# Analysis of Calls related to Concentrated Solar Thermal (CST) technologies in the Cluster 5 WP

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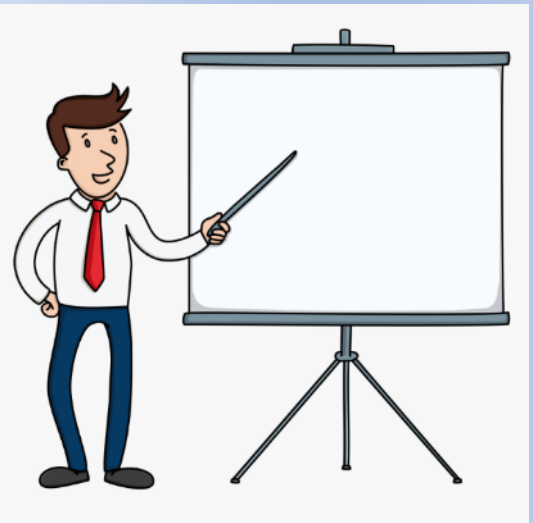
# Outline



- Call Topics description + Analysis of Call requirements
- Additional important aspects + Consortium building hints
- Indicative successful past examples of approved CST proposals with CERTH as participant
- Conclusions

# TOPIC ID: HORIZON-CL5-2022-D3-03-01 (I)

**Title**: Innovative components and/or sub-systems for CSP plants and/or concentrating solar thermal installations

**Type of action**: HORIZON-IA HORIZON Innovation Actions

**Deadline model**: single-stage; **Opening date**: 06 September 2022; **Deadline date**: 10 January 2023

**Expected Outcome:**

CST technologies supply renewable, dispatchable energy → important element of the evolving energy system. Projects expected to contribute to **some of the following expected outcomes**:

- *Higher shares of variable output renewables in the energy system.*
- *Higher efficiency of concentrated solar power (CSP) plants and/or CST installations.*
- *Reduced operation and maintenance costs of CSP plants and/or CST installations.*
- *Achievement of the targets of the SET Plan Initiative for Global Leadership in CSP.*

# TOPIC ID: HORIZON-CL5-2022-D3-03-01 (II)

**Title**: Innovative components and/or sub-systems for CSP plants and/or concentrating solar thermal installations

**Type of action**: HORIZON-IA HORIZON Innovation Actions

**Deadline model**: single-stage; **Opening date**: 06 September 2022; **Deadline date**: 10 January 2023

**Scope:**

- **Demonstration** of innovative, cost effective & more reliable components &/or sub-systems for CSP &/or CST installations.
- The components and/or sub-systems will allow **better efficiency** in terms of solar energy conversion.
- The demo for a continuous interval of **at least 6 months** covering all possible incidence angles of direct solar radiation.
- **Assess sustainability** of proposed components &/or sub-systems in environmental, social & economic terms.
- Demos should be **fully & transparently documented**, to ensure replicability, up-scaling & assist future planning decisions.

**Specific Topic Conditions:**

Activities are expected to **achieve TRL 6-7 by the end** of the project.

**Cross-cutting Priorities:**

Artificial Intelligence

Digital Agenda

# TOPIC ID: HORIZON-CL5-2023-D3-01-04 → Draft (I)

**Title**: Solar Systems for Industrial Process Heat and Power

**Type of action**: HORIZON-IA HORIZON Innovation Actions

**Deadline model**: ?; **Opening date**: ?; **Deadline date**: ?

- **TRL 6-7** by the end of the project
- EU contribution ~ **EUR 7.00 M€**. It does not preclude selection of a proposal requesting different amounts.
- The total indicative budget for the topic is EUR 14.00 million → **2 projects to be funded**

**Expected Outcome:**

**RE integration in industry** is key in achieving low-carbon systems. Solar systems for industrial process heat & power are gaining attention and have the potential for significant scale up, particularly in areas **combining** large & diverse industrial sector with rich solar resources. Projects expected to contribute to:

- **Energy efficient solar resource integration in the industrial sector** → low-carbon, emission-free systems.

