Heat Management

Paper mill, Thailand

Application: CFB Boiler
Efficiency solution: Infrasound Cleaning
Cleaning area: APH, ECO, SH

General info

Mill: Kraft paper mill
Boiler: China Western Power Industrial
Fuel: Sub-bituminous coal, wood chips, waste
Capacity: 70 t/h

Installation

Type: APX2000
Year of installation: 2025
Country: Thailand

Situation description

The boiler is a CFB unit co-firing sub-bituminous coal, wood chips, and waste reject, with a typical fuel mix of 63%, 33%, and 4%. It is designed with a vertical back pass containing the superheater (SH), economizer (ECO), and air preheater (APH) (see Fig. 1 Boiler Layout).

The infrasound cleaning system was installed to reduce soot accumulation on the heat transfer surfaces of the Air Preheater (APH), Economizer (ECO), and Superheater (SH). The goal was to achieve at least a 50% reduction in steam sootblowing while maintaining overall energy efficiency.

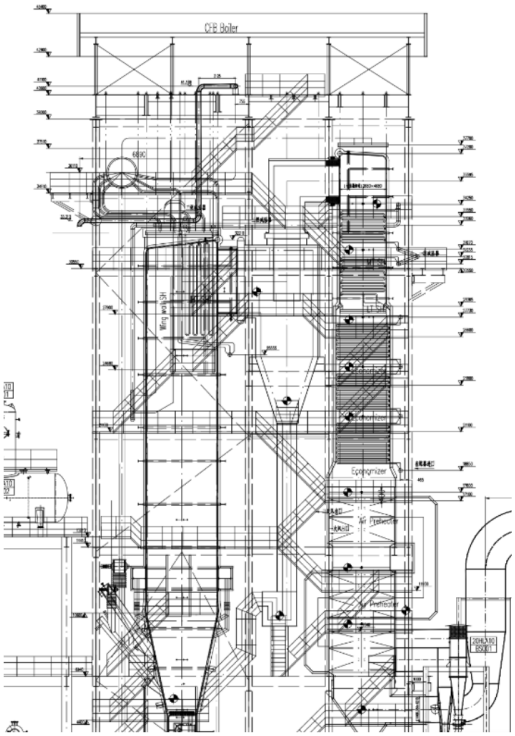


Figure 1. Boiler Layout

The evaluation was carried out under two operating conditions:

1. Infrasound cleaning combined with 50% reduced steam sootblowing, during the period 2025-05-24 to 2025-06-10.
2. No infrasound cleaning with 100% steam sootblowing, during the period 2025-06-18 to 2025-07-05.

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Results

Operational data analysis shows that total heat transfer is higher when using infrasound cleaning with reduced steam sootblowing. The figures (Fig. 3 and Fig. 4) present the measured heat transferred in the Air Preheater (APH), Economizer (ECO), and Superheater (SH), with averages for each period highlighted.

- **APH**: 3139 kW with infrasound cleaning compared to 2832 kW without, an improvement of **+10.8%**.
- **ECO**: 5036 kW with infrasound cleaning compared to 4738 kW without, an improvement of **+6.3%**.
- **SH**: 3942 kW with infrasound cleaning compared to 3956 kW without, a marginal change of **–0.4%**.

When the contributions from APH, ECO and SH are combined, the total power produced increased from 11.5 MW to 12.1 MW (an increase of 5%), despite slightly more challenging fuel mix conditions during the infrasound period.



Figure 2. Outside view of the mill.

Conclusion

- The installation of infrasound cleaning enabled a **50% reduction in steam sootblowing**.
- **Lower water consumption** and **less wear on heat surfaces**.
- **Average power production increased by 5%,** from 11.5 MW to 12.1 MW.

