (number of projects funded 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	∑
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	0	2	0	2
PV7 Si feedstock, crystallization and wafering	0	1	0	0	1
PV8 Organic solar cells and other emerging concepts	0	0	2	0	2
CSP1-4 All four CSP topics together	1	2	1	1	5
Total	*10*	*15*	*11*	*9*	*45*

The success rates of preproposals differ between call topics, reaching from around 13% for projects on PV concentrator technology to 50% for projects on Organic solar cells and other emerging concepts. Figure 6 shows the success rates (preproposals being finally funded as projects) by call topics.

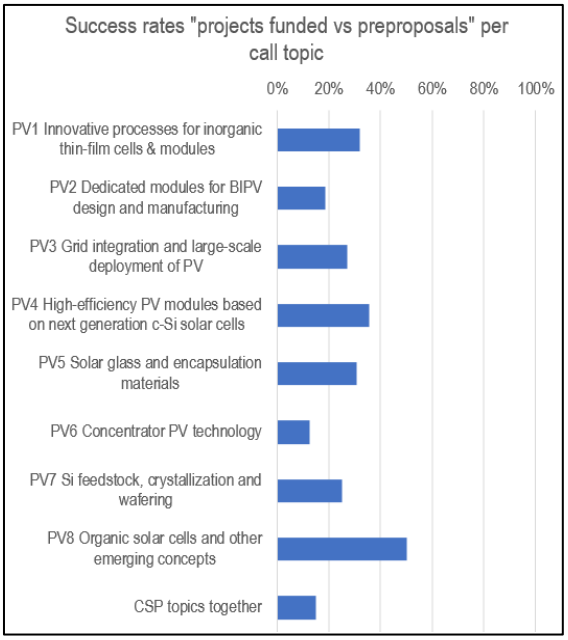

Figure 6: Success rates (preproposals being finally funded as projects) by call topics.

The 45 projects (40 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
- BLACK: Black Silicon and Defect Engineering for Highly Efficient Solar Cells and Module
- 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
- HyLighT: Design, Development and Application of a Technologically Advanced System of Natural Day-light and Artificial PV Lighting - Hybrid Light Tube
- InnoModu: Leadfree Modules with Low Silver Content and Innovative Busless Cell Grid
- AER II: Industrialization and System Integration of the Aesthetic Energy Roof Concept
- SNOOPI: Smart Network Control with Coordinated PV Infeed
- PV4FACADES: Photovoltaics for High-Performance Building-Integrated Electricity Production Using High-Efficiency Back-Contact Silicon Modules
- ACCESS-CIGS: Atmospheric Cost Competitive Elemental Sulpho-Selenisation for CIGS
- PV me: Organic PhotoVoltaic Systems Integrated in Manufactured Building Elements
- 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
- U-light: Ultra Lightweight PV Modules and their Applications in Innovative PV Systems Achieving Lowest Levelized Cost of Electricity (LCOE)

- HESiTSC: High Efficiency Silicon Based Tandem Solar Cell PV Module
- InGrid: High Efficiency PV Modules Based on Back-Contact Cells and Novel Interconnecting Grid
- 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
- APPI: Atmospheric Pressure Processing for Industrial Solar Cells
- FunGlass: FunGlass – Multi-Functional Glass for PV Application
- SITEF: Silicon Fluid Test Facility
- PROOF: Competitive Industrialized Photovoltaic Roofing
- SolFieOpt: Optimal Heliostat Fields for Solar Tower Power Plants
- BIPVpod: Building Integrated Photovoltaics Panels on Demand
- SPRINTCELL: Sulfide-Based Ink for Printable Earth-Abundant Solar Cell
- DINAMIC: Dilute Nitride Based Concentrator Multijunction Solar Cells, with Efficiencies over 47%
- ALCHEMI: A Low Cost, High Efficiency, Opto-electronic HCPV Module for 1000 Sun Operation
- IPERMON: Innovative Performance Monitoring System for Improved Reliability and Optimized Levelized Cost of Electricity
- HVolt-PV: High Voltage IBC Photovoltaic i-Cells and Modules
- Bifalo: Bifacial PV Modules for Lowest Levelized Cost of Energy
- CNT-PV: Carbon Nanotube Hole-Transporting and Collecting Layers for Semi-Transparent, Flexible and Low-Cost Solid-State Photovoltaic Cells
- HESTPV: High-Efficiency and Stable Tin-Based Perovskite Solar Cells
- HIPPO: High-Efficiency Poly-Si Passivated Contact Solar Cells and Modules
- INFORPV: Innovative Forecasting PV Energy Yield Solution for Sustainable Large Scale Deployment
- Liquid Si 2.0: 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
- Refined PV: Reduction of Losses by Ultra Fine Metallization and Interconnection of Photovoltaic Solar Cells
- ENHANCE: Enhanced Rooftop PV Integration through Kinetic Storage and Wide Area Monitoring
- HIPER: High-Efficiency Si Perovskite Tandem Solar Cells
- PEARL TF-PV: Performance and Electroluminescence Analysis on Reliability and Lifetime of Thin-Film Photovoltaics

SOLAR-ERA.NET not only allows for supporting innovative research projects on a transnational level but also provides added value in terms of networking and programming, namely:

- New industry-led innovation projects and partnerships in a strongly competitive environment
- Common initiatives and implementation activities
- Networking and collaboration between countries across Europe
- Overview on European research and insight into trends
- Best practice for supporting projects on the transnational level

4.2 Outlook

The successful projects demonstrate i) potential commercial impact / relevance to industrial and market needs / contribution to the Strategic Energy Technology Plan (SET-Plan) 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 ERA-NET Cofund scheme, the network continues its activities and launched the 5th joint call in December 2016. The SOLAR-ERA.NET Cofund call addressed 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. Projects shall aim at Technology Readiness Levels of 5 to 7.

Within this 5th call, SOLAR-ERA.NET is likely to fund another 15 projects with a total project volume of around 15 MEUR of which around 10,5 MEUR is from public funding. Most projects are about to be started by the time of writing this contribution and public information will be soon available.

The 6th call launched by SOLAR-ERA.NET (Cofund 2) comes along with a total funding budget of 22 MEUR (including the EU-Top-Up). The first stage ends on 2nd of October 2018 with the deadline for submission of preproposals. The topics are similar to the previous call, plus a topic dedicated to Emerging PV technologies. The range of Technology Readiness Levels (TRL) is extended, reaching from TRL 3 to 7. An additional call (7th Call) will be launched in spring 2019.

News on ongoing and future SOLAR-ERA.NET activities are 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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