



MPO – Mobile Process Optimisation

Modular Measuring Systems for Power Plant Efficiency Improvement,
Environmental Protection and CO₂ Emission Reduction





Teaming up for your benefit: E.ON Engineering and STEAG encotec

Services rendered to our own and numerous client's power plants gave us the required experience and the essential know-how to develop the versatile **Mobile Process Optimisation (MPO) system**.

The MPO-system hardware consists of different individual measuring and monitoring modules to be arranged and customised for the respective requirements.

Combined with intense theoretical and practical training on site, the MPO-system becomes a powerful tool for performance improvement and optimisation of all relevant power plant components.

E.ON Engineering and STEAG encotec have taken a joint approach to combine over 40 years of individual expertise and vast experience in:

- Optimisation of pulverisers and firing systems
- Thermodynamic examinations of the water-steam-cycle
- Measurements in the air/flue gas path
- Conducting tests on flue gas cleaning plants
- Determination of emissions
- Calibrations of measuring equipment
- Determination of sound emissions and immissions
- Optimisation of the combustion process

Our technical services constitute the basis for successful application of the MPO-system on site.

After the individual requirements have been determined, we will arrange and configure the MPO-system in close cooperation with your experts.

Before delivery of the MPO-system, your system operators will receive an introductory training on system technology, operation and maintenance of the modules from our experts.

Practical training on site on all aspects of process optimisation will then enable you to achieve maximum economic viability and environmental protection including CO₂ and emission reduction.

For support and reference during practical application, our experts remain at your disposal whenever required.

E.ON Engineering

We are the technology centre of E.ON Energie AG, Europe's largest private power supplier. Depending on the assignment, we optimise the efficiency and economy of your energy plants through analytical, conceptual and planning services.

STEAG encotec

We are the engineering and consultancy arm of STEAG AG a power company founded more than 65 years ago. STEAG AG is the second largest producer of hard coal-derived electricity in Germany, with a generation capacity of approx. 6,000 MW.





▣ Theoretical training
– one component
of technical services



▣ Practical training
– the foundation
for successful
implementation



MPO modules to optimise power plant processes

▣ **Pulverised-coal measuring module**
for optimising pulverisers and firing systems

▣ **Flue gas analysing module**
for optimising firing systems and checking monitoring instrumentation

▣ **Fly ash measuring module**
for checking and optimising the collection efficiency of dust collectors as well as for determination of particulate emission

▣ **Automatic flue gas analysing module**
for performing time-saving grid-measurements in large duct cross-sections

▣ **Temperature measuring module**
for determination of temperatures and temperature profiles in the air/flue gas path

▣ **Calibration module**
for calibration of monitoring instrumentation and mobile measuring equipment

▣ **Modules for thermodynamic examinations**
for determination of efficiencies and operating parameters of turbines, pumps, condensers, cooling towers and auxiliaries as well as for development of maintenance strategies

▣ **Sound measuring module**
for performing sound emission and immission measurements

▣ **Volumetric flow rate measuring module**
for measuring volumetric flow rates in various media

▣ **Evaluation module**
for data acquisition and processing of measured values on the basis of high-precision data acquisition systems and power plant specific evaluation software



▣ Automatic sample separator



▣ Flue gas analysing modules



■ MPO System on its way to the next site



■ Training on pulverised coal measuring module



Mobile Process Optimisation – References & Benefits

P.R. China – 1991

First delivery of a MPO-System to TPRI – Thermal Power Research Institute, Xian, applied to approx. 6,000 MW in total.



Proven Benefits:

By application of the MPO-System in 18 different power stations ranging from 200 MW to 600 MW, the boiler efficiency has been improved by some 1.1%-points in average, resulting in fuel savings of 140,000 t/y and CO₂-reductions of approx. 300,000 t/y.

Based on actual fuel cost of 40 US-\$/ton, the achievable financial benefit for the power plant operators due to the increased efficiency adds up to more than 5.5 Mio. US-\$ per year.

P.R. China – 2001

11 MPO-Systems have been delivered to several provincial research institutes.



Huge Potential:

In total, power plants with an installed capacity of more than 140,000 MW in more than 14 provinces will be served and optimised on a regular basis.

