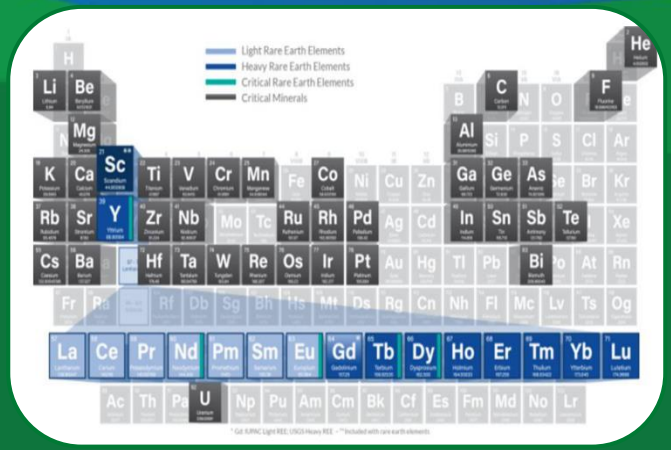
U.S. DEPARTMENT OF ENERGY

Fossil Energy and Carbon Management

Greenhouse Gas Supply Chain MMRV Framework U.S. Stakeholder Meeting

Office of Fossil Energy and Carbon Management

September 15, 2023



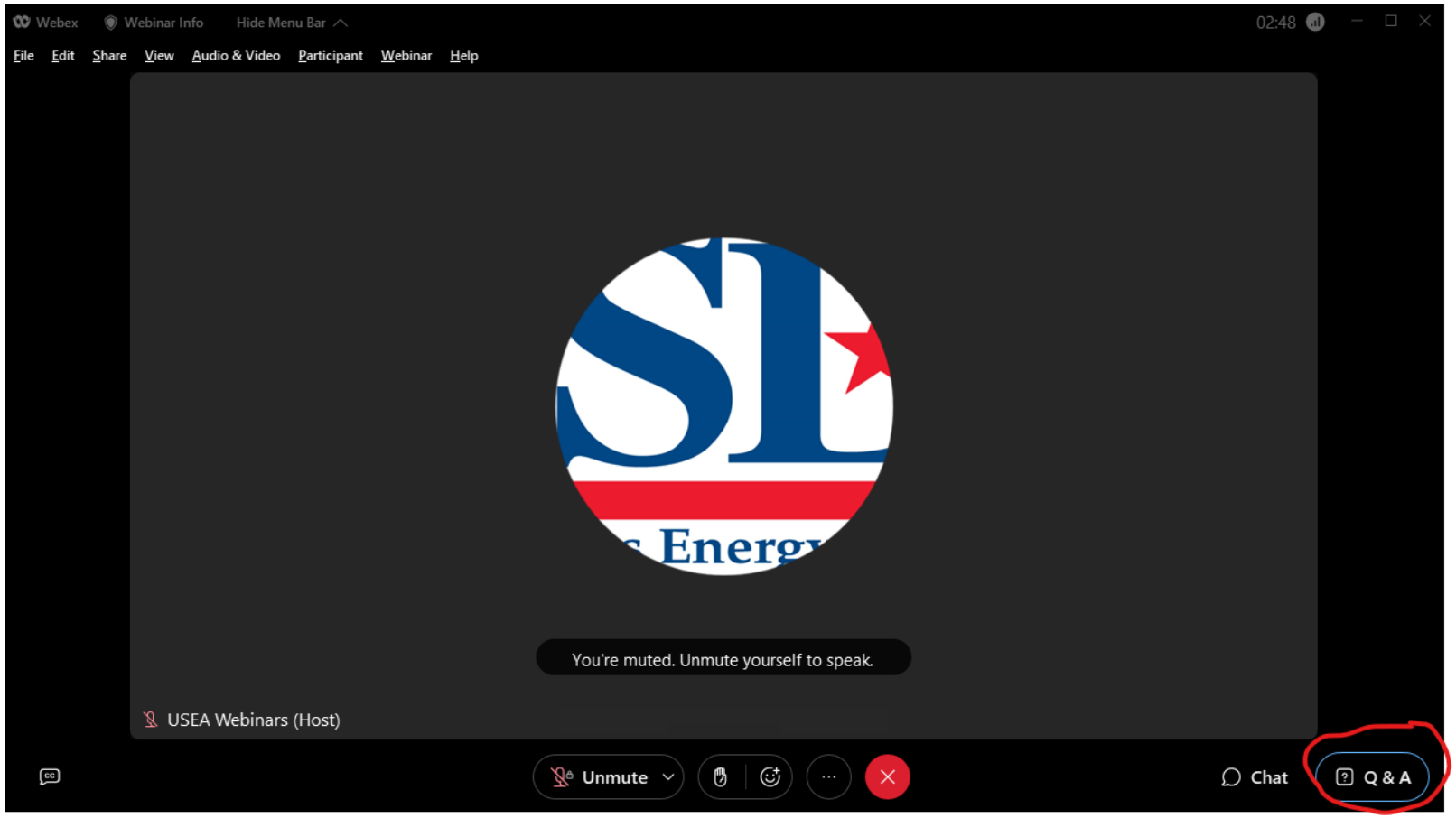
Agenda

- Welcome Remarks
- Background on FECM's Natural Gas Activities
- MMRV Framework Overview
- Recent Developments
- Opportunities for Additional Feedback
- Q&A

Logistics

- Before we get started, we want to review a few important logistics:
  - The webinar will be about 1.5 hours; there will be approximately 45 minutes of remarks and slide presentation followed by Q&A.
  - Please submit your questions and comments using the Webex Q&A throughout the presentation and we will respond to questions at the end of the presentation.
  - If you have technical difficulties, please email Andrew Palmateer (apalmateer@usea.org).
