Internal Deliverable 5.3

Report questionnaire: EU-SOLARIS user requirements/ needs

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EU SOLARIS

CAPACITIES

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EU-SOLARIS European Commission (EC) Scientific Project Officer	Mariano MENNA			

Table 1. Document history/change log

Version	Date	Amended by	Change made

Executive Summary

Within EU-SOLARIS, we can count 13 Research Infrastructures (RI) that cover a large range of services, equipment, temperatures, powers … available for the users. However, these services available for access have never been assessed to see if this really fits the requirements that the user needs. In this sense, there is a real importance to carry out this assessment to be sure that the existing CSP infrastructures corresponds to what a user needs and can also be improved to better fit these needs.

The EU-SOLARIS Task 5.3, part of the Work Package (WP) 5 of the project aims at collecting the user needs and requirements in regards to the services and equipment offered by Concentrated Solar Power (CSP) infrastructures within EU-SOLARIS. The final goal of this task is to assess the replies from the users. This is particularly important since the analysis of the results of the questionnaire will help EU-SOLARIS to see what the needs are and how the already existing infrastructures should improve.

For this aim, a questionnaire has been drafted and sent to a list of users (at a worldwide level). The targeted group were those who have already had an access and use of the infrastructure in order to get their feedback on what could be improved regarding what they already used but missed during their access. Another group was those who have not yet had an access to the infrastructure but are related to CSP and could be interested in accessing these infrastructures. Their feedback is important to be able to know the needs of future users.

The questionnaire was sent on the 30th of April 2014 through the SurveyMonkey platform and is presented in this deliverable. Within 3 months, 186 replies have been collected and will be further analysed to be part of the milestone MS27.

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Introduction

The EU-SOLARIS vision is to further assist the Concentrating Solar Thermal and Solar Chemistry Technologies deployment by enhancing the research infrastructures development and Research and Technological Development (RTD) coordination. EU-SOLARIS is expected to be an entity, where industrial needs and private funding will play a significant role, along with the public fundings.

The current project addresses the Preparatory Phase of EU-SOLARIS in order to bring EU-SOLARIS at a level of joint maturity. This initiative, included in the 2010 European Strategy Forum on Research Infrastructures (ESFRI) Roadmap, currently involves 15 partners (13 key Scientific Centres, 1 Ministry and the European STE Industry Association) which provide an excellent mix representing all actors relevant for supporting the further development of the Solar Thermal Electricity Research. Given that this technology is to a decisive extent Industry driven, the inclusion of the STE Industry has been considered necessary. With this in mind the involvement of industries within the project is assured through the partner participation of the European Solar Thermal Electricity Industry Association, (ESTELA). In addition, the support of the various stakeholders such as national and regional governments, renewable energy agencies, and funding bodies will be represented through an Advisory Board.

The duration of the Preparatory Phase is four years starting from November of 2012. The EU-SOLARIS project is co-funded by the European Union‘s Seventh Framework Programme. The success of this initiative will be the establishment of a new governance body, aided by sustainable financial models. EU-SOLARIS will be a valuable instrument for maintaining the European STE research and industrial sector in its present position of leadership.

This internal deliverable falls within the framework of the Work Package (WP) 5 “Distributed Facility Activity & Logistical Work”. The overall objectives of this WP are to facilitate and optimise relations with the user community in STE and to best prepare the implementation and management of the implementation phase of EU-SOLARIS. For this purpose, fostering communication with the users and especially assessing their requirements for the CSP infrastructures will be of primary importance in order to improve the services EU-SOLARIS will be able to provide.

With this in mind, Distributed Facility & Logistical activities will focus on the following points:

- Establishing relations with related infrastructures or initiatives and possible synergies to produce a guide of best practices to enhance the integration of EU-SOLARIS into the landscape of EU large scale infrastructures.
- Enhancing relations with user communities by creating a user database and using a commercial contact database software to facilitate communication with the users.
- Assessing the user requirements by sending a questionnaire in order to know how EU-SOLARIS could be improved to best fit the needs of the users.

