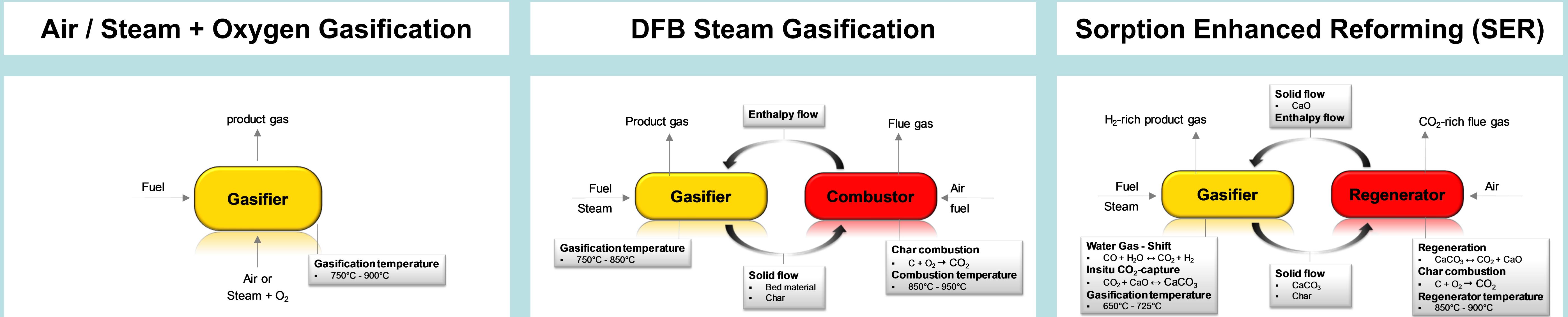


Fluidized Bed Research Facilities for Gasification at IFK

Department of Decentralized Energy Conversion

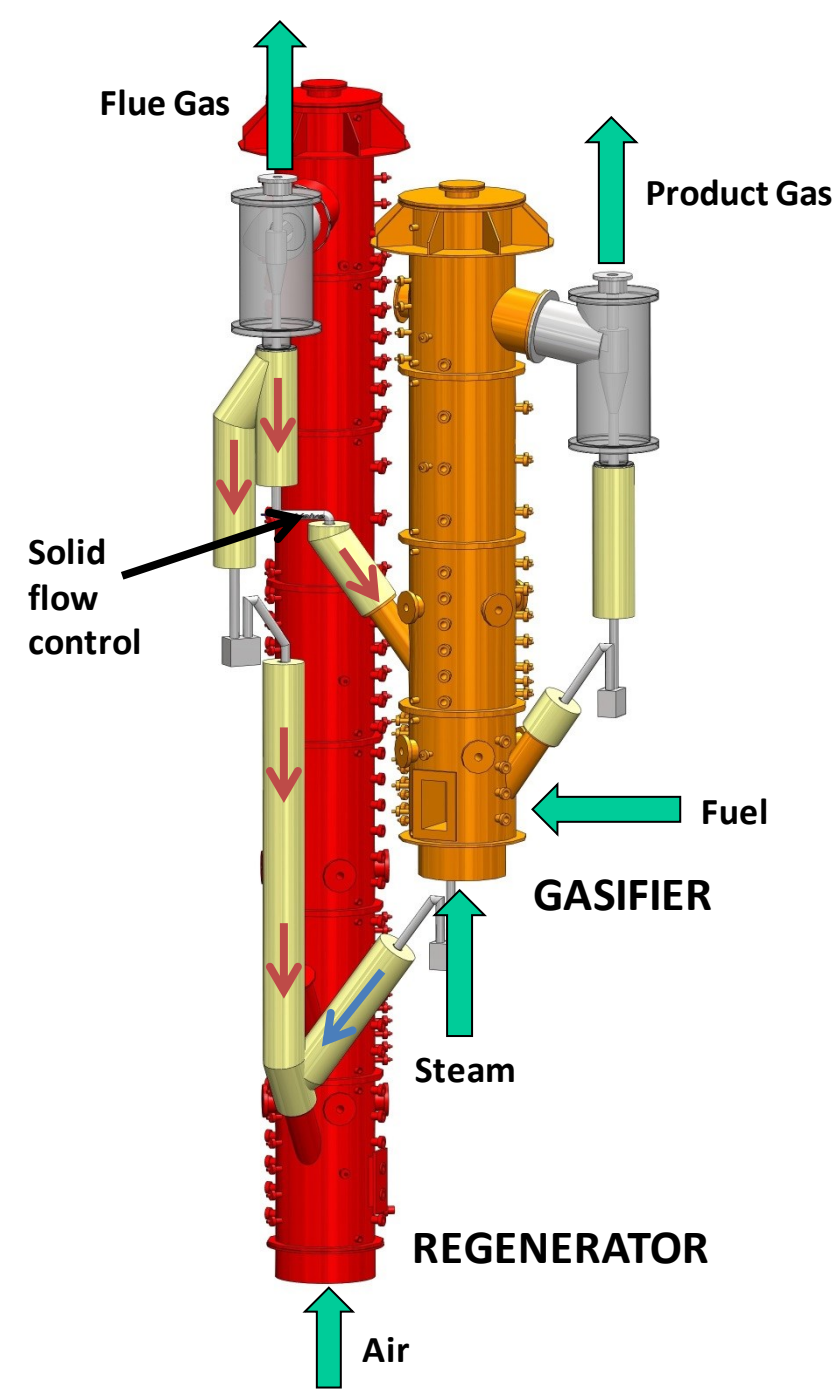
A. Gredinger, N. Armbrust, D. Schweitzer, M. Beirow, H. Dieter, G. Scheffknecht

