Jura Cement AG, Wildegg cement works

The redesign of its high-performance ventilators will enable Jura Cement AG in Wildegg to save nearly 700 MWh per year.

Jura Cement AG (JCF) produces nearly 2000 tonnes of clinker or 2300 tonnes of cement daily in Wildegg (AG). The cement factory has been modernized several times since its founding in 1890. With 34 years in operation, the current cement kilns dating back to 1984 are some of the most recent in Switzerland.
In addition to the 56-metre long rotary kiln, the distinctive silos, mills and conveyors, the ventilators form an important component of the cement works. They provide the airflow for combustion, transport part of the atomized material and serve to cool the clinker produced in the rotary kiln.

The Wildegg cement factory has seen several changes since the 1980s: instead of coal and heavy oil, almost 80 % of the kiln's power comes from renewable fuels such as old tyres, synthetic waste and many other residual materials. Various filtration systems have been transformed. Countless steps have been taken to cut emissions (of noise, dust and vibrations). The considerable waste heat released by cement production is used to generate electricity and to power the district heating system for the commune of Wildegg.

As a result of these various changes, the operating points of some fans have also been moved. After verifying ventilators at current operating points, JCF decided to replace the kiln exhaust ventilator (1.7 MW) and the six clinker cooler ventilators by new, more efficient and optimally sized ventilators (two of the total of 8 ventilators had already to be replaced in the last years). For the clinker cooler, the old motors were also replaced by much more efficient models.

All installations have been fully automated and feature continuous measurement. Initial assessments show that elec-

Cement factory Wildegg

Left: the kiln exhaust ventilator before transformation, right: the set of clinker coolers before transformation

Left: the old ventilator, right: the new, more efficient and optimally sized ventilator

tric energy consumption for the new ventilators running at full speed has dropped by almost 90 kW. With round-the-clock production, this means an energy saving of some 720 MWh per year, almost the equivalent of a small-scale manufacturing company.

This project is supported by the ProKilowatt subsidy programme under the auspices of the Swiss Federal Office of Energy.

«The new outsized ventilators enable us not only to save energy but also to boost our power reserves.»

Urs Portmann,
JCF Energy Coordinator

Topmotors
Industry accounts for around one-third of electricity consumption in Switzerland. Roughly 70 % is due to electric drive systems. Topmotors' priority is to create a positive effect by encouraging the use of highly efficient motors and a transition to intelligent controls. All Topmotors events together with practical information are covered here:
www.topmotors.ch

Comparison between the old and new

Kiln exhaust ventilators: rotor and housing replacement		
	Before	**After**
Motor	ABB AMI 500L6L BAFH three-phase medium-voltage motor, year of manufacture 2015, 1770 kW with a separate frequency converter	unchanged
Ventilator	η = 80.7 %	η = 84 %
Specific energy consumption	P_{el} = 1 563 kW	P_{el} = 1 501 kW
Operation time	approx. 7 800 hrs/a	approx. 7 800 hrs/a
Energy consumption	12 191 MWh/a	11 711 MWh/a

▌Cost savings per year: 480 MWh
▌Payback: 7.7 years without subsidies, 6.5 years with subsidies

Clinker cooler ventilators: Replacement of motors, rotors and housings		
	Before	**After**
Motors	8 motors of different ages with separate frequency converters	All IE3 motors with frequency converters
Ventilators	Efficiency unknown	η approx. 80 %
Specific energy consumption	P_{el} = 316 kW	P_{el} = 285 kW
Operation time	approx. 7 800 hrs/a	approx. 7 800 hrs/a
Energy consumption	2 465 MWh/a	2 223 MWh/a

▌Cost savings per year: 242 MWh
▌Payback: 10.1 years without subsidies, 8.5 years with subsidies