



# Large-scale CFB and BFB Gasification from Power & Heat to Syngas applications

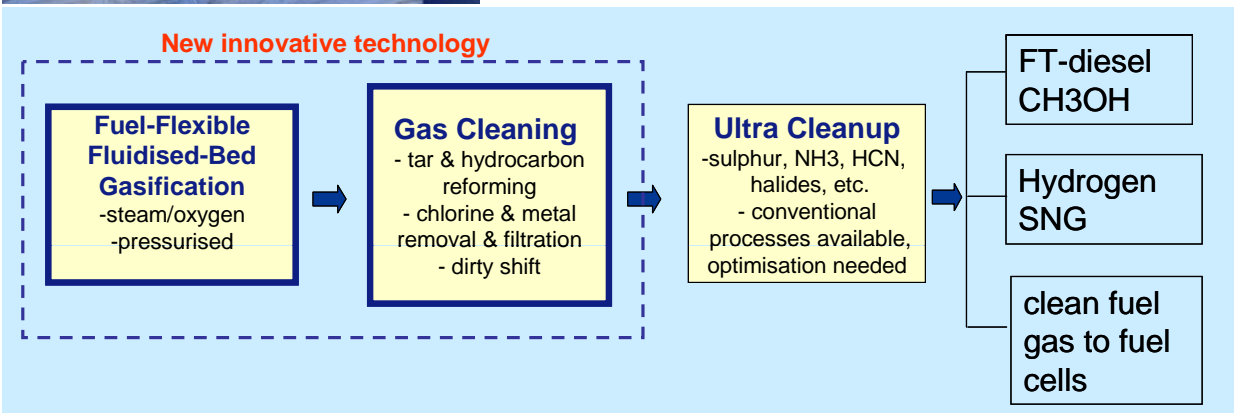
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## ➤ Air-blown CFB and BFB gasifiers in commercial use

- Fuel flexible and robust gasifiers (boilers and kilns)
- Gas cooling and filtration developed for biomass and waste fuels
- IGCC development in 1990's: gasification at 20 bar & hot filtration
- Catalytic reforming of tars for syngas applications

## ➤ Industrial development projects for syngas

- NSE Biofuels together with Foster Wheeler and VTT
  - VTT PDU=>12 MW demo=>industrial plant
- UPM together with Andritz and GTI
  - GTI pilot tests, industrial plant in planning phase



- Present pilot/demo projects huge investments on biomass gasification R&D
- Success and Economics of BTL projects in 2010-15?
- New technologies for power and heat applications
  - Simplified solutions



# UCGFunda

Fundamental gasification R&D in 2008-2010

## Critical R&D issues of biomass gasification

- Ash behaviour and fuel reactivity of different biomass feedstocks with respect to different gasification processes (limits for real fuel flexibility)
- Removal of particulates, alkali-metals and chlorine by hot filtration (fundamental R&D, industrial-scale design and operation experience)
- Formation and behaviour of tars in gasifiers, gas coolers and filtration (still a long way to fundamental understanding)
- Removal of tars and ammonia by catalytic high-temperature systems or by advanced wet scrubbing (industrial experiences & further R&D)
- High-quality process simulation and system analysis for different gasification applications (international co-operation?)
- Robust on-line analytics from R&D labs to industrial gasification plants (rapid tar analysis developed by VTT, robust sampling lines and analysers needed)