



CST4ALL

Support to the Activities of the Concentrated Solar Thermal Technology Area of the SET Plan



CST4ALL Newsletter: No. 4, September 2025

On-going* CST4ALL Activities at SolarPACES 2025

Sept. 23-26, 2025
Almeria, Spain

*The SolarPACES 2025 Conference was on-going when this newsletter was published.

Side event: EU CST Projects & Research Agenda

Thur., 25 Sept. 2025, 8.30-10.30 (CET)

This event focuses on EU-funded research in Concentrated Solar Thermal (CST) and how ongoing projects contribute to fulfilling the CST Implementation Plan of the SET-Plan. The workshop will feature seven EU-supported CST projects, which will present their objectives, main results, and perspectives on future developments. It will conclude with a round-table discussion on EU funding and future research requirements to meet the goals of the CST Implementation Plan with the participation of EU Project Officers, the CST IWG Chair and other important contacts for R&I funding in Europe.

For online participation, you can register [here](#).



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101075408. Views and opinions expressed are those of the authors only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them. Copyright © 2025 CST4ALL Project. All rights reserved.

Oral Presentation in Session: CSP Integration, Markets, and Policy & Commercial Projects 2

Fri., 26 Sept. 2025, 10:45-12:45 CEST

The oral presentation *CST4ALL: Insights for Hybridization Frontiers of CST* will present the results of CST4ALL's 9 workshops that attracted over 1,200 participants to identify CST integration opportunities and priorities, supporting EU initiatives including the Green Deal and Clean Energy Transition Partnership; incorporation of social science research on technology adoption, public acceptance, and gender inclusion in the CST sector; and demonstrating how CST hybridization with other renewables can reduce costs, improve technology acceptance, and enhance project viability for future renewable energy installations.

Closing Words from the Coordinator

Peter Heller, DLR

We are pleased to share that the Horizon Europe project CST4ALL is on-track to be successfully completed next week (30 Sept. 2025), thanks to the strong collaboration of CIEMAT, ESTELA, ENEA, GUNAM and DLR. Together with the CST

Implementation Working Group, the SET-Plan Steering Group and the European Commission, we have advanced the role of Concentrated Solar Thermal (CST) technologies within Europe's energy transition. The dedication of all partners has ensured that the project delivered beyond its initial objectives.

A central part of our work was the organization of nine online workshops, which created a valuable platform for dialogue between industry and the research community. Five of these events focused on industry-related topics, in particular the hybridization of CST with other renewable energy technologies. The other four workshops addressed cross-cutting research challenges, such as materials development, meteorology and integration issues. Beyond the technical dimension, we also examined social sciences, humanities and gender aspects, ensuring that policy frameworks such as the European Green Deal and the Net-Zero Industry Act are supported with evidence from both the technological and societal perspective.

The project has underlined several strengths of CST hybridization. All the technologies assessed—CST, photovoltaics, biomass, heat pumps, geothermal and energy storage—are already commercially deployed and benefit from manufacturing capacities within the European Union. When combined, these technologies offer dispatchable electricity, industrial process heat, district heating and cooling, as well as hydrogen and other renewable fuels. Hybrid plants have the potential to bring efficiency gains, require less land, reduce infrastructure costs, and in the case of CST, provide high recyclability and a lower dependence on critical raw materials. Importantly, CST can also support local job creation and regional industrial development.

Nonetheless, challenges remain to be addressed. Hybrid systems still face relatively high initial costs and greater complexity compared with stand-alone projects. Some hybrid configurations are at a low technology readiness level, and the lack of large-scale demonstration projects contributes to investor caution. Awareness of CST technology is still limited among developers, financiers and industrial users. Furthermore, regulatory frameworks and dedicated funding for hybrid projects are fragmented, while regional resource constraints and skills gaps in multi-technology

integration persist. Tackling these issues will be crucial to realizing the full potential of CST hybrid systems in Europe's sustainable energy future.

CST4ALL 2025 Final Event In Person Closing Meeting

Belgium, Brussels
September 9, 2025



In-person attendees including CST4ALL project officer, Charles-Andre Lemarie.

The CST4ALL project held its project closing event on September 9th, 2025, showcasing its project outputs to different policy officers of the EU, the CST IWG chair and also SHE (Solar Heat Europe), along with representation from project partners DLR (DE), ESTELA (BE), ENEA (IT), CIEMAT (ES) and GUNAM (TR).