  - If your comments are not addressed during the webinar, they can also be submitted via email to FE-30correspondence@hq.doe.gov.
  - The slides will be shared with all participants after the event.
  - This webinar is being recorded.

Webex Q&A



Please submit your questions and comments using the Webex Q&A

Welcoming Remarks

A Word from Brad Crabtree

Assistant Secretary, Office of Fossil Energy and Carbon Management

U.S. Department of Energy

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Background on FECM's Natural Gas Activities

Office of Fossil Energy and Carbon Management

Advancing Carbon Management to Achieve Deep Decarbonization *Priorities:*

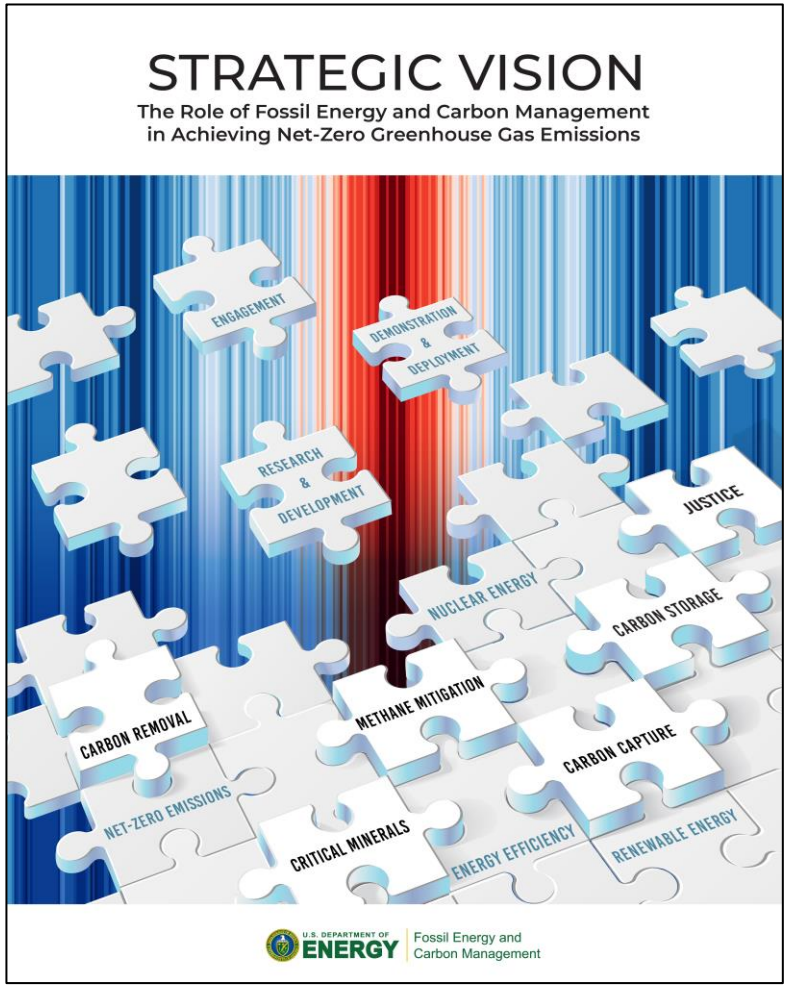
Carbon capture, conversion of captured carbon emissions, removal of carbon dioxide from the atmosphere, and CO_2 transport and storage

