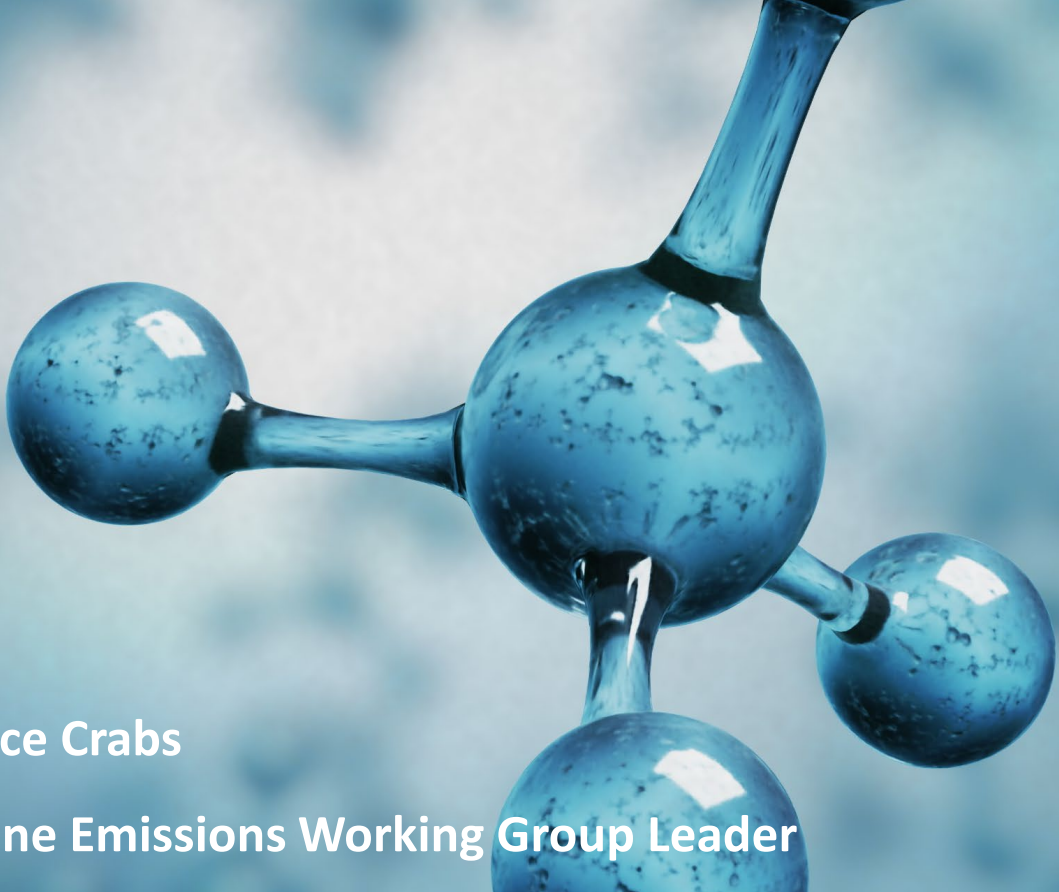


Research Roadmap

METHANE EMISSIONS MANAGEMENT



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METHANE EMISSIONS IN THE SPOTLIGHT

Rapidly reducing methane emissions is regarded as **single most effective strategy to reduce global warming in the near term.**

This year seen an important momentum on the methane emissions issue:

- European Commission's legislation to be launched this December to **measure, report and verify** methane emissions, put limits on **venting and flaring**, and impose requirements to **detect leaks and repair them.**
- The **Global Methane Pledge**: collective goal of reducing global methane emissions by at least 30 percent from 2020 levels by 2030
- Launch of the **International Methane Emissions Observatory (IMEO)** at the G20 Summit
- Strong focus on methane diplomacy at the **COP26** in Glasgow.



METHANE EMISSIONS

The **European Gas Research Group (GERG)** has long been involved in methane emissions reduction from the mid- and downstream gas sector, with a European perspective.

Over the past decades, the mid- and downstream gas industry has consistently worked on development & testing of **new technologies** and methodologies, first for leak detection and LDAR, then also explicitly for methane emissions reporting and reduction.

Continuous improvement of methane emissions management requires continued and collective R&D actions.

