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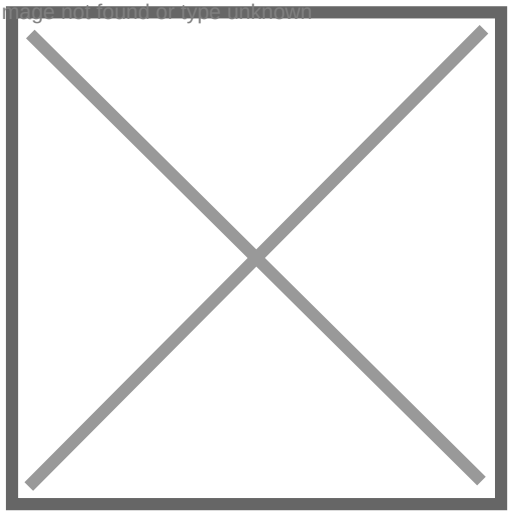

HORIZON-CL4-2022-TWIN-TRANSITION-01-17

HyInHeat

Full Title: Hydrogen technologies for decarbonization of industrial heating processes

Aim:

The main objective of HyInHeat is the integration of hydrogen as fuel for high temperature heating processes in the energy intensive industries. While some of the equipment is already presented as hydrogen-ready, the integration of hydrogen combustion in heating processes still needs adoption and redesign of infrastructure, equipment and the process itself.

Concept:
To reach this overarching objective within the project, furnace and equipment like burners or measurement and control technology but also infrastructure is redesigned, modified and implemented in eight demonstrators at technical centres and industrial plants. Besides hydrogen-air heating, oxygen-enriched combustion and hydrogen-oxyfuel heating is implemented to boost energy efficiency and to decrease the future hydrogen fuel demand of the processes. This might result in a total redesign of the heating process itself which will be supported by simulation methods enhancing digitalisation along the value chain. Since critical production processes are converted, it is a fundamental requirement to maintain product quality and yield. Priority is also given to the refractory lining to prove sustainability. From an environmental perspective, new concepts for NOx emission measurement in hydrogen combustion off-gas are developed. Material flow analysis and life cycle analysis methods will support the comprehensive cross-sectorial evaluation, which allows the determination of the potential for the implementation of hydrogen heating processes in energy intensive industry. With these activities, HyInHeat contributes to the objectives of decreasing CO2 emission of the processes while

increasing energy efficiency in a cost competitive way keeping NOx emission levels and resource efficiency at least at the same level. The project is located in the Technology Readiness Level (TRL) 3 to 7 and thus incorporates the development stages from experimental technology development to prototypes in an industrial environment. Within this framework, eight furnaces will be converted on a pilot and industrial scale and the respective processes will be investigated in detail.

Start date:
01/01/2023

End date:
31/12/2026