

# IMPACT OF HEAT RECOVERY AND RESOURCE DIVERSIFICATION IN INDUSTRIAL PROCESS

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**Abstract:** *The presented problem of energy consumption decreasing by employing secondary sources together with solar system in industrial process based on original data is shown. The impact of energy sources diversification results with fuel consumption lowering also in non-cellulose fibers i.e. polyester manufacturing. The implementation of boiler exhaust flue gases with temperature of 204°C used for combustion air preheating gives natural gas savings of about 7%. Simultaneously, the air pollution is also lowered while flue gases volume diminished from 4885.6 m<sup>3</sup><sub>FG/h</sub> to 4550.5 m<sup>3</sup><sub>FG/h</sub> and the outlet temperature becomes from 204°C to 61.6°C. Solar energy utilization caused significant energy efficiency increasing and the environment protection. Analyzed process with solar heat based on data for the selected location (Croatia, Zagreb,  $\varphi = 45^{\circ}45' N$ ) using minimum collector area of  $A=23.13 \times 10^3 \text{ m}^2$  and air preheating results with natural gas savings of about 60%. Also the volume of exhaust flue gases is reduced to 1964.1 m<sup>3</sup><sub>FG/h</sub>.*

**Key words:** *polyester, heat recovery, solar hybrid, energy efficiency*



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