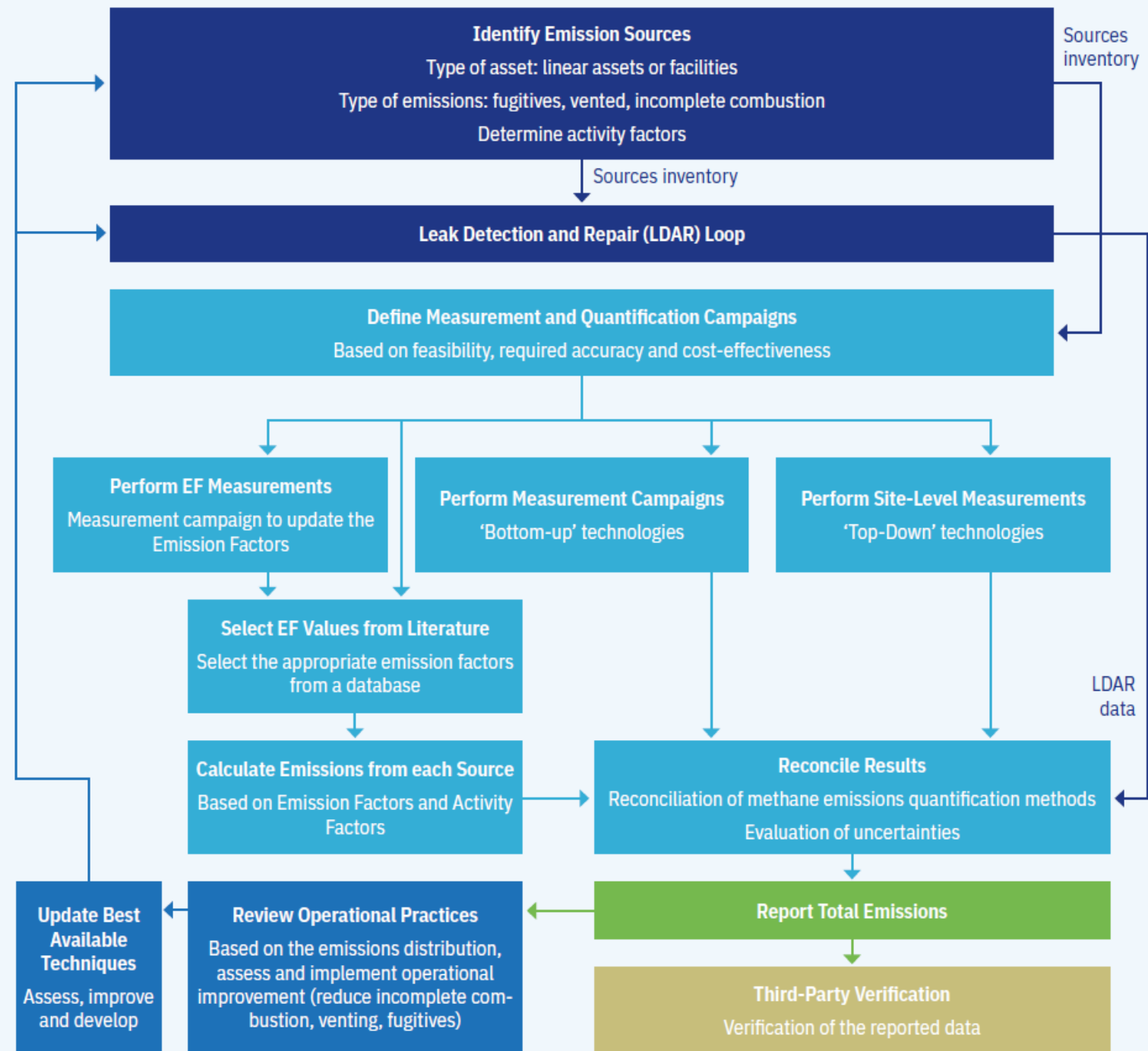
Innovation is central to successfully tackling these emissions.



HOW SHOULD METHANE EMISSIONS BE MANAGED

Methane emissions **management** and **mitigation** is a process where information circulates in a loop, in order to enable **continuous improvement**.

Each sector of the energy value chain faces specific technological and operational challenges.



