SMALL ENTERPRISES

Uroš Grošelj

Energy optimization of steam production and heat recovery in the largest bakery in the north east part of Slovenia

Company:
Žito d.d., PE Kruh pecivo Maribor
Slovenia

Products/Services:
Manufacture of bread; manufacture of fresh pastry goods and cakes

No. of employees:
100

Energy concept description

The goal was to reduce the natural gas consumption for process needs.

Existing situation

5x too big steam boilers are installed & there is no heat recovery on existing process thermal oil boilers.

Solution

Replacement of steam boilers (dimensioned to real process needs) and installation of heat recovery units in thermal oil boilers with the aim of pre-heating of steam boilers feeding water. More, existing hot sanitary water treatment with steam will be replaced with existing hot water boiler (installed for heating purposes).

Effect

Yearly reduction of natural gas consumption for more than 2 000 MWh.

Results

Form of energy	Natural gas
Energy saving potential	2 185 MWh/year
Cost saving potential	98 000 EUR/year
CO_2 – saving potential	437 t/year
Project total costs	170 000 EUR
Payback period	1.7 Years
Date of implementation	November 2015

Results: period gas consumption measurements show even better results as predicted (depends on production)

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Thomas Hau

Environmentally compatible design of water pumps in the supply network

Company:
OsthessenNETZ GmbH
Germany

Products/Services:
Electricity, gas and water network operators

No. of employees:
250

Energy concept description

The pump systems in the water supply network are not yet controlled intelligently. It takes stock of the technical equipment to know the actual state. By calculating the best hydraulic efficiency of the pumps, the pump systems that have the largest deviations from the best point (BEP) become visible. In these a digital flow measurement including frequency converter is installed so that the pumps are only operated if water is needed. By means of the intelligent control of flow measurement and frequency converter, the greatest technical and economic benefit can be achieved. After implementing the measures, the West XII well saves 163 MWh of energy per year and reduces 85 t of CO2, resulting in an energy price of € 0.197 / kWh for € 32 000.

Results

Form of energy	Electrical power
Energy saving potential	163 MWh/a
Cost saving potential	32 000 EUR/year
CO_2 – saving potential	85 t/a
Project total costs	6 043 EUR
Pay-back time	0.3 Years

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Roman Hutta

Reconstruction of steam and condensate loop of the paper machine

Company:
Spirax Sarco
Slovakia

Products/Services:
Hygienic paper

No. of employees:
200

Energy concept description

The purpose of the reconstruction of steam and condensate loop is to increase energy efficiency which means to maximalize the usage of potential in supplied heat energy. The basic situation and potential is given by the venting of blowthrough and flash steam into atmosphere. Solution proposal is simple and is based on recovering of blowthrough steam in technological process which means reduction of direct boilerhouse steam consumption. This is assured by means of installation controlable thermocompressor with accessories. Consequently this solution is completed with a flash steam recovery unit which consists of flash vessel with exhaust vapour condenser and the heat is used for process water heating. Every kilogram of flash steam used in this way is a kilogram of steam that does not need to be supplied by boiler- this is not only economical and environmental benefit, but it also reduces the quantity of expensive boiler feed water.

The proposed solution will save totally 7 460 MWh per year, which means 44% of costs for heat energy production in comparison to measured year 2015. These arrangements consists of thermocompressor installation and flash steam recovery unit have a high degree of the return on investment and payback time is 8 months only.

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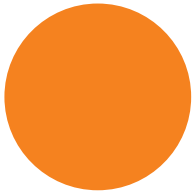

Michael Labek

Woodchip drying and underground buffer storage in the fortress hill

Company:
BIOENERGIE Kufstein GmbH
Austria

Products/Services:
District heating and electricity from biomass

No. of employees:
9

Energy concept description

Aims

Reduction of wood chips consumption
Use of unused heat
Improvement of boiler efficiency
Load peaks should be smoothe
Reduction of gas consumption

Base situation

The plant consists of a boiler with a firing capacity of almost 28 MW/h thermal and a downstream steam turbine with about 5 MW/h of electrical peak power. The residual heat is fed into the district heating network. Currently, the waste heat from the CHP and the boiler house is not used and partially cooled with river water. For firing, wood chips with a residual moisture of 48% to 55% are used. For peak load coverage, additional gas boilers are used.

Optimization potentials / weak points

The use of wet wood chips not only reduces the efficiency of the boiler but also makes it possible to lose rotten wood. In summer, the system has a low electrical efficiency in base load operation. The waste heat from the buildings is not used.

Proposals of solution / Optimization possibilities

With the woodchuck drying, unused heat can be sensibly used. The boiler efficiency increases and the material consumption decreases. A buffer could smooth the load spikes and lower gas consumption.

Effects

- Material savings of 4% per year
- Boiler efficiency increased by 0.8%
- Use of unused waste heat
- Smoothing the load peaks in winter
- Reduction of gas consumption

Results

Form of energy	Natural gas
Energy saving potential	3 700 MWh/a
Cost saving potential	132 000 EUR/year
CO_2 – saving potential (according to CO_2 calculator Environment Federal Office, UBA)	Electricity: 0.302 kg/kWh * -378 720 kWh = -114 tons Natural gas: 2.467 kg/m³ * 49 800 m³ = 122 tons District heating: 0.191 kg/kWh * (720 MWh + 3 700 MWh) = 844 tons Total: 852 tons/year
Project total costs	409 000 EUR
Payback period	3.1 Years