Marina Montero Carrero, Policy Officer, addressed the future of CST within the Horizon Europe (2021-2027) agenda, Clean Industrial Deal implications to support the Affordable Energy Action Plan and the new efforts towards the Electrification Action Plan in support of CST Technologies.

As an important pillar in engaging research and industry entities in support of concentrated and non-concentrated solar thermal activities across Europe, Cristina Trueba, the Concentrated Solar Thermal Technologies Implementation Working Group (CST IWG) Chair, highlighted the current outputs and the new structuring of the CST IWG group. The CST4ALL project has worked closely with the CST IWG group in support of better alignment of hybridization opportunities for CST and also supported working group activities with representation of expertise from the consortium.

CST4ALL project partner Ricardo Sanchez Moreno from CIEMAT presented the progress on

the CST Implementation Plan (IP), highlighting the significant progress made toward CST IP targets especially in cost reduction, efficiency improvements, production of solar fuels, and for industrial heat applications. National and EU funding support was quantified with Germany, Spain and Italy having the greatest number of projects and also receiving the most funding portraying institutional and country commitments to enhance CST technology.

CST4ALL project partner Konstantinos Genikomsakis from ESTELA showcased the industry workshop outputs for PV, Biomass, Heat Pumps, Geothermal and Energy Storage. The presentation drew attention to the SWOT (Strengths-Weaknesses-Opportunities-Threats), as well as the core technology needs and R&I focus for each renewable energy pairing and key investment opportunities for sustained technology development.



Round Table Discussion chaired by Simona De Iuliis (ENEA).

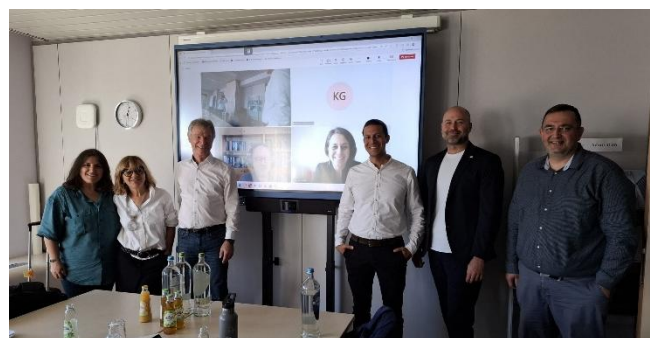
CST4ALL project partner Hande Eryilmaz from GUNAM delivered the results from the work on the Social Science and Humanities (SSH) aspects of the CST ecosystem and CST's hybridization potential through the lens of cross-sectoral collaboration, technology adoption, social acceptance, just transition, energy poverty and gender aspects. The presentation reflected the alignment with core EU documents and ended with suggestions for short-medium-long term implications under social, economic and policy aspects for CST technology.

The afternoon session was enriched with a roundtable discussion focused on the needs for EU cross-technology cooperation. The event concluded with closing remarks by project coordinator Peter Heller, representing DLR.

CST4ALL 2025 Final General Assembly Meeting

September 10, 2025, Belgium, Brussels

The final CST4ALL General Assembly Meeting was hosted by the coordinator DLR at their offices located in Brussels, Belgium. All project partners had the participation of at least one person on-site with other colleagues joining online. This was an important meeting since it summarized all project results and discussion was held about the next steps towards dissemination and exploitation of the results. Each work package leader presented the work done and the project progress in regard to the deliverables and milestones. Key results from the final project event were discussed and how these findings can be used to leverage the work being done by the partners. Specific tasks were identified to enable the successful completion of the project on September 30, 2025, as well as final reporting commitments.



Participants to Project Closing Meeting (Left to right: Hande Eryilmaz, Simona de Iuliis, Peter Heller, Derek Baker (online), Yelda Erden Topal (online), Daniel Benitez, Luca Turchetti, Konstantinos Genikomsakis).

Completed Online Workshops

Industry Workshop on the Hybridisation of CST with Geothermal

March 10, 2025

CST4ALL hosted its "Industry Workshop on the hybridisation of Concentrated Solar Thermal Technologies (CST) with geothermal" as an online event on 10 March 2025, bringing together 100 stakeholders from across 20 countries. Organised by ESTELA with contributions from all project

partners and with the support of the European Technology & Innovation Platform on Geothermal (ETIP-Geothermal), the workshop explored the industrial potential of combining CST and geothermal technologies.

