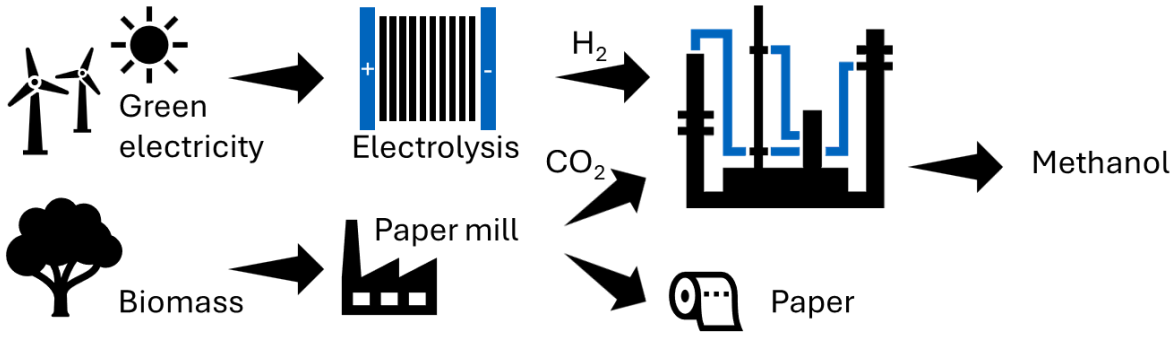
Lehrstuhl für
Anlagen- und Prozesstechnik

Bachelor's Thesis or Semester Thesis:

Assessing the Technical Potential of Green Methanol Production in Uruguay (DE / EN)



The transition to sustainable energy systems increasingly relies on integrating renewable electricity and green hydrogen production into large-scale industrial processes. In the context of Power-to-X applications, methanol synthesis represents a promising pathway for converting renewable energy into valuable chemicals and fuels. The two critical components of this process are the availability of abundant renewable power and concentrated CO2 streams. The country of Uruguay boasts an electricity grid that is 95 % green and a well-developed pulp and paper industry, which, as a significant emitter of biogenic CO2, offers an attractive source that aligns with circular economy principles and decarbonization goals.

Objectives:

- Assess the technical potential in Uruguay for utilizing CO2 emissions from the pulp and paper industry as a feedstock for Power-to-Methanol
- Assess challenges: What are typical characteristics (purity, volume, variability) of CO2 streams from pulp and paper industry processes? Do they have to be conditioned for use in methanol synthesis?
- Determine the heat and process integration potential for paper mills with CO2 capture and Power-to-Methanol.

Prerequisites / tools:

- TVT 1 or equivalent; Chemical engineering / process simulation basics.
- Optional: UniSim Design for process integration assessment
- Writing can be done in German or English

Start date: ASAP
Duration: 3 - 6 months

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