

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



## Scientific and Technical Report – M12

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V0.1	25/09/2025	Initial draft
V0.8	29/09/2025	Draft for review
V0.9	23/01/2026	Final draft after implementing comments, ready for editing
V0.9.1	23/01/2026	Final draft after editing, ready for approval
V1	23/01/2026	Final report

## Public Executive Summary

This report aims to summarize the technical and scientific progress of the project between April 2025 and September 2025 and to identify the main deviations regarding the work plan. During the second semester of the project, steady progress was achieved across technical, dissemination, and management activities, with tangible outputs delivered and key coordination mechanisms strengthened.

A Multimedia Resources Package (D6.3) was prepared under WP6. Moreover, the dissemination and communication activities advanced with the launch of a social media guide to support the development of the project outreach activities in specialized social media networks, the first project newsletter and the first press release. These actions, complemented by ongoing website updates and active participation in events, are consolidating SPECTRUM's external visibility and stakeholder engagement.

All WP7 tasks remained active covering the project coordination, the financial and administrative management, the scientific and technical monitoring of project activities and deliverables and the project risk management and quality assurance. In particular, the Risk Management and Quality Assurance Plan (D7.4) was finalized and is being implemented, with rolling risk monitoring and deliverable quality checks integrated into Steering Committee oversight.

Two technical work packages (WP1 and WP2), that form the basis of the SPECTRUM project concept and its technical developments, are ongoing. WP1 finalized the Guidelines on the potential of Industrial Wastewaters as sources of sacrificial agents for photocatalytic H<sub>2</sub> production (D1.1), a public report available in the project website. A Shortlist of industrial wastewater sources for SPECTRUM applications (MS1) was produced by screening 27 industrial wastewater (IWW) samples from 17 companies across nine sectors. Eight promising candidates were identified and at least two will be selected for laboratory and pilot-scale photocatalytic testing. The development of photocatalysts for hydrogen production with synergistic degradation of pollutants is ongoing with the synthesis and structural characterization of photocatalysts and its test in lab-scale photocatalytic experiments using synthetic ethanol or glycerol aqueous solutions and two glycerol rich wastewater samples from biodiesel production.

The definition of sub-component and collector level Key Performance Indicators was carried out, strengthening the technical framework for the design of the SPECTRUM-LT and SPECTRUM-HT collectors and the evaluation of the resulting prototypes. The optical, thermal and electrical design of both collectors is being carried out.