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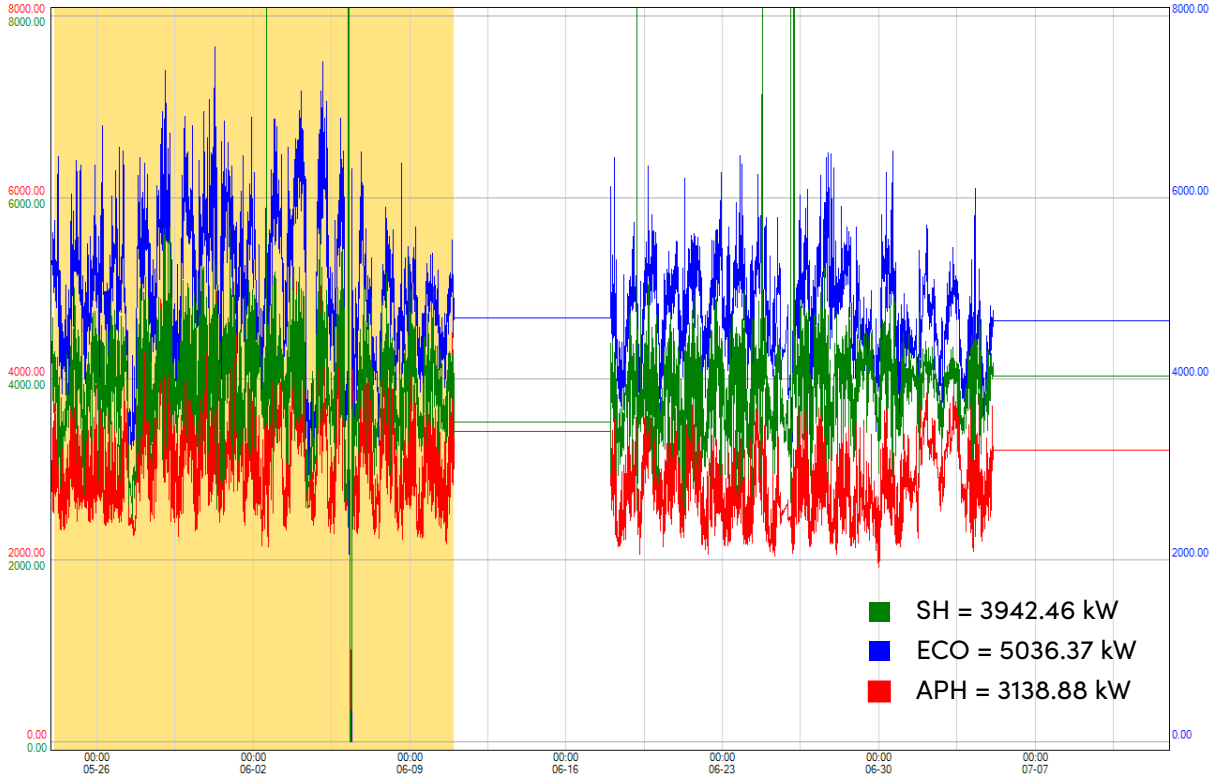


Figure 3. kW heat transferred in Air preheater (APH), Economizer (ECO) and Superheater (SH), with Infrasound and 50 % reduced sootblowing.

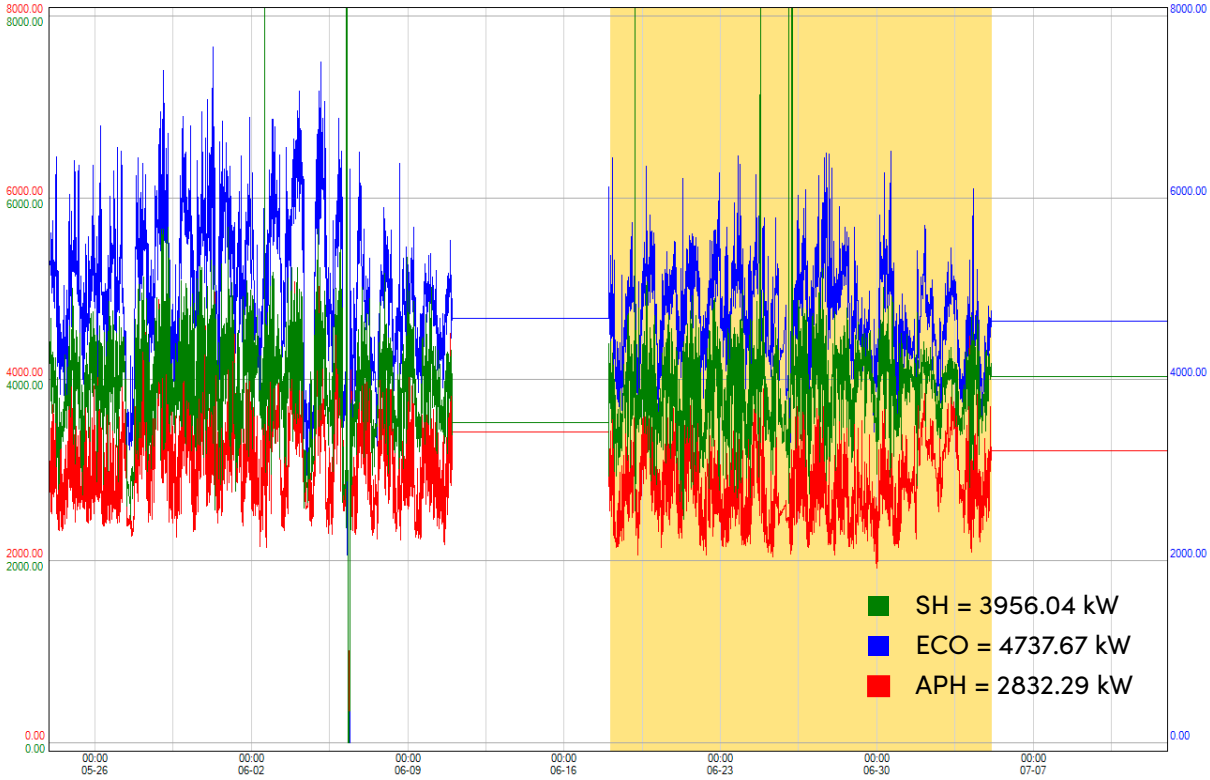


Figure 4. kW heat transferred in Air preheater (APH), Economizer (ECO) and Superheater (SH), with no Infrasound and 100% sootblowing.

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