



Energy efficiency services for industry and trade

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STEAG Energy Services – your engineering partner



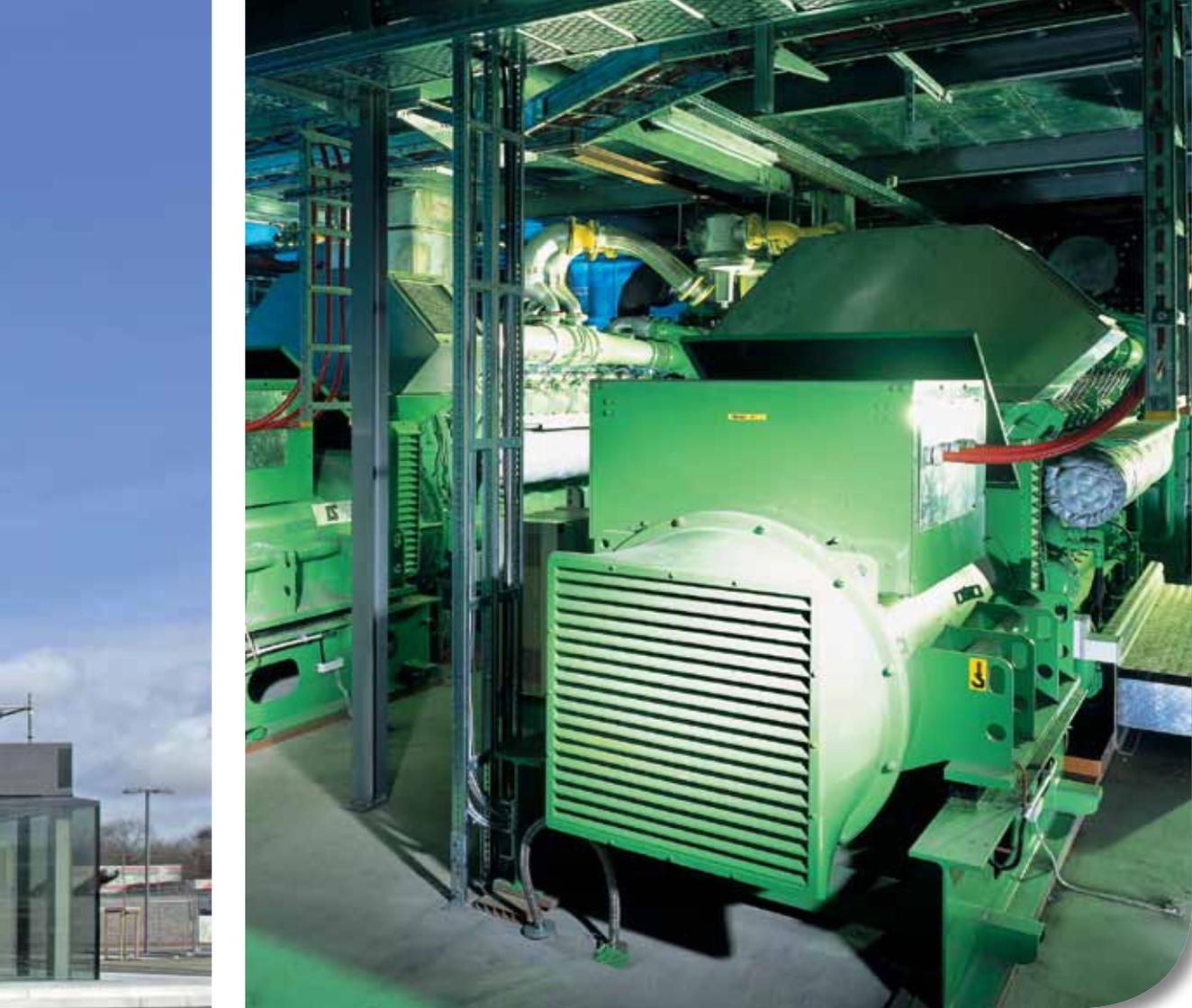
The success of a modern industrial facility in national and international competition depends today more than ever on a reliable energy supply at, above all, reasonable cost. Rising raw material and energy procurement costs account for a significant and growing share of the production costs in the motor vehicle, food, chemicals, metal and paper industries, to name a few examples.

STEAG has concerned itself with energy-efficient, economical energy production and the optimization of existing generation units since it was established in 1937 and boasts more than 75 years of experience and expertise in all matters relating to energy

Our comprehensive approach

Our portfolio systematically covers all services so that we can consider the energy-related challenges in your industrial environment as a whole and offer you optimal methods for solving problems.

- Our engineers distinguish from an economic point of view between external procurement and in-house generation.
- They devise concepts for the use of suitable fuels at your production sites.
- In the process engineering field we cover the full range of services, from the thermal generating plant through the design of the flue gas path to efficient flue gas cleaning equipment for emission reduction.
- Examination of the electric consumers and the power



supply system and a review of the existing protection concept by our engineers are the prerequisites for lastingly trouble-free operation. This gives you a definite advantage for your production in terms of reliability.

