

High-recovery gas upgrading systems

Membrane gas permeation | biogas | producer gas | renewable methane | high recovery

Production of renewable methane to substitute natural gas has become an important technology. In spite of recent developments, there is still a high potential for further improvements in process efficiency. Current air pollution regulations in Europe require higher methane recovery in the treatment of biogas. The new 2-compressor membrane permeator configurations are maximizing methane recovery, while minimizing energy consumption in the production process as well as membrane areas and therefore investment costs. Cost saving is an important step on the way to economic success of sustainable gas production.

Background

State of the art single stage and two stage configurations are correlating with low investment but also with relatively low methane recovery. Significant amounts of methane are lost in waste streams. Vienna University of Technology & BIOENERGY 2020+GmbH experts have developed new permeator configurations and evaluated them together with a broad range of known configurations in a validated numerical modelling tool, finding optimal solutions for minimal investment in compressor and membranes as well as energy input and assuring at the same time high level of methane recovery (from 98,0 to 99,5 %).

Technology

The technology comprises:

- Cost optimized new permeator configurations for high methane recovery levels
- Simulation tool for optimization of permeator configurations

Advantages

- Reaching high levels of methane recovery
- Optimization of investment and energy costs of biogas upgrading plants
- Improvement of the economic viability of sustainable and environmentally friendly biogas production

Potential applications

The technology delivers solutions for gas upgrading for biomethane production plants, that operate on basis of anaerobic digestion (biogas) and biomass gasification.

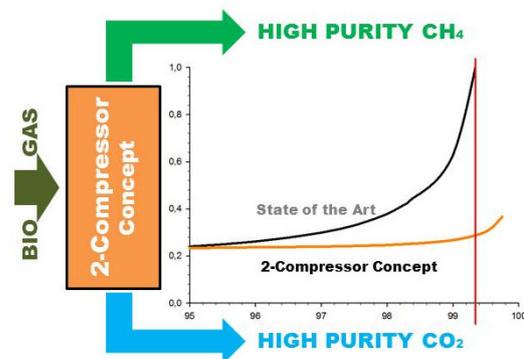


Fig1 Energy consumption (y) & methane recovery (x) of the 2-Compressor-Concept compared to state of the art technology

State of development

Proof of concept, simulation tool

IPR

Patents pending, AT patent granted

Options

license agreement, R&D cooperation, expert reports

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