Techno-Economic Assessment of Processes that produce Jet Fuel from Plant-Derived Sources

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- Research problem
- Potential routes, feedstock and product
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- Proposed Processes
- Method
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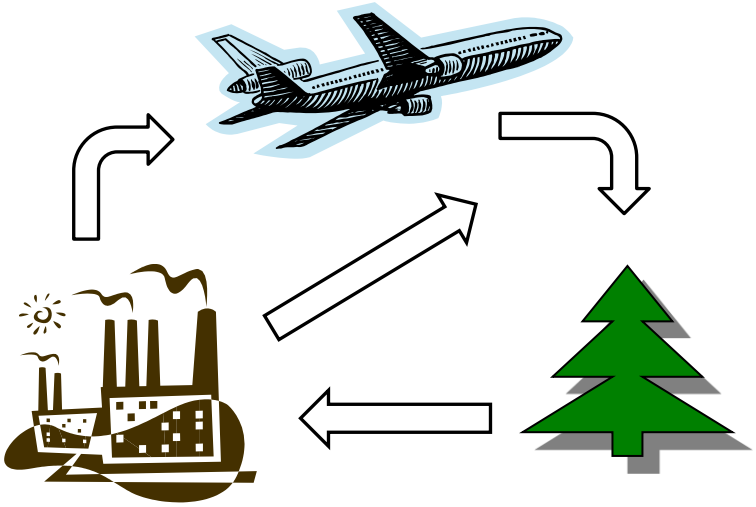
Research problem

- High consumption of Jet fuel
- Conventional Jet Fuel - high GHG emissions
- Non-fossil processes - low GHG emissions
- Closed carbon-cycle

