RECP Best Practice Catalogue

Steam Mapping and Monitoring
Developed within the framework of MED TEST II

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

switchmed

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Best Practice - Steam Mapping and Monitoring

SECTOR:	**Others**
SUBSECTOR:	Manufacture of refined petroleum products
PRODUCTS	Oil-based lubricating oils and paraffin wax.
CATEGORY	Process control or modification
APPLICABILITY	Utilities

COMPANY NAME	---
COMPANY SIZE	Large

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Description of the problem (Base scenario):	The company has three natural gas steam boilers with a rated capacity of 60 t/h each, used to supply the production complexes with the required steam (Superheated steam, 14 bar, 279 ^{o}C) for the turbines. After use within the turbines, the steam is used at a pressure of about 4 bar for heating purposes in the production facility. Typically, all the 3 boilers are in operation; presumably for safety reasons, as the consumption of steam is just at the limit of what 2 boilers can handle. This way of operation brings the boilers to a mode with low energy efficiency.
Description of the solution	It was necessary to map the steam consumption in more details to be able to optimise this energy system. Results of the steam mapping based on estimates provided not only a good overview where are the biggest challenges but indicated also where can be achieved the most energy savings. It was concluded that about 13.5 t/h of steam can be saved based on the steam mapping, visual observations during the walkthrough in the production facility and based on the discussion with staff having in-depth knowledge of the company's steam network. Introducing a good monitoring system for the steam consumption was advised to get realistic data from the steam meters. The savings can be realized through implementation of the following actions: • Improvement of insulation of pipes. • Reduction of leaks. • Replacement/repair of steam traps that are not working properly.

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Economic Benefits	All these measures together with the SCADA system will optimize the boilers operation and their efficiency leading to water and energy savings. Water saving is about 40,000 m^3/y (4% from the baseline) Water cost saving is about 40,000 Euro/y Energy saving is about 35,865 MWh/y (5% from the baseline) Energy cost saving is about 549,930 Euro/y Total cost saving is 589,930 Euro/y
Environmental Benefits	Water saving of about 40,000 m^3/y (4% from the baseline) Natural gas saving of about 3,188,000 m^3/y (35,865 Mwh/y)-which represents 5% from the original baseline. Reduction in CO_2 emissions of about 7,241 t/y

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Capital investments & financial indicators	Total investment cost is in the range of 150,000 Euro depending on the level of details and number of points to be monitored. Payback: 0.25 year
Suppliers	Different monitoring systems are well known for industrial applications.
Other aspects	The information system for the steam consumption at each user is a must to have good records with the savings, and to monitor the performance is such a huge network.
Implementation	This action is in full feasibility study phase

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Replicability sectors	**The same concept can be replicated in:** All companies with high steam demand and several steam users.
Aspects to investigate for replicability	Steam balance. Supply and demand of steam consumption along all users.
Useful resources	