- Creating a good working methodology for the implementation of EU-SOLARIS after the Preparatory Phase (PP). The work will focus on internal and external communication, risk and contingency management, quality control, logistical support, e-infrastructure design.

This report presents the first action taken within the framework of the task 3 for the assessment of the user requirements.

Since one of the main activities for EU-SOLARIS is to provide access to its infrastructure to the users, one decisive action is to have a database with the user needs in order to improve the services and equipment available at the different existing infrastructures.

This internal deliverable presents the questionnaire used to list the user needs and which has been sent to the contact database drafted in the task 5.2. The platform used for sending the questionnaire is Survey Monkey. This was sent on the 30st of April 2014.

The questionnaire was also added on the website for a larger public dissemination.

EU-SOLARIS User Questionnaire

The questionnaire as presented below is the one that has been sent to 800 contacts thanks to the platform Survey Monkey.
Also, you can find in the Annex 1, a screenshot of the welcome page of the questionnaire.

The questionnaire is divided in six section, in order to address the main objectives of this task:

I .Introduction to EU-Solaris and the user questionnaire

This part presents the purpose of the questionnaire and its importance for EU-SOLARIS.

II. Introduce Yourself

This part aims at gathering participant information like names, institutions, address, …

III. Your Field of Work

This part aims at gathering information on the participant field of work.

IV. Your needs of CST Research Infrastructures for your activities

This part aims at gathering information related to the type of CST infrastructure needed.

V. Your needs of services and equipment for your activities

This part aims at gathering information related to services and equipment

VI. Access procedures to the Research Infrastructure

This part aims at gathering data related to the access procedures, if CST infrastructures have already been used by the participant and the financial type of access (free, paid access, …)

I. Introduction to EU-Solaris and the user questionnaire

EU-SOLARIS is a project funded by the European Union and aims to create a new legal entity gathering European Concentrated Solar Thermal (CST) Research Infrastructures (RI) in order to optimize the development of these RIs and provide the best equipment and services to the scientific community.
One of the fundamental outcomes of EU-SOLARIS will be to provide access to its facilities for the scientific community in Europe and beyond. For this purpose and to best prepare the creation of the

EU-SOLARIS infrastructure dedicated to its users, the objective of this questionnaire is to assess the user requirements/expectations in regards to CST so that EU-SOLARIS is in line with the user community and can improve the services offered to users.

You are now invited to fill in this questionnaire because you are related directly or indirectly to CST technologies and high temperature processes. Your replies to this questionnaire are considered essential to make a step further and improve the services we can offer you in CST research facilities. We thank you in advance for your cooperation and participation to this questionnaire.

All information will be used for internal purposes only and will not be shared, sold, or otherwise distributed.

II. Introduce Yourself

1. First name

2. Family Name

3. Email Address

4. Telephone Number

5. Organisation Full Name

6. Organisation Acronym

7. Address of your Organisation

8. Type of Organisation

9. Position in your Organisation

III. Your Field of Work

10. Tick your corresponding scientific field

Thermal Conversion

Thermal Storage

Chemistry

Material Science

Control Science

Optical Science

Solar Resource

Fluid Dynamics

Instrumentation

Mechanics

Modeling & Simulation

Other (please specify)

11. Give precisions on how your field of work is or could be related to CST and high temperature Processes

12. Which of the following CST research infrastructures do you use? (several items may be marked)

Parabolic Trough

Fresnel Linear

Parabolic Dish

Solar Tower

Solar Furnace

Solar Simulator

None yet

Other CST infrastructures relevant for your activities (please specify)

13. Which thermal power do you use for your activities?

Less than 1kW

Between 1 and 5 kW

Between 5 and 500 kW

Between 500 kW and 1 MW

Between1 MW and 5 MW

More than 5 MW

Not applicable

Comments

14. Which range of temperature are you working with?
Less than 250°C

Between 250 and 400°C

Between 400 and 600°C

Between 600 and 1000°C

Between 1000 and 1500ºC

Between 1500ºC and 2000°C

More than 2000°C

Not applicable

Comments

IV. Your needs of CST Research Infrastructures for your activities

15. Your needs of CST Research Infrastructures for crosscutting activities related to CST plants
Testing of working fluids (Heat Transfer Fluids or Heat Storage Medium)