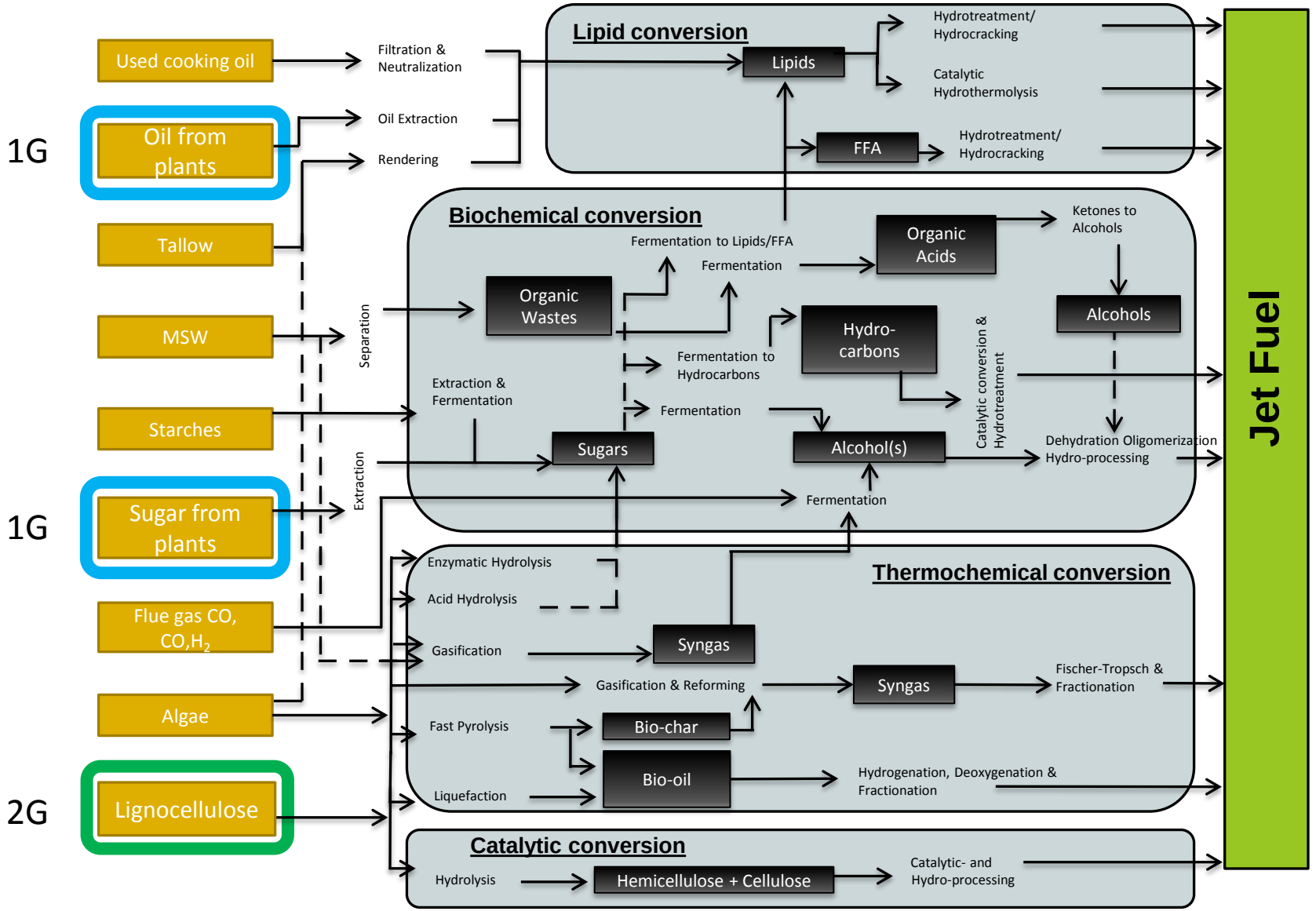


Research problem

- Large number of potential feedstocks
- Large number of potential processes

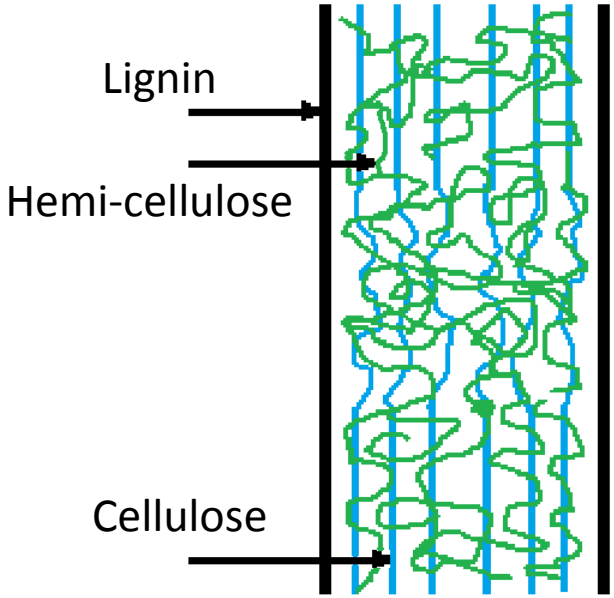
- Unsure what is the best option
- Need to determine the best option

Potential routes from non-fossil sources



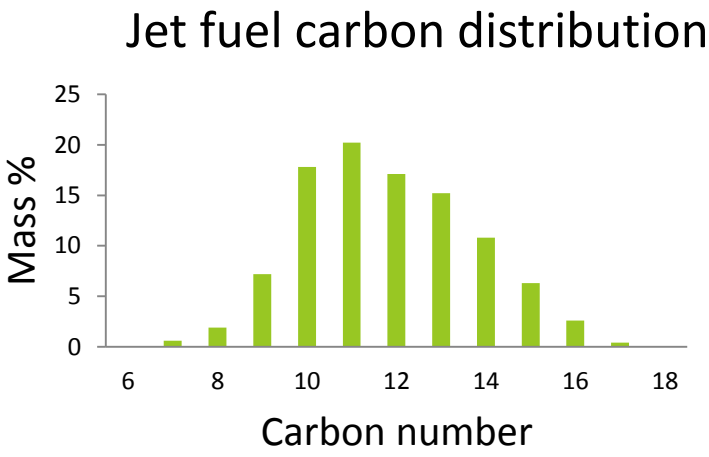
Lignocellulose

- Cellulose, hemi-cellulose and lignin
- Source
  - Wastes
  - Forest products
  - Energy crops



Jet fuel

- Mixture of hydrocarbons
- “Drop-in” jet fuel
- ASTM approval process
  - HEFA process
  - GFT process



Objectives

Main Objective:

