

Industrial Process Heat: The Potential of Hybrid Concentrated Solar Thermal and Electric Heating Systems



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BIO

Marco Colombi: Ph.D. student at Politecnico di Milano. His research focuses on concentrating solar thermal technologies for industrial processes and solar pyrolysis within the EU PYSOLO project, with emphasis on process modelling, MILP optimization, and techno-economic analysis.

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ABSTRACT

Concentrated Solar Thermal (CST) is an emerging option for industrial heat processes. At present, its use is mostly limited to low- to medium-temperature processes (50-250°C), with pressurized water, steam, or thermal oil as the main heat transfer fluids (HTFs). However, its competitiveness at higher temperatures has been explored less extensively.

This seminar presents the economic optimization of a CST-based system for supplying industrial heat in the 300-500°C range, using thermal oil and molten salts as HTFs. The study considers hybridization with resistive heating powered by photovoltaic and wind generation and includes the optimization of the collectors' azimuth angle for different locations and renewable penetration targets. For three representative locations, competitive costs were obtained in the European context under current market conditions.



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