Testing of solar reflectors

Testing of new cooling systems

Testing of thermal storage prototypes

Testing of solar mirror washing devices

Testing of new power conversion cycles

Thermal insulation analysis and evaluation

Testing of optical coatings (i.e, selective and/or antireflective coatings)

Testing of water treatment technologies (desalination, detoxification, …)

Testing of hybridization concepts

Equipment calibration (flowmeter, pyrheliometers, radiometers, ..)

Not Applicable

Other (please specify)

16. Your needs of CST Research Infrastructures for Parabolic Troughs

Complete evaluation and characterization of new collector designs

Evaluation and characterization of new linear receivers

Evaluation of new working fluids (molten salts, gases, ..)

Evaluation and characterization of flexible connections (balljoints, flex hoses, …)

Evaluation and characterization of new solar tracking systems

Lifesize testing of new control schemes for large solar fields with parabolic troughs

Testing of drive units for parabolic troughs

Not Applicable

Other (please specify)

17. Your needs of CST Research Infrastructures for Central Receivers

Complete Evaluation and characterization of new heliostat designs

Evaluation and characterization of new solar tracking systems for heliostats

Testing at life size of new aiming control schemes for large heliostat fields

Testing of new drive units for heliostats

Evaluation and characterization of receiver prototypes working with atmospheric air

Evaluation and characterization of receiver prototypes working with molten salts

Evaluation and characterization of receiver prototypes working with pressurized gases (air, CO2, …)

Evaluation and characterization of receiver prototypes working with water/steam

Evaluation and characterization of receiver prototypes working with supercritical fluids (CO2/H2O)

Evaluation and characterization of particle receiver prototypes

Not Applicable

Other (please specify

18. Your needs of CST Research Infrastructures for Linear Fresnel Collectors (LFC)

Complete Evaluation and characterization of new LFC designs

Evaluation and characterization of new linear receivers for LFC

Evaluation and characterization of new solar tracking systems for LFC

Evaluation of new working fluids (molten salts, gases, ...)

Lifesize testing of new control schemes for large solar fields of LFC

Testing of drive units for LFC

Not Applicable

Other (please specify)

19. Your needs of CST Research Infrastructures for Parabolic Dishes

Complete evaluation and characterization of new designs

Evaluation and characterization of new thermal engines (either Stirling or any other type)

Evaluation and characterization of new solar tracking systems

Not Applicable

Other (please specify)

20. If your needs of CST Research Infrastructures are not related to CSP plants and the production of electricity, please specify which are your activities requiring CST Research Infrastructures and high temperature processes

21. Do you have any comments on your needs of CST RIs?

V. Your needs of services and equipment for your activities

22. Services and equipment needed for your activities

Heat transfer fluid characterization

Thermal storage media characterization

Ageing of materials for durability predictions (use of environmental chambers, controlled shutters, ..)

Bulk mechanical properties characterization such as Young modulus, elastic limit…

Bulk thermal properties characterization such as thermal conductivity, heat capacity…

Surface optical characterization such as reflectivity, emissivity…

Shape surface analysis such as microscope, SEM, tribology, durometer…

Chemical surface analysis such as XPS, DRX…

Coating optical characterization such as absorptivity, transparency…

Coating thermal characterization such as thermal conductivity

Coating mechanical characterization such as adhesion, ageing…

Porous material characterization such as SSA, porosity…

Particles shape and distribution characterization

Softwares for modeling

Optical thermal measurement such as pyrometers, thermal imaging camera

Flowmeter calibration

On line gas analyser

Process control systems

Flux density characterization

Optical quality characterization such as photogrammetry, deflectometry…

Weather and atmospheric observation such as DNI, air temperature, turbidity, aerosol content

Weather nowcasting and forecasting

Other (please specify)

23. If you need any of the services and equipment above, please provide technical parameters when these are crucial for your activities (temperature range, material nature, equipment details, spectral wavelength, specific parameters, modeling softwares, …)

24. Which are your needs for the setup of your experiments and other resources?

Data acquisition

Filters

Flowmeter

Temperature probe

Pressure gauge

Electrical grid connection

Water supply

Closed loop or dry cooling systems

Air supply

Other gas supply

Lift

Crane

Not Applicable

Other (please specify)

25. Do you have any needs in training on CST Research Infrastructures?

Yes

No

If yes, please specify what kind of training?