Advancing Technologies that Lead to Sustainable Energy Resources *Priorities:*

Hydrogen with carbon management, domestic critical minerals (CMs) production, and methane mitigation

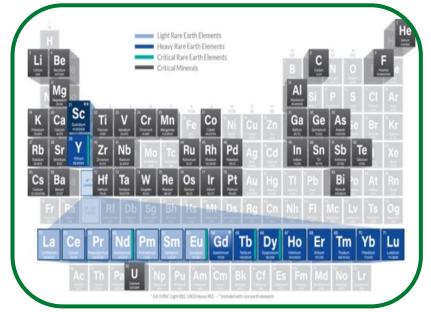
Advancing Domestic Engagement and International Collaboration *Priorities:*

Collaborate with domestic and international partners to engage communities and key stakeholders to help ensure communities see tangible economic, environmental and jobs benefits from deployment of projects and infrastructure and to foster project success



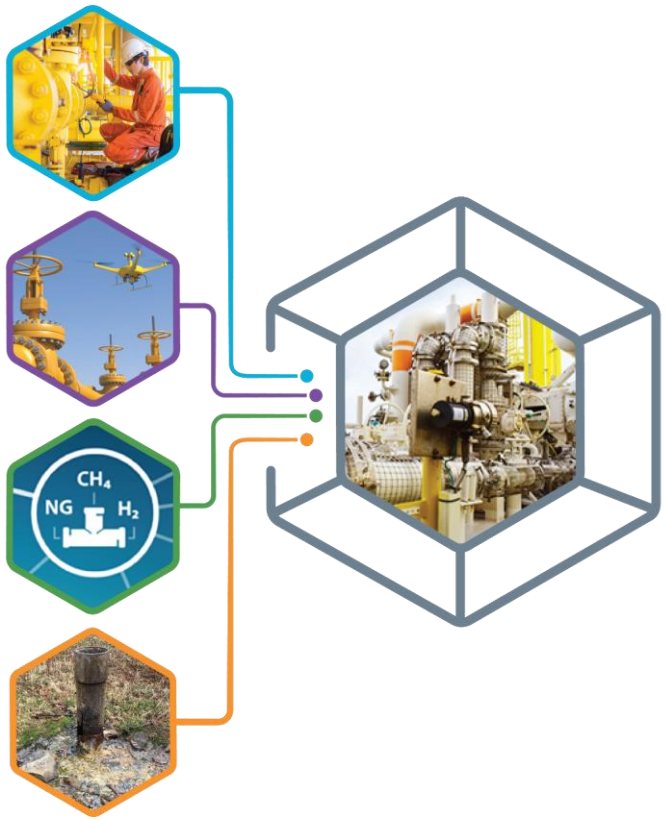
Office of Resource Sustainability

- Design and administer activities to reduce environmental and climate impacts of the production and use of our nation's coal, oil, and natural gas resources
  - Reduce environmental impacts and emissions associated with ***fossil energy development, use, transportation and storage***, through produced water management, abandoned mine remediation, and methane mitigation
  - Improve the economics and reduce environmental impacts of ***critical minerals extraction, processing, use and disposal***
  - Regulate the ***import and export of natural gas***
  - Conduct analysis of ***oil and natural gas markets***
- Accomplish these goals through ***policy, research, innovation, outreach, and stewardship***