Elisabeth Schellmann (European Commission) provided an overview of the EU's energy policy priorities, highlighting the Clean Industrial Deal and Affordable Energy Action Plan as key initiatives at balancing decarbonisation with industrial competitiveness and reducing energy costs.



Diego Caro Pegalajar (ACCIONA Industrial) presenting design and operational challenges of CSP plants and hybridisation with geothermal.

Keynote presentations highlighted technical opportunities and challenges of hybrid CST-geothermal systems. Diego Caro Pegalajar (ACCIONA Industrial) presented challenges in the design and operation of CSP plants and provided insights on hybridisation with geothermal technologies, while Dr. Konstantinos Genikomsakis (ESTELA) discussed on behalf of Dario Bonciani (Consortium for the Development of Geothermal Areas), the technological advantages of hybrid CST-geothermal systems for power production compared to standalone systems, along with the challenges that need to be addressed. Dr. Ahmet Lokurlu (Solitem Group GmbH) showcased various CST applications, including a small-scale hybrid CST-geothermal system in Germany.

Dr. Rosie Christodoulaki (Centre for Renewable Energy Sources and Saving) moderated the roundtable discussion featuring a diverse panel of experts from both sectors. The panel addressed a range of topics, including technological readiness, project financing, application viability, skills and workforce development, policy frameworks,

research and innovation, market potential and collaboration between the two sectors.



Roundtable discussion on CST-geothermal hybridization.

A key takeaway from the workshop was the strong consensus on the potential of hybrid CST-geothermal systems to enhance energy security, grid stability, and decarbonisation beyond electricity, particularly in industrial process heat and district heating and cooling. However, location-specific viability studies, pilot demonstrations, supportive policies, cross-sector collaboration, and strategies tailored to industrial needs and regional conditions are key to advancing these hybrid systems.

The event agenda is available [here](#). More information about the event can be found in the [press release](#).

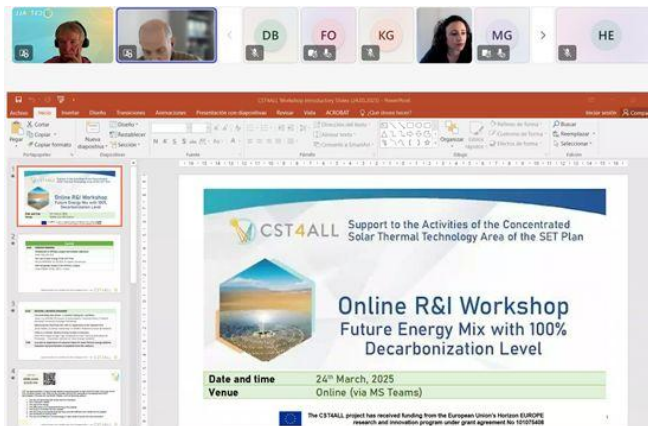
R&I Workshop on Future Energy Mix with 100% decarbonisation level

24 March 2025

On 24th March 2025, CIEMAT hosted a successful online R&I workshop on Future Energy Mix with 100% decarbonisation level. More than 150 unique participants within two sessions addressed the main challenges and opportunities to the most relevant renewable technologies to achieve the full decarbonisation target, with special focus on the role and potential of CST to contribute to 100% decarbonisation objective.

The workshop started with a welcome address by the CST4ALL coordinator Peter Heller (DLR) emphasizing the role of hybridisation opportunities for CST. The message relayed by Marina Montero (EC RTD unit) has emphasized the calls and supportive new EU documents to support solar thermal technologies. Dr. Hande Eryilmaz,

(ODTU-GUNAM) presented the undergoing SSH study under the CST4ALL project.



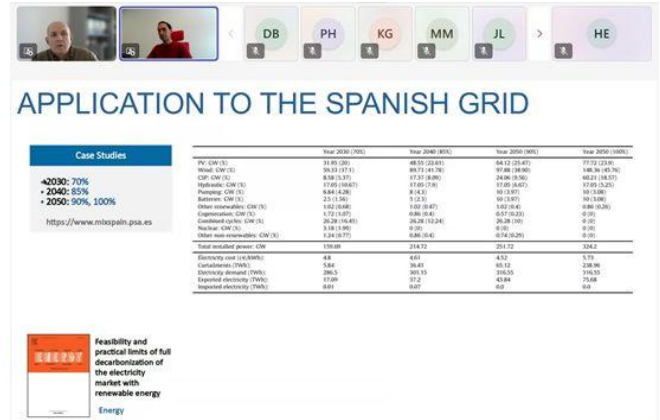
Start of Workshop.