- General
- Measurement
- Reporting
- Verification
- Mitigation



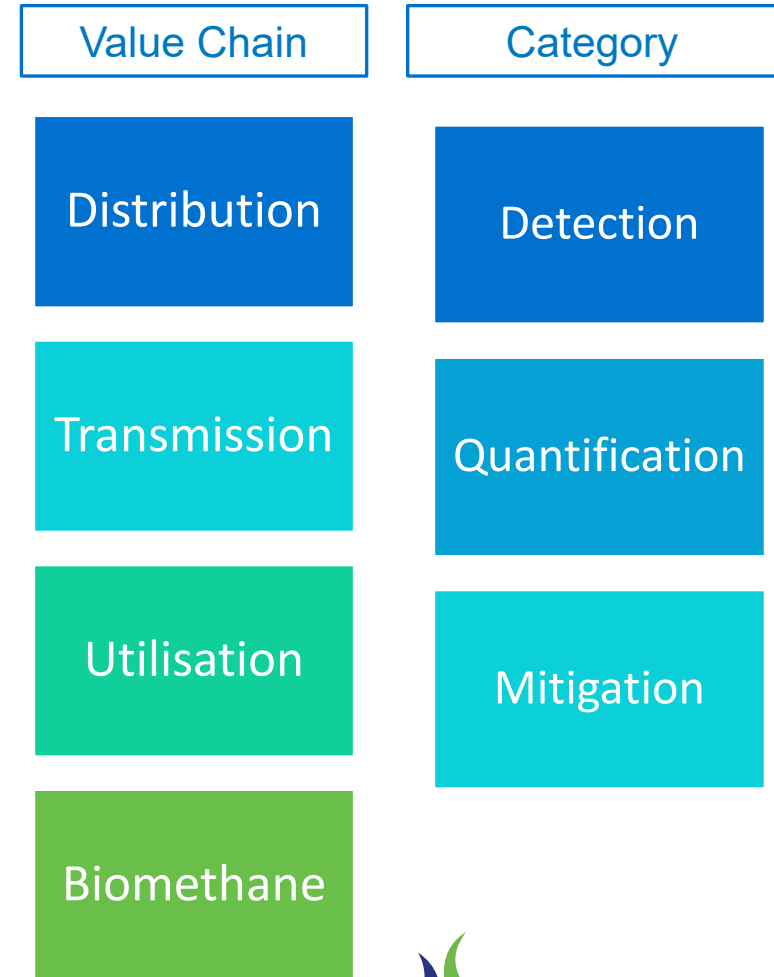
THE GERG ROADMAP

A collaborative effort by industry experts to define research and development gaps and integrates the results of other ongoing initiatives in Europe and internationally.

It will be used as a tool to inform the larger R&D community, as well as policy makers, facilitating the creation of targeted research projects.

For each value chain segment and each methane emissions management topic, the roadmap defines precise research actions and prioritises them. Tentative timelines were created, representing the criticality of the different R&D topics.

GERG Methane Emissions Roadmap





KEY FINDINGS: RESEARCH ACTIONS

Transmission and distribution

- Compare **different detection and quantification techniques**: develop methods **reconciling data** from different sources and **validating** new technologies.
- Develop improved **correlation factors**: a priority to demonstrate how close estimated methane emissions are to the reality on the ground.
- Improve **emission factors**: develop a European database
- Gather better knowledge on **activity factors** – leak size distribution – to **target more efficiently the emission reduction measures**.
- Mitigation: define and implement **best-practices** (LDAR campaigns and other operational practices), and invest in creating **more efficient and cost-effective technologies**.

LNG

- Share best practices for **LDAR campaigns** and define accurate **emission factors** (including also the emerging small-scale LNG sites).
- **Mitigation actions**: include limitation of emissions from transfer and regasification, use of nitrogen to purge LNG pipes, optimised LNG truck loading, and flaring best practices.



KEY FINDINGS: RESEARCH ACTIONS

Utilisation

- Investigate the existing emissions: gather data from the field : emission factors, etc.
- Develop test protocols to assess emissions
- Mitigate incomplete combustion from engines

Overarching

- Finally, develop precise cost abatement curves per value chain segment to give visibility of the needed resources per achieved reductions.

Biomethane

- Assess the life cycle emissions from the biogas and biomethane sector - a high potential decarbonisation solution.
- Perform data collection exercises, define emission factors through measurement campaigns
- Provide plant operators survey kits
- Collect and share best practice methods



CONCLUSION

- The gas industry is building on long-standing efforts to limit and reduce methane emissions from the European gas sector.
- Collaborative R&D and knowledge sharing is key to manage the reduction of emissions.
- The GERG Research Roadmap is an example of such a collective initiative, and follow-up actions are already ongoing (Site-level quantification project).
- A Summary Brochure of the Roadmap will be publicly available after the conference.

