Bäckerei Evertzberg, Remscheid, Germany

„The objectives are clear," says Oliver Platt taking a look at the new state-of-the-art production hall - calling it a bakehouse would not do it justice. The master baker is the head of production for Evertzberg Bakery in Remscheid, Germany. Since November 2012, they have been producing their goods in a new building equipped with technology for the future. MIWE is also on board, providing technology for heat recovery as well as oven technology.

Three objectives were to be implemented in the new building. „And we succeeded in doing so," adds Platt with a hint of pride. Looking back, Oliver Platt remembers the old location simply did not have enough space to ‚grow'. The delivery area had reached its limits and made further expansion impossible. Quality advances were also impossible as there simply was not enough space for cooling.

Accordingly, one of the goals was to make the products even better with appropriate technology as well as generously-proportioned and modern work stations. Another goal was to fulfil extremely strict hygienic requirements. The new building reaches a standard which is otherwise only achieved in the meat processing sector. This also includes a clear separation into black and white areas, as well as a high level of hygiene and hygiene awareness among the staff.

Similar objectives are shared by many new building projects in the baking industry. „We also want CO_2-neutral production," is how Oliver Platt explained the third and most ambitious goal for the new building. Admittedly, this goal has not been reached yet. But the Evertzberg family has already taken the first steps towards the goal with their latest investments - successfully, too. The photovoltaic system on the building roof supplies their basic electricity demand.

However, other energy saving measures are less conspicuous. For example, the cooling systems use water-cooled heat exchangers (instead of standard air-cooled systems). For this purpose, six kilometres of piping was laid on the company's car park. The piping transfers the heat there →

The excess energy from rack and wagon ovens is fed to a MIWE eco:nova which is installed via a cooling cell. This makes long pipelines unnecessary and saves space.

Flue gas and steam are routed separately from the rack ovens MIWE roll-in e+ (pictured) to a MIWE eco:nova. They receive further energy from the leftover steam from three thermal oil wagon ovens.

Surplus energy from the rack ovens in the form of hot flue gas and energy-rich steam can be made available for heat recovery.

in winter. In summer, the hot water is cooled via 15 geothermal probes which extend up to 100 metres underground.

The waste heat from the cooling systems is also incorporated in the company's heat recovery concept. The concept was drawn up with an energy consultant. The consultant also pointed out that a lot of energy could be recovered from the ovens in particular. That's good news for the environment, thanks to the lower CO_2 emissions, but also good news for the company's finances thanks to the lower energy costs.

Just one look at the production hall is enough to see that a lot of energy can be recovered. It features a large tank with a capacity of 30,000 litres. This multi-layer storage tank buffers energy as water at different temperatures. „The hottest water goes to the rack dishwasher. The slightly cooler water is still hot enough to power the underfloor heating system in the entire building," explains Oliver Platt.

The heat is supplied by a wide range of oven systems. For example, the new production facility at Evertzberg includes a multi-deck continuous oven and two wagon ovens heated with thermal oil. These ovens were taken over from the old operations. Two tube coil deck ovens and four rack ovens of the MIWE roll-in e+ type were added. Master baker Platt: „We have different oven systems as we wanted the perfect baking conditions for each of our products."

Products which require a tender crisp crust are baked in MIWE rack ovens. Equipped with the modern TC control system, baking results with consistently excellent quality can be achieved, batch after batch. While it is probably the most economical rack oven in the world, it still needs energy - but any excess energy is made available for heat recovery as hot flue gas and energy-rich steam.

Flue gas and steam are fed separately to the heat recovery system MIWE eco:nova. Put simply, eco:nova is just an elongated heat exchanger. Special stainless steel heat exchanger plates - the first of the special features - transfer the energy in the flue gas and steam to another medium. The other medium is heating water, which is then fed to the buffer storage tank.

Flue gas and steam have to be separated, as the two have different energy densities. Heat recovery would be far less efficient if they were transported together. All four rack ovens, as well as the steam from the two wagon ovens are connected to a MIWE eco:nova.

