Waste Heat Recovery in the Steel Industry

A simulation-assisted study revealed that the steel mill's heat recovery potentials should be used to generate electricity, using decentralized conversion technology.

Description of the case study:

Assessment of waste heat recovery potential

The Georgsmarienhütte GmbH steel mill belongs to one of the most energy-intensive sectors of the German industry. It is therefore essential to identify all potential energy-saving possibilities and to test their likelihood of implementation. For this reason, Georgsmarienhütte GmbH launched a project to systematically evaluate the waste heat recovery potential of the steel mill. The goal was to identify, evaluate and estimate the use potential of heat sources and heat sinks. A simulation-assisted study was set up in order to technically and economically assess the existing potential of use.

Analysis of heat sources

The analysis revealed more heat sources than heat sinks on the site of Georgsmarienhütte GmbH. Developing a holistic heat concept from the on-site investigations was challenging because the simultaneous influence of the time sequence, the amount of available waste heat, the carrier medium, the temperature level as well as the physical
characteristics of the site and distances between sources complicate assessing the potential of use. Several possible uses were considered, including conversion into electricity, cooling and use for heating purposes. A dynamic (time-dependant) simulation of the different processes was made.

Applicability to other businesses

The simulation results revealed that the heat recovery potentials should be used to generate electricity, using decentralized conversion technology. Intelligent connections must be set up in order to reduce energy losses.

This demonstrated that a simulation-assisted study can be successfully employed to map the current heat situation, present potentials and support the planning of measures. A purely static analysis, in contrast, would not have sufficed to illustrate the complex interdependencies and to identify and assess optimization potential. Because the project approach was designed in a universally valid way, it can be adapted and used in other businesses of the same sector.

Project theme:
Demonstration of a structured, simulation-supported concept development for waste heat recovery in the steel industry, using Georgsmarienhütte GmbH as a case study.

Project implementation:
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Quelle in deutscher Sprache: Deutsche Bundesstiftung Umwelt
https://www.dbu.de/123artikel33190_341.html [3]

What was the type of green solution? Please select the type of solution.: Technology/Product [4]
What does the featured solution contribute to?: Resource efficiency
Which technology area(s) does the case study belong to?: Resource efficiency [5], Energy efficiency [6]
How was the green solution financed?: Other [7]
Partners:
- Georgsmarienhütte GmbH [8]

Relationship type:
Company that went 'green' by adopting the green solution

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Links
[1] mailto:marketing@gmh.de