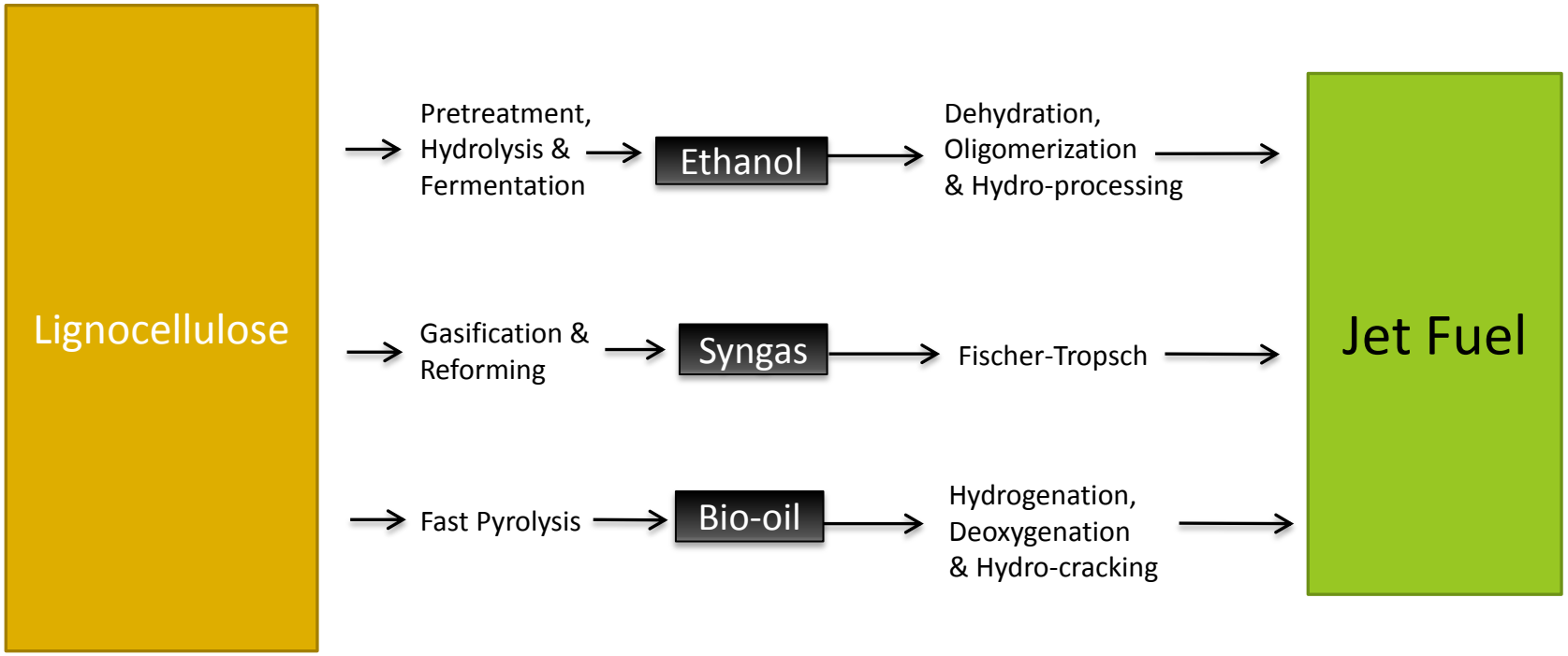
- Compare lignocellulose to jet fuel processes

Minor Objectives:

- Compare plant-derived jet fuel production processes
- Commercial feasibility of lignocellulose to jet fuel processes

