



Bio-gas reactor

Waste to energy project

Projects

- **South Africa - IBERT:**
 - 1 completed, operational (Jan Kempdorp)
 - 3 Projects ready for construction, design is finished
 - 7 Projects finalizing agreement and starting design
- **Germany - Bio4Gas EXPRESS:**
58 plants operational additional 32 ready for construction
- **Italy:**
12 constructed 4 ready for construction
- **France:**
6 constructed 3 ready for construction



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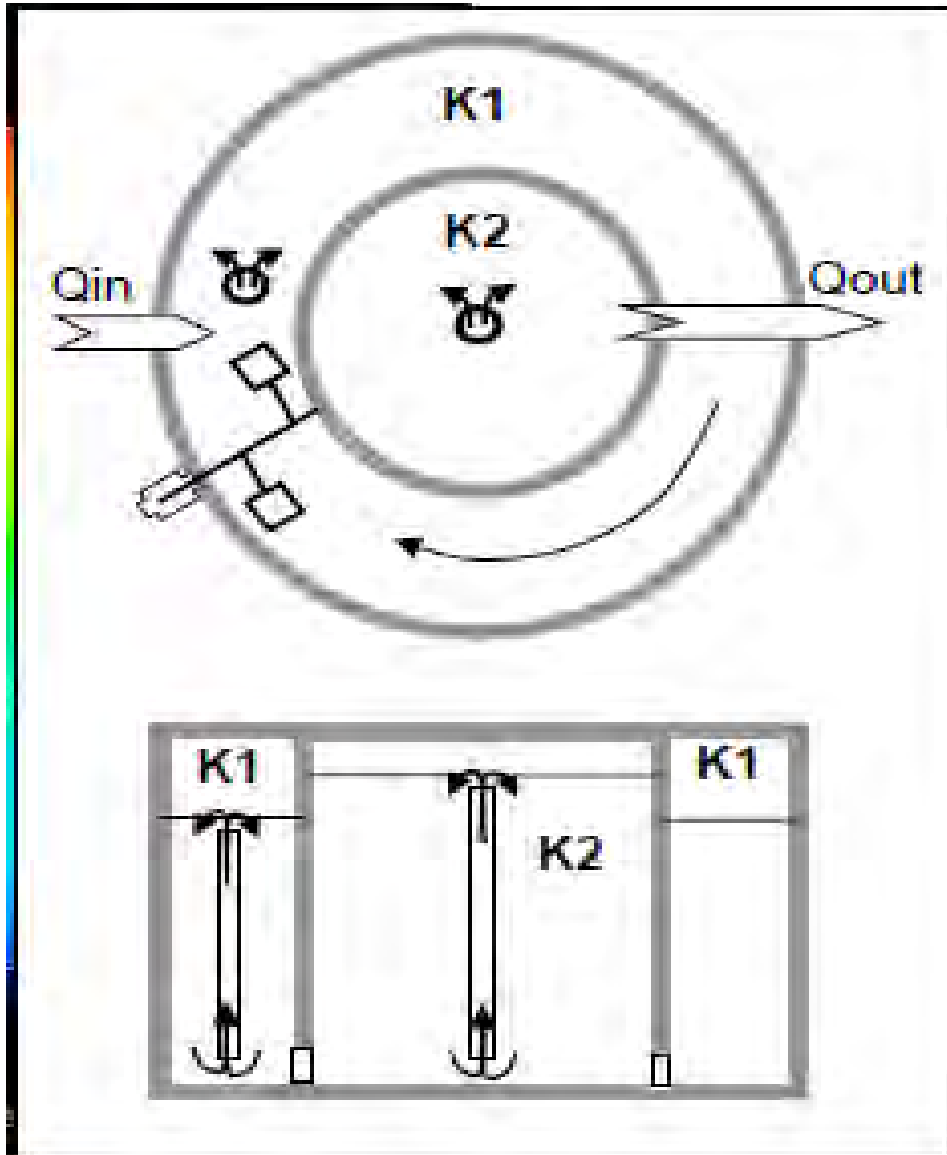
Alternative technology

- Technology developed over 40 year period by University of Innsbruck Austria
- Duel chamber bio-reactor
- Patented Thermo-gas-Lift Technology that offers:
 - cocktail/ selection of on-site waste streams
 - Require small quantities of bio-waste (2,5m³ upwards)
 - Free heating & mixing (biologically)
 - Scalable system (150m³ up to 3000m³)
 - Low tech (no moving part inside bio-reactor)
 - Single feed in & out system
 - Completely automated via PLC driven system
- Up to 12% more gas production from same waste stream

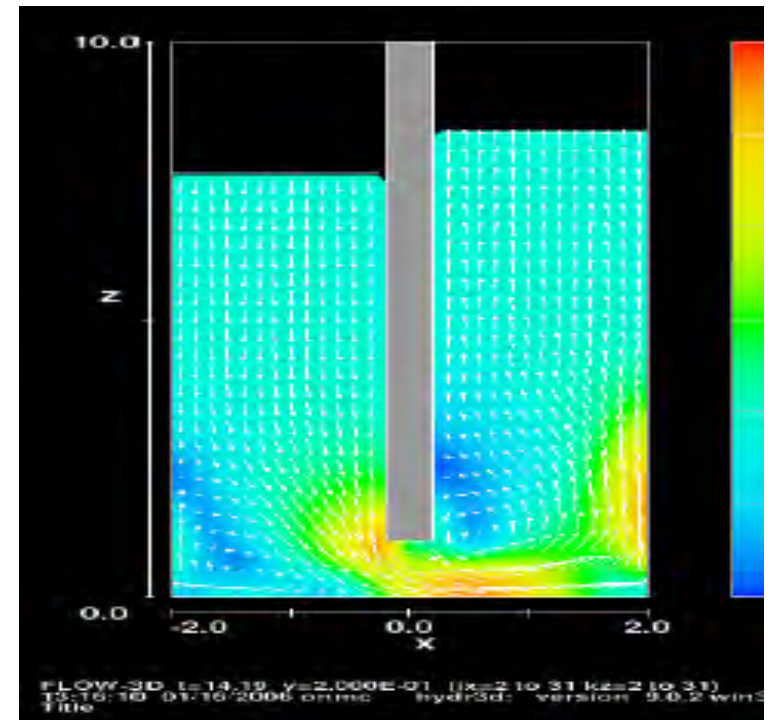


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Thermo-Gas-Lift Technology



- Singular dual chamber Bio-reactor
- Singular in & out feeding system
- Biological-mixing & heating
- No moving parts via gas pressure & heat differential
- Stable and controllable bio-reactor environment
- AD reactor





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Jan Kempdorp



Current status of Jan Kempdorp

- Completed construction
- Process avg of 10 ton of slaughter waste per day
- Produced >6000kWh 120 hrs

Project challenges

- Operational staff “education/ focus” 24/7 operations/ monitoring vs 9 - 5 job
- Very unstable municipal supply network/ phase balance problems (trip-out CHP)



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Current challenge for industry

- Un-informed public & authorities
 - Bio-gas always the bad apple
 - Explosion hazard
 - Smells??
 - Environmental hazard
 - Fertilizer no good
- No uniformity on national level (EIA/ licence needed or not?)
- Generation licence?
- Wheeling ?
- Land rezoning for waste processing?



THANK YOU