The keynote speaker Johan Lilliestam (FAU Erlangen-Nürnberg) in his presentation titled “Concentrating Solar Power: A solution looking for a problem” presented the timeline of the key policy changes from 2012-2021 in CST, the evolution of the technology transition, and the role of CST as a hybrid generation/storage technology.



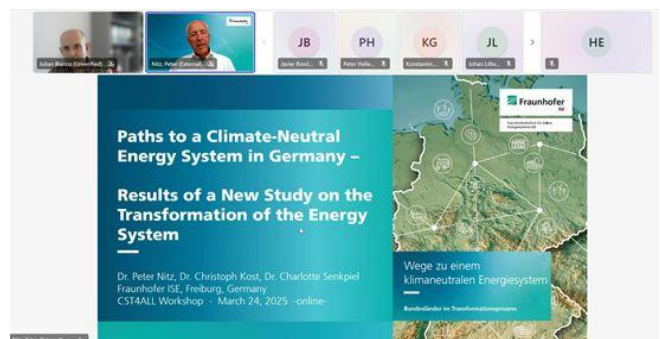
Sample slide from Keynote J. Lilliestam's Presentation.

The other keynote speaker Javier Bonilla Cruz (CIEMAT) detailed optimization practices on the Spanish Grid with an optimal energy mix and a clear distinction of purpose, objective and restrictions, by giving insight into traditional and new ways to optimize the electricity mix. The outputs of the demonstrated tool highlights a striking 85% reduction in CO2 emissions in the electricity sector.



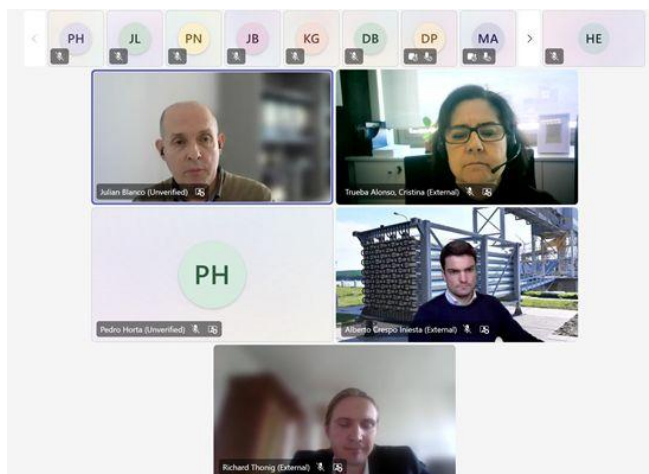
Sample slide from Keynote J. Bonilla's Presentation.

The last Keynote Speaker Peter Nitz (Fraunhofer ISE) discussed different approaches in the German ecosystem to ensure climate neutrality, by giving insights on the flexible generation capacities with hydrogen and electricity exchange, the importance of reducing geopolitical dependencies, the extension of renewable energies across Germany, the changes in efficiency accelerated by political measures, changes in user behavior, and the role of solar thermal with different energy coupling scenarios.



Sample slide from Keynote P. Nitz's Presentation.

The roundtable, moderated by Julian Blanco (CIEMAT) included Cristina Trueba (CST IWG); Pedro Horta (University of Evora, Portugal); Alberto Crespo (ENERGYNEST); and Richard Thonig (Senior consultant). These experts discussed the main aspects of the current context and future perspectives of the market and policies related to challenges to achieve the full decarbonisation of energy systems, with a focus on the role of CST technologies.



Roundtable Discussion Participants.

The event agenda is available [here](#). More information about the event can be found in the [press release](#).

Industry Workshop on the Integration of CST with Energy Storage

May 19, 2025

CST4ALL also hosted the online “Industry Workshop on the integration of Concentrated Solar Thermal Technologies (CST) with energy storage” on 19 May 2025. The event, organised by ESTELA with contributions from all project partners and with the support of the European Technology and Innovation Platform on Renewable Heating & Cooling (RHC-ETIP), attracted 142 energy sector stakeholders from 29 countries to explore the industrial potential of integrating CST with energy storage solutions.

