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Technical and digital twin concept of an industrial heat transfer station for low exergy waste heat

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Abstract

Within the German industrial sector, more than 70 % of final energy is used to supply processes with thermal energy. Nonetheless within manufacturing systems substantial quantities of heat are released as low exergy waste heat due to technical and organizational barriers. This paper presents a concept and digital twin model for an industrial heat transfer station connecting industrial thermal networks with district heating systems to integrate low exergy waste heat from production processes efficiently. A case study of an industrial site shows potential waste heat utilization of up to 70 % while reducing operating expenses by up to 6 %.

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