

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

Stefan Nowak, NET Nowak Energy & Technology, Waldweg 8, 1717 St. Ursen, Switzerland,
T: +41 26 494 00 30, F: +41 26 494 00 34, stefan.nowak@netenergy.ch
Marcel Gutschner, NET Nowak Energy & Technology, marcel.gutschner@netenergy.ch
Stefan Oberholzer, Swiss Federal Office of Energy, stefan.oberholzer@bfe.admin.ch
Christoph Hünnekes, Forschungszentrum Jülich – PtJ, ch.huennekes@fz-juelich.de
Herman Bastek, Forschungszentrum Jülich – PtJ, h.bastek@fz-juelich.de
Martina Biedrawa, Forschungszentrum Jülich – PtJ, m.biedrawa@fz-juelich.de
Dorothea Winkler - Forschungszentrum Jülich – PtJ, d.winkler@fz-juelich.de
Melanie Schulte, Forschungszentrum Jülich – ETN, me.schulte@fz-juelich.de
Stefan Rabe, CEF-NRW, rabe@cef.nrw.de
Karin Wikman, TEKES Teknologian Ja Innovaatioiden Kehittaemiskeskus, Karin.Wikman@tekes.fi
Yvonnick Durand, Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME), yvonnick.durand@ademe.fr
Manon Gerbaud, Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME), manon.gerbaud@ademe.fr
José Herrero, Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT),
jose.herrero@ciemat.es
Juan Francisco Trigo Escalera, Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT),
juanfrancisco.trigo@ciemat.es
Severino Falcon Morales, MINECO, severino.falcon@mineco.es
Laurence Polain, Service Public de Wallonie (SPW), laurence.polain@spw.wallonie.be
Nicolas Delsaux, Service Public de Wallonie (SPW), nicolas.delsaux@spw.wallonie.be
Elsie De Clercq, Agentschap Innoveren & Ondernemen (VLAIO), elsie.declercq@vlaio.be
Anna Ostapczuk, Narodowe Centrum Badan i Rozwoju (NCBR), anna.ostapczuk@ncbr.gov.pl
Małgorzata Świdarska, Narodowe Centrum Badan i Rozwoju (NCBR), malgorzata.swiderska@ncbr.gov.pl
Kaan Karaöz, Türkiye Bilimsel ve Teknolojik Arastirma Kurumu (TUBITAK), kaan.karaoz@tubitak.gov.tr
Ismail Dogan, Türkiye Bilimsel ve Teknolojik Arastirma Kurumu (TUBITAK), ismail.dogan@tubitak.gov.tr
Otto Bernsen, Ministerie van Economische Zaken, Landbouw en Innovatie / RVO, otto.bernsen@rvo.nl
Bouke Bussemaker, Ministerie van Economische Zaken, Landbouw en Innovatie, B.H.Bussemaker@minez.nl
Stathis Tselepis, Kentro Ananeosimon Pigon ke Exikonomisis Energeias (CRES), stselep@cres.gr
Christian Inglis, Innovate UK, Christian.Inglis@innovateuk.gov.uk
Graham Mobbs, Innovate UK, graham.mobbs@innovate.gov.uk
Leonidas Antoniou, Research Promotion Foundation (RPF), lanto@research.org.cy
Demetra Petsa, Research Promotion Foundation (RPF), dpetsa@research.org.cy
Adriana Agrimi, Regione Puglia, a.agrimi@regione.puglia.it
Dario Tornabene, Regione Sicilia, dario.tornabene@regione.sicilia.it
Fabio Montagnino, Regione Sicilia, fmontagnino@consorzioarca.it
Theodor Zillner, Bundesministerium für Verkehr, Innovation und Technologie (BMVIT), theodor.zillner@bmvit.gv.at
Ulrike Rohrmeister, Bundesministerium für Verkehr, Innovation und Technologie (BMVIT),
Ulrike.Rohrmeister@bmvit.gv.at
Elvira Lutter, Klima- und Energiefonds, elvira.lutter@klimafonds.gv.at
Gernot Wörther, Klima- und Energiefonds, gernot.woerther@klimafonds.gv.at
Pierre-Jean Rigole, Swedish Energy Agency, Pierre-Jean.Rigole@energimyndigheten.se
Tobias Walla, Swedish Energy Agency, tobias.walla@energimyndigheten.se

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 is an EU funded FP7 project running from 2012 to 2016. Through the support of the funding organisations, some 70 MEUR will have been mobilised for transnational RTD and innovation projects through four joint calls carried out. Intermediary results are presented for the transnational calls in this paper.

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 concentrating solar power (CSP) / solar thermal electricity (STE).

SOLAR-ERA.NET shall contribute to reaching the objectives of the former Solar Europe Industry Initiative (SEII), recently replaced by the European Technology & Innovation Platforms (ETIP) for PV and STE, by carrying out the coordination and support actions for the implementation of the SEII between national and regional RTD and innovation programmes.

The SEII was a joint initiative of the industry sector, EC and member states and is 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 energy 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 Solar Europe Industry Initiative (SEII), the mission of the network is to implement central parts of the SEII on a transnational level and thus contribute to achieving the goals defined in the SEII.

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 SEII priority topics based on the Implementation Plans for PV respectively CSP for transnational calls, the SOLAR-ERA.NET network shall select and fund 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 approximately 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 17 countries covering up to 8 PV and 4 CSP topics.