Potential emission reduction per year of:

- 7,000,000 tons CO₂
- 80,000 tons SO₂
- 42,000 tons particulate matter.

Serbia – 2002

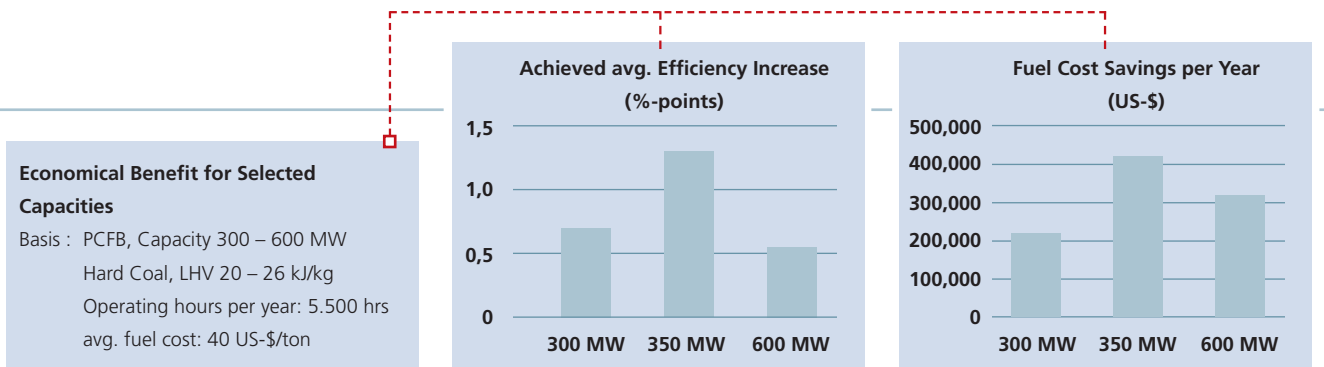
Electric Power of Serbia operates a MPO-System to check operation of its lignite fired power plants with 5,500 MW installed capacity.



Creating Competence:

The MPO-System is used to accompany retrofit measures including performance and acceptance tests and to optimise plant performance.

A new team of experts was established in Electric Power of Serbia, trained on the MPO-System and in process optimisation by E.ON / Steag.





With an appropriate selection of MPO Modules you are able to analyse and optimise all power plant components ...

... for the benefit of economic viability and environmental protection.

Checking, evaluation and optimisation of flue gas cleaning processes like filter systems, post-combustion DeNO_x plants and flue gas desulfurisation systems resulting in a maximum of environmental protection

Measurement of emissions as well as checking and calibration of continuous emission monitoring equipment with the aim of keeping pre-set emission limits

