

ENNOH Workshop on Hydrogen emissions

13 October 2026

Key points raised

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1. Introduction

ENNOH is tasked to develop and promote best practices in the detection, monitoring and reduction of hydrogen leaks.

The purpose of the workshop held on 13 October 2026 was to assess where we are now on this topic. The first discussion panel focused on the impacts associated with hydrogen emissions; two insights on the state of the art in turbines and compressors were given by Siemens Energy and EUTurbines, whilst the second discussion panel centred on advances in the monitoring, detection and reduction of emissions.

Various environmental, economic and safety impacts have been addressed.

All the materials presented at the workshop are available on the ENNOH website at the following link:

https://ennoh.eu/sites/default/files/2026-10/ENNOH_H2_Emissions_Webinar_Presentations.pdf

2. Key points raised

Valuable lessons have been learnt about the impact of hydrogen emissions, as well as the detection and reduction of leaks respectively. Points of attention were also raised.

2.1. Impact of hydrogen emissions

- *Grid emissions cause only 1.8% of the total emissions from hydrogen use. Upstream chain emissions have therefore to be considered.*
- *In the future German Hydrogen core network, the climate impact of hydrogen losses will be reduced by 96% per kWh of energy transported.*
- *At equal percentage leakage, hydrogen has about 6.5 times lower warming impact per energy delivered than methane.*
- *1% leak means, in term of indirect Global Warming Potential (GWP), 0.12kgCO2/kgH2, as using hydrogen saves potentially 10kgCO2/kgH2.*
- *Vented emissions (i.e. intentional) are predominant over fugitive emissions (i.e. unintentional).*
- *Liquified hydrogen has greater losses than pipeline delivery (10 times less).*

2.2. Detection and reduction of leaks

- *According to Siemens Energy presentation, advanced rotors enable higher pressure ratios, lower compressor trains and lower cost and leakage opportunities.*
- *EUTurbines stated that leakage recovery system related to compressors & zero-leakage compressors are being developed.*
- *Methane leak detection methods are useful precedents but cannot be transferred directly to hydrogen grids.*
- *The presentation of Opthycs project mentioned the development of new sensor technology to improve hydrogen safety and minimize releases.*
- *The National Physical Laboratory (NPL) presented the development of high-flow sampling and traceable controlled-release facilities to test measurement performance.*
- *As part of the NHyRA project, which is to be prolonged by six months, an inventory of anthropogenic hydrogen emissions throughout the value chain is currently being built.*
- *Equinor and adMS are developing a toolbox for accurate hydrogen emissions quantification.*
- *Hydrogen emissions may eventually enter clean hydrogen carbon intensity calculations; such inclusion should wait however for more settled science.*

2.3. Points of attention

- *It is necessary to master the growing use of hydrogen, particularly upstream emissions and without losing focus on safety.*
- *Industrial emissions data and monitoring remain insufficient.*

3. Conclusion

The workshop highlighted some very encouraging points on this topic.

The issue of hydrogen emissions must not be conflated with that of methane emissions.

The benefits of hydrogen as a decarbonised energy carrier for the future are expected to overwhelmingly outweigh the anticipated losses.

However, scaling up to a pan-European market with an interconnected transmission network backbone requires continued monitoring.

ENNOH will therefore include this topic in its Annual Work Programme 2027 in order to continue the investigations regarding best practices for detection and reduction of leaks.