

Heat pumps for new developments in industrial electrification

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Abstract

In the energy efficiency directive of the European Union the use of industrial waste heat has a central role, and it shall be used wherever possible either directly in the industry or secondary in district heating systems. The presentation is focusing on the direct reuse in the industry in the example of the the chemical industry and includes one resent industrial example with the world largest steam generating heat pump in industrial operation.

In the further course the presentation is discussing the collaboration of such heat recovery heat pumps with innovative combined heat, power plants with gaseous and liquid fossil and biogenic fuels, and electric steam generators as a system for electricity flexible industrial production sites. Such “new” industrial production sites can operate flexible in the electric grid with positive and negative electrical generation serving the future demands of electric grids, which have to cope with the variations of the renewable generation even with it extremes as the ”dark-wind-lull” and the “light-sun-breeze”. Due to this fact it can be shown that such industrial sites or even industrial clusters as chemical parks can act similar or better as back-up power plants planned all over the European countries as e.g. recently discussed in the German politics. For this reason, such extended operation of industrial clusters has the potential to avoid or reduce economical investments needed for the grid stability.