Gasification Processes



IFK fluidized bed test facilities

200 kW_{th} pilot gasifier



200 kW_{th} DFB pilot plant gasifier

- Air gasification, steam gasification, SER gasification
- BFB, CFB and DFB
- DFB heat input by Combustor/Regenerator
- Solid flow between reactors controlled by high temperature screw
- Wide range of fuels
- Dosing system: loss in weight feeders (2x fuels, 2x additives)
- For long duration experiments

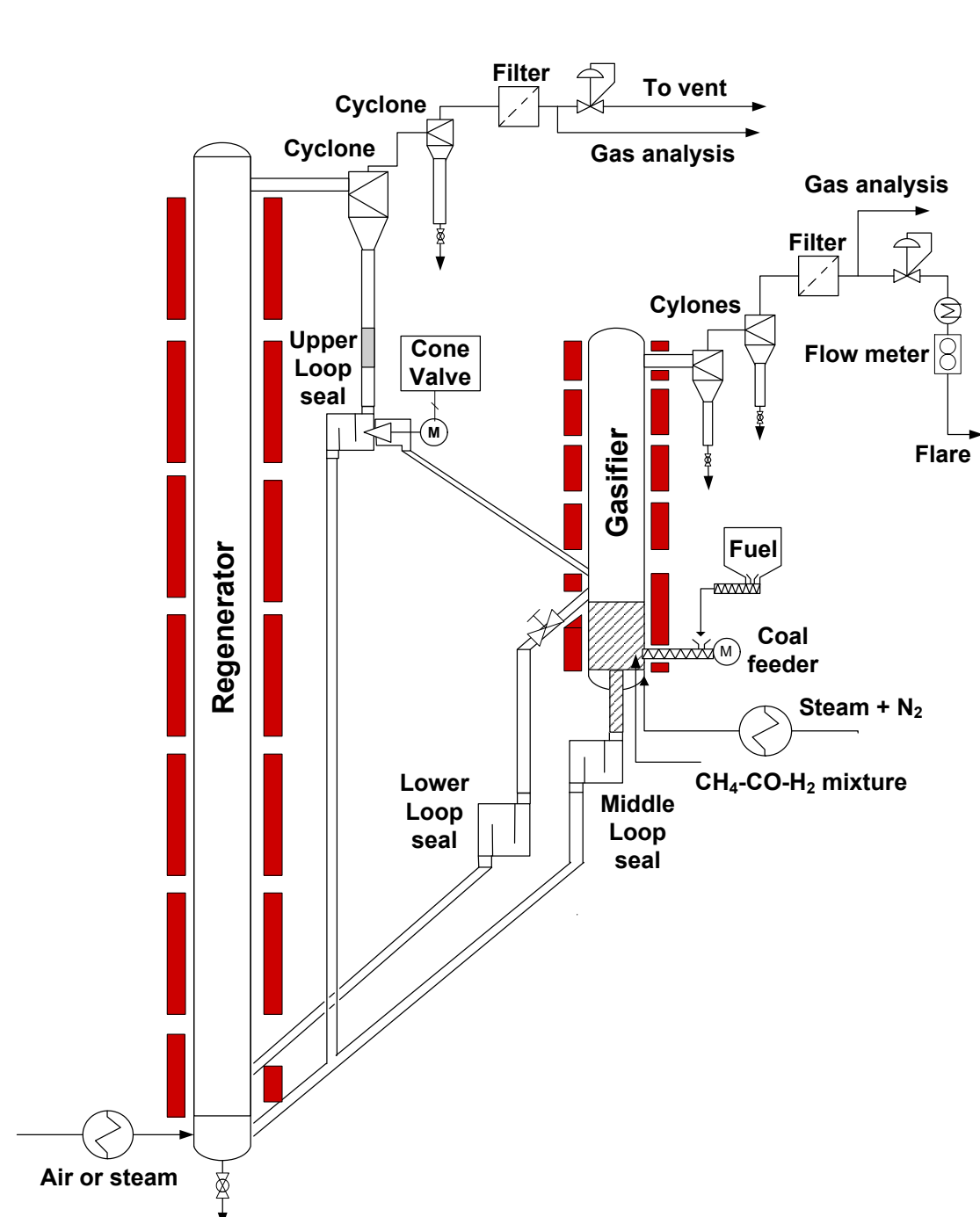
Gas measurement:

