COMBUSTION TUNING
Give your operating budget room to breathe

Power plant equipment is pushed to the limit in today's international energy market. Increasingly strict environmental legislation and fierce market conditions are forcing conventional power plants to look for new ways to improve efficiency. But how?

Combustion tuning is proving to be powerful and effective in helping achieve this. With newly developed measurement tools, ENGIE Laborelec extracts all the relevant information so that power plant operators can make the decisive adjustments, lowering operating costs without compromising compliance with environmental legislation.

Meet stricter environmental legislation

Thermal power plants are faced with ever stricter rules on CO, NO_x and other exhaust gas emissions. Compliance with emission rules has typically been achieved by introducing or upgrading flue gas treatment equipment at the end of the power generation process. But **reducing emissions** can also be achieved by acting **right at the source, on the combustion process itself**. Adjusting and fine-tuning parameters such as burner configuration and air-to-fuel ratio are examples of this powerful strategy.

Reduce operational costs

Market evolution has forced thermal power plants to cut costs, and this must continue to safeguard the future. But is there still room for additional cost-saving? Recent projects prove that combustion tuning has **substantial OPEX saving potential** since it allows power plants to reduce fuel costs and maintenance and to increase capacity and uptime.

Combustion tuning: a rich untapped vein
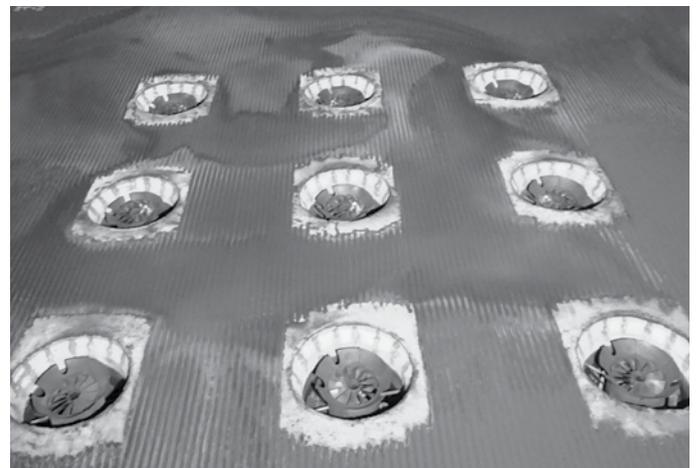
Although often unheeded, substantial reduction in boiler operating costs can be achieved through combustion tuning.

REDUCING OPEX, IMPROVING FOOTPRINT
The benefits of combustion tuning

Minimize unburned fuel

Reduce tube failures

Improve combustion balance

Minimize energy losses

Scale down fouling

Reduce slagging

Diminish corrosion

Cut NO_x emissions

OUR OFFER

No matter whether your installation is long-established or recent, uses pulverized fuel or circulating fluidized bed technology, we provide expert assistance tailored to your exact needs, taking full account of the installation's technical features and your staff's knowledge and skills.

Diagnose / **Improve** / **Monitor**
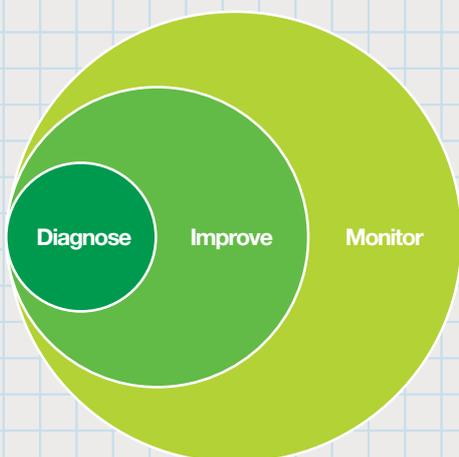
01 Diagnose
We fully screen the combustion process on site and assess its overall performance.

02 Improve
Based on our diagnosis, we recommend improvements to the existing combustion system. We can also play an active role in putting this advice into practice.

