

Modelling and Balancing of EFG Process

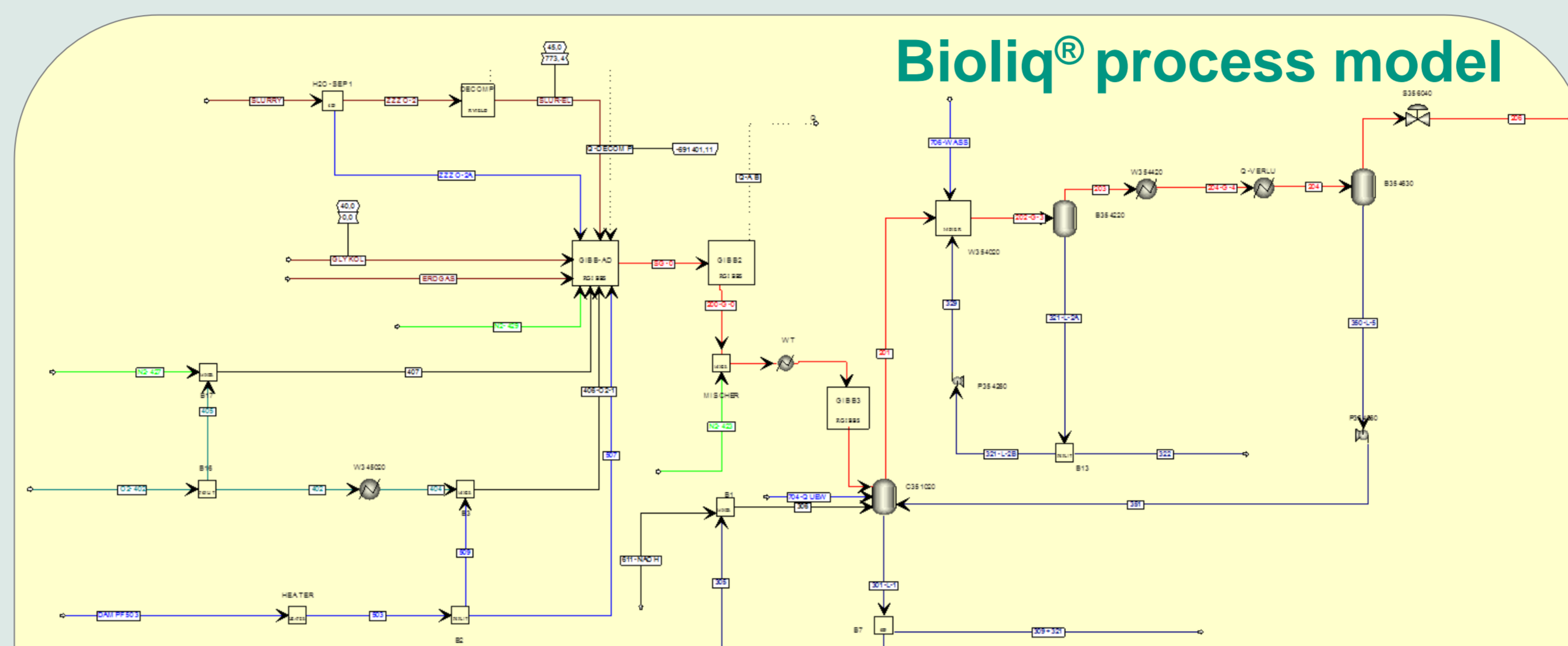