VI. Access procedures to the Research Infrastructure

26. Have you ever used one of the EU-SOLARIS CST Research Infrastructures?
CTAER Advanced Technology Centre for Renewable Energies (Spain)

CIEMAT-PSA Centro de Investigaciones Energeticas, Medioambientales y Tecnologicas Ciemat

(Spain)

CYI The Cyprus Research and Educational Foundation (Cyprus)

CNRS National Center for Scientific Research (France)

DLR Deutsches Zentrum Fuer Luft Und Raumfahrt Ev (Germany)

APTL-CERTH Centre for Research and Technology Hellas (Greece)

CRES Centre for Renewable Energy Sources and Saving (Greece)

ENEA Agenzia Nazionale per le Nuove Tecnologie, L'energia e lo Sviluppo Economico Sostenibile (Italy)

WEIZMANN Weizmann Institute of Science (Israel)

LNEG Laboratório Nacional de Energia e Geologia, (Portugal)

U.EVORA Universidade de Evora (Portugal)

GÜNAM MiddleEast Technical University (Turkey)

SELCUK U Selcuk Universitesi (Turkey)

None yet

27. If no, what are the reasons for not accessing one of the CST RIs?
You have never needed these facilities

No fundings available neither in my company nor in public entities for paying the access fee

Not aware of the possibility to access CST RIs

Incompatibility between your experiments and the RI

Confidentiality problems

Not Applicable because you have already used a EUSolaris RI

Other (please specify)

28. If yes, how do you evaluate your experience?

Very poor

Poor

Fair

Good

Very good

Not Applicable

Any comments?

29. What was the cost model applied when accessing one of the EU-SOLARIS RIs?

Full Cost: the users pay all the costs associated to the experiments (i.e., staff, instruments, amortization and, consumables)

Subsidized Model: the users pay a fraction of the total expenses (i.e. 50%), and the rest is paid by the institution providing the RI (own institution budget, national or european schemes)

Running Cost: the users only pay the consumable required for the experiment

Free Access: the users do not pay anything (access is entirely covered by own institution budget, national or european schemes)

Not Applicable because you have never used a EUSOLARIS RI

Other (please specify)

30. If the access was not free of charge for you, what was the origin of the funds for the payment of the access fees?
Public, please specify (European Union, national grants, institution own funds, ...)

Private, please specify (industrial collaboration, your own personal budget, banks, ...)

Other, please specify

31. If the access is not free of charge for you, would you still be able to carry out your work at this Research Infrastructure and pay the access fees?

Yes, I would still be able to find external funds to pay for the access fees

No, I would not be able to find external funds to pay for the access fees

32. Do you have any comments you would like to add?

Thank you for your participation in this questionnaire!

We appreciate the time you have spent in providing us with feedback that will help us. We will come back to you with the results once all replies have been analysed.

In the meanwhile, we invite you to visit the EU-SOLARIS website at http://www.eusolaris.eu/

Pursuant to the European Regulation on Personal Data Protection (“ERPDP”) and the national subsidiary provisions approving the ERPDP Implementation in European Countries (jointly, the “Data Protection Legislation”), the addressee of this communication is hereby informed that the personal data provided to CNRS, as a member of the EU-SOLARIS project, as well as data which may be gathered in the future, could be included in a database controlled by CNRS. Unless otherwise advised, the addressee personal data will be used for the sole purpose of maintaining and developing the addressee