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# TOPIC ID: HORIZON-CL5-2023-D3-01-04 → Draft (II)

**Title**: Solar Systems for Industrial Process Heat and Power

**Type of action**: HORIZON-IA HORIZON Innovation Actions

**Deadline model**: ?; **Opening date**: ?; **Deadline date**: ?

**Scope:**

Industrial processes need considerable amounts of heat & power. Much of process heat, ~ 50% among most **energy-intensive** manufacturing industries (e.g. food & beverages and pulp & paper) occurs at **T ≤ 400 °C**. The Solar Thermal (ST) medium-temperature **process heat or cogeneration** with electricity can be an effective way to transition to **clean energy sources**. On the other side, PV systems convert sunlight to DC electricity and this can be used to power or heat industrial processes directly (or via the grid) with electric heating technologies. **PV and ST are not competing** but can be **suitably integrated** in an energy system to best benefit of different features offered **by the 2 options**. This high synergy output would allow a **useful integration of solar in many industrial processes.**

Proposals are expected to:

- ***Demonstrate a system*** *that considering solar energy's generation potential, topographic characteristics, land-use constraints and system performance, generates* ***solar medium- temperature heat and electricity*** *in a modular, low environmental footprint, low cost and* ***high-efficiency hybrid PV-ST design****.* ***Optimize*** *the manufacturing processes based on the* ***process integration concept*** *(→ opportunities for energy efficiency & heat recovery)* ***and process control****, to* ***reduce process power & heat*** *demand to its practical minimum for energy efficient solar energy supply (****possibly incl. storage****) investment.*
- ***Demonstrate the potential of hybrid approaches*** *(PV-ST) that produce heat & electricity to power a* ***broad range of manufacturing end uses****. A plan for the exploitation & dissemination of results should include* ***a strong business case*** *and* ***sound exploitation strategy****. Exploitation plan should include* ***preliminary plans*** *for scalability, commercialization & deployment (feasibility study, business plan) indicating possible funding (e.g. Innovation Fund).*

International cooperation with the **Mediterranean Region** is encouraged.

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# Additional important aspects for consideration (I)

Check also the **Destination description → Sustainable, secure & competitive energy supply**

- Address in the proposal all aspects relevant to the technology you are proposing
  - *Strategic objectives, additional expected impacts, European global leadership aspects, important energy supply aspects (e.g. storage optimized management), CCUS etc.*
- Show connections to other projects (running or completed) to:
  - *Document relevance to the Call and capacity to implement the work*
  - *Show synergies, potential for further exploitation, funds/resources leveraging etc.*
- Aim at the high TRL requested by the Call, if possible for your case
- In general, competition in CST-related calls is high → details matter and may make the difference!
- Start preparation of your proposal as early as possible

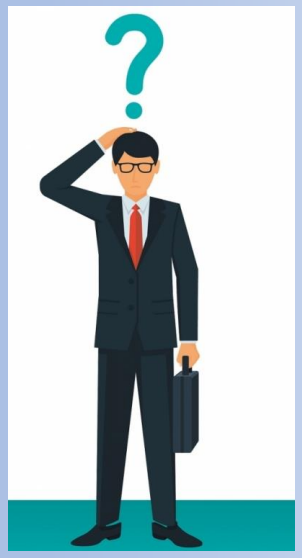
# Additional important aspects for consideration (II)

**Some consortium related hints:**

- IAs require <u>essential involvement</u> of **industrial partners**:
  - *Examples: solar thermal industries, power utilities/energy suppliers, users of the technology, EPCs, partners with proven capacity in digital design tools, experts in LCA, business planning, effective dissemination/exploitation organization etc.*
  - It is OK to have an Academic/RTO coordinator but <u>strong industrial engagement is a must</u>

# Additional important aspects for consideration (III)

Make sure you have the right template for the Call! → start submission function



- Follow the structure of the template and read instructions carefully
- Aspects often overlooked and may result to shortcomings of the proposal:
  - *Define specific, tangible & quantitative (where/if possible) objectives!*
  - *Define Key Performance Indicators (KPIs) to monitor progress of the work & assessment*
  - *For IAs it is often important to include a preliminary business plan in the proposal*
  - *Dissemination & communication activities should not be general and must also have quantitative targets!*
  - *Define a clear workplan with reasonable time scheduling & clear interaction among WPs*

# Additional important aspects for consideration (IV)

- Aspects often overlooked and may result to shortcomings of the proposal:
  - *Distribute your milestones throughout the project's duration*
    - ✓ *Do not overdo it with milestones!*
    - ✓ *Not more than 1-2 milestones at the end of the project!*
  - *Risk analysis & risk mitigation measures are important! Be convincing, concise and specific!*
  - *Distribute/allocate resources carefully among WPs and partners!*
- Do not be afraid to use the FAQs function and ask your NCP for advice
- Go also to ''*Partner search announcements*''

# Examples of recent successful proposals @CERTH

**Proposal title:** *Air-Brayton cycle Concentrated Solar Power future plants via redox oxides-based structured thermochemical heat exchangers/thermal boosters (ABraytCSPfuture)*