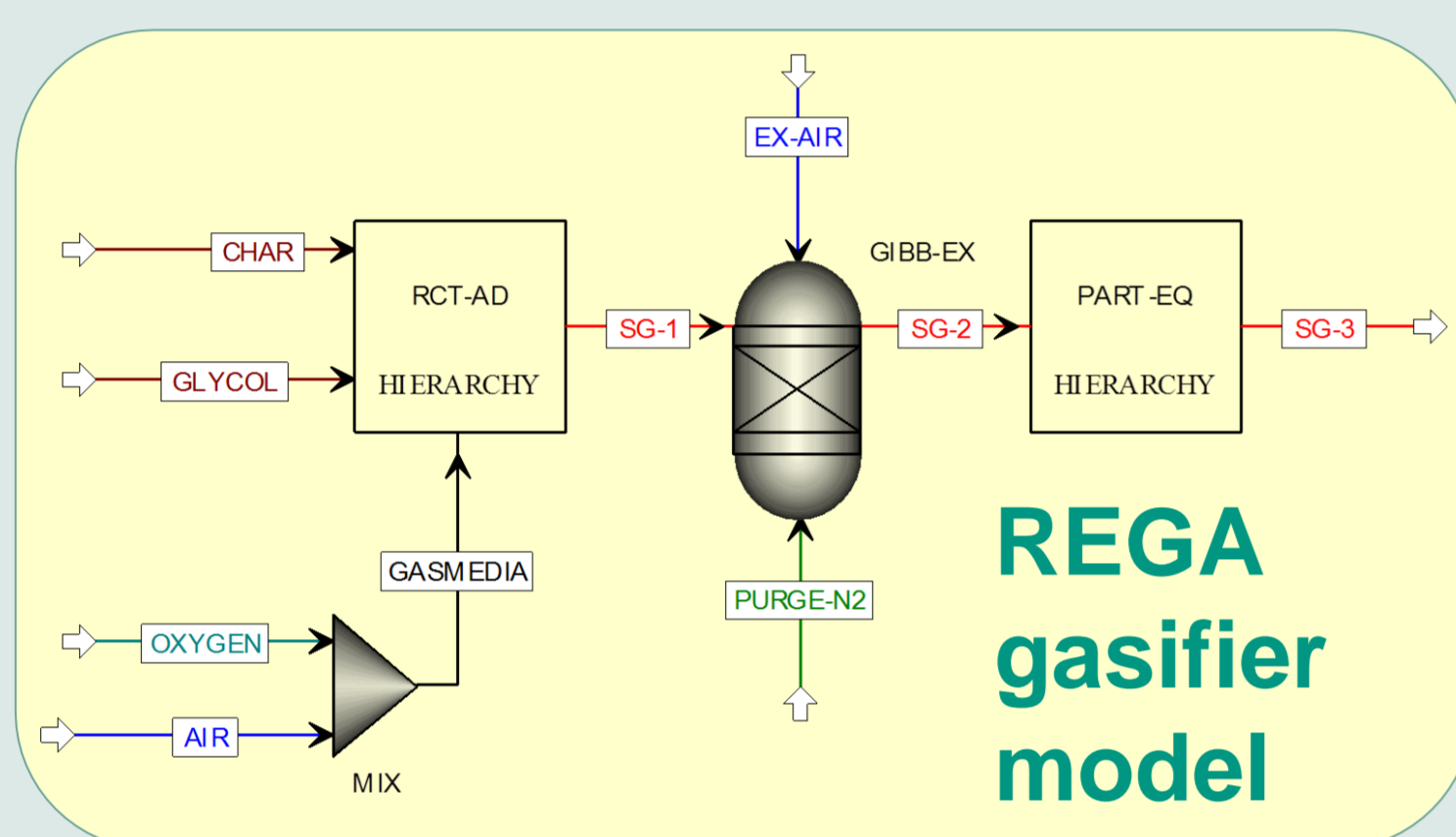
Process Development for High Pressure Entrained Flow Gasification