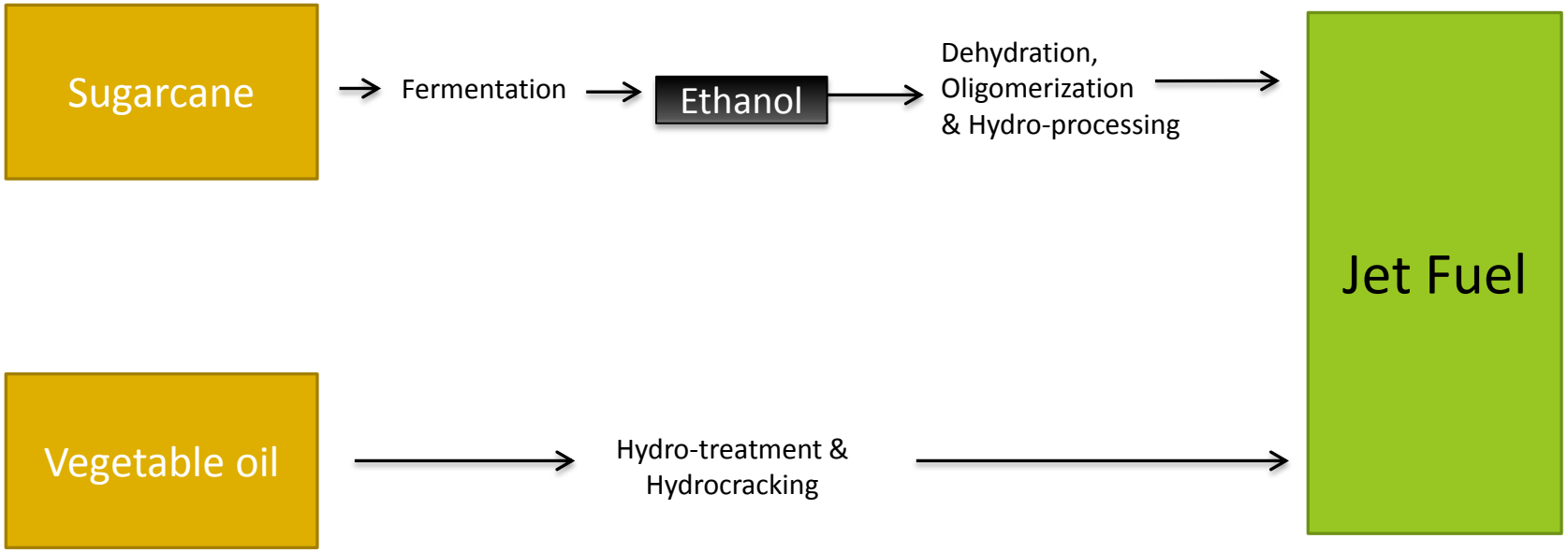
Proposed Processes

Most mature lignocellulose to jet fuel processes:



