

***Performance Test of Conventional Distillation System on Solar-Based Fish Smoking Equipment***

Risse Entikaria Rachmanita, S.Pd., M.Si. (*Supervisor Thesis*)

**Isrolana**

*Renewable Energy Engineering Study Program  
Department of Engineering*

**ABSTRACT**

*This study aims to analyze the performance of a conventional distillation system in a solar-powered fish smoking device and determine the quantity of liquid smoke produced. The distillation system condenses smoke from biomass combustion into liquid smoke through a cooling process in the condenser. Observed parameters included the smoking hotspot temperature, combustion chamber temperature, distillation inlet and outlet temperatures, and the volume of liquid smoke produced. Furthermore, performance analysis was conducted by calculating the temperature drop ( $\Delta T$ ) and condenser cooling efficiency. The research method used was an experiment with two treatments: one with a spiral condenser system and one without a spiral condenser system. The results showed that the conventional distillation system produced an average temperature drop ( $\Delta T$ ) of 22.04°C, higher than the 20.23°C achieved by the system without the spiral condenser system. The cooling efficiency of the system with the spiral condenser reached an average of 94.85%, while the system without the spiral condenser only achieved 63.88%, with greater fluctuation. Although the volume of liquid smoke produced without a spiral condenser is greater, using a spiral condenser produces a more controlled, stable, and efficient condensation process. This indicates that the use of a spiral condenser significantly improves system performance, thus potentially developing it as a more effective and environmentally friendly fish smoking technology.*

**Keywords:** *liquid smoke, conventional distillation, condenser, fish smoking*