Methane and Natural Gas Related Activities

- Provide funding to advance the development and deployment of technology solutions to increase efficiency, reliability, resiliency, and methane mitigation across the oil and natural gas infrastructure.
- Review applications related to the import and export of natural gas (including liquefied natural gas-LNG, compressed natural gas, compressed gas liquids, etc.) from and to foreign countries.
- Develop technical, economic, and policy analyses in support of FECM's research programs and DOE's mission.
- Engage with importing and exporting countries, and U.S. stakeholders, to explore a shared and broadly credible global MMRV Framework.



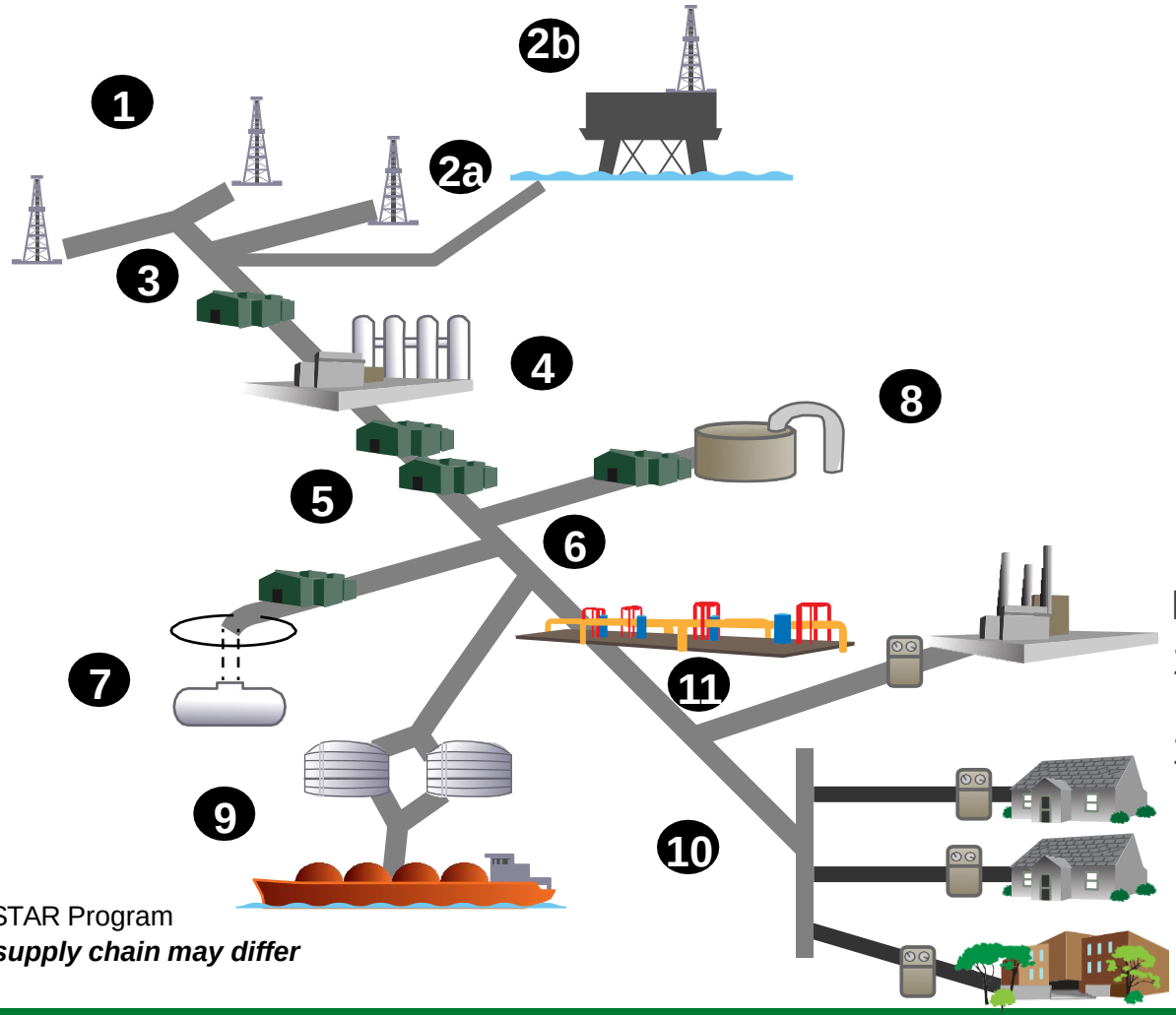
Natural Gas Supply Chain Illustration

Production & Processing

1. Drilling and Well Completion
2. Producing Wells
   a. Onshore Wells
   b. Offshore Wells
3. Gathering and Boosting
4. Gas Processing Plant

Natural Gas Transmission & Storage

5. Transmission Compressor Stations
6. Transmission Pipelines
7. Underground Storage
8. LNG Storage
9. LNG Import-Export Equipment



Distribution

10. Distribution Mains/Services
11. Regulators and Meters

Adapted from American Gas Association and EPA Natural Gas STAR Program

Note: for illustrative purposes only; actual scope of MMRV supply chain may differ

Measurement, Monitoring, Reporting, and Verification (MMRV)

- MMRV is a multi-step process used to account for the greenhouse gas (GHG) emissions and emissions intensity associated with specific sources across the value chain.
- There is considerable activity underway related to MMRV of methane, carbon dioxide, and other GHG emissions associated with delivered natural gas.
- However, there is currently no consensus regarding what purchaser, regulator, or other stakeholder expectations should be for a company making a claim about the GHG intensity of delivered or contracted gas.
- In response, FECM is exploring a shared and broadly credible global framework for estimating GHG emissions across the international supply chain for natural gas.

MMRV Framework Purpose

- DOE is not introducing a regulatory standard for natural gas, nor will DOE be certifying natural gas in the marketplace.
