Recovery of waste heat

from 6 kilns on 6 roof tile dryers

Pontigny
Burgundy Franche Comté France

Pictures: Modification of kiln hoods at the Wienerberger roof tile manufacturing site to capture high-temperature fumes - Chimney flames from a roof tile kiln

Industry	Decarbonisation	Energy savings	Productivity gains
Ceramics Tilery - brickworks	500 tonnes of CO_2 saved per year*	15% reduction in energy consumption	5 % productivity gains

The project

Wienerberger wants to reduce the carbon impact of its Pontigny production site.

Eco-Tech Ceram is proposing the installation of an Eco-Stock® stack heat exchanger.

The Eco-Stock® recovers waste heat from their 6 kilns and sends it to the 6 dryers.

**Based on an emission rate of 0.201 kgCO2/kWh consumed*

Customer needs - requests

Wienerberger wanted to find a way of optimising the waste heat coming out of 6 kilns at a unit producing over 95% of the Pontigny site's output (Burgundy - France Comté). The presence of 6 dryers in a nearby building meant that it was possible to envisage recovery from these processes.

The aim was to provide the heat required by the dryers by recovering waste heat.

Project progress

Analysis of:
➢Sites: 6 kilns
➢Needs: 6 dryers
➢On-site installation and remaining fume extraction constraints.

The characterisation of the deposits/needs led to the planning of a heat storage solution via a pair of Eco-Stock® in order to be able to restore it to the dryers. As the chronograms of the ovens and dryers are not synchronised, the Eco-Stock® solution means that this heat release can be staggered and adapted as required.

This also avoids having to change production programmes.

Eco-Tech Ceram achievements

➢Study of the chronograms of baking ovens and identification of the periods of the baking cycle when the waste heat exceeds 350°C.
➢Drafting of PFD/PID
➢Overhaul of kiln hoods (design and manufacture)
➢Proposals for solutions in terms of process regulation
➢Sizing of an Eco-Stock® solution: storage capacity of 2.3 MWh per tank
➢Thermal and aeraulic study of the flue gas network
➢Energy and environmental assessment
➢Proposal for a third-party financing solution
➢Design of the waste heat capture and recovery solution

Description of the proposed solution

Recovery of waste heat from UP2's 6 furnaces to UP2's dryers via ceramic storage.

This solution will save up to 2,400 MWh.

Detailed description of the proposed solution

The fumes are recovered by a spigot on the chimneys of each furnace. The management of fume evacuation has been modified to ensure controlled rather than passive dilution. This dilution is regulated according to the temperature of the fumes leaving the furnace, to ensure a recovery temperature of less than 600°C.

Dampers are installed on the chimney downstream of the spigot and on the spigot, to isolate the equipment from the solution in place. The existing control devices on the furnaces (pressure sensors), air curtains and dampers are retained, so furnace operation is not affected.

The fumes are sent to the Eco-Stock® and stored. A pair of storage units is positioned, allowing simultaneous charging and discharging to optimise recovery.

To unload the Eco-Stock®, ambient air is sent in counter-current.

The discharged heat is used to supply the various dryer chambers, replacing the burners. The dryer's aeraulic network is virtually unchanged, with only a connection made to each chamber downstream of the existing burner and upstream of the chamber injection to inject the hot air from the Eco-Stock®.

The burners and combustion air supply fans remain in place but are only switched on if the recovery solution malfunctions. The Eco-Stock® discharge flow rate is regulated to maintain the same mixing temperature (air injected into the chambers).

This solution was studied in the case of two production volumes, A and B. The aim is to achieve a design compatible with both cases, so that the recovery solution operates independently of changes in Wienerberger's activity.

The technical data is therefore identical for both cases, but changes in economic and environmental data are indicated wherever necessary.

Tests during the commissioning of a high-temperature fume collection system on one of the tiling kilns and validation of the command control and mechanical systems, Pontigny site.

Installation of two Eco-Stocks® at the Pontigny site.

The **energy transition** and the **decarbonisation** of industry are no longer unattainable challenges!

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