

ENERGY AND ENVIRONMENTAL ASPECTS OF INDUSTRIAL HEAT SAVING IN VARIOUS SITUATIONS

Variny M.¹, Kšiňanová, M.¹, Furda P.¹

¹Department of Chemical and Biochemical Engineering, Faculty of Chemical and Food Technology, Slovak University of Technology in Bratislava, Radlinského 9, 812 37 Bratislava, Slovak republic

Large industrial facilities and industrial clusters traditionally operate a combined heat and power unit serving as marginal heat source. This unit can consist of either a steam Rankine cycle unit or comprise a Combined Cycle-based cogeneration unit. These distinctive designs differ by both heat to power ratio and delivered heat quality (temperature); both parameters being further impacted by the unit's operation. A change in heat quantity exported from the combined heat and power unit can thus have various impact on cogenerated electric energy quantity and released greenhouse gases emissions. This contribution aims at elucidating this aspect of industrial heat saving projects with the goal to deliver valuable input for industrial energy managers and decision makers. Rankine and combined cycle units are modeled, providing a realistic assessment of energetic and environmental impact variability of their operation change due to the variable heat export. Greenhouse gases emissions generated in external power sources are considered as well.

Funding: This work was financially supported by the Slovak Research and Development Agency, Grant No. APVV-15-0148 and APVV-18-0134.