

NATURAL GAS INFRASTRUCTURE



NETL

NATIONAL ENERGY TECHNOLOGY LABORATORY

The Natural Gas Infrastructure Program is pursuing research to help mitigate and reduce methane emissions throughout midstream infrastructure and to better assess potential methane leakage. Better understanding of the potential size and distribution of methane leak rates will help provide a scientific basis for technology development efforts to reduce impact on the environment. Research into mitigation technologies will help accelerate the commercial availability of cost-effective products and procedures for significantly reducing methane emissions in the coming years.



The United States is fortunate to have a large natural gas resource base. However, the volume of natural gas moving through midstream infrastructure has increased nearly five-fold since 1950 and is expected to increase by another 22 percent by 2040. The U.S. natural gas delivery system includes four major elements: production, processing, transportation/storage, and distribution. NETL's Natural Gas Infrastructure Program accelerates the development of new tools, technologies, and processes that can help industry adopt "next generation" facilities, equipment and components that will conserve natural gas, reduce methane emissions, and improve transportation efficiency. In pursuit of its primary mission, the Natural Gas Infrastructure Program is proceeding along three parallel paths:

- To identify and accelerate development of economically viable technologies to more effectively reduce or eliminate both inadvertent and operational methane emissions from U.S. natural gas infrastructure.
- To catalyze the development of new technologies and methodologies for improving the operation of natural gas infrastructure systems.
- To catalyze the development of new technologies and methodologies for enabling the wider application of "smart" systems within the U.S. natural gas infrastructure that can improve risk assessment, safety, reliability, and operational efficiency.

NETL'S RESEARCH WILL IMPROVE OUR EFFORTS TO PROTECT THE NATURAL ENVIRONMENT BY INVESTIGATING THESE ASPECTS OF INFRASTRUCTURE:

IMPROVED RESILIENCY — To enhance protective coatings and pipeline materials to extend the operational life and further reduce leakage potential.

LEAK DETECTION — To develop improved sensor platforms for "real-time" detection of potential leakage from pipelines, gathering systems, and other midstream infrastructure.

LEAK MITIGATION AND REPAIR — To produce materials and tools to mitigate leakage from pipelines and associated infrastructure components with minimal disruption of service.

MITIGATION SOLUTIONS FOR FLARED GAS — To develop novel processes and technologies for the effective utilization of natural gas that would be otherwise vented or flared.

TECHNOLOGY PARTNERSHIPS

The Pipeline and Hazardous Materials Safety Administration (PHMSA, part of the Department of Transportation) manages a research program that currently includes efforts to detect internal pipeline defects associated with methane leaks in pipelines. Further, within DOE, ARPA-E has several research projects focused on the development of infrared and spectrometry-based sensors for detecting and quantifying methane leaks from natural gas production sites

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