IEA Bioenergy
Technology Collaboration Programme

IEA Bioenergy Task 34

Direct Thermochemical Liquefaction

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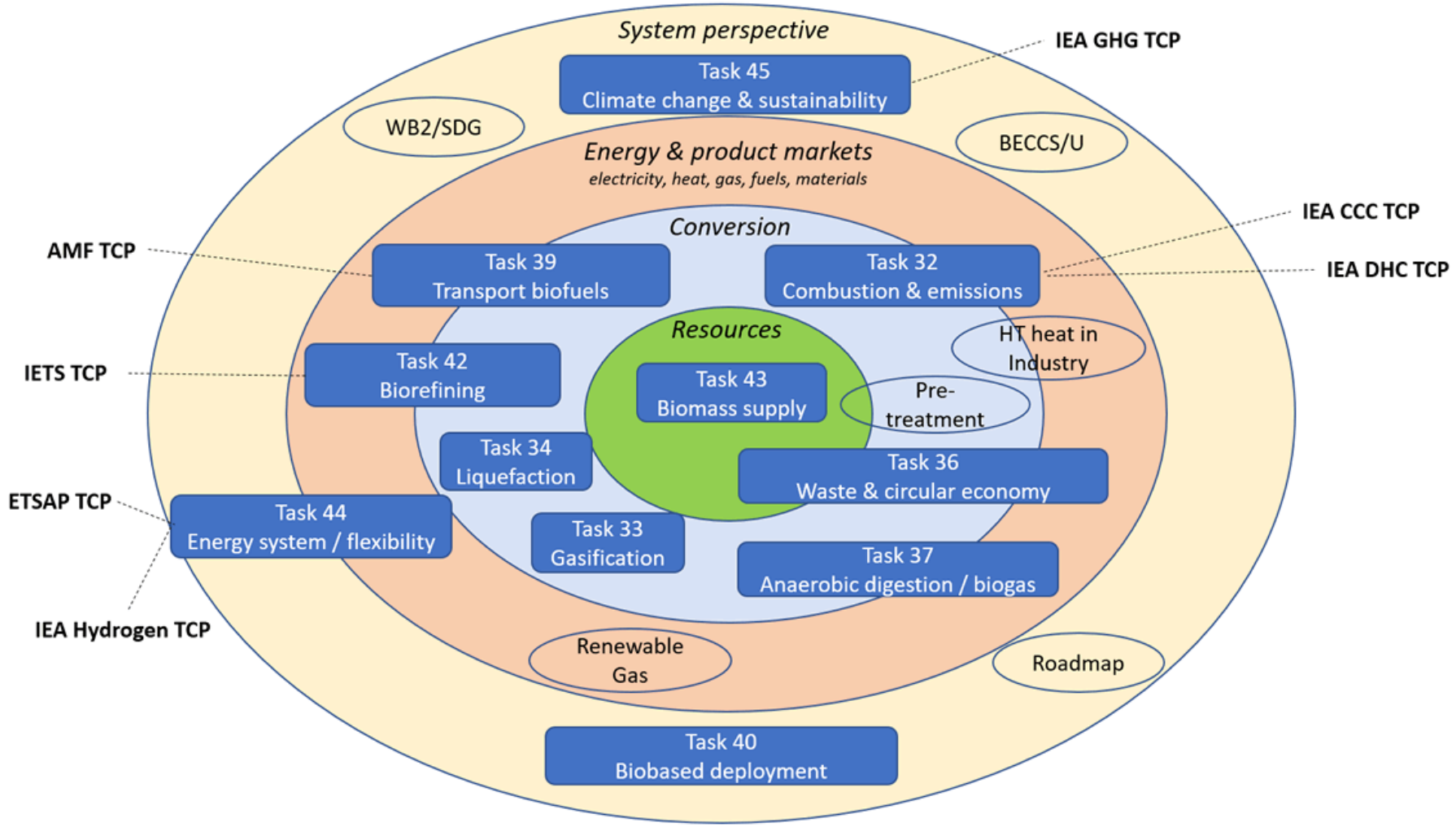
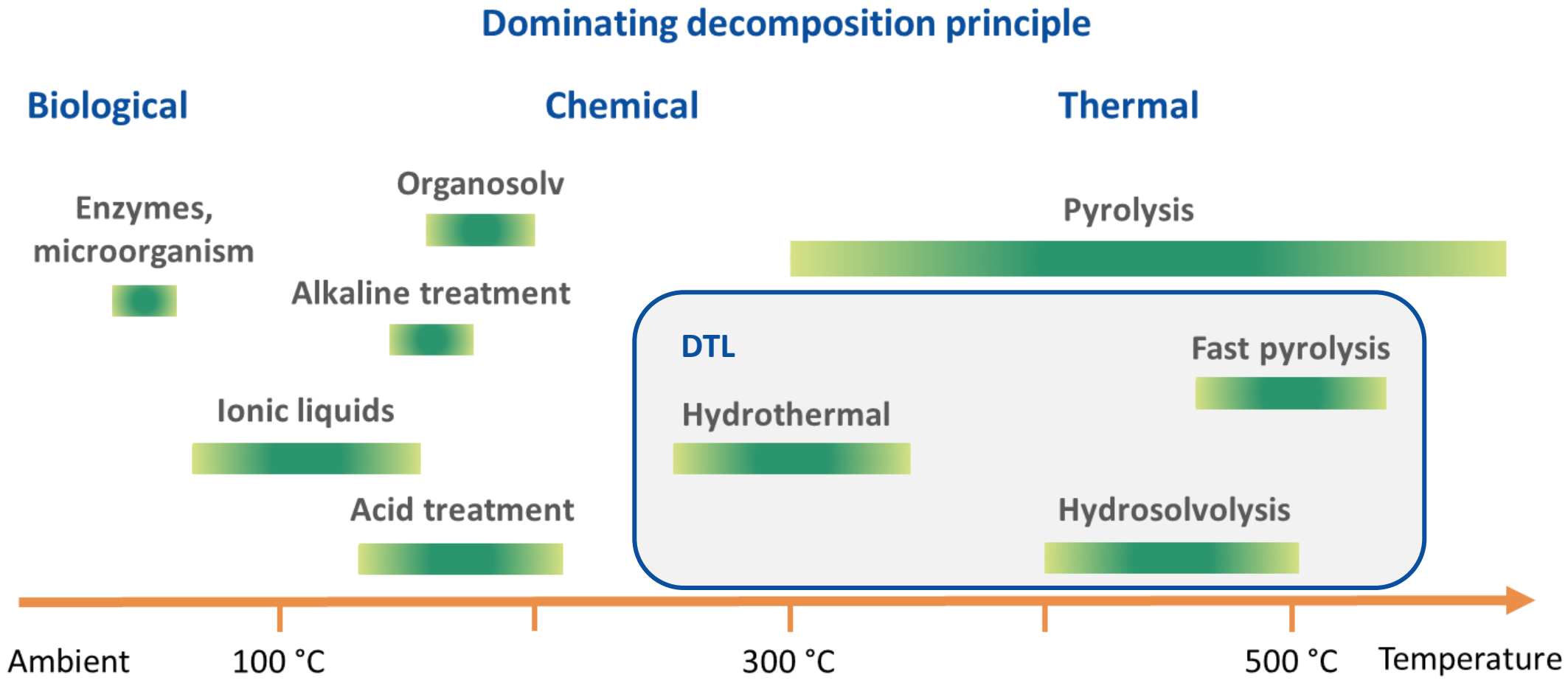
BioTheRos Workshop @CEBC, Graz, 21. January 2025

