Methane Emissions
Measures in the distribution network and results of the DVGW project "ME-DSO"

Westnetz GmbH · Klaus Peters · Innovation Management · Methane Monday · March 2022
1. Avoidance of methane emissions during operation
2. Researches for emission reduction
3. Research results meet proposal of regulation
Avoidance of methane emissions during operation

Methane emissions of DSO in Germany contribute 0.24%¹ to the total GHG of Germany

- Westnetz operated 24,000 km gas lines (usually up to 16 bar)

- And Westnetz operate ~2,700 PRMS (Pressure Regulation Measurement Stations)

¹ Source: DVGW-Brochure-Methane-emissions

Source: https://www.dvgw.de/themen/gas/wie-funktioniert-die-gasversorgung

Source: Westnetz
Avoidance of methane emissions during operation

0.24% of the total GHG of German caused by DSO is a sum of tiny little emissions

• LDAR is applied
  – It is tuned to the tiny emissions and to the leak rates of different pipe technologies
  – It’s a law and a standard

• MRV is applied
  – The „National Inventory Report“ is applied
  – The national DVGW-Reporting is in DE applied

• Avoidance of Venting and Flaring is applied
  – There are 29 measures described and applied in DE manly to avoid venting
Most comprehensive DVGW emission measurement program in Germany, 28 DSO participate

126 Emission readings at line leaks
   • 30 (± 5) l/h/leak (average) before: 140 (±40) l/h/Leak

159 Emission readings at an PRMS & 662 readings at vents
   • 1.8 (± 0.3) l/h/station (average) before: 105 l/h/HP-Station & 26 l/h MP-Station

Comprehensive uncertainty analysis (error propagation, bootstrap, Monte Carlo simulation)

The results will be published in a few days
Researches for emission reduction

Source level needs one day for one accurate pipeline leak measurement

**Principle**

1. Leak with gas blowout
2. Up to 9 measuring probes for gas suction
3. Gas leakage into the environment, if the gas is completely evacuated, this gas leakage becomes zero
4. Emission measurement

**Description**
New LDAR regulations will challenge DSO

0.24% of the total GHG of German caused by DSO is a sum of tiny little emissions

Related to our 2,700 PRMS (above ground)
- We are working on a reduction of just 1.8 l/h/station (average)
- Or about just < 10% of our methane emissions and we will discuss: Is that a relevant component?

Related to our 24,000 km Network (under the ground)
- 4 detections per year will overwhelm the measurement service provider market massively
- In winter we don’t do measurements, because the results are not accurate enough
- Satellites or other mobile measuring systems for pipeline leaks are not accuracy enough, jet

New research, innovations and products are urgently needed.
New venting and flaring regulations

This guideline gives us 29 measures to reduce venting, e.g.:

- Pressure Reduction
- Bypassing
- Reduction of the pipeline section e.g. with crushing devices or shut-off bladders

DVWG Website: G 201813 ME-Red DSO
0.24% of the total GHG of German caused by DSO is a sum of tiny little emissions

MRV is a need for more transparency and international benchmarking to get better

New MRV regulations

Related to our research results we will do more in
• measurements
• transparency
• best practice benchmarking

Modern reporting systems require more digitization

What can we conclude from the reports?
• We reduce our emissions, it’s our strategy

What can NGOs or authorities do with a result close to zero?
Innovations for climate protection

Our methane emissions reduction: 8t CO₂e/year

Odorisation technologies:
- Invented by Westnetz.
- Scientifically perfected by DBI-GUT GmbH.
- Brought to series production by Böhler.
- Inspection in 5 minutes (600 times faster than previously).
- Nozzle change in 15 minutes (200 times faster than previously).
- Avoidance of methane emissions when changing odorising nozzles; the goal of zero emissions is almost achieved.
- Over 20 odorising nozzles and around 10 odorising nozzle replacement units (CWE) ensure a good return on investment for Westnetz.

Gas expansion turbine:
- Invented by Westenergie Technologie & Infrastruktur.
- Perfected by Dortmund University of Technology.
- Tested at Westnetz and has been in trouble-free trial operation for 4 years.
- Manufactured by W2 Armaturen GmbH and already commissioned by two innovative distribution system operators.

Hydrogen supply:
- Westnetz is currently developing new solutions for the hydrogen supply of the future together with the Münster University of Applied Sciences (Steinfurt campus).
- In extended cooperation with Schötz GmbH Messtechnik, research is being carried out on decentralised gas quality measurement with quantity conversion and ideally with a connection to the gas smart meter – based on the latest sensor technology.

sustainable electricity from line pressure

DSO networks ready for H2 supply: methane emission free
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