- DOE is working with other countries on an international framework for the MMRV of greenhouse gas emissions associated with the global natural gas supply chain that can be used by both buyers and sellers or by individual governments.
- DOE's efforts align with the Biden Administration's U.S. Methane Emissions Reduction Action Plan and pledge that the U.S. will work with global partners to reduce the world's methane emissions.

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MMRV Framework Overview

Overview of the Framework

- This initiative aims to **identify key elements of an MMRV framework for GHG emissions across the international supply chain for natural gas**

- Such a framework would **enable comparable and reliable information on methane, carbon dioxide, and other GHG emissions across the supply chain** and provide market participants with verified information about life cycle GHG emissions volumes and intensity from pre-production through delivery.

- This effort will **build on the strengths of OGMP 2.0* and other reporting approaches** already operating in the marketplace around the world, while addressing and correcting for recognized gaps across platforms to safeguard integrity and enhance credibility.

- Products of the initiative could include **guidance, protocols, and tools for voluntary use in natural gas markets**.

*The Oil & Gas Methane Partnership 2.0 (OGMP 2.0) is a measurement-based methane emissions reporting framework for oil and gas companies. More information is available at https://www.unep.org/explore-topics/energy/what-we-do/methane/oil-gas-methane-partnership-20-ogmp-20

Scope of MMRV Framework

- **Initially focused on methane and carbon dioxide from the natural gas supply chain**; in future, could include other hydrocarbons.
- Will allow differentiation of natural gas in the marketplace based on GHG intensity. However, it **will not establish specific GHG intensity standards or levels**.
- **Focus is on GHG intensity and quantification**, not on other aspects of existing certification programs, such as management practices, social impacts, or corporate governance commitments.
- The MMRV Framework **will not include economics of supply and demand, commodity pricing, or any attribute other than quantification** of GHG supply chain emissions.