IEA TCP Bioenergy



Decomposition of biomass



Direct Thermal Liquefaction…

- significant contribution to the **energy transition** by enabling sustainable bio-based fuels and chemicals.
- requires **standardization**, robust analytical methods, and high product quality to enable market uptake.
- are technically mature but require further steps toward **large-scale deployment**.

IEA Task 34 - Direct Thermal Liquefaction

Current focus

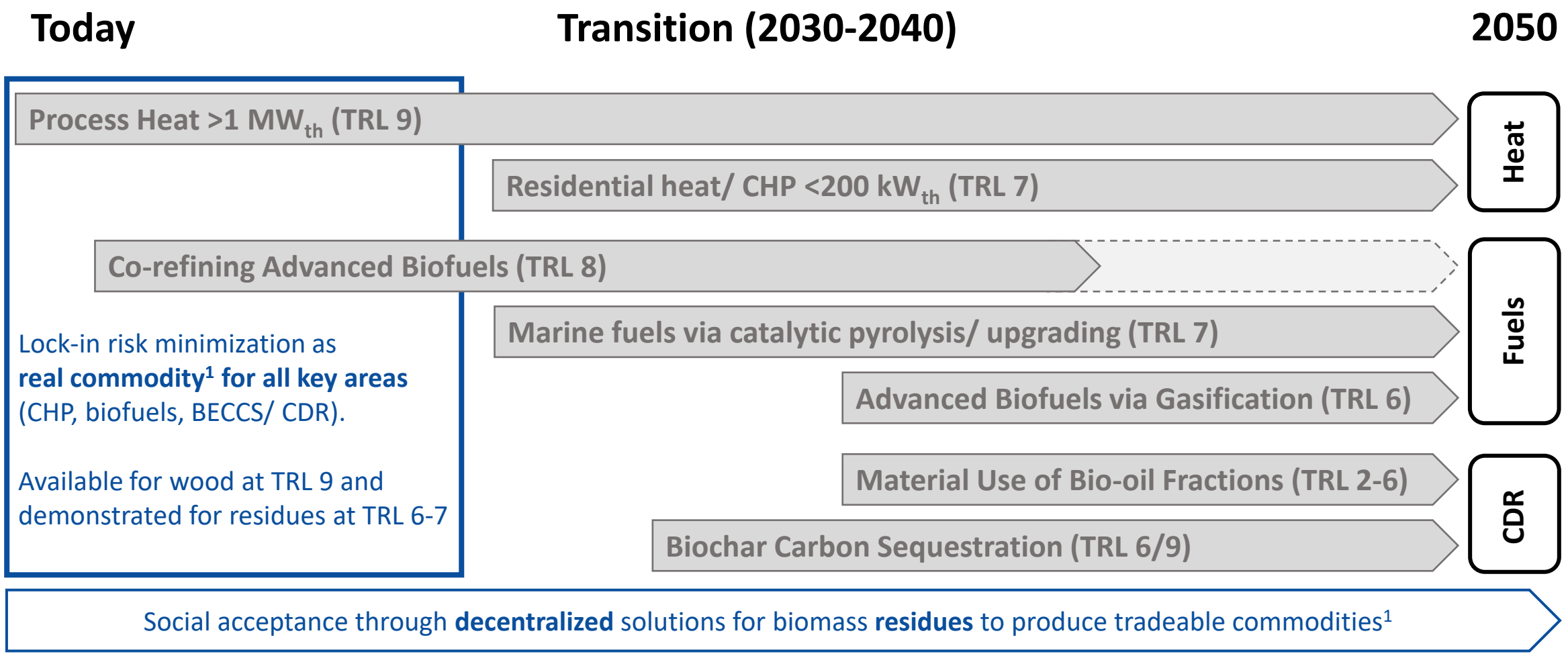
Advanced products from DTL

- Towards SAF and marine fuels,
- smart byproduct use
- water management

From diverse feedstocks to biobased fuels

- Fast pyrolysis of non-woody biomass and mobile FP units.
- Bringing innovative biofuels from lab to application.

Contribution of Fast Pyrolysis to Net Zero Emissions



[1]IEA Bioenergy Task 43 ‚To be or not to be a biobased commodity' DOI 10.18174/562461

Sample homogeinity impact on analytics of Biomass Liquefaction Oils

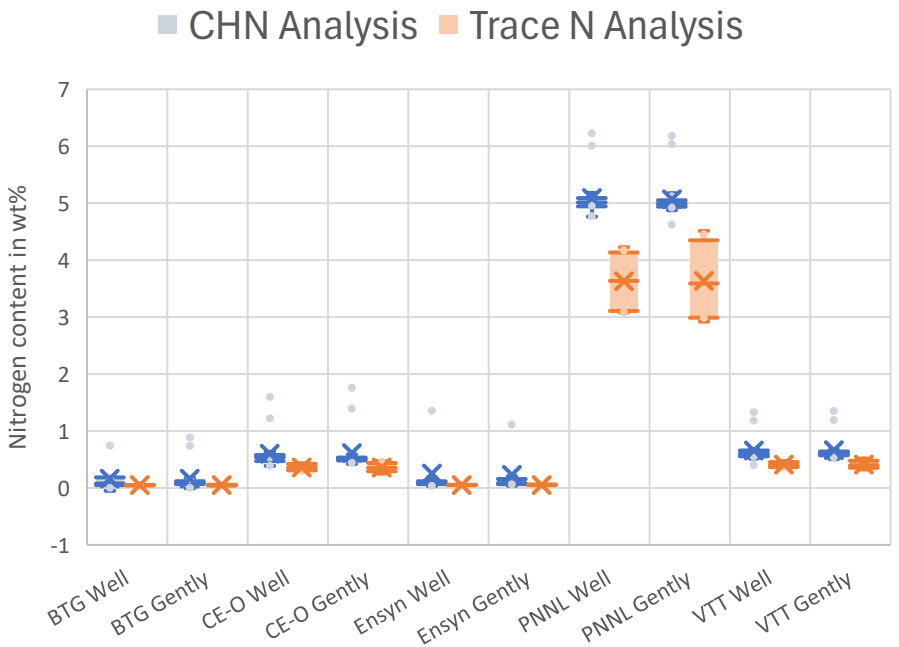
Interlaboratory Study of Sample Homogeneity Impact on CHNS, Water, and ICP Analysis of Biomass Liquefaction Oils
Philip Bulsink, Leslie Nguyen, Murlidhar Gupta, François-Xavier Collard, Axel Funke, Jawad Jeaidi, and Benjamin Bronson
Energy & Fuels **2025** *39* (29), 14223-14236. DOI: 10.1021/acs.energyfuels.5c01309