On behalf of the European Commission, Elisabeth Schellmann underscored the importance of the workshop’s focus on the synergies between CST and energy storage and further outlined the ambitious goals of the Clean Industrial Deal, the Affordable Energy Action Plan, and the legislation packages under the Net Zero Industry Act.

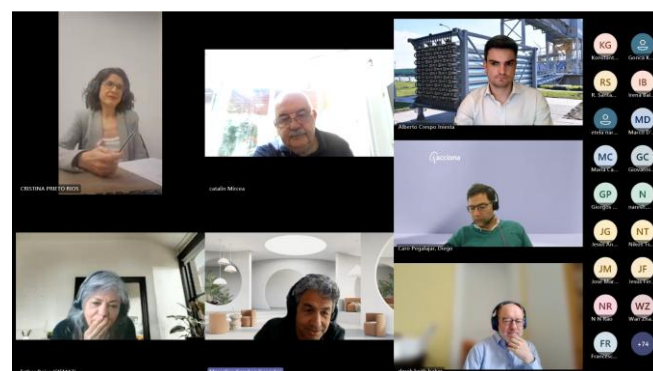
The keynote presentations examined various dimensions of CST integration with energy storage. Diego Caro Pegalajar (ACCIONA Industrial) addressed CST’s role in grid stability, referencing recent incidents in Spain and Australia and reflecting on global developments. Alberto Crespo Iniesta (ENERGY-NEST) showcased thermal energy storage solutions for industrial

decarbonisation, presenting four commercial projects, including two integrated with CST.



Alberto Crespo Iniesta (ENERGY-NEST) presenting thermal energy storage solutions for industrial decarbonisation using heat from renewable sources and/or cheap electricity.

In the roundtable discussion moderated by Dr. Derek Baker (ODTÜ-GÜNAM), a diverse panel of experts shared their insights and exchanged views on key areas including industrial maturity and applications, project financing and risk mitigation, regional integration, skills and workforce, market potential and manufacturing facilities, R&I contributions and priorities, as well as synergies and collaboration between the two sectors.



Roundtable discussion on CST-energy storage integration.

The expert panel highlighted the role of CST with integrated energy storage in Europe’s clean energy transition, along with its unique advantages in grid stability, 24/7 energy availability, and industrial process heat decarbonisation. It is a mature and versatile solution that can be effectively hybridised with other renewable energy technologies, such as solar PV, to reduce energy costs and provide additional value rather than competing with them. The workshop concluded with a call for coordinated action across sectors to scale up CST-storage integration through supportive policies, demonstration projects, skills

development, and clear communication of its system value for achieving Europe's decarbonisation goals.

The event agenda is available [here](#). More information about the event can be found in the [press release](#).

CST4ALL participation in other events

ETIPs Forum workshop (In-Person Participation)

Advancing the SET Plan for a sustainable energy future - Driving energy innovation together

March 19, 2025, Brussels, Belgium



CST4ALL's participation in the ETIPs Forum workshop in March 2025.

The ETIPs Forum hosted the hybrid event "Advancing the SET Plan for a sustainable energy future - Driving energy innovation together" on 19 March 2025, with the participation and support of the SET Plan Secretariat.

During the event, Dr. Konstantinos Genikomsakis of ESTELA represented the CST4ALL project and took part in the panel discussion titled "Driving a Clean Industrial Future – Decarbonisation, Competitiveness, and Affordable Energy" where he highlighted key innovations in CST technologies. He particularly emphasised the

pivotal role of advanced thermal energy storage as a game-changer that transformed CST technologies into a dispatchable, 24/7 source of green heat and power. He also stressed the importance of a successful transition to commercial deployment within Europe to leverage existing strengths in CST technologies.