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 involving more than 800 partners respectively contributions from 18 countries. The fourth joint call is currently in the second stage, i.e. the phase from preproposals to full proposals.

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.

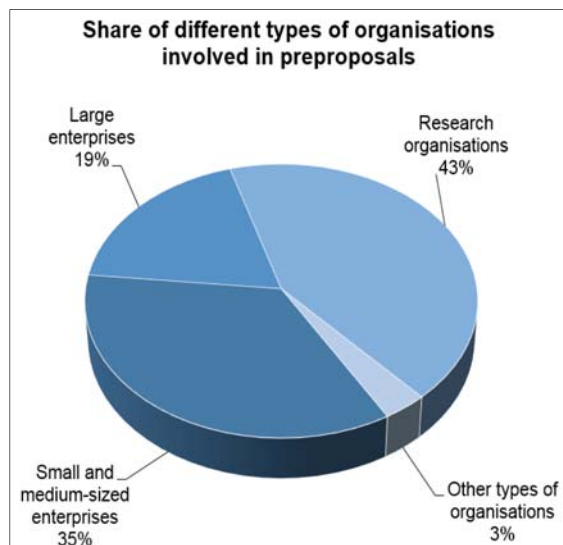


Figure 2: Share of different types of organisations involved in preproposals

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

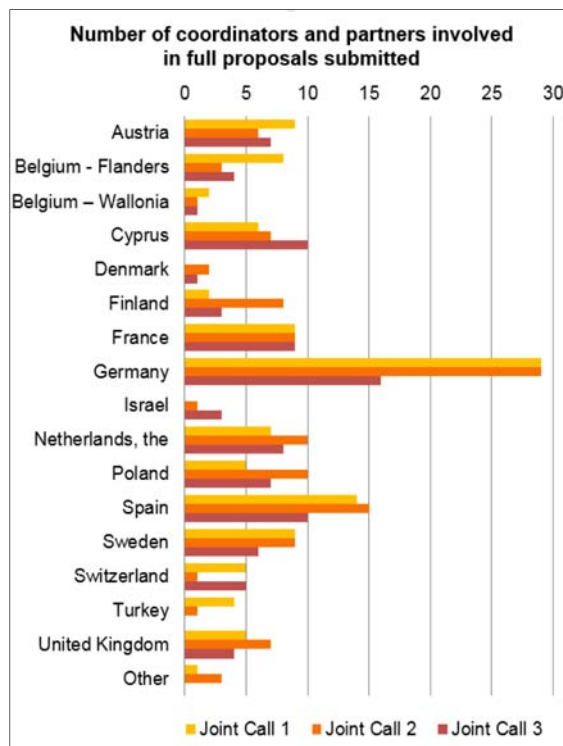


Figure 3: Number of coordinators and partners in full proposals submitted according to the countries / regions participating in the three transnational SOLAR-ERA.NET calls

Out of the 66 full proposals submitted, 57 were for PV topics and 9 for CSP topics. Table 1 shows the number of full proposals submitted per call topic. Some topics have been added in the second and third call.

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

Transnational SOLAR-ERA.NET topics in calls 1, 2, 3 and all three together	1	2	3	Σ
PV1 Innovative processes for inorganic thin-film cells & modules	3	4	2	9
PV2 Dedicated modules for BIPV design and manufacturing	6	3	1	10
PV3 Grid integration and large-scale deployment of PV	3	2	4	9
PV4 High-efficiency PV modules based on next generation c-Si solar cells	3	5	4	12
PV5 Solar glass and encapsulation materials	2	3	1	6
PV6 Concentrator PV technology	-	3	3	6
PV7 Si feedstock, crystallization and wafering	-	2	1	3
PV8 Organic solar cells and other emerging concepts	-	-	2	2
CSP1 Cost reduction and efficiency increase in components	2	0	1	3
CSP2 Dispatchability through storage and hybridisation	2	1	1	4
CSP3 New fluids for CSP plants	0	1	1	2
CSP4 Innovative thermodynamic cycles	-	0	0	0
<i>Total</i>	<i>21</i>	<i>24</i>	<i>21</i>	<i>66</i>

4 PRELIMINARY AND EXPECTED RESULTS

4.1 Preliminary results

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

- 180 preproposals submitted with total project costs of 230 MEUR and funding requested of 160 MEUR
- 803 partners / contributions involved in preproposals
- 17 countries and regions participating in the joint call consortium
- 66 full proposals submitted (after three joint calls)
- 25 projects running (mainly out of first and second joint call)
- Funding committed so far for the 25 projects running: approximately 24 MEUR public funding for an approximate total project volume of 35 MEUR

Although some delays and insolvency issues occurred, SOLAR-ERA.NET is rather on track, dedicating about 10 to 12 MEUR of funding per set of transnational joint calls on innovative PV and CSP projects.

The 25 projects (22 projects with PV and 3 projects with STE) running 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

4.2 Outlook

SOLAR-ERA.NET will likely result in some 40 RDI projects with up to 50 MEUR of public funding.

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.

Having successfully submitted a proposal in the ERA-NET Cofund scheme, SOLAR-ERA.NET will launch another joint call by end of 2016. Allocated with a funding budget of 20 MEUR, the SOLAR-ERA.NET Cofund call will address 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

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.

ACKNOWLEDGEMENTS

The support of the SOLAR-ERA.NET joint activities by the EC under grant agreement N° 321571 within the 7th Framework Programme is gratefully acknowledged.