IMPROOF: INTEGRATED MODEL GUIDED PROCESS OPTIMIZATION OF STEAM CRACKING FURNACES

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Abstract: In IMPROOF the steam cracking furnace of the 21st century will be developed and demonstrated. The ambition is to drastically improve the energy efficiency compared with the current state-of-the-art, and this in a cost effective way. Simultaneously the greenhouse gases and NOX emissions per ton ethylene produced will be reduced by 25%. This project will implement and combine several of the latest technological innovations in the field of fouling minimization and energy efficiency at pilot and industrial scale. These include the use of renewable fuels, oxy-fuel combustion, and high emissivity coatings which emit in the non-absorbent flue gas spectrum. Also, new advanced high temperature alloys that lower the coking rate will be implemented in combination with novel 3D reactor technologies leading to reduced coking and enhanced heat transfer between flue gas and the process. In 2019, the furnace will be deployed at the demonstrator at commercial scale using propane as feedstock based on the experimental and modeling data provided by the industrial partners, knowledge institutions and research organizations.