Comparison of Biomass-Based Synthetic Natural Gas Production Scenarios: Cradle-to-Gate Life Cycle Assessment (LCA)

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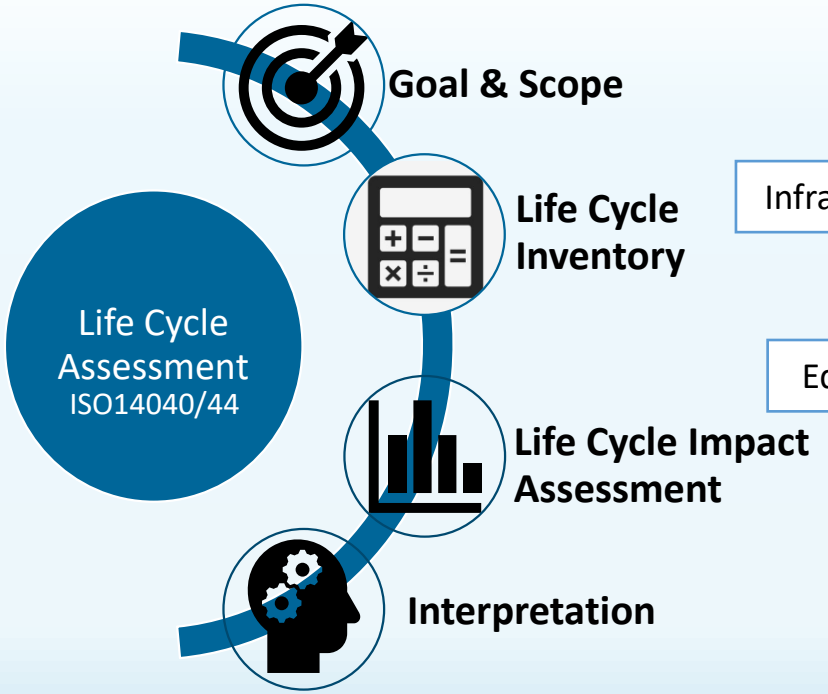
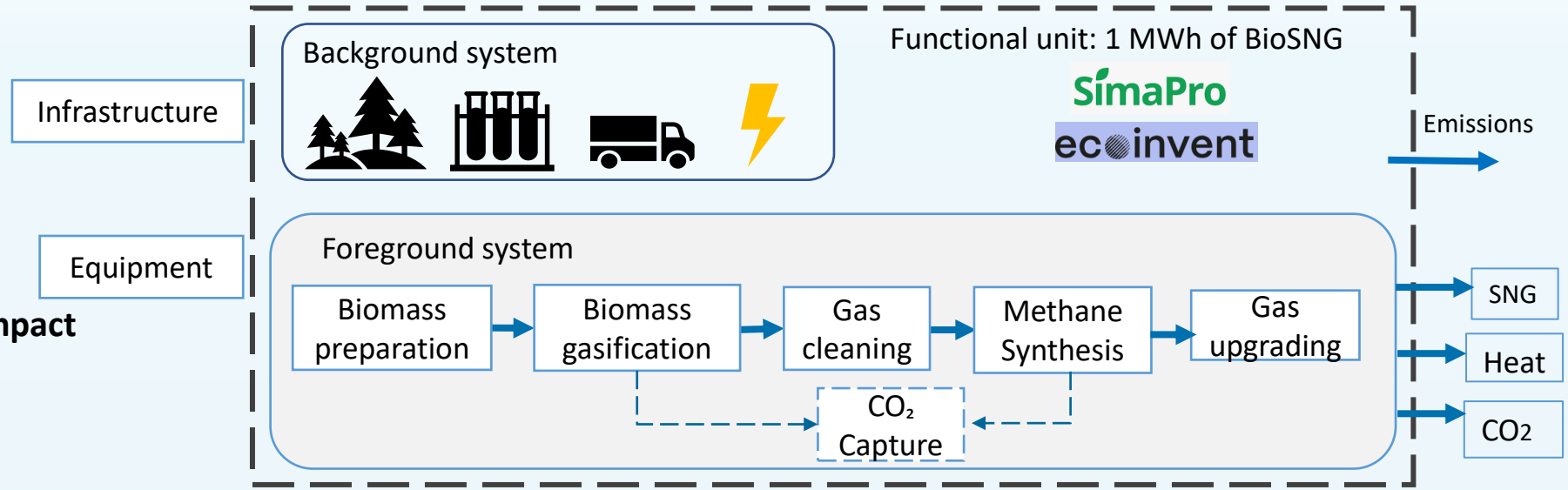
Evaluate the environmental impacts
Hotspot & scenario analysis
Austria