3rd SOLARX Webinar (Online Participation)

9 June 2025, Online

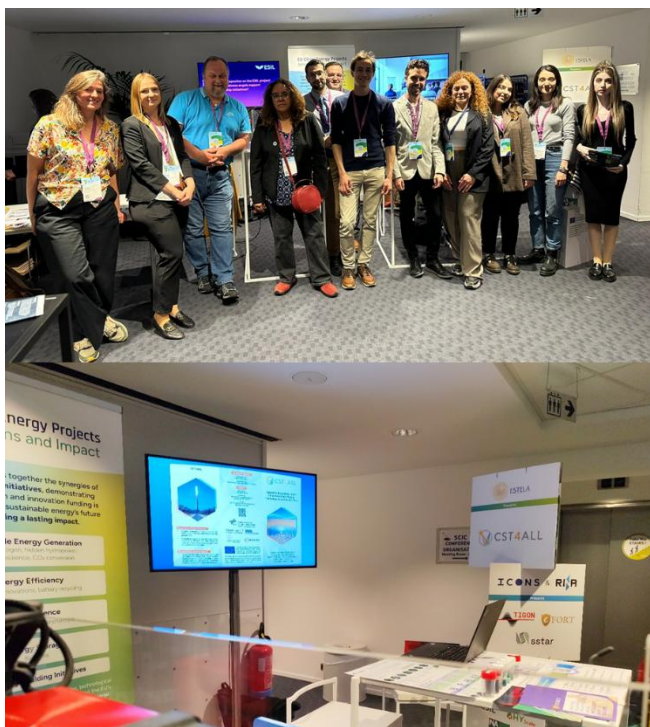


Projects participating in the webinar and overall recommendations and conclusions.

The SOLARX project hosted a webinar under the theme "Solar Concentration Technologies for Flexibility on the Production Side", bringing together key players from six EU-funded projects. As part of the European Sustainable Energy Week's (EUSEW) Sustainable Energy Days initiative, this event showcased how innovative solar concentration technologies can contribute to a more flexible and sustainable energy system across Europe. The webinar underscored the urgent need for dispatchable and hybrid renewable solutions, highlighting solar thermal innovations with the potential to decarbonise industrial and regional energy systems. Participating EU Projects: SOLARX, ROBINSON, ASTERIX-CAESar, HYBRIDplus, LEIA and CST4ALL.

European Sustainable Energy Week 2025 (EUSEW 2025) (In-Person Participation)

Energy Fair at EUSEW 2025
June 10-12, 2025, Brussels, Belgium



CST4ALL's participation in the Energy Fair during EUSEW 2025.

Dr. Konstantinos Genikomsakis of ESTELA represented the CST4ALL project at the Energy Fair during the European Sustainable Energy Week (EUSEW 2025), held in Brussels from 10 to 12 June 2025.

ESTELA together with other 6 organizations — Carr Communications, CJH Multisourcing SNC and Università degli Studi di Padova (UNIPD) / University of Padua, CLERENS, ICONS Innovation Strategies and META Group — shared the stand C28 "EU Clean Energy Projects: Innovations and Impact". Throughout the event, they actively engaged with attendees at the exhibition area to showcase and promote their respective projects and initiatives.

The featured projects addressed key areas including renewable energy generation, grid resilience, energy storage, efficiency and capacity-

building initiatives. By encouraging cross-sector collaboration, technological innovation, and market deployment, these projects directly support the EU's ambition to achieve climate neutrality, drive industrial competitiveness, and create high-quality investment opportunities in the evolving energy landscape.

CST4ALL Open Access Publication

CST4ALL - Support to the Activities of the Concentrated Solar Thermal Technology Area of the SET Plan

The CST4ALL publication *CST4ALL - Support to the Activities of the Concentrated Solar Thermal Technology Area of the SET Plan* is now available open access as part of the SolarPACES 2024 Conference Proceedings and can be downloaded using the doi link below..

Topal, Y.E., Eryilmaz, H., Baker, D., Genikomsakis, K., Heller, P., Benitez, D., Galves, J.B., Sanchez, R., Turchetti, L., De Iuliis, S. and Gunay, A., 2024. CST4ALL-Support to the Activities of the Concentrated Solar Thermal Technology Area of the SET Plan. In *SolarPACES Conference Proceedings* (Vol. 3). doi: [10.52825/solarpaces.v3i.2507](https://doi.org/10.52825/solarpaces.v3i.2507).

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Contact CST4ALL

Coordinator: DLR e.V.
German Aerospace Center
Institute of Solar Research
peter.heller@dlr.de,
daniel.benitez@dlr.de
<https://www.dlr.de/sf/en>

Consortium Members



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