EN

CASE STUDY

Inline H_2S sensor optimizes CHP engine efficiency at Haerup Biogas

Danish Biogas plant Haerup Biogas wanted to enhance the efficiency of its CHP engines and reduce maintenance on H_2S sensor equipment. To achieve this, the operator installed a SulfiLogger H_2S sensor with continuous in-pipe measurements for early biofilter cleaning alerts. This proactive approach reduced sensor maintenance needs, minimized the risk of gas flaring, and optimized the plant's overall efficiency.

Background
Hydrogen sulfide (H_2S) presents a significant challenge for Combined Heat and Power (CHP) engine units at Biogas plants. Excessive H_2S levels can lead to unscheduled downtime, unwated gas flaring, and increased wear on engine components. This hampers the goal of maximizing biogas utilization for power and heat generation while also posing environmental compliance risks due to sulfur dioxide (SO_2) emissions.

To address these issues, precise and continuous H_2S monitoring is essential to verify the performance of desulphurization processes before the CHP engines.

Challenge
To enhance the efficiency of their CHP engines, Haerup Biogas, a Danish biogas plant, recognized the limitations of their existing H_2S monitoring system. The existing setup relied on a traditional multi-gas analyzer, which required drying samples before measurements, leading to operational complications.

CHP engine unit at Haerup Biogas.

As the operating manager highlighted:

"The old extractive system could clog weekly and sometimes even several times daily due to condensation. This lead to a lot of unexpected downtime, and in severe cases, long periods of unmonitored gas, where the engine would shut down and send the gas directly to the flare."

Industry
Biogas

Business needs
- CHP engine optimizations
- Reduction in H_2S sensor maintenance

Solution
SulfiLogger™ H_2S sensor measuring continuously in the wet biogas before the CHP engines.

Benefits
- Superior H_2S insights for proactive biofilter performance monitoring
- Reduced risk of gas flaring
- Improved CHP engine protection
- Significant reduction in H_2S sensor maintenance requirements

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Surpassing H_2S thresholds in CHP units accelerates wear on crucial engine components like turbochargers, intercoolers, and pistons. Additionally, it leads to increased oil change frequency, further exacerbating operational disruptions.

These challenges emphasized the need for a robust and dependable sulfide monitoring solution. Such a solution would not only ensure continuous biogas utilization, keep track of the effectiveness of the plant's biofilters, but also protect the CHP engines from H_2S-related damage, and ultimately streamline operations at Haerup Biogas.

Setup

To tackle this challenge, Haerup Biogas installed a SulfiLogger™ H_2S Sensor, a robust sensor for continuous monitoring in rough environments.

The sensor was installed in-pipe after the biofilter and before the CHP engine, enabling direct measurements in the wet biogas with no sampling and no risk of clogs or sensor dry-out time. The sensor's continuous sensor signal was seamlessly integrated into the plant's SCADA system via a 4-20 mA analog output.

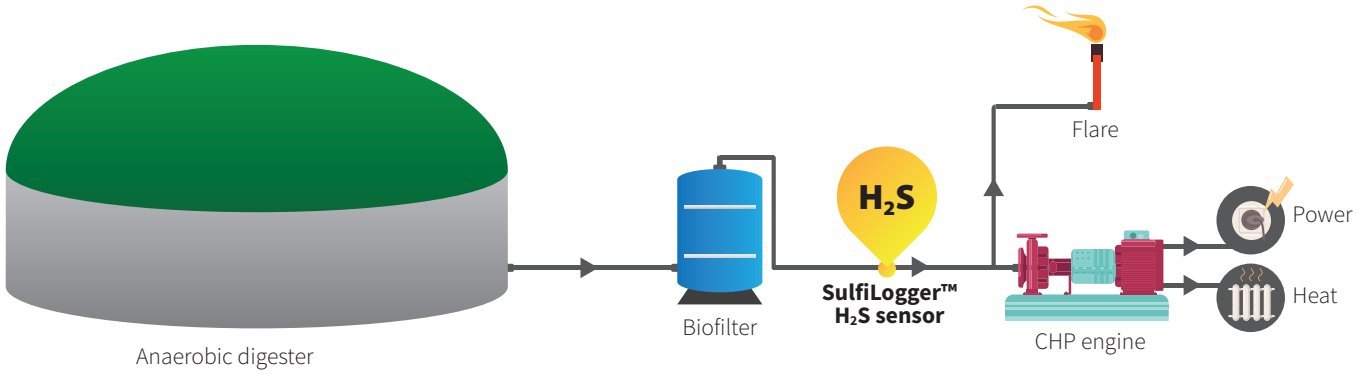
Results

After implementing the SulfiLogger™ H_2S sensor, Haerup Biogas experienced several benefits related to CHP engine efficiency and protection.

The SulfiLogger™ H_2S sensor at Haerup Biogas. It measures in-pipe right after the biofilter.

"The sensor lets us know when to plan a cleaning procedure of the biofilter. We track if the H_2S readout slowly rises from the normal levels, giving us time to plan accordingly, before the filter saturates. The timing of filter cleans depends on the feedstock we use. Therefore, early warnings come in handy."

Moreover, the sensor drastically reduced maintenance requirements, providing reliable readouts with minimal hassle. Unlike the old extractive system, which demanded extensive servicing and often proved unreliable, the SulfiLogger™ H_2S sensor significantly minimized gas wastage through flaring, ultimately enhancing daily operations at Haerup Biogas.



The SulfiLogger™ H_2S sensor measures in the wet gas between the biofilter and the CHP engine. The sensor's uninterrupted measurements provide early warnings of the biofilter, thereby allowing the plant operator to improve the efficiency of the CHP engine and minimize the risk of gas flaring.

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