Optimal process design for thermochemical production of fuels from biomass

Martin Gassner, François Maréchal
Laboratory for Industrial Energy Systems, École Polytechnique Fédérale de Lausanne, Switzerland
martin.gassner@epfl.ch

MOTIVATION
Polygeneration of energy services from waste biomass

CO₂-mitigation potential for wood-based cogeneration options:

- Biomass: renewable, CO₂ neutral, land is limited
- Heat and power sector: energy/CO₂ efficient technologies exist
- Transport is the challenge

OBJECTIVES
Process design for the optimal use of a scarce resource

APPROACH
Environomic process performance

Process synthesis
Development of a firm process layout. Define:

- heat exchanger network
- strategy of process operation

RESULTS
Environomic process performance

Conclusions

- Process integration and polygeneration is compulsory to fully exploit the energy potential of biomass.
- The optimisation of the process with respect to multiple objectives allows to find a sound design compromise.

References

The authors gratefully acknowledge funding provided by Erdgas Otschweiz AG, Gasverband Mittelbaden AG and Gaznat SA, Switzerland.