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# APPLICATION OF ASPEN PLUS SOFTWARE FOR RESEARCH INTO SUSTAINABLE BIOMASS UTILIZATION TOPICS: A REVIEW

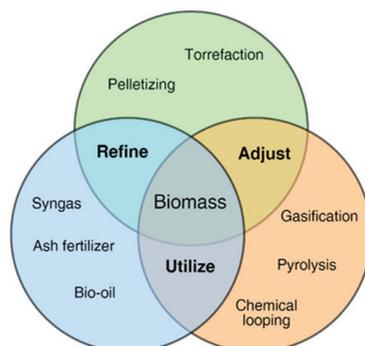
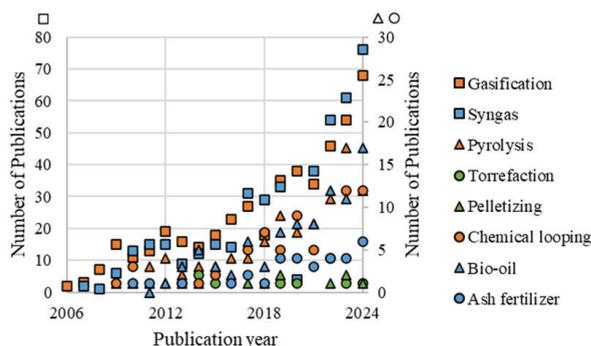
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**Abstract** – Historically, technological developments have been experimented with by testing or demonstrating the viability of an innovative idea. However, using advanced software can increase the added value of the study, which can resume at a much faster and more reliable progression. In the context of biomass disposal, there is a significant tendency to use the Aspen Plus software over the last two decades, as evidenced by available data in the Scopus database. Most of the studies related to the types of processing technologies consist of the gasification process (38.7 %). Pyrolysis (8.0 %) and chemical looping (5.6 %) are less studied. In the case of processed products, the use of syngas is most investigated (35.6 %). A promising direction is the utilization of bio-oil (7.3 %). Studies also explore the potential of using ash as a valuable fertilizer (2.7 %). Few studies use Aspen Plus to improve biomass properties; only 1 % focus on pelletizing, and 0.6 % on torrefaction. However, these processes are interconnected because all of the mentioned processes are utilized in the bioenergy sector, whether as a by-process of combustion or as combustible itself. Aspen Plus software can chemically analyse and optimize these processes to increase efficiency and economic performance. The authors will assess their options for integrating the Aspen Plus software into own future studies based on the information gathered. The availability of published data in identified articles will enable the comparison of results and the partial validation of the model.

**Keywords** – Aspen Plus; bioenergy; biomass pellets; biomass utilization; combustion process; densification; energy density; modelling; pelletizing



Material flow analysis algorithm for the study

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