Elements of the MMRV Framework

- [Verification / Certification] Criteria
- Accreditation
- Data Transparency and Dissemination Tools
- Coordination

Elements of the MMRV Framework: Criteria

Verification/ Certification Criteria

Identify common criteria for verification/certification, such as criteria to ensure rigor of quantification and reporting of greenhouse gas emissions and a process for independent verification of emissions estimates and adherence to criteria.

- Review and build upon existing protocols and standards to:
  - Establish a consistent set of technical criteria for reporting emissions and operating data.
  - Develop common requirements that an independent certifier would use to assess GHG emissions intensity accuracy, representativeness, and completeness of
    1. Emissions and operating data and
    2. Aggregated life cycle supply chain result.
- Define certification documentation for reporting the GHG supply chain emissions intensity and data quality metrics.

Elements of the MMRV Framework: Data and Tools

Data Transparency and Tools

Establish expectations for collecting and reporting data consistent with the needs of natural gas market participants and others. Develop transparent and consistent life cycle analysis tools for calculating and reporting supply chain data quality and GHG emission intensity.

- Value measured data over modeled data.
- Develop consistent and transparent life cycle analysis framework and spreadsheet tools.
- Establish a data quality metric for reporting data reliability (accuracy) and data representativeness.

Elements of the MMRV Framework: Accreditation

Accreditation

Establish an accreditation process through which certifiers are confirmed as employing consistent protocols as identified through the framework including a mechanism for independent oversight of the accreditation process.

- Review existing and established accreditation approaches to identify potential models to build on as appropriate.
- Explore use of accreditation to confirm that certifiers are independent of the reporting entity, are technically qualified to conduct the review, and verify information in accordance with the MMRV Framework criteria.
- Develop a mechanism to ensure accredited certifiers are adhering to the MMRV Framework.

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MMRV Working Group Structure

MMRV Working Group

In May 2023, DOE FECM began engaging and collaborating with representatives from importing and exporting governments and regions to form the GHG Supply Chain Emissions MMRV Framework Working Group.

The MMRV Working Group is supported by distinct groups:

1. Working Group of participating government principals.
2. Technical Group of participating government technical staff.
3. Stakeholder Representative Group of global stakeholders with global perspectives and technical expertise providing input to the Technical Group.
4. Domestic Stakeholders including all interested industry, environmental groups, academics, and the general public.

Participating Countries / Regions

Country / Region	Agency / Department
Australia	Department of Industry, Science and Resources
Azerbaijan	Ministry of Energy
Brazil	National Agency of Petroleum, Natural Gas & Biofuels, Ministry of Mines & Energy
Canada	Natural Resources Canada
Colombia	Ministry of Mines and Energy
East Mediterranean Gas Forum	Secretariat
Egypt	Ministry of Petroleum & Mineral Resources
European Commission	DG-Energy
France	Ministry for the Energy Transition
Germany	Federal Ministry for Economic Affairs and Climate Action

Country / Region	Agency / Department
India	Ministry of Petroleum and Natural Gas
Italy	Ministry of Environment & Energy Security
Japan	Ministry of Economy, Trade and Industry
Korea	Ministry of Trade, Industry and Energy
Malaysia	Ministry of Economy
Mozambique	National Petroleum Institute
Norway	Ministry of Petroleum and Energy
United Arab Emirates	Ministry of Energy and Infrastructure
United Kingdom	Dept for Energy Security and Net Zero
United States	Dept of Energy, Dept of State, Environmental Protection Agency

Government and regional entities listed on this slide have been participating in Working Group discussions. Inclusion on this list should not be interpreted as a commitment to endorse or use the framework or other work products of the Working Group.

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Opportunities for Feedback

Next Steps and Stakeholder Feedback

We greatly appreciate the input we have received to date and welcome continued feedback!

Updates on this initiative will be posted via our web site:
Greenhouse Gas Supply Chain Emissions Measurement, Monitoring, Reporting, Verification Framework | Department of Energy

Comments or feedback can also be shared via email to
FE-30correspondence@hq.doe.gov


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Q&A

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Thank You