

EIP060

Can we remotely differentiate leaked and vented gas?

Problem Statement Details

WWU have around 17,600 gas sites of various sizes and ages. These sites reduce gas pressures as gas is transported through the gas network. Pneumatically driven components vent gas as part of normal operation, and safety devices vent gas to avoid over-pressurisation. Gas leaks from the system are predominantly through joints and points of failure. Unless the leaks are large and obvious, these could remain undetected (until the next maintenance/inspection visit) and indistinguishable from gas which is vented. Many of these components alongside others are situated within a housing. As such, solutions must be suitable for indoor operation and ATEX compliant.

We cannot currently detect, quantify and distinguish between a gas leak and gas that is automatically vented without physically going to site and taking manual measurements. The advantage of remote detection means that monitoring can be conducted over a sufficiently long period and multiple sites can be monitored at once. Ideally, the solution is portable so that once a site has met a satisfactory emissions level, the equipment can be transferred to another site for monitoring.

If successful, operational managers would be able to effectively plan for the most appropriate emissions reduction solutions, avoiding over-engineered designs by knowing the location and scale of emissions sources, thus saving gas consumer money and improving public health through better air quality.

Key Stakeholders

Gas consumers, Gas shippers, Gas Distribution Networks, Gas Transmission Networks, Ofgem, BEIS, Manufacturers.

Target Market

The UK signed up to the Global Methane Pledge at COP26 which aims to reduce methane emissions by at least 30% below 2020 levels by 2030. The UK also committed to working to continuously improve the accuracy, transparency, consistency, comparability and completeness of national greenhouse gas inventory reporting.

Enablers and Constraints

Enablers:

- Cadent's SIF funded 'Digital Platform for Leakage Analytics' project in collaboration with NGG, WWU, SGN and NGN: https://smarter.energynetworks.org/projects/cad_sif0002/
- NGG's NIA funded 'Monitoring of Realtime Fugitive Emissions (MoRFE)' project: https://smarter.energynetworks.org/projects/nia_nggt0137/

Constraints:

- The solution must operate within a hazardous area.
- The greatest challenge will be distinguishing between leaked gas and vented gas.
- Gas emissions quantification is needed, not just detection.
- Considerations need to be given to the compatibility or adaptability to work with future gas compositions (e.g., blended hydrogen/natural gas, full hydrogen).
- Cost effective for scalability.

Scalability and Target Implementation Date

The project would start by trialling at different sized sites as a proof-of-concept exercise and to confirm whether different solutions are needed depending on the size and type of site. If successful, this can then be rolled out to further sites. The target implementation date would be February 2024 so that gas networks can put forward the solution, alongside supporting evidence, in their RIIO-3 business plans for implementation in 2026-2031.

Innovation Strategy Target Areas

Innovation Theme	Target Area	Primary or Secondary
Data and Digitalisation	<p>The shift to data-driven, digitally-enabled networks is critical as we move towards Net Zero.</p> <p>We need your help to drive standardisation, interoperability, security and digital skills whilst accelerating our transformation to data-driven networks by the mid 2030s.</p>	Primary
Flexibility and Market Evolution	<p>Energy networks must quickly and efficiently respond to the rapidly evolving needs of the energy system transition. We need your support to eliminate barriers to new market entrants, deploy novel commercial and network management solutions whilst ensuring fair participation and eliminating regulatory barriers within the RIIO-2 price control periods.</p>	
Net zero and the energy system transition	<p>In order to meet the UK net zero targets of 2050 we must start converting our networks to deliver low carbon fuels today. We want to work with you to develop the role of our gas networks into the future by investigating, trialling, implementing and delivering safe, low carbon alternatives to natural gas such as Hydrogen.</p>	
	<p>Net Zero requires connection of more low and zero carbon sources of energy generation, storage and demand to both the transmission and distribution networks. We need your innovative methods for effective network management and accessing flexibility to improve visibility, forecasting and modelling of low carbon technologies.</p>	
Optimised assets and practices	<p>Innovation has a key role to play in ensuring our networks continue to remain reliable, safe, secure and resilient to our changing climate. We are constantly looking to improve and welcome support to identify methods to prevent interruptions, ensure resilience, reduce climate impact and future-proof our networks.</p>	Secondary
Supporting Consumers in Vulnerable Situations	<p>Equality and fairness are the foundations of a just transition to Net Zero. We hope you can provide insight into the transient and situational nature of vulnerability and how we can overcome the impact the energy system has on consumers, building strong relationships for the future.</p>	
Whole Energy System Transition	<p>The energy system must consider the full range of opportunities, risks and interdependencies that exist across the energy networks to integrate and optimise them in a way that best serves the consumer. We are looking for ways to improve visibility of the networks and transitional options, co-ordinate approaches and collaborate across the UK.</p>	