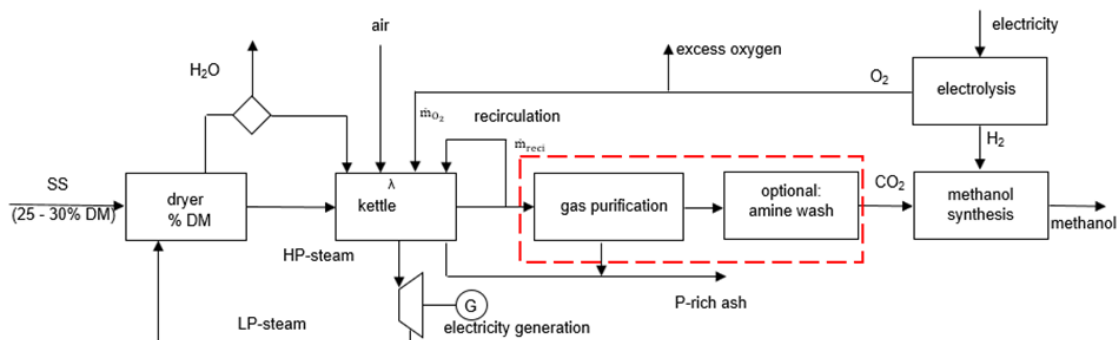


Master Thesis:

Modeling of an oxyfuel combustion of sewage sludge with subsequent CO₂ utilization in a P2X process

Project Description:

In our research project, we investigate the partial and complete oxyfuel mono fluidized bed combustion of sewage sludge together with an oxyfuel flue gas cleaning section. The goal is to separate the carbon dioxide contained in the flue gas and make it usable for downstream P2X processes.



A simulation software (Aspen Plus) is used to model a combination of a power plant and a P2X process. The methanol production using carbon dioxide and hydrogen is analyzed as an exemplary P2X process. The oxygen for the O₂-enriched combustion and the hydrogen for the chemical synthesis come from water electrolysis.

Two configurations are investigated:

- (1) Partial oxyfuel combustion including amine scrubbing and a P2X process.
- (2) Oxyfuel combustion including a P2X process

Tasks:

- Literature research
- Modeling of both configurations
- Parameter study/sensitivity analysis
- Optimization of heat integration
- Economic efficiency study

(On request, this work can be carried out entirely online)

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