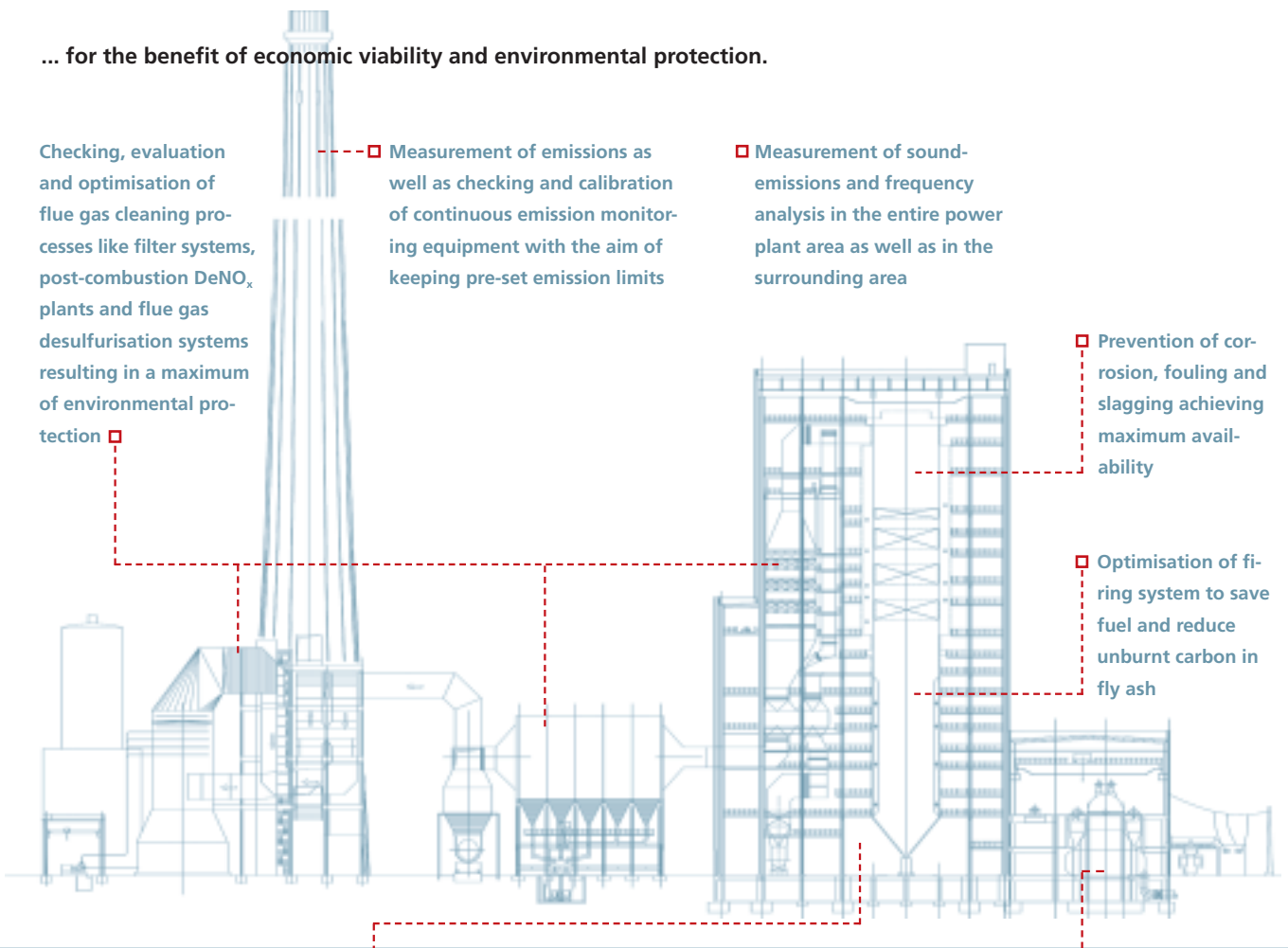
Measurement of sound-emissions and frequency analysis in the entire power plant area as well as in the surrounding area

Prevention of corrosion, fouling and slagging achieving maximum availability

Optimisation of firing system to save fuel and reduce unburnt carbon in fly ash

Optimisation of pulveriser performance to ensure operation of steam generator as per design

Thermodynamical examinations to ensure high availability of turbines and auxiliaries and to optimise heat rates with regard to economic plant operation under all conditions





■ Mobile Process Optimisation on duty



Your partner with practical experience and engineering expertise

E.ON Engineering

With our staff of approx. 370, we at E.ON Engineering GmbH bundle the experience in the energy business acquired in several decades. We take care of a wide range of our customers' power plants as well as 78 power plants owned by E.ON Energie AG featuring:

- Operating times from a few hundred to several hundred thousands of hours
- Plants from 0.55 to 3,800 MW with a total generation capacity of more than 30,000 MW
- Conventional, nuclear, renewable and combined-cycle power generation.

STEAG encotec

The core competences of STEAG encotec GmbH are comprehensive engineering and management services related to energy. With our staff of about 250 we provide services for the design, construction and optimisation of power plants and industrial plants. We render our services to STEAG's own power plants with a total capacity of over 6,000 MW as well as to external clients. Our services also include operation and maintenance (O&M) management and support based on hands-on experience.

Our own IT and communication technology rounds off our service portfolio. With our holistic approach, we have been offering ideal single-source solutions for more than 30 years throughout the world.

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