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Flowsheet Simulation, ASPEN plus® of REGA + bioliq® EFG

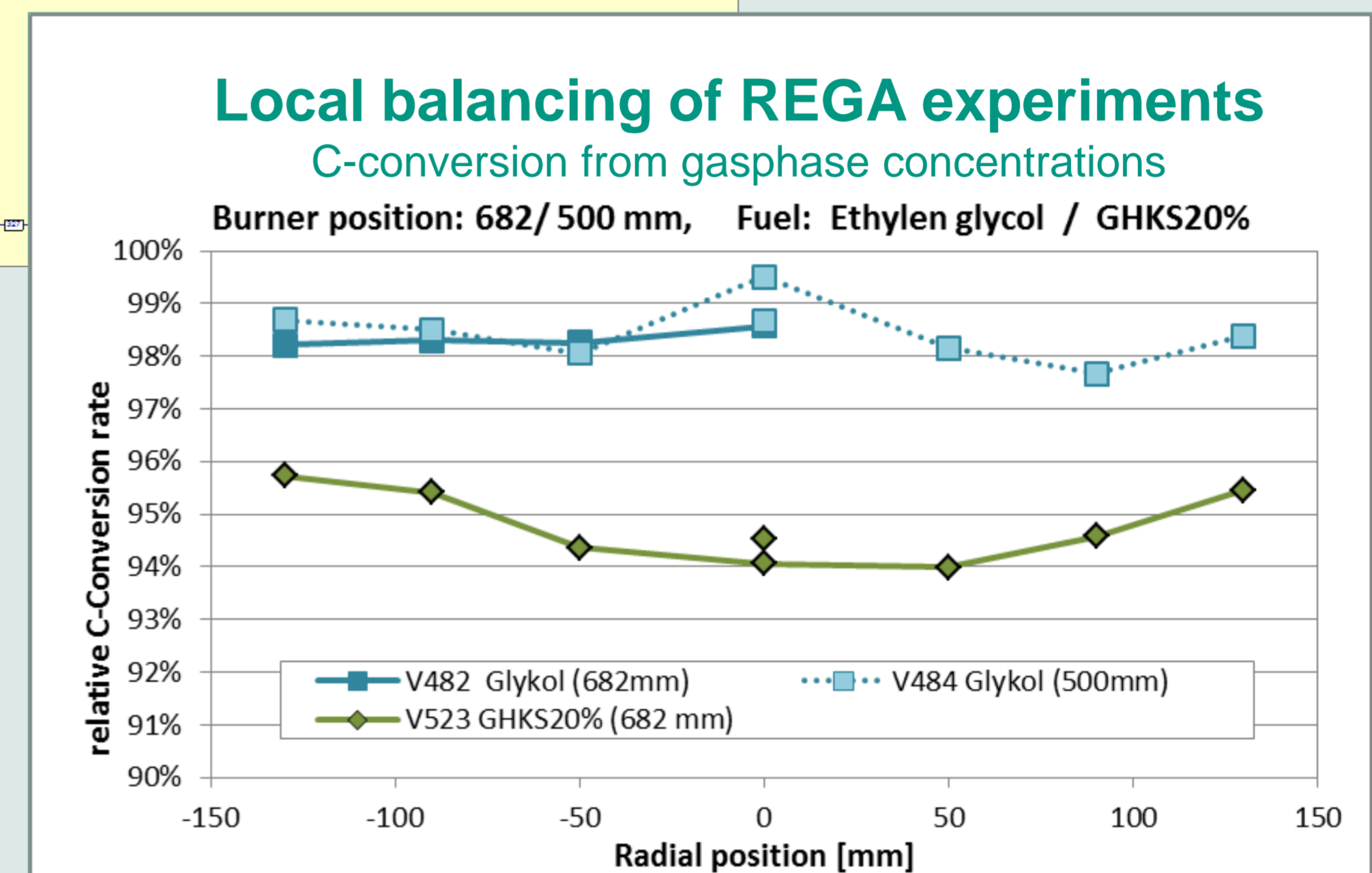
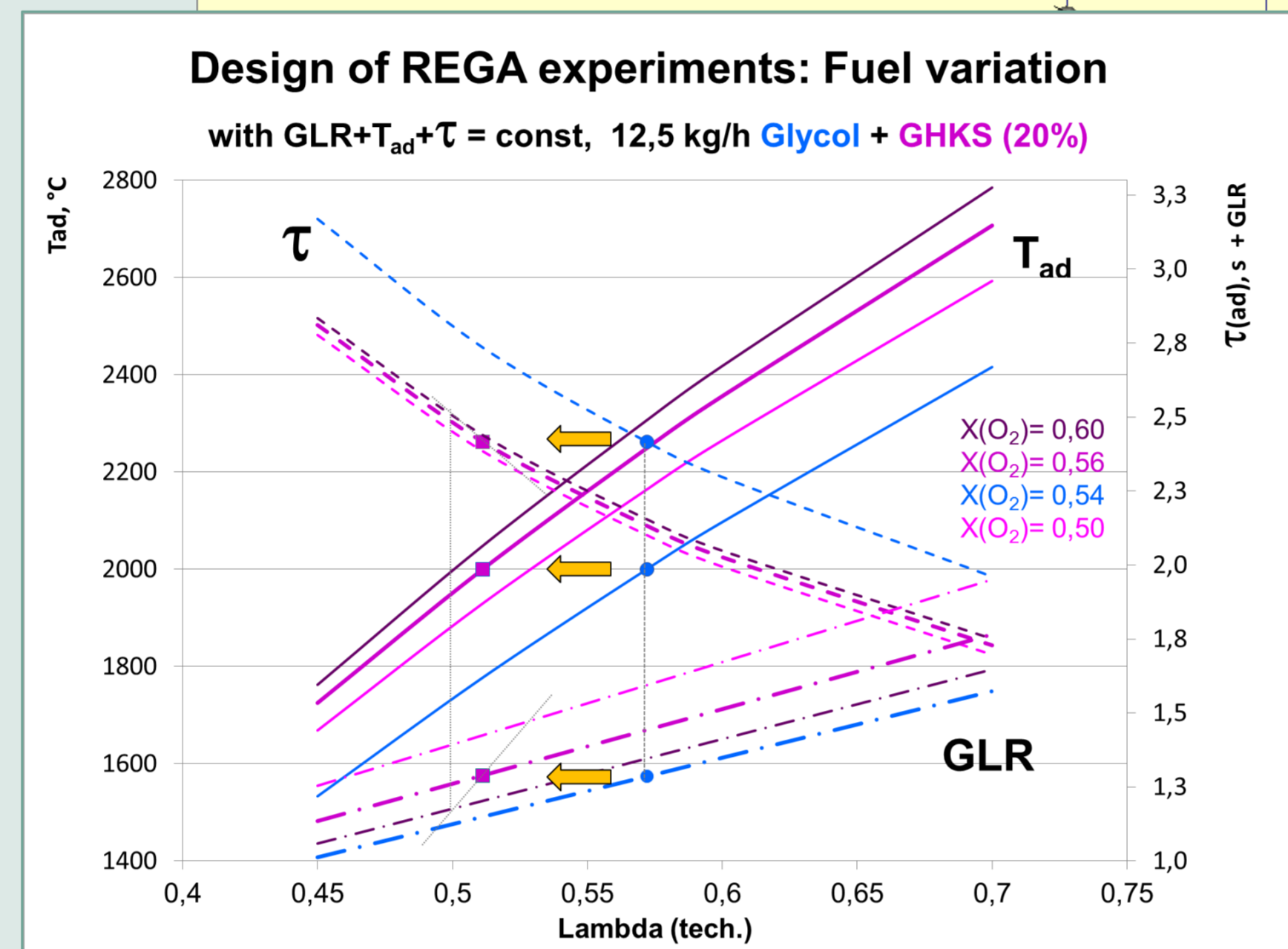
Process + gasifier models:

