

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)



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

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



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



Measured pipeline Leaks



Measured PRMS

126 Emission readings at line leaks

- $30 (\pm 5)$ l/h/leak (average) before: $140 (\pm 40)$ l/h/Leak

159 Emission readings at an PRMS & 662 readings at vents

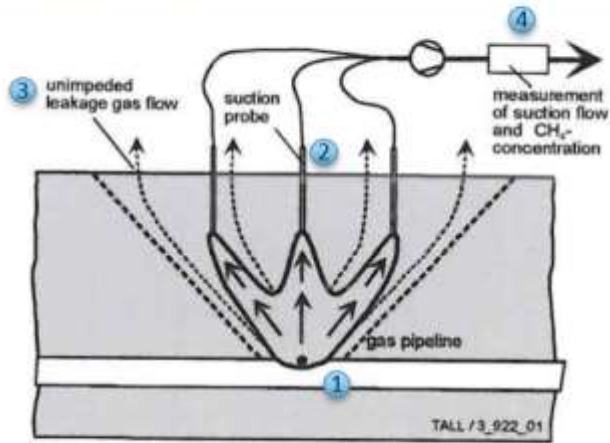
- $1.8 (\pm 0.3)$ l/h/station (average) before: 105 l/h/HP-Station & 26 l/h MP-Station

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

The results will be published in a few days

Source level needs one day for one accurate pipeline leak measurement

Principle



Description

- 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

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

New LDAR regulations will challenge DSO

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.



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

New venting and flaring regulations

New venting and flaring regulations

- This guideline give 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



[DVGW 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

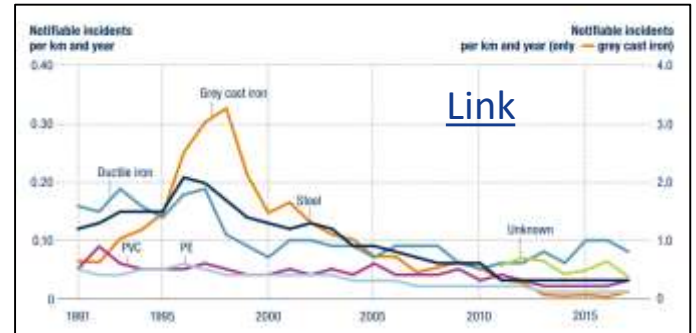
- measurements
- transparency
- best practice benchmarking

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

Odourisation technologies




 ready & available

- Invented by Westnetz.
- Scientifically perfected by DBI-GUT GmbH.
- Brought to series production by Böhm.
- 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 odourising nozzles; the goal of zero emissions is almost achieved.
- Over 20 odourising nozzles and around 10 odourising nozzle replacement units (OWE) ensure a good return on investment for Westnetz.

Our methane emissions reduction: 8t CO₂e/year

Gas expansion turbine



 ready & available

- 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.

sustainable electricity from line pressure

Hydrogen supply



Digital Innovation 2021

- 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 Schütz 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.

DSO networks ready for H2 supply: methane emission free



[Link to the Westnetz Innovation Report](#)

Contact



Klaus Peters

Innovation Management / Patent Management
+49 162 2845366
klaus.peters@westnetz.de