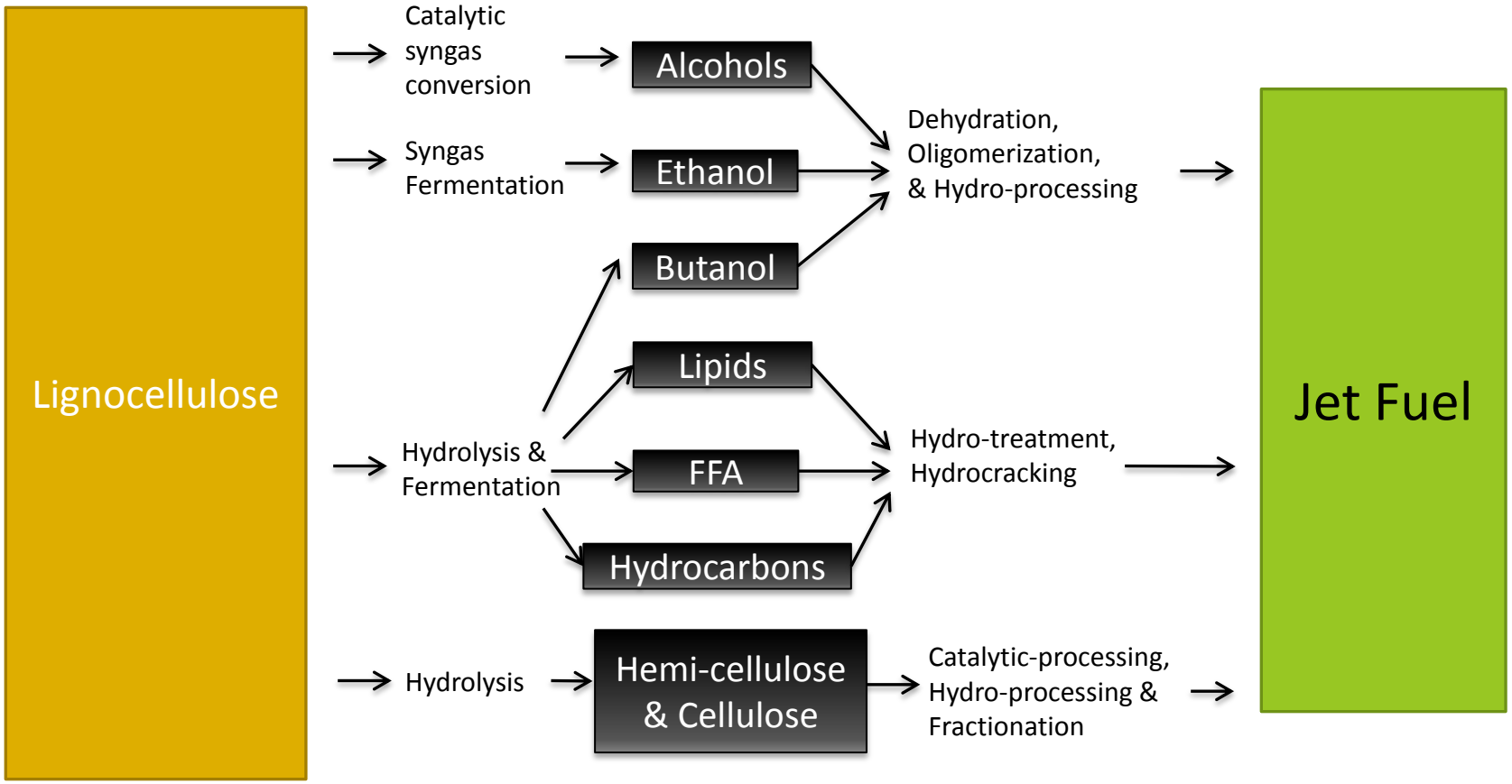
Proposed Processes

Mature non-lignocellulose to jet fuel processes:



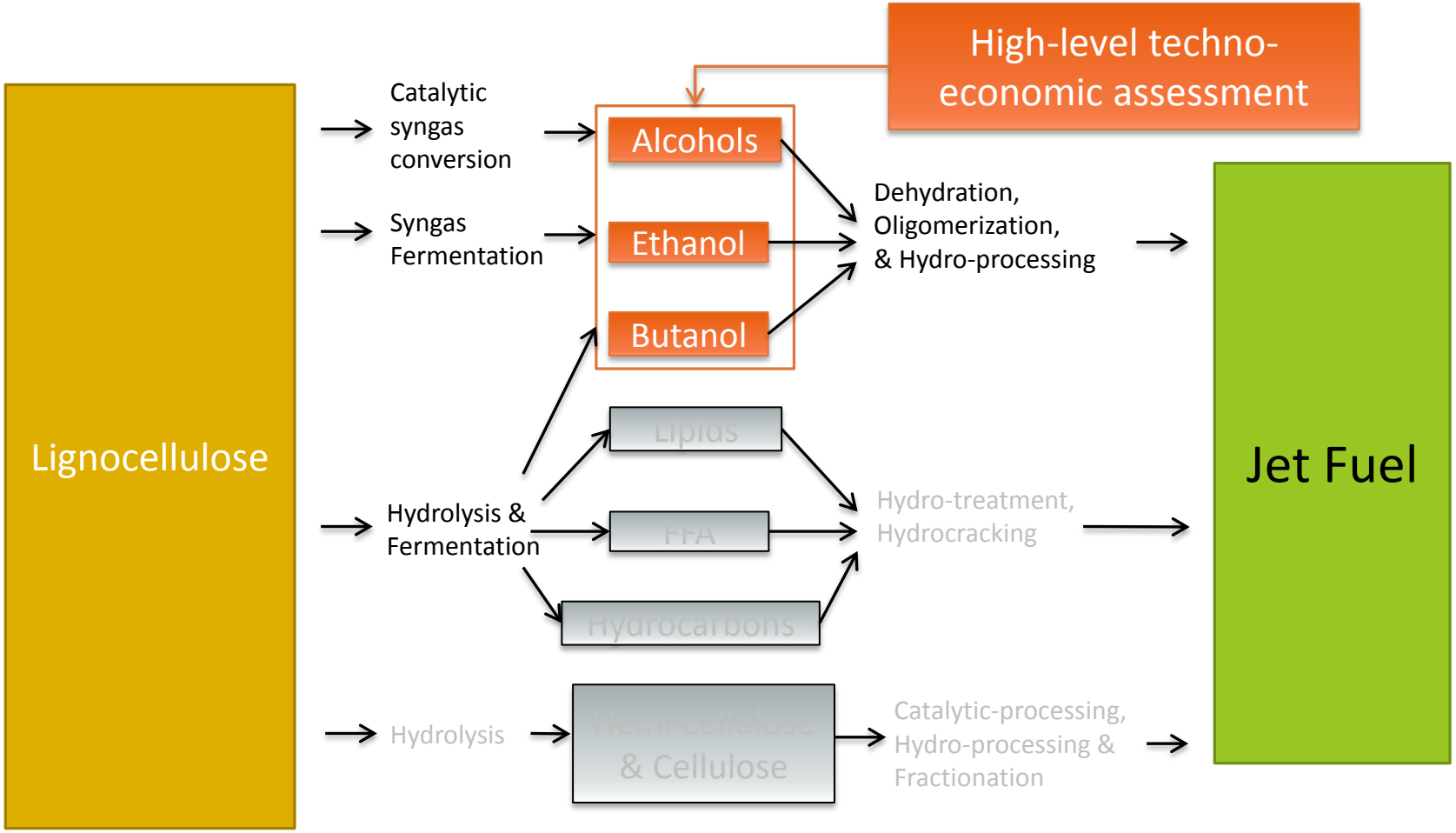
Proposed Processes

Novel lignocellulose to jet fuel processes:

