



NEW STAPELFELD WTE PLANT

Integrated EMSR and control technology solutions
from SAR



With the replacement construction of the Stapelfeld waste-to-energy plant, EEW Energy from Waste has completed a forward-looking project for sustainable energy generation. The new facility replaces an existing plant that had been in operation for decades and sets new standards in terms of efficiency, availability, and integration.

SAR was commissioned in 2021 to implement the EMSR technology and was responsible for a comprehensive range of services—from planning and implementation to commissioning and optimization. This white paper provides a concise overview of the project scope, technical implementation, and the special role of integrated automation.

PROJECT OVERVIEW

The Stapelfeld waste-to-energy plant represents a modern and efficient waste treatment facility with significantly increased energy yield. Every day, large quantities of municipal and commercial waste are thermally treated and converted into electricity and district heating.

Key specifications of the plant are:

- Processing of approximately 1,400 tons of waste per day
- Incineration at a minimum temperature of 850 °C
- Significantly increased energy efficiency compared to the existing plant
- District heating output of up to 400,000 MWh per year
- More than double the electricity production

The plant thus makes an important contribution to the region's sustainable energy supply.



PROJECT SCOPE AND APPROACH OF SAR

SAR took a holistic approach to the project. The goal was not merely to supply individual systems, but to create a fully integrated and end-to-end solution. In addition to engineering and system integration, SAR also coordinated the electrical installation through partner companies.

The scope of services included, among other things:

- Complete EMSR engineering and system design
- Supply of electrical infrastructure from 30 kV to 24 V
- Implementation of the central control system
- Supply and integration of building and infrastructure systems
- Commissioning and optimization during ongoing operations

By consolidating responsibility in this way, a high level of consistency and quality was ensured throughout all project phases.

TECHNICAL IMPLEMENTATION

The technical solution is based on a highly available and scalable system architecture. At its core is a modern process control system that centrally integrates all plant components and enables seamless operation.

Key components include:

- Control system with redundant server and control structure
- Medium- and low-voltage switchgear
- High-performance drives and frequency converters in the megawatt range
- Comprehensive measurement technology for recording process and emission values
- Fail-safe and redundant safety and monitoring systems

Particularly noteworthy is the consistent integration of a wide variety of systems into the control system. In addition to process control, these include:

- Fire load control
- Ventilation and air conditioning systems
- Lighting and emergency lighting systems
- Communication and camera systems

This holistic integration creates a unified database and enables efficient operational management.

IMPLEMENTATION AND PROJECT SCOPE

The project was carried out over a period of more than five years, underscoring its industrial scale. In addition to the installation of numerous components, the cabling work in particular accounted for a significant portion of the project.

As part of the implementation, the following were carried out, among other things:

- Over 1,200 analog, 5,200 digital, and 500 safety signals were processed via ET200SP HA stations
- Profinet systems were set up with 95 Simocode motor controllers, 43 ABB drives, and 140 Auma actuators with redundant MRP connectivity
- 90 control cabinets and sub-distribution panels were planned, delivered, and installed
- over 290 km of cable was laid
- more than 1,700 lights were installed
- industrial networks for control technology and communication were set up

A total of approximately 50,000 working hours were spent on the project. These figures demonstrate the complexity of the project and SAR's ability to implement even large-scale projects in a structured manner.

ADDED VALUE THROUGH INTEGRATION

The key to the project's success lies in the seamless integration of all systems. Combining process, energy, and building technology into a single central platform offers clear advantages:

- Centralized and intuitive operation
- Increased transparency across all system components
- Faster fault diagnosis and reduced downtime
- Optimized and more efficient process control

At the same time, the system architecture lays the foundation for future expansions and continuous optimization.

CONCLUSION

The construction of the new Stapelfeld waste-to-energy plant demonstrates how modern energy facilities can be built efficiently and with a view to the future through integrated automation solutions. Of particular note is the significantly increased energy yield: compared to the existing plant, significantly more energy is generated from nearly the same amount of waste—clear evidence of the efficiency gains achieved.

In this project, SAR has impressively demonstrated its expertise in control and measurement technology and system integration. With a holistic project approach, high technical competence, and experience in complex industrial projects, SAR positions itself as a strong partner for demanding energy and infrastructure projects.





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