

# Solar Polygeneration Collector for Combined Heat, Power, Hydrogen Fuel and Wastewater Treatment



## First R&D+I Hub meeting

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# First R&D+I Hub meeting

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## Executive Summary

The Polygenerating Solar Collector's Alliance (PolyGen Alliance) was successfully launched on 27 March 2026 through the organisation of its first official meeting within the SPECTRUM project.

The meeting brought together project partners to establish a shared vision for the SPECTRUM R&D+i Hub, aligning on its name, scope, purpose, and initial operational approach. The PolyGen Alliance was defined as a collaborative and flexible platform aimed at connecting research, industry, and innovation stakeholders working on hybrid solar technologies and polygenerating solar collectors.

The Hub focuses on system-level integration challenges, including the combination of heat, electricity, hydrogen production, and wastewater treatment, rather than isolated component development. The initiative aims to create a practical space for knowledge exchange, discussion of integration bottlenecks, and alignment between research outcomes and real-world applications.

The meeting also defined the initial communication strategy and identified next steps, including engagement with external experts and participation in international initiatives such as Task 72 - Solar Photoreactors for the Production of Fuels and Chemicals from the Solar Heating and Cooling Technology Collaboration Programme of the International Energy Agency (IEA SHC Task 72) and the EuroSun 2026 conference.

The milestone was successfully achieved, establishing the foundation for a growing community that will support SPECTRUM's dissemination, collaboration, and long-term impact.

## 1. Introduction

The SPECTRUM project aims to develop and validate an innovative solar concentrating collector capable of converting the full solar spectrum into three valuable energy vectors - heat, electricity, and green hydrogen - while simultaneously contributing to industrial wastewater remediation through photocatalytic processes. By integrating optical, thermal, and electrical subsystems with a photocatalytic IWW remediation process that also co-generates hydrogen using low cost and sustainable photocatalysts, the project seeks to demonstrate a novel approach to solar energy utilisation and sustainable resource recovery.

To maximise the project's impact and strengthen its connection with the broader research and innovation ecosystem, the establishment of a dedicated R&D+i Hub was identified as a key activity within dissemination and engagement efforts.

The Polygenerating Solar Collector's Alliance (PolyGen Alliance) was conceived as a collaborative platform to:

- connect expertise across research, industry, and applied innovation;
- address collector-level challenges in polygenerating solar technologies;
- support knowledge exchange beyond the project consortium;
- enhance the visibility and relevance of SPECTRUM results.

The launch of the PolyGen Alliance, corresponding to this milestone, represents a first step in building a structured yet flexible community around polygenerating solar collectors and their real-world integration.

## 2. Hub Launch Organisation

The first PolyGen Alliance meeting took place on 27 March 2026, in an online format.

The meeting was organised by MG Sustainable Engineering with the active participation of the SPECTRUM project partners as an internal coordination meeting. Targeted invitation where made to external researchers leading R&D projects and networks related with the topic of the SPECTRUM project.

The primary objectives of the meeting were to:

1. formally launch the SPECTRUM R&D+i Hub;
2. agree on the final name of the hub;
3. define the scope and purpose of the Hub;
4. discuss how the Hub supports SPECTRUM activities;
5. align on communication and engagement approaches;
6. identify next steps for development and external outreach.

The meeting included structured presentations and an interactive discussion session to gather input from all partners.

### 3. Concept and Scope

During the meeting, the identity and scope of the Hub were clearly defined.

The initiative was officially named as the Polygenerating Solar Collector's Alliance (PolyGen Alliance) after a voting between all attending members (see figure 1).



*Figure 1 SPECTRUM Hub voting*

The PolyGen Alliance was positioned as a collaborative and evolving community, a practical exchange platform, rather than a formal structure, and a space focused on collector level integration challenges, not only component-level innovation.

The scope of the PolyGen Alliance includes:

- hybrid solar technologies and system architectures;
- solar-to-hydrogen and solar-to-chemical pathways;
- industrial solar applications;
- integration with water and wastewater systems;
- environmental and economic assessment approaches.

In addition, the Alliance incorporates both technological and non-technological dimensions, including:

- modelling and simulation;
- experimental validation and methodologies;
- standardisation and KPIs;
- system integration and design;
- regulatory and market-related aspects.

A key principle agreed upon during the meeting is that the PolyGen Alliance should remain lightweight and flexible, avoiding complex governance structures while enabling meaningful collaboration.

## 4. Communication and Engagement Approach

A lean and targeted communication approach was defined to support the development of the PolyGen Alliance.

The strategy focuses on building a relevant and engaged network, rather than maximising volume.

Key elements include the creation of a dedicated section within the SPECTRUM website for the PolyGen Alliance, the development of a targeted sign-up mechanism for interested stakeholders, the integration of the Alliance's updates into the SPECTRUM newsletter, and sharing periodic updates based on relevant activities and outcomes.

Partners also discussed the importance of identifying key experts and networks for early engagement and leveraging existing initiatives (e.g., IEA SHC Task 72), as well as ensuring alignment between the Alliance activities and SPECTRUM research developments. This is aimed to ensure efficiency while maintaining strategic relevance.

## 5. Outcomes and Discussion

The meeting successfully established a shared understanding of the purpose and direction of the PolyGen Alliance.

Key outcomes include:

- agreement on the name and positioning of the PolyGen Alliance;
- alignment on a system-level integration focus;
- definition of a flexible and member-driven structure;
- identification of priority topics and thematic areas;
- agreement on a lean communication strategy.

The discussion highlighted the importance of:

- bridging the gap between research and real-world applications;
- addressing integration challenges across energy, hydrogen, and water sub-systems;
- fostering collaboration across disciplines and sectors;

Partners also contributed initial ideas for:

- potential external stakeholders to engage;
- thematic priorities for the first phase of the PolyGen Alliance;
- types of interaction and collaboration formats.

The meeting marked the transition from concept development to active implementation and external engagement.

## 6. Conclusion

The launch of the PolyGen Alliance was successfully achieved through the organisation of the first meeting on 27 March 2026.

The meeting established a clear foundation for the initiative, including its identity, scope, purpose, and operational approach. It also aligned partners on the strategic role of the Alliance in supporting SPECTRUM's dissemination, collaboration, and long-term impact.

By adopting a flexible and integration-focused approach, the PolyGen Alliance is well positioned to evolve into a valuable platform for knowledge exchange and stakeholder engagement in the field of polygenerating solar collectors.

This milestone represents an important step towards building a broader community around SPECTRUM technologies and enhancing the project's visibility and impact at European and international levels.