Operation and service of biomethane plants – Challenges, opportunities and solutions

BEIC Biogas Seminar Malmö- August 14th, 2018
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• Introduction
• Richter ECOS GmbH
• Complexity of upgrading projects
• Upgrading technologies
• Experiences
• Conclusions
Company in brief

- Founded in March 2015
- Brought to life because of experiences and customer „pressure“
- Support with range or services from one hand, supporting to improve project profitability
- Beside own capabilities make use of know-how and resources from the group (focus on industrial service and energy efficiency projects) and network partners
- By distance, availability, know-how and understanding as close as needed and possible to clients
Complexity of projects/plants

- Legislation, regulation
- Substrates: acceptance, availability, costs, gas quality, tariff impact
- Raw and product gas quality and quantity
- Biomethane use and value, market prices / founding
- Energy supply (el./heat/cold) and costs, possible reuse of energy
- Operation, optimization, service
- Up and down stream interfaces, value chain
- Expected and unexpected changes throughout project life cycle

What is the right concept, what technology, what project partners?
Upgrading technologies (examples)

- Water Scrubber Malmberg Water
- Org. Scrubber BMF HAASE
- SEPURAN® Green Membranes Evonik
- PSA Schmack Carbotech
- Chem. Scrubber Puregas Solutions
Selected question before start

- Raw gas quality and how predictable?
- Does gas quality affect technology and its performance?
- What biomethane quality is requested?
- Are best biomethane quality and lowest methane loss optimal?
- Value of gas quality and pressure above average?
- Correct values to be used for business plan?
- Interfaces to AD plant, injection or fuel station?
- Demands and capabilities to run the plant optimal?
- Importance of capex and opex? Before and within a project
- Can conditions change through project life time? Consequences?

...... and many more!
Homework before and during project

- Analyse situation, needs, conditions
- Chose optimal technical/economical solution
- Design plant forward-looking
  - Capacity, flexibility, quality
  - Energy costs, redundancy, service friendly
- Find and keep motivated and qualified staff
- Follow up performance continuously
- Secure solutions to act if needed
- Find right project partners
Project Cycle
Reality

- Everything as expected (and calculated) or better

- Something went wrong
  - project is left open
  - does not perform as expected
  - responsibility is not clear

- project, operation and/or service needs more efforts and costs more than expected

WHY?
Avoid problems and bottlenecks
Example
Upgrading plant in Germany, 1,000 Nm³/h of raw gas.

Based on experiences a potential of around € 100,000 per annum can in some cases be regarded as conservative.

Assumed conditions: 1000 Nm³/h raw gas, 50% CH₄, 0.22 kWhₑₑ/Nm³ raw gas, 16 ct/kWhₑₑ, 1.5% methane loss, 8.500 hours/annum, 5% Costs for service & renewence/annum, Biomethane price 7.5 ct/kWh
Assumed optimization potential: 10% el. power; 0.5% methane loss, 1% availability, 10% service & renewence
(based on experiences the potential of increased income/reduced costs is often much higher)
Potential

• Development moves forward (such as power consumption)
• Availability increases
• Optimise existing facilities
• Find and introduce new solutions
• Avoid or minimise CH$_4$ losses/emissions and efforts for off-gas treatment by integrated solutions (however keep energy costs in mind)
• Introduce energy efficiency solutions (such as for cooling)
• Optimise new plants (interfaces, simplification)
• Make use of tools like spare part pool, monitoring, benchmarking
Conclusions

• No automatic success, even with founding
• Individual project condition favour/request solutions
• Results may differ from assumptions, avoid and be prepared
• Efforts to operate are worthwhile, but often underestimate
• Prepare „Troubleshooting“ incl. spare parts for complex techn. plants, with usually no redundant equipment
• Growing know-how and further strong market players
• New solutions for plants in operation and new plants

Work with biomethane is challenging. It will be fun if done correctly.
Our services

- **Consulting**
- Support to identify, implement and run best solution
- Optimise plants
- Make use of experiences (currently approx. 50 plants)
- Introduce solutions from other industries
- Maintenance concepts/machine repair/spare parts
- Preferable act as link operator – supplier
- Be first contact for operators and coordinate with network partners complex tasks
- Connect clients and other market players (workshop, spare part pool, monitoring)
Contact

Thank you for your attention!

In case of further question or interest in services, please contact

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