A Spanish company offers modular system for instant thermal energy generation from photovoltaic sources

Summary

Profile type
Technology offer

Company's country
Spain

POD reference
TOES20250709024

Profile status
PUBLISHED

Type of partnership
Research and development cooperation agreement

Commercial agreement with technical assistance

Targeted countries
• **World**

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Term of validity
9 Jul 2025

9 Jul 2026

Last update
9 Jul 2025

General Information

Short summary

A Spanish company specialized in renewable energy (hardware developer) offers a modular technology that converts photovoltaic electricity into thermal energy for water-based heating in industrial, infrastructure and remote contexts. Fully autonomous, the system requires no batteries or grid connection. It reduces fossil fuel dependence and simplifies Integration in any hydraulic system.

The company seeks research and development cooperation agreement.

Full description

A private Spanish company specialized in renewable energy technologies, offers a modular thermal energy generation system designed to transform solar photovoltaic electricity into usable heat. The company has prior experience in international cooperation and develops solutions for decarbonization in industrial and infrastructure contexts.

The technology addresses the need to generate thermal energy—mainly hot water—in locations that lack reliable access to the electrical grid or seek to eliminate fossil fuel consumption. Conventional alternatives rely on fuel-based boilers, which generate emissions and require logistics for fuel supply, or battery-based electric heating, which increases system complexity and cost. These existing approaches are not well-suited for autonomous operation in

remote or off-grid environments.

The system offered is modular and converts electricity from photovoltaic sources into heat using resistive elements integrated into closed-loop hydraulic circuits. A smart control unit dynamically regulates power delivery based on real-time demand, ensuring efficient energy use and protecting system components.
Application areas include industrial process heating, domestic hot water production, remote installations, infrastructure in isolated environments, and mobile energy systems. Its robustness and energy independence also make it suitable for extreme conditions or potential use in space-relevant environments.

The main innovative feature of this technology lies in its ability to produce thermal energy from photovoltaic electricity without the need for intermediate storage, inverters, or fuel combustion. It delivers thermal energy in real time, is modular and scalable, and integrates easily into existing infrastructures with minimal maintenance requirements

The company seeks research and development cooperation agreements and technical collaborations with partners interested in adapting, validating or integrating the photovoltaic-to-thermal system in real use cases. International cooperation is expected to focus on pilot deployment, optimisation under sector-specific constraints, and joint exploration of new application scenarios where autonomous thermal generation from photovoltaic sources provides advantage.

The objective is to identify technical partners capable of exploring new application scenarios for our photovoltaic-to-thermal system, beyond conventional building or industrial heating uses. The aim is to understand where and how this technology can deliver functional or operational value in sectors, environments or workflows not yet addressed.

In terms of technical characteristics:
– Performance: Each module delivers 60 kW or 100 kW of thermal power in the 30–70 °C range, with dynamic response adapted to real-time PV input.
– Ease of use: The system operates autonomously, requiring no user interaction, batteries, or external control infrastructure.
– Cost: Thermal energy cost is estimated at ~0.05 €/kWh over 20 years, with no fuel logistics or maintenance-intensive components.

Advantages and innovations

The main innovative aspect of this technology is its ability to convert photovoltaic electricity directly into thermal energy without the use of batteries, inverters, or grid infrastructure. Unlike conventional systems that depend on electrical storage or combustion-based heat generation, this solution provides real-time, fully autonomous thermal output from solar energy. This design significantly simplifies system architecture, reduces the need for maintenance, and enables deployment in off-grid or infrastructure-limited environments.

Another key innovation is the integrated control system, which continuously adapts the electrical power input to match thermal demand. This dynamic regulation optimizes energy efficiency, ensures thermal safety, and extends the operational lifespan of system components. The control unit functions without external power sources, enabling fully self-regulated operation based solely on solar input.

The modularity of the system adds further value. Standardized units of 60 kW and 100 kW can be deployed individually or in parallel, allowing flexible adaptation to site-specific energy needs. This scalability makes it suitable for small installations, large industrial settings, or decentralized networks. Integration into return lines of water circuits allows the system to operate as a preheating stage, reducing reliance on conventional boilers and improving overall system efficiency.

In comparison with alternative technologies on the market, this system offers substantial advantages:
– A predictable long-term cost of thermal energy (~0.05 €/kWh over 20 years),
– No fuel logistics, emissions, or complex energy storage,
– Minimal maintenance due to the absence of moving parts,
– High compatibility with existing hydraulic and photovoltaic infrastructure,
– Installation flexibility in diverse environments, including remote or mobile applications.

Technical specification or expertise sought

Stage of development

Already on the market

Sustainable Development goals

- **Goal 9: Industry, Innovation and Infrastructure**
- **Goal 13: Climate Action**
- **Goal 11: Sustainable Cities and Communities**
- **Goal 7: Affordable and Clean Energy**

IPR Status

No IPR applied

IPR Notes

IPR Notes

Partner Sought

Expected role of the partner

Type of partner: Partners sought include research organisations, technology centres, universities, and companies with strong engineering capabilities in thermal energy systems, photovoltaic integration or fluid-based heating infrastructure. Special interest is given to entities participating in applied R&D, industrial decarbonisation initiatives, or technical demonstration projects under national or European funding schemes. The partner should have practical experience in the design, deployment or evaluation of energy systems, particularly in low-carbon or off-grid contexts.

Role of the partner: The partner is expected to contribute domain-specific insight and lead the technical application of the photovoltaic-to-thermal system in new or sector-specific use cases. The collaboration will focus on the joint exploration of functional roles for autonomous thermal generation across diverse operational environments.

The ideal partner should bring:
– Identifying application scenarios based on the partner's expertise (remote logistics, medical field units), where the system could provide added value or simplify existing thermal supply strategies.
– Defining technical integration pathways by specifying temperature requirements, spatial constraints, energy demand profiles and interaction with other thermal or electrical systems.
– Adapting the deployment strategy of the system to match the operational, regulatory or mechanical context of the use case (mobility, sanitation standards, field durability).
– Participating in joint dissemination or co-funding proposals to scale up or replicate successful applications (e.g. Horizon Europe, LIFE, Innovation Fund).

Type of partnership

Research and development cooperation agreement

Commercial agreement with technical assistance

Type and size of the partner

- **Big company**
- **R&D Institution**
- **University**
- **SME 50 - 249**

Dissemination

Technology keywords

- **04005004 - Photovoltaics**
- **04005005 - Solar/Thermal energy**
- **04002012 - Other energy related machinery**

Market keywords

- **06003002 - Photovoltaics**
- **06003001 - Solar/thermal energy**
- **06007001 - Other energy production**
- **06009 - Energy Distribution**

Targeted countries

- **World**

Sector groups involved