03 Monitor
Monitoring devices are the best way to ensure that the combustion process remains optimal. We recommend the most appropriate tools, provide the necessary training for your staff and assist you wherever needed to get the most out of the monitoring data.

CONVERTING PROMISES INTO ACTION

CASE 1 – DIAGNOSE

Project overview

In Panama, a 120 MW coal-fired boiler was experiencing severe slagging. A root cause analysis was carried out, investigating the fuel, ash, slag, and air-to-fuel ratio at each burner.

Main benefits

Following our recommendations, the power plant retuned its fuel and boiler settings, leading to a significant reduction in slagging issues. The oxygen content in the exhaust gas was also optimized, increasing combustion efficiency and lowering operating costs.


CASE 2 – IMPROVE

Project overview

Air and fuel flow measurements at a 660 MW coal-fired power plant in Thailand revealed that the expected global air-to-fuel ratios had been overestimated compared to the measured values.

Main benefits

The measurement results were used to tune the combustion process by resolving hardware and software issues. Persistent imbalances in the oxygen, flue gas flow rate, temperature and NO_x at the furnace outlet were significantly reduced. Corrosion and slagging risks were also reduced, and the combustion tuning made it possible to optimize the $deNO_x$ stage.
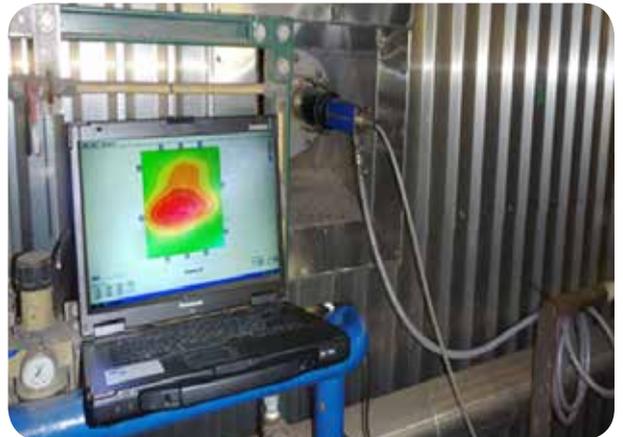
CASE 3 – MONITOR

Project overview

A Belgian 80 MW biomass-fired power plant was experiencing multiple tube failures. Advanced fuel and air flow measurement systems were installed at burner level, together with a remote temperature measurement system, providing the operators with a 2D-image of the temperature field at the furnace outlet.

Main benefits

Continuous furnace exit gas temperature monitoring allows operators to reposition the flame in the combustion chamber for all loads, leading to a significant reduction in tube failures and a positive effect on maintenance costs. The continuous monitoring of fuel and air distribution per burner also ensures optimal control of combustion efficiency and NO_x emissions for all loads.

Why choose ENGIE Laborelec?

Multidisciplinary expertise

Combustion optimization requires expertise in multiple areas, such as:

- Fuels and combustion processes
- Mechanical aspects and materials
- Emissions and flue gas treatment

Independence from OEMs

ENGIE Laborelec operates fully independently from original equipment manufacturers. It is our objective to minimize the total cost of ownership, whereas OEMs thrive on repairs and replacements.

The online advantage

Most of our devices measure directly inside the boiler or associated equipment in real time.This has many advantages, such as not having to take samples, send them to the laboratory and wait for the results.

Temperature mapping equipment
To ensure an accurate measurement of temperatures and their 3D mapping.

Gas analyzers
Suited for measurements of SO_x, CO, O_2, SO_x, …

Reliable measurement reliable advice
Reliable measurement and expert advisory are a powerful combination, achieving realistic and cost-effective solutions.

Flow measurement
To ensure a correct distribution of fuel between the different burner feeders.

Particle size measurement
To ensure an optimal combustion of fuel particles and to make adjustments at the milling step possible.

Would you like to know more?

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