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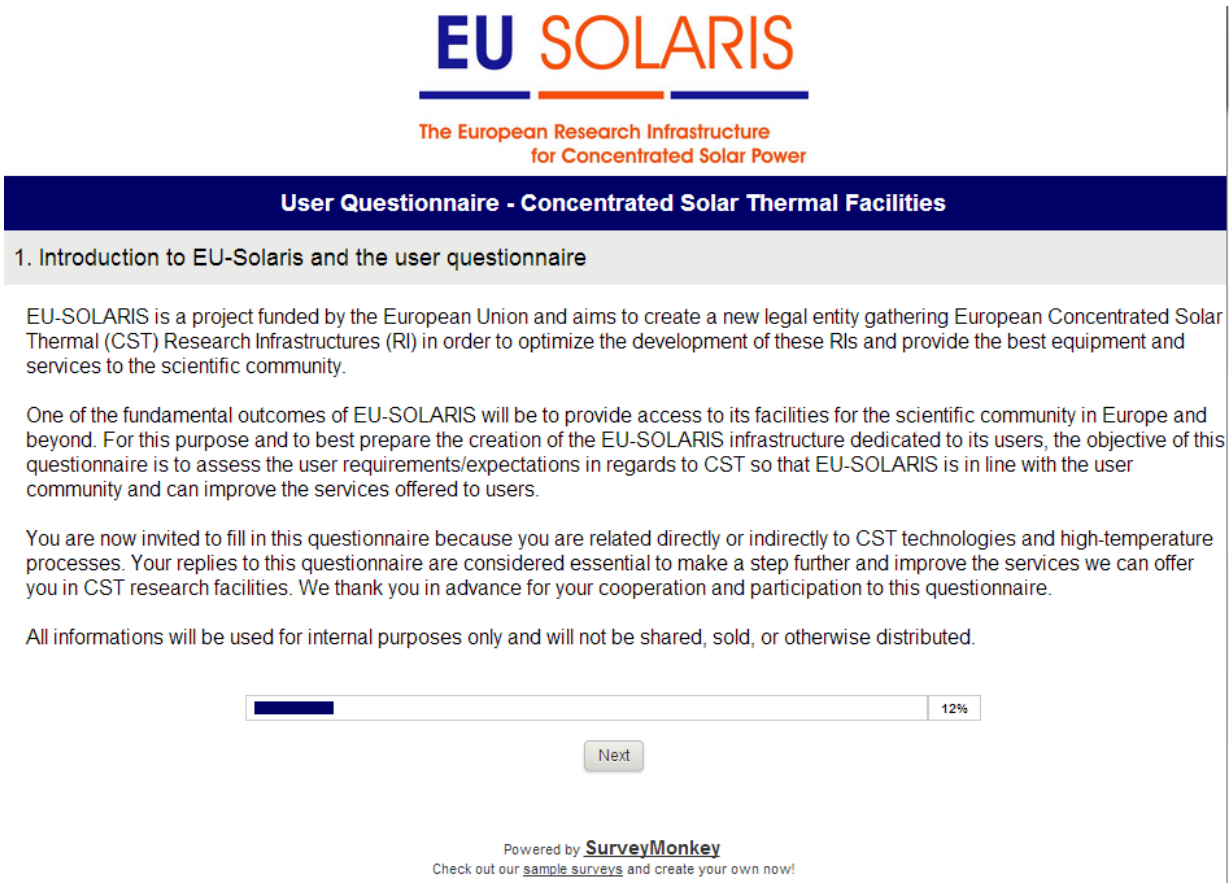
Annex 1: User Questionnaire Screenshot



EU SOLARIS

The European Research Infrastructure for Concentrated Solar Power

User Questionnaire - Concentrated Solar Thermal Facilities

1. Introduction to EU-Solaris and the user questionnaire

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List of abbreviations and definitions

CSP	Concentrated Solar Power
CST	Concentrated Solar Thermal
ESFRI	European Strategy Forum on Research Infrastructures
EC	European Commission
EU	European Union
LFC	Linear Fresnel Collector
PP	Preparatory Phase
RI	Research Infrastructure
RTD	Research and Technological Development
STE	Solar Thermal Electricity
WP	Work Package