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**Summaries**

**6**

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## PROCESS INTEGRATION ANALYSIS OF BOILER HOUSES: CASE STUDIES AND RETROFIT

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In Ukraine an incentive for energy savings and pollution reduction is perhaps even more important than in the other European countries. The lack of natural energy resources and a need to cope with Chernobyl heritage are amongst the reasons.

Of total energy consumption about 75% is heat energy and about 80% of heat is produced by various kinds of boiler houses. Thus heat satisfies the need of district heating systems and hot water.

To tackle this very crucial problem a novel approach has been needed. In this work the results of case studies of big boilerhouses are discussed. A typical boilerhouse produces the heat energy for district heating system for the part of a city with population 120,000 people. The heat capacity of the boilerhouse is about 170 MW consuming 30,000 m<sup>3</sup>/h of gas. The boilerhouse consist of six hot-water boilers, system of water treatment for boilers feeding, systems of decarbonisation, deneration and heat exchangers. A part of heating water is used as hot tap water (opened system), so the feeding of boilerhouse is more 1,000 tons of fresh water per hour.

The main sources for total energy saving are: decreasing the flow of district heating water through boilers, eliminating the usage of district heating water as hot tap water (the "closing" of system) and recuperating the heat of flue gases.

To investigate the potential for energy savings Process Integration methodology was used. The integration of boilerhouse heat exchange networks with district heating system was analysed. The completion of all steps of retrofit following the PI targeting provides a scope for decreasing the consumption of gas by 40% and water as well.

The implementing of effective heat transfer equipment was take place too. Twelve Alfa-Laval gasketed plate heat exchangers were installed to isolate the boilers from district heating water, which contains dirties. It lets to prolong service life of the boilers.

The working of plate heat exchangers during half a year lets to say that this equipment is a good tool for energy saving retrofit.