- Design/planning of experiments
- Systematic parameter variation
- Analysis of experiments
- Balancing + validation
- Data sets for CFD-simulation
- Model fuel blending
- Sensitivity analysis
- Process development
- Process optimization



Basis:

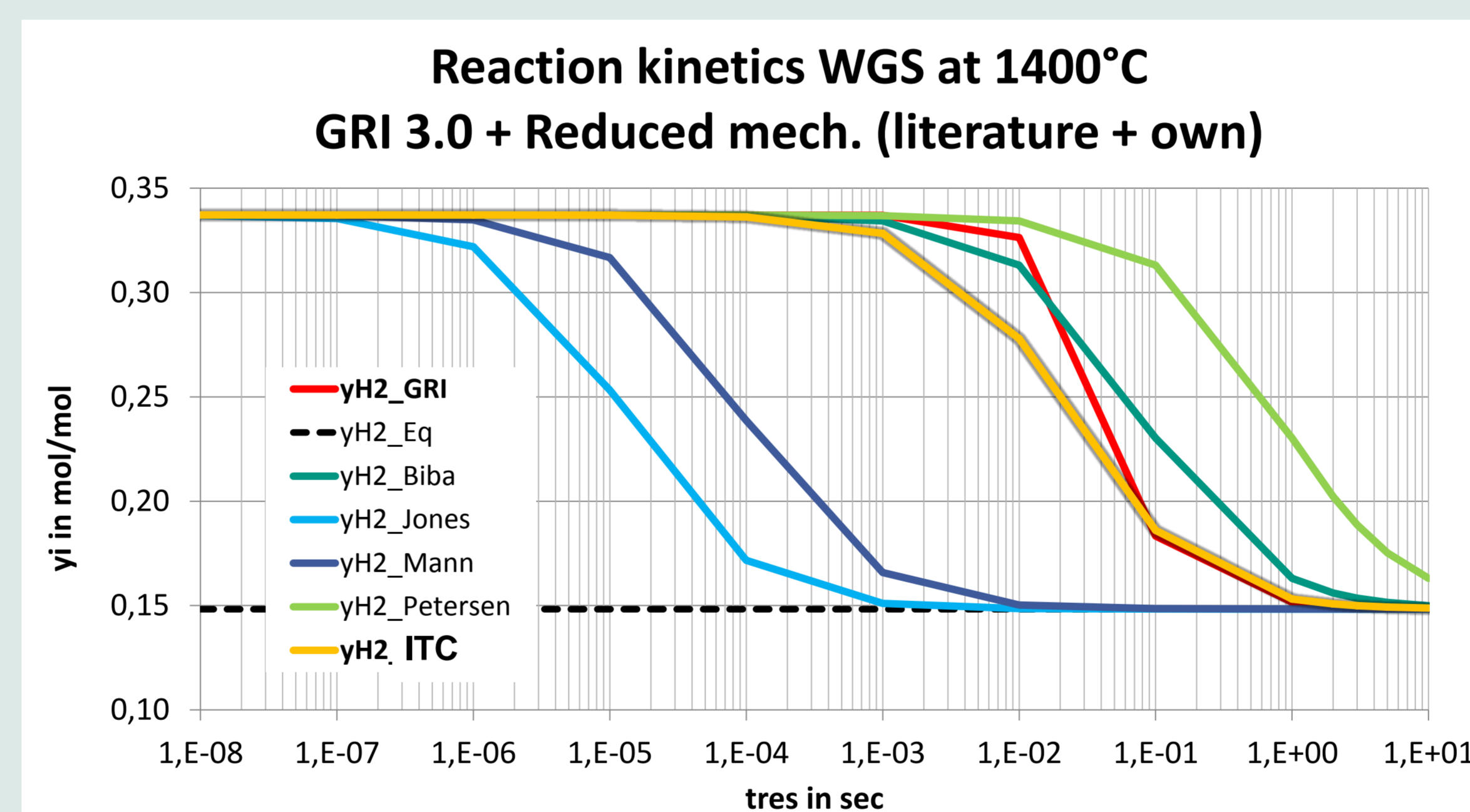
- Model + technical fuels
- Gibbs eq. reactors
- Data base 1-80 bar, up to 2000°C
- Incomplete conversion via inert streams



Chemical Reaction Modelling, Chemkin

Gasifier models:

- Analysis + validation of exp.
- Examination + development of reduced homog. mechanism for CFD + ASPEN
- Sensitivity analysis
- Development of detailed kinetic gasifier model