- Continuous & online: H₂, CO, CO₂, O₂, CH₄, H₂O
- Semi-continuous & online: non-condensable hydrocarbons (Micro-GC), „Tars“ (TA120-3)
- Offline: Tar Protocol, SPA and HCl (DIN EN 1911)

	Gasifier	Regenerator/Combustor
height	6 m	10 m
diameter	0.33 m	0.12 - 0.21 m
fluidization	BFB	CFB
fuel (kg/h)	10 - 100	10 - 100
additives	0.5 - 30 kg/h	0.5 - 30 kg/h



20 kW_{th} lab-scale gasifier



20 kW_{th} DFB lab-scale gasifier

- Air and steam+O₂ gasification, steam gasification, SER gasification
- Batch / Semi batch mode possible
- BFB and DFB
- DFB heat input by Combustor/Regenerator
- Solid flow between reactors controlled by cone valve
- Electrically heated
- Wide range of fuels
- Dosing system: 1 screw feeder
- For baseline investigations

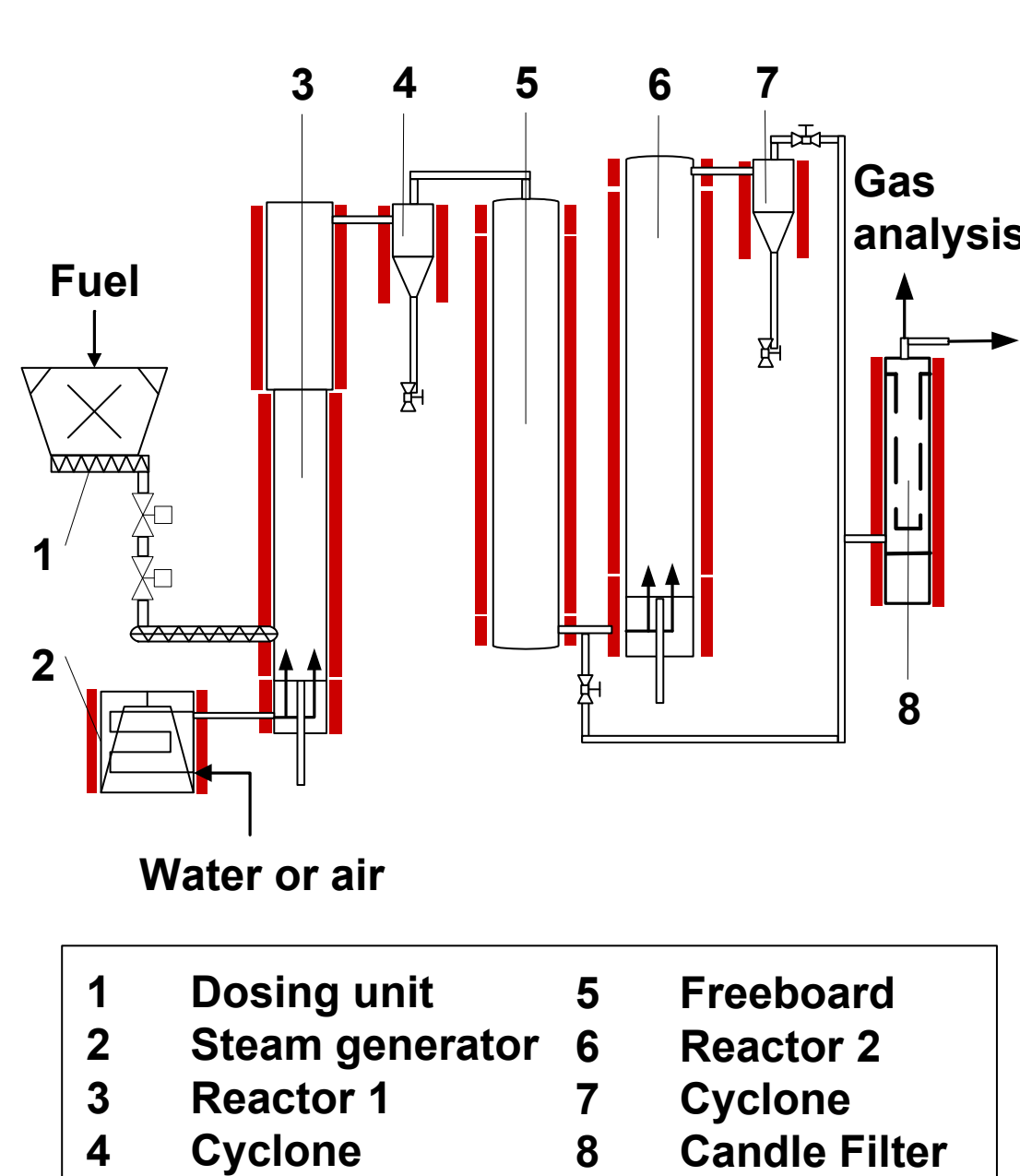
Gas measurement:

- Continuous & online: H₂, CO, CO₂, O₂, CH₄, H₂O
- Semi-continuous & online: non-condensable hydrocarbons (Micro-GC), „Tars“ (TA120-3)
- Offline: Tar Protocol, SPA and HCl (DIN EN 1911)

	Gasifier	Regenerator/Combustor
height	3 m	10 m
diameter	0.15 m	0.07 m
fluidization	BFB	CFB
fuel (kg/h)	2 - 15	-



5 kW_{th} lab-scale gasifier



5 kW_{th} BFB lab-scale gasifier

- Air and steam+O₂ gasification, steam gasification
- SER in batch / semi batch mode
- BFB
- Electrically heated
- Dosing system: 1 screw feeder
- For baseline investigation of:
 - New fuels
 - New or modified processes

Gas measurement:

- Continuous & online: H₂, CO, CO₂, O₂, CH₄, H₂O
- Semi-continuous & online: non-condensable hydrocarbons (Micro-GC), „Tars“ (TA120-3)
- Offline: Tar Protocol, SPA and HCl (DIN EN 1911)

	Reactor 1	Reactor 2
height	1 m	1 m
diameter	0.07 m	0.11 m
fluidization	BFB	BFB
fuel (kg/h)	0.1 - 2	-

