



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

CASE STUDY

IMPROVEMENT OF BOILER ENERGY EFFICIENCY WITH COMBINED SOLUTIONS

at Tin Thanh Group's Steam Plant in Sai Gon - Cu Chi Beer Factory

OVERVIEW

SAVINGS:



994 TONS OF BIOMASS /YEAR



1,291 MILLION VND/YEAR

CO₂ REDUCTIONS:



EQUIVALENT TO **1,441** TONS/YEAR

The Project has helped our Group to accelerate the training process to improve the professional capacity and awareness on energy savings of our boiler operators. We will continue to apply energy-saving solutions at other facilities of the Group over the country.



Mr. Tran Dinh Quyen
Chairman of Tin Thanh Group

ABOUT TIN THANH GROUP'S STEAM PLANT IN SAI GON - CU CHI BEER FACTORY

With the experience of using biomass instead of fossil fuels, Tin Thanh Group is now providing the water steam to more than 30 leading companies and industrial factories in Vietnam such as Sabeco, Casumina, Coca-Cola, Vinacafe and others. At Sai Gon - Cu Chi Beer Factory, Tin Thanh Group has built a steam plant, firing biomass to supply the water steam for the production line. In the framework of the GEF funded Project **"Promotion of Energy Efficient Industrial Boiler Adoption and Operating Practices in Vietnam"** jointly implemented by the Ministry of Industry and Trade (MOIT) and the United Nations Industrial Development Organization (UNIDO), in March 2019, the national experts conducted an efficiency assessment of the boilers at this steam plant and proposed solutions to improve the boiler efficiency in order to save energy consumption.

FINDINGS OF THE ASSESSMENT

THE 30 TPH BIOMASS FIRED BOILER OPERATES WITH THE EFFICIENCY OF 73%



THE CONDUCTIVITY OF BLOWDOWN WATER IS RELATIVELY HIGH (13,340 μS/cm), leading to scaling inside the boiler that can reduce heat transfer.



RECOMMENDATION: Adjust the blowdown mode to improve the boiler water quality.

THE OXYGEN CONTENT IN FLUE GAS IS RELATIVELY HIGH (> 10%), THAT INCREASES STACK LOSSES



RECOMMENDATION: Adjust the boiler combustion mode to reduce excess air.

THE OUTSIDE SURFACE OF THE AIR PREHEATER, FEEDWATER PIPE, FURNACE DOORS AND VALVES ON THE STEAM HEADER ARE NOT INSULATED, that increase heat loss to the environment.



RECOMMENDATION: Insulate the air preheater, piping systems and high temperature areas.

IMPLEMENTED SOLUTIONS



The boiler combustion mode was adjusted to reduce excess air. After adjusting, the oxygen content in flue gas decreased from 10.09% to 7%.



The heat recovering equipment (economizer, air preheater) and feedwater tanks have been insulated.



The insulation thickness of the whole steam piping system was increased from 50mm to 100mm.

ADDITIONAL COMBINED SOLUTIONS



Additional secondary economizer and steam accumulator have been installed.

The fuel feeding system was upgraded, flow and pressure of fuel feeding blower have been increased.

RESULTS

BOILER ENERGY EFFICIENCY: INCREASED BY MORE THAN 4% (FROM 73% TO 77.36%).



ANNUAL FUEL SAVINGS:
994
TONS/YEAR

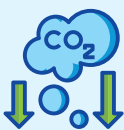
ANNUAL COST SAVINGS:
1,291
MILLION VND/YEAR

PROMOTION OF ENERGY EFFICIENT INDUSTRIAL BOILER ADOPTION AND OPERATING PRACTICES IN VIETNAM

PROJECT OBJECTIVES



Annual energy savings:
1,955,304
GJ/YEAR



Annual greenhouse gas emission reductions:
183,736
TON OF CO₂EQ/YEAR

BENEFITS FOR BUSINESS PARTICIPANTS



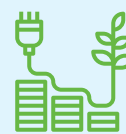
Free training on boiler efficiency evaluation techniques, EE best boiler operating practices and EE boiler manufacturing



Support to access financing sources and incentives for the implementation of EE boiler adoption and manufacturing projects



Technical assistance from international/national experts to implement EE boiler adoption and manufacturing projects



Energy savings, energy cost reductions, increased competitiveness

CONTACT

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