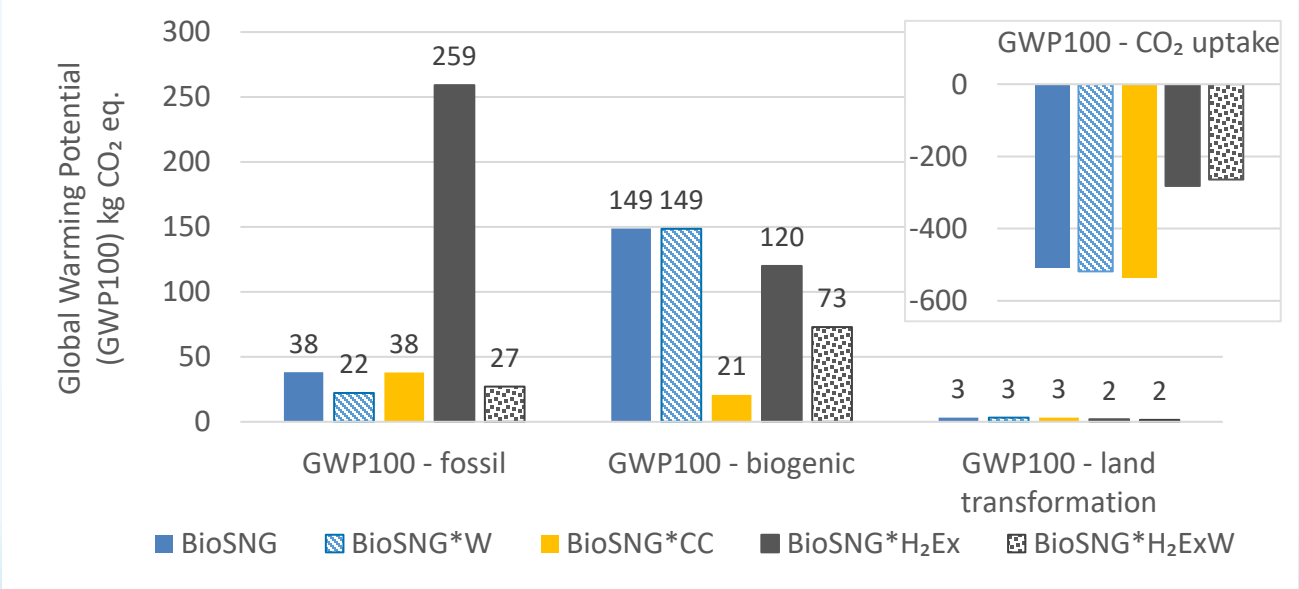
Experimental results, mass & energy balances extracted from [1]

[1] Bartik Alexander. 2024. SNG from biogenic resources. Doctoral thesis. TU Wien, Vienna, Austria.

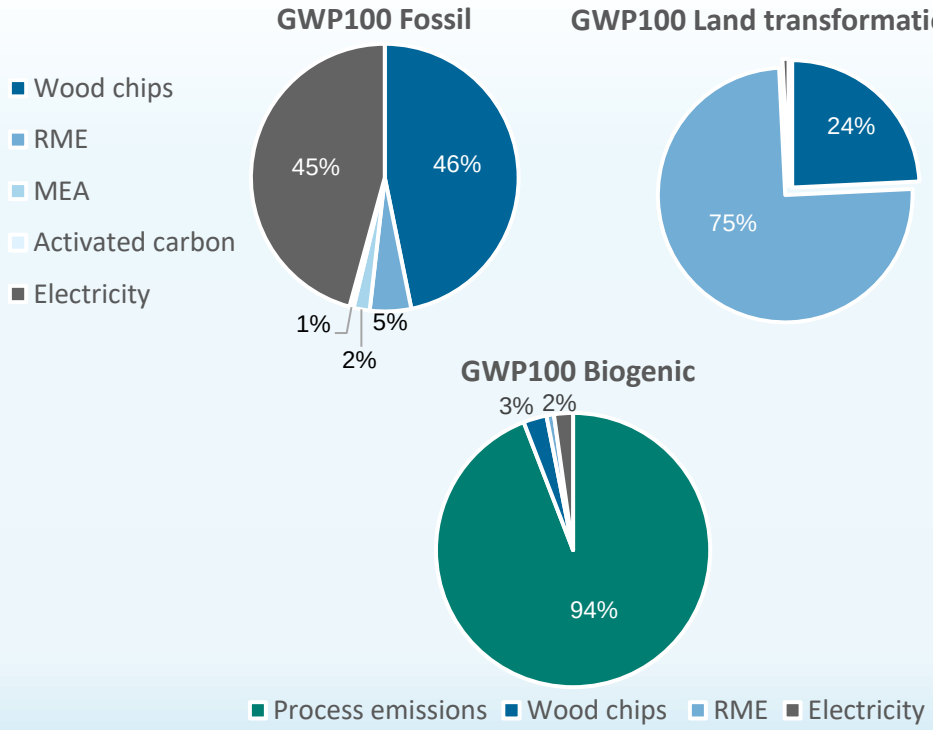
Life Cycle Impact Assessment

Scenarios

BioSNG – base case: partial CO_2 capture (after methane synthesis) & Austrian grid electricity;
BioSNG*W – wind electricity; **BioSNG*CC** – Capture of total CO_2; **BioSNG*H_2Ex** – addition of hydrogen;
BioSNG*H_2ExW – addition of renewable hydrogen & wind electricity.



GWP100 Process Contribution - BioSNG



Summary

- Biogenic emissions show the carbon intensity of biomass-based processes
- Addition of hydrogen from electrolysis only in regions where there is no water scarcity
- Optimisation of process route needed to include more feedstocks (waste and residues) to avoid competition for arable land and carbon sinks

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