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Decarbonization of industrial high-temperature processes with an innovative Electric Gas Heating

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Transitioning industrial processes to electric power offers the potential to decrease CO2 emissions by utilizing renewable energy sources. Electric gas heating enables more compact and efficient setups compared to traditional combustion heating methods.
Expected huge market demand of high temperature gas electrical heating in different industrial sectors cannot be covered only by available state-of-art technologies, both in terms of scale and in meeting techno-economic needs.
In this context, SMS developed a proprietary solution consistent with the requirements in iron & steel industry, with potential application in other industries. Better feasibility than existing technologies is expected, due to ease scalability, high efficiency, temperature rise and optimized equipment cost. The innovation of this technology consists in a combination of wire resistance for heating with refractory checker used in Blast Furnace Hot Stoves. This equipment is suitable to work with different type of gas, including Hydrogen and CO2.
A prototype of a 0.5 MW electric heater, maintaining identical internal geometry to its industrial version, has undergone successful testing. It demonstrated stable performance at 1000 °C and responded smoothly to operational variations. The paper discusses the distinctive benefits of this solution and explores its potential applications.

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