Approach

- **5 BLO samples**: 4 FPBOs + 1 HTL biocrude
- **Two mixing regimes**: gentle vs. vigorous
- **Analyses**: CHN, water, trace N, S, ICP elements

Key Findings / Conclusions

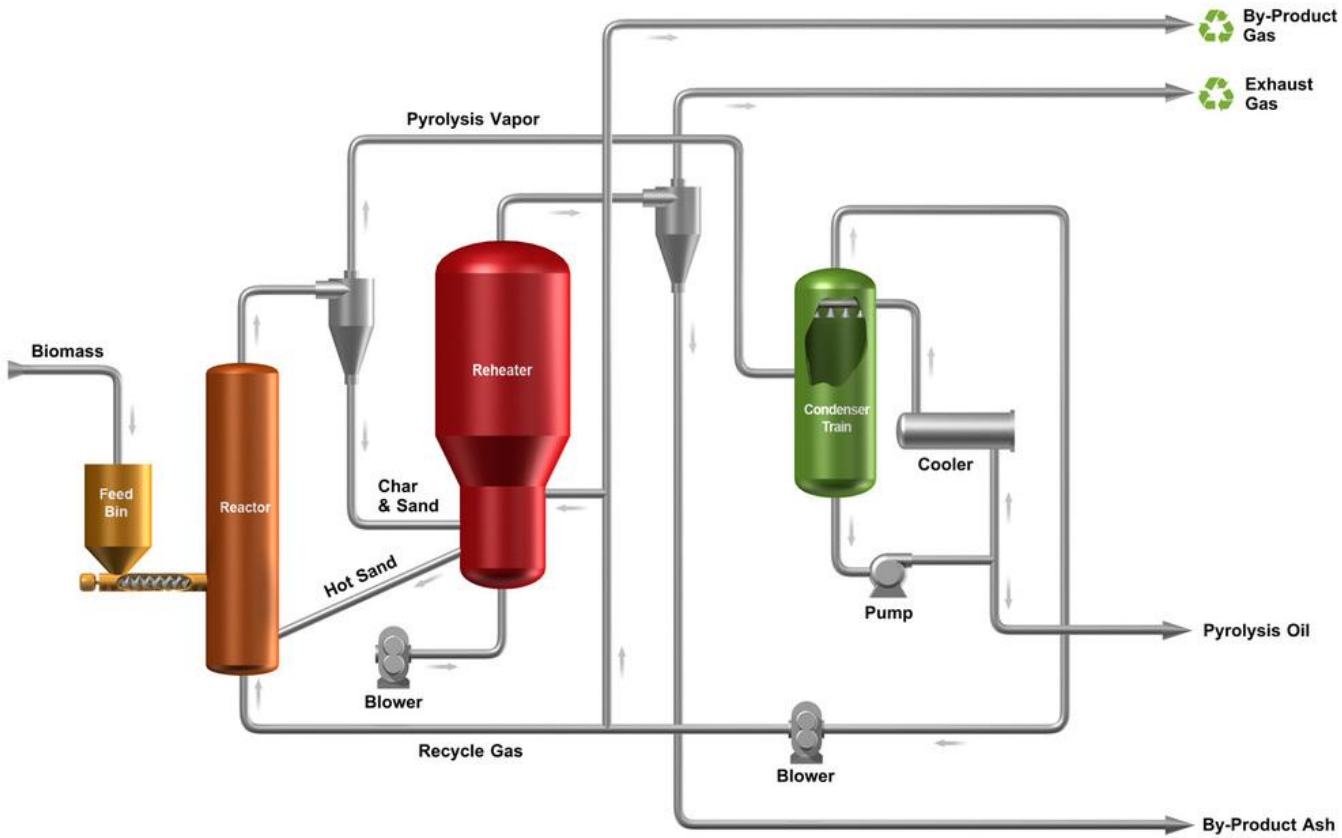
- **Vigorous mixing ≠ better results**: no improvement in precision/reproducibility; consistency of mixing is what matters
- **Trace nitrogen issue**: adapted methods report **25–50% lower N** vs. CHN method→ reconciliation needed.
- **ICP analysis highly variable** across labs
  - urgent need for **standardization**
  - dissolution ineffective for multivalent analytes; **digestion recommended**.



Demo and commercial plants

CÔTE NORD - Port-Cartier, Quebec

http://www.ensyn.com/quebec.h



Fast Pyrolysis Demoplant Database | Task 34

- Sawmill residues
- 16 million litres/year
- Arcelormittal pellet ore production

Thank you for your attention

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