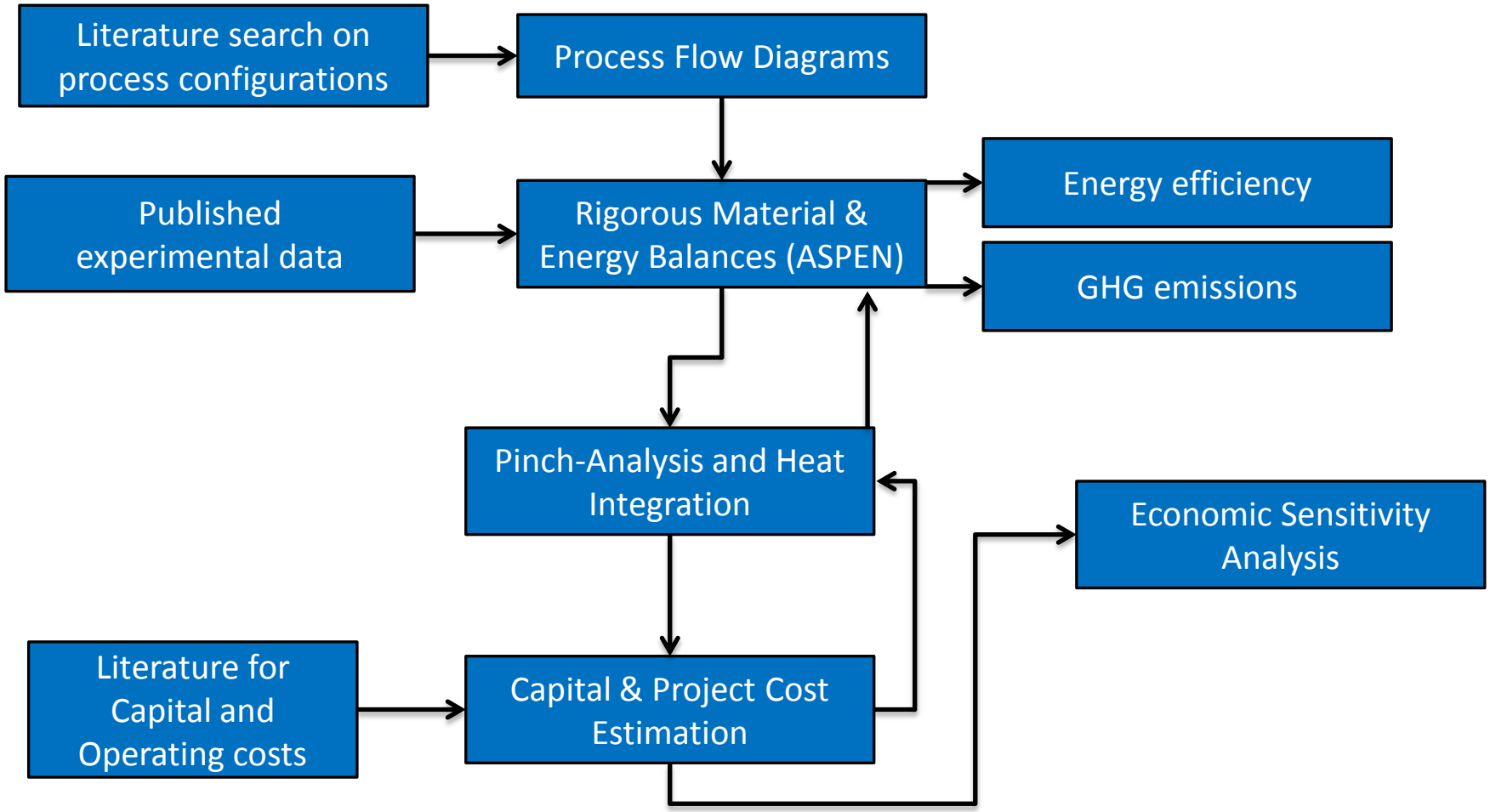


Proposed Processes

Novel lignocellulose to jet fuel processes:



Method: Techno-Economic Assessment



Main Outcomes

- Understanding of jet fuel production processes
- Mass- and energy-balances for the processes
- Comparative techno-economic analysis of processes
- Sensitivity analysis of economics
- GHG emissions - jet fuel production processes

Acknowledgements

- CRSES