ENERGY EFFICIENCY PROJECT DEVELOPMENT

Case study: SONG DA CAO CUONG JOINT STOCK COMPANY

→ FROM IDEAS TO MATURE EE PROJECT

Song Da Cao Cuong Joint Stock Company

Sector

Producing sustainable green construction materials.

Brief information

Currently, SCL produces products in the construction materials industry including AAC bricks, ALC panels, ready-mixed dry mortar and concrete additives. Types of stone tile adhesives, Skimcoat putty.

The production capacity of autoclaved aerated concrete is 200,000 m^3/year. The output of wet fly ash (humidity about 16 - 18%) and dry fly ash (humidity 1%) in 2022 is 158,586 tons and 322,279 tons, respectively.

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ENERGY AUDIT

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Pre-FS

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Key opportunities identified

Opportunity 1:

- Improve the steam system by installing a flash tank and a deaerator heat recovery system.
- Annual cost savings: 465 tons of fuel/year.
- Annual investment savings: 400 million VND.
- Net present value: 2,154 million VND.

Opportunity 2: Control the combustion mode.

Opportunity 3: Install an air preheater for primary air to utilize the exhaust heat from the fly ash and sand drying furnace.

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ENERGY AUDIT

Key opportunities identified

Opportunity 1: Improve the steam system by installing a flash tank and a deaerator heat recovery system.

Opportunity 2:

- Control the combustion mode.
- Annual cost savings: 58 tons of fuel/year.
- Annual investment savings: 100 million VND.
- Net present value: 219 million VND.

Opportunity 3: Install an air preheater for primary air to utilize the exhaust heat from the fly ash and sand drying furnace.

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ENERGY AUDIT

Key opportunities identified

Opportunity 1: Improve the steam system by installing a flash tank and a deaerator heat recovery system.

Opportunity 2: Control the combustion mode.

Opportunity 3:

- Install an air preheater for primary air to utilize the exhaust heat from the fly ash and sand drying furnace.
- Annual cost savings: 1,826 tons of fuel/year.
- Annual investment savings: 400 million VND.
- Net present value: 9,634 million VND.

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Pre-FS

Opportunity 1:

- Solution: Improve the steam system by installing a flash tank and a deaerator heat recovery system.
- Expected investment: 400 million VND.
- Expected energy savings: 465 tons of fuel/year.
- Main opportunities: Install a flash tank and a deaerator to recover steam from the exhaust process and condensate from the autoclave process.

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Pre-FS

Opportunity 2:

- Solution: Control the combustion mode.
- Expected investment: 100 million VND.
- Expected energy savings: 58 tons of fuel/year.
- Main opportunities: Split the main air supply chamber into 2 chambers to control and increase the air volume on the fuel pile side.

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Opportunity 3:

- Solution: Install an air preheater for primary air to utilize the exhaust heat from the fly ash and sand drying furnace.
- Expected investment: 400 million VND.
- Expected energy savings: 1,826 tons of fuel/year.
- Main opportunities: The temperature of the flue gas in the drying furnace is about 130°C and needs to be reduced to 90°C to protect the filter bag membrane. By utilizing the heat from the flue gas of the sand and fly ash drying furnace to pre-dry the air for the boiler, we can reduce the flue gas temperature in the drying furnace and increase the air temperature supplied to the boiler.

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- Project 1: Improve the steam system by installing a flash tank and a deaerator heat recovery system.
- Main findings regarding solution design: The plant doesn’t recover condensate for the boiler. The steam trap system is not working effectively. High pressure steam (12 bar) is discharged directly into the environment after the sterilization process.
- Investment costs: 1,199 million VND.
- Value of energy saving: Saving 465 tons of fuel/year.
- Non-energy benefits: Saving 674 million VND/year.
- Payback time: 1.7 years.

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- Project 2: Control the combustion mode.
- Main findings regarding solution design: Using fans to distribute fuel is ineffective, causing it to pile up in some small areas, leading to ineffective mixing of air and fuel.
- Investment costs: 100 million VND.
- Value of energy saving: Saving 58 tons of fuel/year.
- Non-energy benefits: Saving 84 million VND/year.
- Payback time: 1.2 years.

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- Project 3: Install an economizer for make-up water to utilize the exhaust heat from the fly ash and sand drying furnace (Because the plant did not have enough space to install an air preheater, the audit team switched to the solution of installing an economizer).
- Main findings regarding solution design: Instead of water entering the boiler at an ambient temperature of about 25°C, the water will go through an economizer, utilizing the heat from the exhaust gas of the drying furnace and reducing the exhaust gas temperature from 120°C to 90°C, helping to protect the filter bag.
- Investment costs: 1,590 million VND.
- Value of energy saving: Saving 691 tons of fuel/year.
- Non-energy benefits: Saving 1,002 million VND/year.
- Payback time: 1.5 years.

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