



Full-steam ahead with sugar beets

The system was ready right on time for the sugar beet campaign. In total, 72 tonnes of steam generated from two highly efficient Bosch double-flame tube boilers were put into operation at SLOVENSKÉ CUKROVARY s.r.o. in late summer of 2021. The project was impressive not only in terms of sustainability, but in many other ways.

Transforming sugar beet into pure crystallised sugar is a multi-stage process that uses a large quantity of steam. In the southern Slovakian town of Sered', SLOVENSKÉ CUKROVARY s.r.o. processes around 5000 tonnes of sugar beet every day. As part of the global AGRANA Group, the company's top priorities are sustainable processes, energy efficiency and the careful use of resources. These values were also reflected when an entirely new steam supply system for the factory was fitted. For this major project, SLOVENSKÉ CUKROVARY found partners in Bosch and general contractor PPA CONTROLL, a.s. „Both companies' pooled expertise enabled professional management and implementation,“ says Marek Ivanovic, head of the Bosch industrial boiler team in Slovakia.

A ZFR Universal steam boiler system forms the core of the

new boiler house, which PPA CONTROLL built from scratch in the space of six months. The team from Bosch configured and manufactured the complete boiler system precisely according to the specific customer requirements. To keep the steam generation process as sustainable as possible, the boilers are also configured for biogas operation. The factory treats production waste water created by the beet processing and uses it to generate biogas, which partially replaces the fossil secondary fuel of natural gas. The NO_x emissions are under 80 mg/Nm³. Another feature of the system is the boiler design – each of the boilers is equipped with two independent burners and flue gas paths, which enables full flexibility both in single and double-flame tube operation and reduce fuel-intensive burner switching cycles. Its efficiency of almost 98% shows that it is even possible to generate large quantities

of steam of up to 36 t/h per boiler in a particularly efficient manner. The system is completed by components such as economizers, air preheating systems and oxygen control systems. These help to return process-related waste heat back into the boilers in an environmentally friendly manner and to optimise the combustion quality.

As a systems supplier, Bosch also provided modules for feed water treatment and water analysis. The feed water system thermally treats high volumes of condensate from production processes and fresh water and has a very large storage capacity of 50 m³. A water analyser ensures reliable system protection, with sophisticated sensors continuously measuring and checking the water parameters and transferring the values to the system control unit. SLOVENSKÉ CUKROVARY also uses a control system from Bosch. This solution not only brings together boilers and components in a single system and controls them fully automatically, it also implements a remote connection and a digital efficiency assistant, which help the operator to optimise steam processes while the system is in operation.

The new steam concept makes production processes at SLOVENSKÉ CUKROVARY more efficient, more sustainable and future-proof. It was not only the technology but also the project management that was of high quality. „Few interfaces, experiences from comparable applications and the cooperative collaboration between Bosch and PPA CONTROLL made the major project a success,“ summarises Marek Ivanovic.



Production

5000 t/d sugar beet processing
72 t/h steam in total



Environment

Waste heat recovery
Biogas use
NO_x < 80 mg/Nm³



Efficiency

Efficiency level of almost 98 %



Industry 4.0

System integration into customer's
process control system
Efficiency assistant and remote access

Operator: SLOVENSKÉ CUKROVARY s.r.o.
www.korunnycukor.sk

General contractor: PPA CONTROLL, a.s.
www.ppa.sk

Bosch on site: Robert Bosch, spol. s r.o.
www.bosch-industrial.com/sk



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