Paper 01: Electrification of Process Heat from technologies to large scale implementation

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Abstract:

Industrial emissions come mostly from process heating powered by fossil fuels. To reduce environmental footprint and transition towards cleaner energy, a growing opportunity is to implement electrical heating, leading to new power system applications. These technologies benefit from better efficiency, lower maintenance, more accurate temperature control compared to fired heaters.

However multiple challenges are associated with the adoption of process heat electrification.

This paper explores the different technologies and possible applications of electrified heaters from the process efficiency perspectives, as well as the power control solutions according to the temperature control accuracy and flexibility. It addresses the impacts on power system in terms of power quality covering control strategy options according to heating circuits technology. It also unveils details on a large-scale electrical heater's implementation at a European End-User Refinery, illustrating the collaboration with a Process Licensor, how specific requirements for electrical, safety features, compacity and modularity have been considered for implementation.