Application of Aspen Plus software for research into sustainable biomass utilisation topics

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Aspen Plus has seen a significant increase in popularity, as evidenced by the increasing number of publications and citation on biomass utilisation

The software's functionality is most widely applied to research related to the **gasification**, while **syngas** is the most studied product of **biomass utilisation**.

The number of relevant studies related to biomass **pelletization** and **torrefaction** is negligible. However, authors of the different studies reviewed argue that the software provides high-added value to the results.
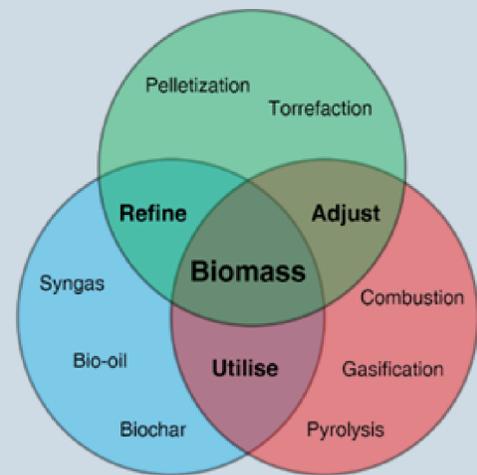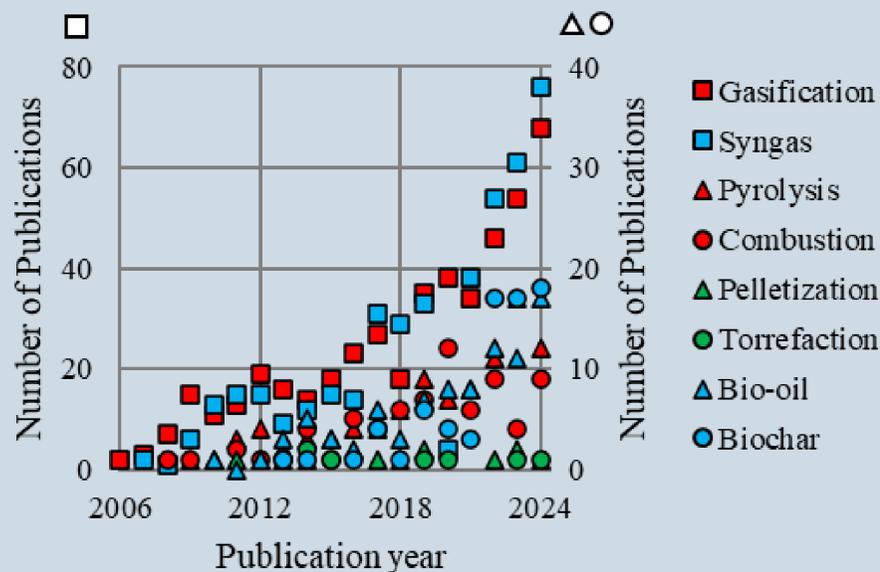
Bibliometric analysis results (left) and Venn diagram (right) for biomass utilisation

Main focus

The authors' main goal was to verify with a literature analysis approach the possibilities of using Aspen Plus in studies to **analyse** and **improve** the technological process of **existing biomass pellet production plants** in Latvia.

The authors noted different studies conducted worldwide and in the Baltic Region and compiled their modeling approaches. The information available shows that Aspen Plus enables the development of the biomass pellet plant to be studied in at least three paths:

1. **Introduction of low-quality biomass**
2. **Optimisation of the existing cogeneration plant**
3. **Improvement of the calorific value of the pellets**

The diagrams **1**, **2** and **3** shows how technological processes change depending on the main focus.

Conclusion

The study provides valuable literature review-based insights into the use of Aspen Plus to study biomass utilisation issues, focusing on biomass pellets as a case study.

The authors will use the data and results in future studies, where the authors will use software to further develop and optimise technological processes with modelling. In addition, the possibility of using Aspen Process Economic Analyzer to make not only technical but also economic analysis will be explored.

These findings will provide the basis for a more in-depth analysis and will allow the impact of different scenarios on the efficiency and sustainability of biomass production to be more accurately anticipated.