Energy-efficient Use of Low Grade Heat in Process Industries for Local Energy Systems

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Low grade heat available in process industry is often wasted without heat recovery and upgrade. Heat integration between low grade heat in process industry and local energy systems can be considered, as the utilization of low-quality heat may not be economic, but potential heat sinks may be existed in local energy systems to utilize low grade heat from neighboring plants. In this work, a design methodology is introduced to systematically screen the opportunities of waste heat recovery between a plant and local energy systems, and evaluate the potential economic impact of such integration. The demand and supply of energy in local energy infrastructure is typically dynamic by nature, which will be considered in the current study by considering heat storage and degradation of heat. Case study will be presented to validate the methodology presented and to demonstrate the benefits of using heat integration between process industry and local energy systems.

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