- Every technical process, no matter how sophisticated, requires intelligent automation technology. Our engineers know the requirements and the available technical concepts and options for ensuring trouble-free operation.
- New and existing plants must always be integrated into a consistent overall concept and numerous inter-

disciplinary interfaces need to be coordinated – challenges our engineers readily accept.

- Interface coordination is an integral part of our project management, which includes transparent expediting and budget monitoring.
- Quality assurance and testing is an essential aspect in the realization of projects. Acceptance and performance tests as well as support for commissioning and first start-up are necessary in our view for the responsible implementation of measures to enhance energy efficiency.

Energy efficiency

Energy in different forms is the lifeblood of your industrial production. The efficient use of energy is the prerequisite for competitiveness. Consciously saving energy without negatively impacting the production process is an important measure to offset rapidly rising energy prices.

Statutory provisions like the Renewable Energy Act and the EU Efficiency Directive today already define the long-range orientation of future energy supply. So for you as industrial customer it is time to set a course for an energy-efficient future together with an experienced partner

like STEAG Energy Services. This will further enhance your competitiveness.

The matrix on the right illustrates our energy-efficiency services at a glance:

Examples of energy efficiency-boosting measures

1. Pump systems

Initial situation:

- Oversized pumps
- Pump operating times unsuited to needs
- Inefficient control
- High head losses

Example:

- Efficiency-boosting measures at a chemical complex
- Operation of old fixed-speed pumps

Energy efficiency measures:

- Replacement of 40 old pumps with high-efficiency pumps
- On-demand operation of 40 high-efficiency pumps

Obtained savings:

- Savings of electricity: 130 MWh/a (- 59%)
- Cost savings: about 11,700 €/a
- Investment: about 40,000 €
- Amortization: 3.4 years

2. Distribution systems

Initial situation:

- Supply structures evolved over decades
- Different process heat consumers
- Non-optimized hot water networks and systems

Example:

- Metalworking industry in North Rhine-Westphalia, Germany
- Construction of a combined heat and power (CHP) unit (2 MWel and 2 MWth) with hot water boilers

Energy efficiency measures:

- Development of concept for the optimum use of waste heat from engines

Result of energy efficiency measures:

- Reliability of supply optimized by two-stage heating
- Max. supply temperatures 150° C
- Long-term economic coverage of heat needs of 16 GWh/a

Energy Production and Energy Efficiency Consulting Services

Energy management systems complying with DIN EN ISO 50001

Monitoring

Identification of requirements

- Initial technical discussion with starter questionnaire
- Local inspection with plant-specific checklists
- Recording of load profiles
- Comparison of design values and operating values for the consumer
- Examination of plants and equipment
- Performance of measurements

Analysis

- Processing of data
- Development of individual energy-related optimizing measures
- Derivation of specific energy efficiency measures

Concept

- Economic assessment of package of measures
- Prioritization of measures
- Final report
- Benchmarking of producers
 - Weak spot analysis
 - Potential for improvement
 - Recommended action
 - Potential savings

Implementation

- Basic engineering
- Tendering, compilation of permitting documents
- Field fabrication inspection
- Commissioning
- Contracting

3. Generating systems

Initial situation:

- Heat feed into district heating network from combustion of biomethane in a highly efficient cogeneration process (so-called green heat)
- Ensuring supply of connected households and industrial consumers, especially of neighboring hospitals

Example:

- District heating supply in North Rhine-Westphalia, Germany
- Replacement of a coal-fired boiler by a state-of-the-art CHP unit (5 MWel and 4 MWth)

Energy efficiency measures:

- Technical feasibility check
- Compilation of permitting documents
- Owner's Engineer services for design, contract awards and field fabrication inspection

Result of energy efficiency measures:

- Optimized minimum load operation
- Efficient delivery of heat to downstream low and high temperature networks
- Reliable year-round operation 8760 h/a

1. Pump systems



2. Distribution systems



3. Generating systems

STEAG Energy Services – your partner for energy efficiency

STEAG Energy Services is an engineering services provider with a proven track record in planning, engineering, implementation and optimization of industrial power plants and the appurtenant process systems.



Our comprehensive approach is not limited to electric power generation, but also encompasses other secondary energy sources like heat, cold, water, steam and compressed air, which all find application in industrial environments.

The use of these energy sources always raises the question how they can be used in a way that makes good economic sense and is at the same time ecologically responsible.

Your core competence is focused on the production of your products. With our concentrated know-how from many years of power plant operation, we ensure comprehensive energy efficiency at your company. Nationally and internationally.

We offer you:

- Customized energy efficiency concepts and implementation support.
- Answers to your practical questions about the economical use of in-house generation in a new or existing plant or about the modernization and optimization of your existing plants.
- Security of supply for your production systems, and lasting economic benefit.



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