**Call Topic**: Novel approaches to concentrated solar power (CSP) → 2021 Call

| N. | Proposer name | Country |
|---|---|---|
| 1 | DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT EV | DE |
| 2 | ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS | EL |
| 3 | UNIVERSITEIT TWENTE | NL |
| 4 | FUNDACION CENER | ES |
| 5 | FUNDACION TEKNIKER | ES |
| 6 | FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV | DE |
| 7 | OPRA Engineering Solutions B.V. | NL |
| 8 | KRAFTBLOCK GMBH | DE |
| 9 | Landson Emission Technologies A/S | DK |
| 10 | COBRA INSTALACIONES Y SERVICIOS S.A | ES |

**Type of Action**: RIA

**Targeted TRL**: TRL 5

**Project start/end date**: 1.11.2022 – 31.10.2026

**Total score: 14.50/15.00**

*Excellence: 5.00/5.00*

*Impact: 4.50/5.00*

*Implementation: 5.00/5.00*

**Excellence checklist**

Objectives 👍
Progress beyond s.o.a. 👍
Methodology 👍
Interdisciplinarity 👍
TRL 👍
Sustainability of solution, circularity, LCA etc. 👍
*Open science practices* 👍

**Impact checklist**

How to achieve outcomes 👍
Contribution to advance CST 👍
Reinforcement of EU scientific basis 👍
Exploitation strategy & measures 👍
Communication & dissemination 👍
*One technical shortcoming* 👎

**Implementation checklist**

Quality & effectiveness of workplan 👍
Milestones & deliverables 👍
Risk assessment & mitigation plan 👍
Resources allocation & justification 👍
Validity of roles per partner 👍
Skills, expertise, value chain coverage 👍

# Examples of recent successful proposals @CERTH

**Proposal title:** *Efficient water splitting via a flexible solar-powered Hybrid thermochemical-Sulphur dioxide depolarized Electrolysis Cycle (HySelect)*

**Call Topic**: Efficiency boost of solar thermochemical water splitting → 2022 Call in Clean Hydrogen

| N. | Proposer name | Country |
|---|---|---|
| 1 | DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT EV | DE |
| 2 | ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS | EL |
| 3 | AALTO KORKEAKOULUSAATIO SR | FI |
| 4 | AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE, L'ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE | IT |
| 5 | HELIOHEAT GMBH | DE |
| 6 | FEN RESEARCH GMBH | AT |
| 7 | Grillo-Werke Aktiengesellschaft | DE |

**Type of Action**: RIA

**Targeted TRL**: TRL 6

**Project start/end date**: 01.01.2023 – 31.12.2026

**Total score: 14.00/15.00**

*Excellence: 4.50/5.00*

*Impact: 5.00/5.00*

*Implementation: 4.50/5.00*

**Excellence checklist**

Objectives 👍
Progress beyond s.o.a. 👍
Methodology 👍
Interdisciplinarity 👍
TRL 👍
End users engagement 👍
Open science practices 👍
*1 shortcoming: limited progress at component level* 👎

**Impact checklist**

How to achieve outcomes/impacts 👍
Significance to the EU $H_2$ strategy 👍
Significant contribution to the technical objectives of the Call 👍
Exploitation strategy & measures 👍
Communication & dissemination 👍

**Implementation checklist**

Quality & effectiveness of workplan 👍
Risk assessment & mitigation plan 👍
Skills, expertise, value chain coverage 👍
*1 shortcoming: non optimal allocation of resources (PMs) in some WPs* 👎

# Conclusions

- 👍 CST-related Calls are not many and thus competition is in general high. High scores to be funded!
- 👍 Read though the Call description carefully and be convincing in <u>all aspects</u> of:
  - ✓ *Scope, expected outcome, TRL requirements, suggested budget figures,…*
  - ✓ *Do not underestimate the details*
  - ✓ *Go also through the Destination description and address relevant to the topic aspects included there*
  - ✓ *Show how your proposal aligns with EU priorities and important policy documents/decisions of EU*
- 👍 Include in the proposal material that clearly shows the relevance, expertise and capacity of the consortium &/or partners to the S&T concepts proposed
- 👍 Innovation Action → Strong industrial involvement is mandatory
- 👍 Aim at the high TRL if a range is requested but:
  - ✓ *Feasibility to achieve this is in the duration of the project is more important than the promise*
- 👍 If substantial construction & demonstration activities are foreseen → 4 year project (or more if allowed/necessary) to ensure time to carry out the work is sufficient

# *Thank you for your attention!*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