The eco:nova also controls the chimney draught for the individual ovens. It can be adjusted separately for every oven via the heat recovery system control unit. A positive side effect of this is that it prevents fluctuations in the baking result due to air pressure, as the chimney draught is always constant. Another side effect which also saves a lot of money is the reduction of the number of chimneys required. „You now only need one chimney away from the eco:nova, instead of one for each oven," explains Oliver Platt.

However, piping is required from the ovens to the eco:nova. To make this as efficient as possible, the MIWE eco:nova is really fitted ‚in the air' in the production hall at Evertzberg. It is located on a custom platform suspended from the hall ceiling. That allowed it to be positioned optimally for technical purposes. It also means that the equipment on the floor did not have to be taken into consideration.

A second MIWE eco:nova also literally soars over the heads of the bakers at Evertzberg. It uses excess energy from the two nine-oven tube coil deck ovens. It is located above the oven, which reduces piping distances and also saves space on the floor.

But even all of that was not quite enough. Energy is also recovered from the large thermal oil continuous oven. The MIWE eco:nova required for this is located in the central heating boiler room. It heats the thermal oil for the continuous oven and the three wagon ovens. Outflowing flue gas is routed directly to the heat recovery system. From the production hall, the steam comes from the continuous oven and transfers its residual energy to the heat recovery system.

The energy recovered by the three MIWE eco:nova units is stored in the buffer storage tank mentioned above. From there, the energy is passed on to the respective consumers as required. „It was particularly important for us that the companies involved worked together smoothly," recalls Oliver Platt. Besides MIWE, a planning office which was responsible for overall planning and a building technology company were involved in the project. Oliver Platt called the cooperation exemplary.

The interfaces between the various systems were clearly regulated, as was the data required for the measurement and control technology. Like the interfaces to oven technology, interfaces of the systems to the energy loads/consumers are important.

Owner-user Evertzberg wanted to minimise interfaces where possible. That's why the contract for all chimney technology and piping was also awarded to MIWE. Oliver Platt: „That gave us certainty that a top job would be done." An incorrect pipe diameter can quickly create problems and reduce the effectiveness of the system.

Which takes us to the most important question of the entire project: Is all the trouble worthwhile? „Yes," says Oliver Platt. The results even exceeded the analyses and calculations made in advance. „We recover more energy than was calculated." The burner installed as a backup for hot water →

The multi-layer buffer storage tank has a capacity of 30,000 litres to store the recovered energy and provide it when required.

One MIWE eco:nova is supplied by flue gas from the central heating boiler for the thermal oil ovens. It is located directly beside the central heating boiler.

and heating are therefore seldom required. Even in winter, it was rarely switched on.

„But we want more," adds master baker Platt with an eye to the future. For example, the central heating boiler for the thermal oil system is designed to use renewable fuels as well as gas. They have made a good start on the way to CO_2-neutral production. The heat recovery systems and economical rack ovens by MIWE contribute to this.

Overview of the heat recovery technology:
MIWE eco:nova for four MIWE rack ovens roll-in e+, and three wagon ovens
MIWE eco:nova for two tube coil ovens
MIWE eco:nova for thermal oil continuous ovens
Three-layer buffer storage tank for 30,000 litres of water

Oliver Platt says:
„We chose MIWE for heat recovery as they can also integrate other oven systems and heat supply systems (refrigeration units). It is important to specify exactly where the interfaces of the individual systems to one another are, and which data is to be provided or taken from there for the measurement and control technology. In my opinion, it makes sense to commission one company to provide both heat recovery and chimney technology systems, as we did."

Master baker Oliver Platt, production manager in the bakery Evertzberg.

A brief overview of Bäckerei Evertzberg GmbH & Co. KG	
Managing Directors: Dieter + Stefan Evertzberg Karl-Kahlhöfer-Straße 25 42855 Remscheid	
Branch outlets:	34 + retailers (approx. 5 per cent share of turnover)
Employees	
Production:	60, of whom 9 are apprentices
Sales:	oughly 200, of whom 6 are apprentices
Shipping department/logistics:	30
Administration:	10
Sample prices:	
Hard rolls	0,30 Euro
Rye-and-wheat bread 1,000 g	3,15 Euro
Special breads 750 g	2,85 Euro
Danish-style pastries	1,20 Euro

Stand: 0613