Upgrading of biogas for CBG and LBG

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Biogas – From production to combustion

Produce – Handle – Distribute – Use

- Pre-studies and Concept development
- Risk assessment and documentation
- Financing
- Project management
- Commissioning
- Operation
Upgrading of biogas for CBG and LBG

Available technologies:

• Water Scrubber
• Pressure swing adsorption
• Membrane filtering
• Amine scrubber
Waterscrubber

- Compression of both methane and CO$_2$
- H$_2$S cleaning in the methane stream
- Risk of corrosion in compressor and other parts
- Water is a relatively inefficient absorbent of CO$_2$
Waterscrubber

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Waterscrubber

- Compression of both methane and CO₂
- H₂S cleaning in the methane stream
- Risk of corrosion in compressor and other parts
- Water is a relatively inefficient absorbent of CO₂
Pressure swing adsorption

- Compression of both methane and CO\textsubscript{2}
- H\textsubscript{2}S cleaning in the methane stream
- Risk of corrosion in compressor and other parts
- High maintenance cost because of high pressure
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Raw biogas → H₂S → PSA → 97-99% methane → 1-3% methane loss

High Power input → High maintenance input
Membrane filtering

- Compression of both methane and CO₂
- The biogas must be cleaned very well before entering the membranes
- Large methane loss
- New technology -> what are the maintenance costs?
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Raw biogas

\[ \text{H}_2\text{S} \quad \text{H}_2\text{S} \quad \text{Membranes} \]

94-97% methane
3-6% methane loss

High Power input
Maintenance input ??
Amine scrubber

- Pressure less system
- The amine solution also absorbs $\text{H}_2\text{S}$
- No methane loss
- Low power consumption and maintenance
- Requires heat for regeneration of amine solution
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Thank you for your attention