Press Release

EU-Funded Project 'INDHEAP' Advances Solar Heat and Power Integration for Industrial Decarbonization

Industrial processes account for a significant share of global energy consumption, with many relying on fossil fuels to meet their heat and power demands.

Achieving decarbonization in this sector is crucial for reducing emissions, enhancing energy security, and advancing Net Zero goals.

However, integrating renewable energy solutions — especially for mid-temperature processes (up to 250°C) —remains **a challenge due to technological and economic barriers.**

The INDHEAP project is tackling this challenge head-on by demonstrating the feasibility of **integrating solar thermal (ST) and photovoltaic (PV) energy** systems into industrial settings. Supported by an innovative Thermal Energy Storage (e-TES) system, this approach ensures **reliable and efficient energy supply** while **reducing peak demand** and **dependence on fossil fuels.**

Launched in January 2024 and funded by Horizon Europe, INDHEAP brings together **a consortium of 13 partners from 8 countries. Coordinated by the French Alternative Energies and Atomic Energy Commission (CEA)**, the project unites top-tier research, academic, and industrial experts in solar energy, energy efficiency, and industrial process optimization.

A key milestone will be the demonstration of INDHEAP's solution at TotalEnergies' lubricants blending facility in Spain, validating its performance at **Technology Readiness Level 7 (TRL7)**.

Beyond this site, INDHEAP aims for scalability across Southern Europe and the MENA – the geographic region which comprises the Middle

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East (also called West Asia) and North Africa together – region, positioning solar energy as a viable alternative to fossil-based industrial heat.

In its first year, INDHEAP has already made significant strides.

The project's first publication, developed in collaboration with the **Cyprus Institute**, provided key insights. The consortium also gathered for its **Month 6 meeting in Valdemoro**, advancing the project's technical developments, and have celebrated its **first-year milestone with a meeting in Porto**.

Additionally, INDHEAP has been actively showcased at **key conferences and industry events**, engaging with stakeholders and fostering collaborations to accelerate the adoption of integrated solar energy solutions in industrial processes.

Which technological developments have been achieved during the first year of the project and how is progressing so far?

The project is progressing well, with several key milestones already achieved in its first year. One of the major accomplishments has been **the successful completion of the resource efficiency assessment and optimization of the Total Energies' Valdemoro plant.** Building on this foundation, the consortium is now finalizing the design of the prototype, which will demonstrate the integration of solar heat and power production systems into an existing industrial site.

A significant highlight is the publication of Deliverable 2.1, a public document that outlines the methodology for integrating renewable energy sources—both heat and power—into existing industrial energy systems. This deliverable not only reflects the project's innovative approach but also provides valuable insights for the wider industrial and research communities.

Valery Vuillerme, the project's coordinator, remarked: "The challenge of installing a prototype of solar heat and power production systems on an existing industrial site is great. All the partners involved in the project are currently committed to adapting to the site's many constraints and delivering a hybrid solar heat and power production solution that is as relevant as possible and in line with the project's objectives."

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What is INDHEAP About?

INDHEAP is developing methodologies and tools to optimize the integration of solar thermal (ST) and photovoltaic (PV) energy into industrial processes. The project focuses on:

- Reducing heat and power peak demands by improving energy efficiency, utilizing waste heat, and analyzing demand flexibility.
- Defining the optimal ST-PV balance based on technical, economic, and environmental factors.
- Designing a hybrid system architecture, including component sizing and smart control strategies for maximum solar energy utilization.
- Developing key components such as a flexible Thermal Energy Storage system (e-TES), PV integration enablers, low-cost/mid-temperature solar collectors, and a smart hybrid controller for joint heat and power management.

By demonstrating the feasibility of hybrid ST-PV systems, **INDHEAP contributes to reducing EU dependency on natural gas** and advancing climate targets, paving the way for widespread industrial adoption of solar energy.

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The Consortium:

Partner Name	Country
1. Commissariat à l'Énergie Atomique et aux Énergies Alternatives	France
2. NEWHEAT	France
3. SINTEF Energy Research	Norway
4. ABSOLICON SOLAR COLLECTOR AB	Sweden
5. RINA Consulting S.p.A.	Italy
6. Institut für Nachhaltige Technologien	Austria
7. HELIOSLITE SAS	France
8. THE CYPRUS INSTITUTE	Cyprus
9. TotalEnergies Marketing España, S.A.U.	Spain
10. HEADGY HELMETS SA	Portugal
11. Petrou Bros Dairy Products	Cyprus
12. PIROBLOC SA	Spain
13. AMIRES, The Business Innovation Institution	Czech Republic

Contacts:

Website: https://indheap.eu/

LinkedIn: https://www.linkedin.com/company/indheap-project

Valery Vuillerme

Project Coordinator

CEA

Email: Valery.VUILLERME@cea.fr

Joan Guardià Vilajosana

Dissemination Manager

AMIRES, The Business Management Institute

Email: guardia@amires.eu

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