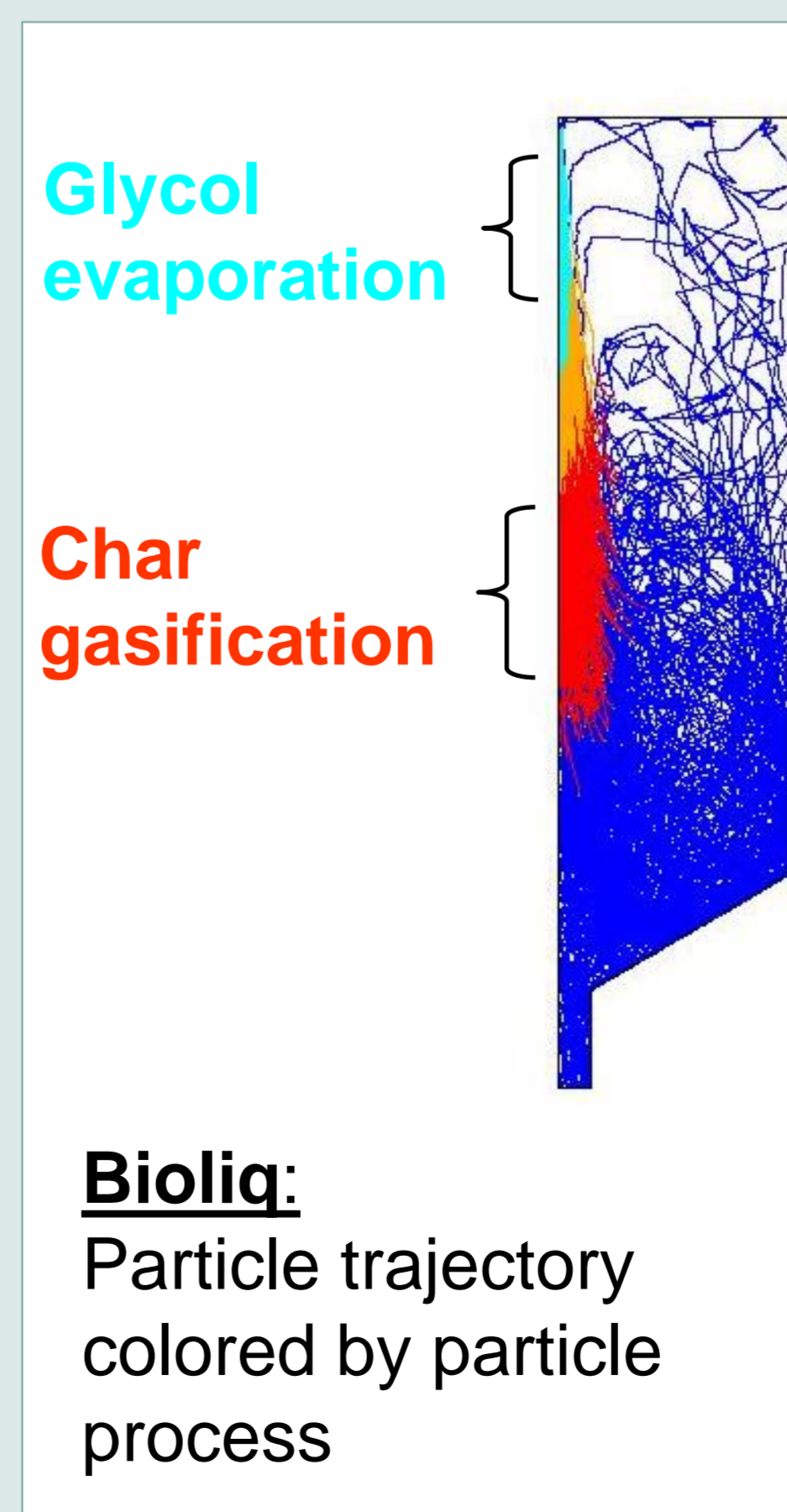
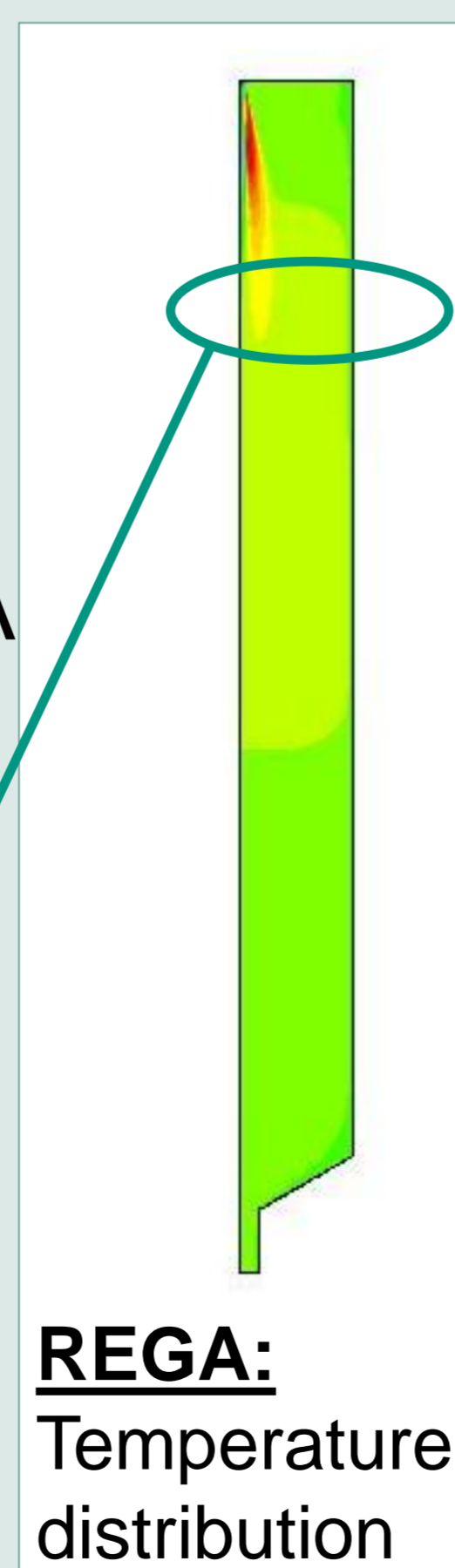
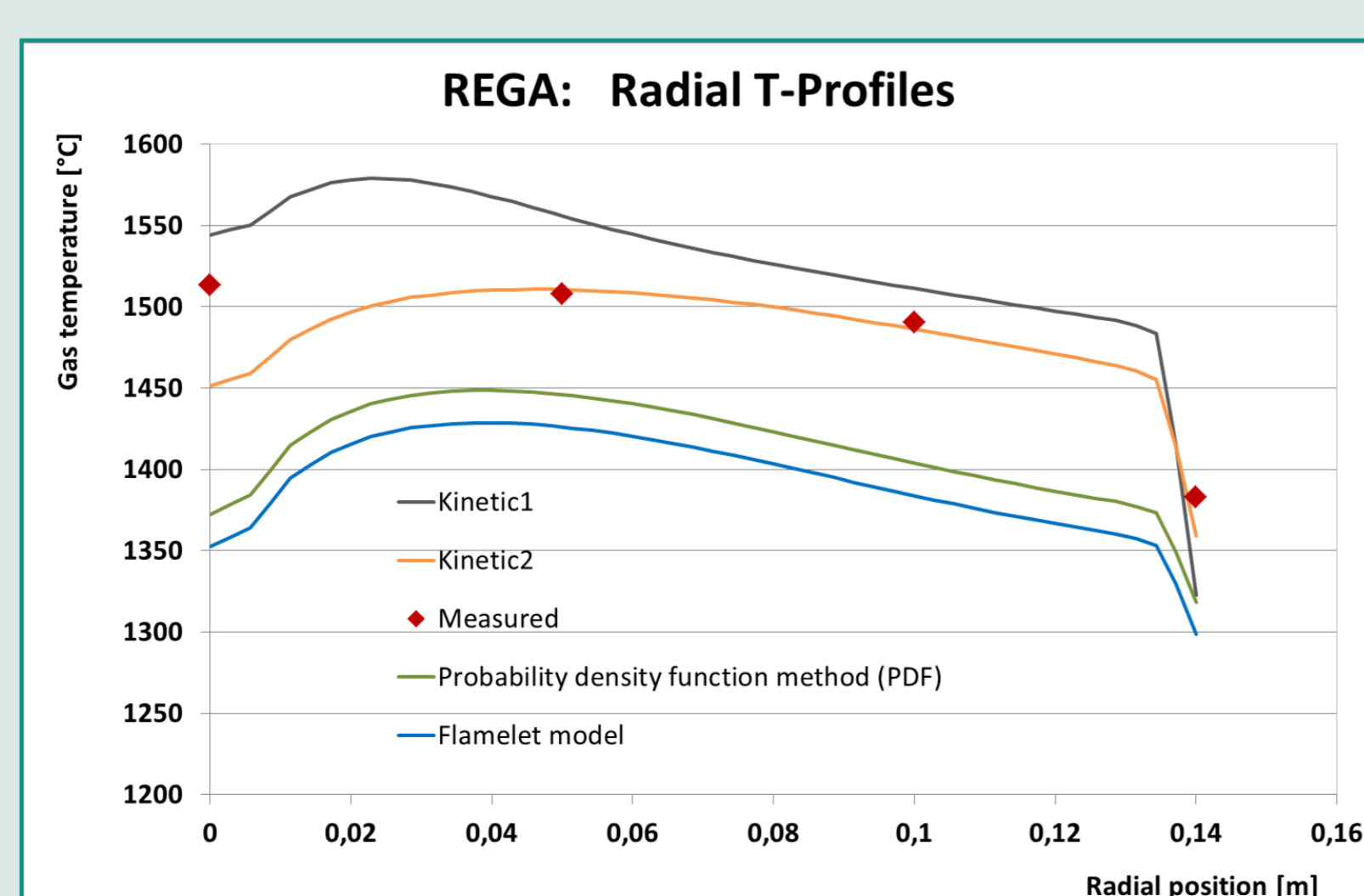
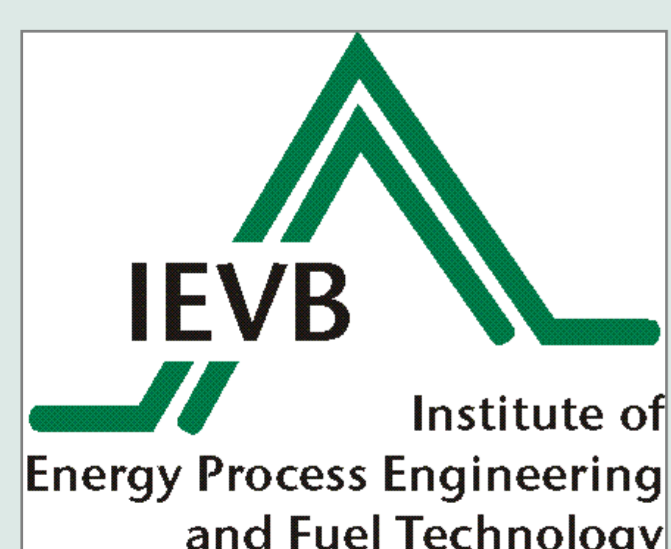
Basis:

- Model fuels
- Gibbs eq., PFR, CSTR
- Validated detailed homog. mechanism for combustion + gasification (GRI3.0, Nancy, ...)
- Reduced mechanism (from literature + own)

CFD Simulation, FLUENT (Coop. TU Clausthal, HVI-GasTech)

Gasifier models:

- Burner development (bioliq)
- Optimization of gasifying + quench zone geometry (bioliq)
- Sensitivity analysis (bioliq+REGA)
- Development + validation of CFD-models for REGA + bioliq



Basis:

- Model fuels
- 2D axis-symmetric model
- K-ε turbulence + EDC
- Reduced heterog. + homog. kinetic mechanism
- Experimental data sets from REGA
- Atomization data sets from PAT/ATMO
- Balancing data from ASPEN
- Comparative kinetic + eq.-calculations, ASPEN + Chemkin