



Facilitators:

- Hon. D. Ethan Kimbrel, Illinois
Chairman, Committee on Gas
- Hon. Diane X. Burman, New York
Chairman, DOE-NARUC Natural
Gas Partnership

Speaker:

Shawn Bennett, Deputy Assistant
Secretary for Oil and Natural Gas,
U.S. DOE

DOE Engagement with EU on Natural Gas Sector Methane Emissions

U.S. Department of Energy-NARUC
Natural Gas Partnership

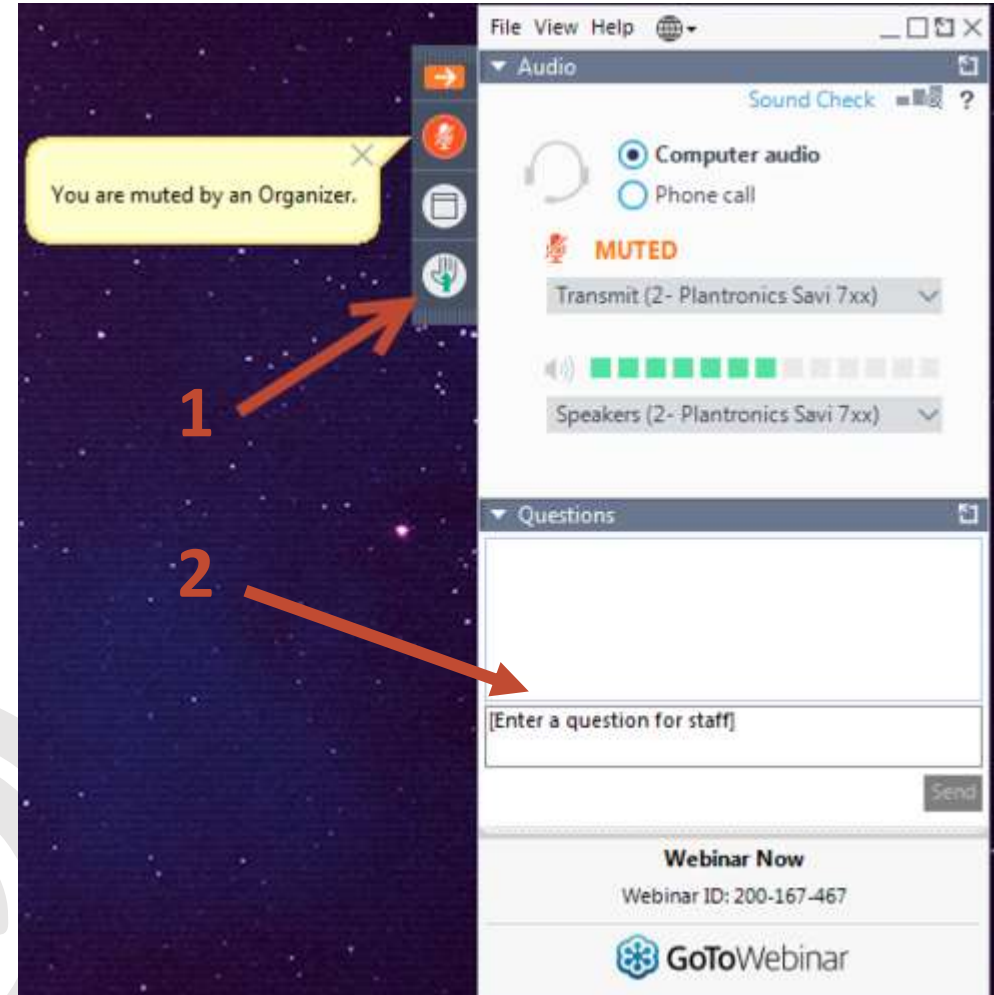
NARUC Committee on Gas

JAN. 15, 2021 | 3:00 – 4:00 PM ET

QUESTIONS

Submit questions two ways:

1. Raise your hand and the moderator will call on you to unmute your line
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TODAY'S GUEST SPEAKER

Shawn Bennett

Deputy Assistant Secretary for Oil and
Natural Gas

U.S. Department of Energy



DOE Engagement with EU on Natural Gas Sector Methane Emissions

Shawn Bennett
Deputy Assistant Secretary

NARUC Committee on Gas, January 15, 2021



Summary

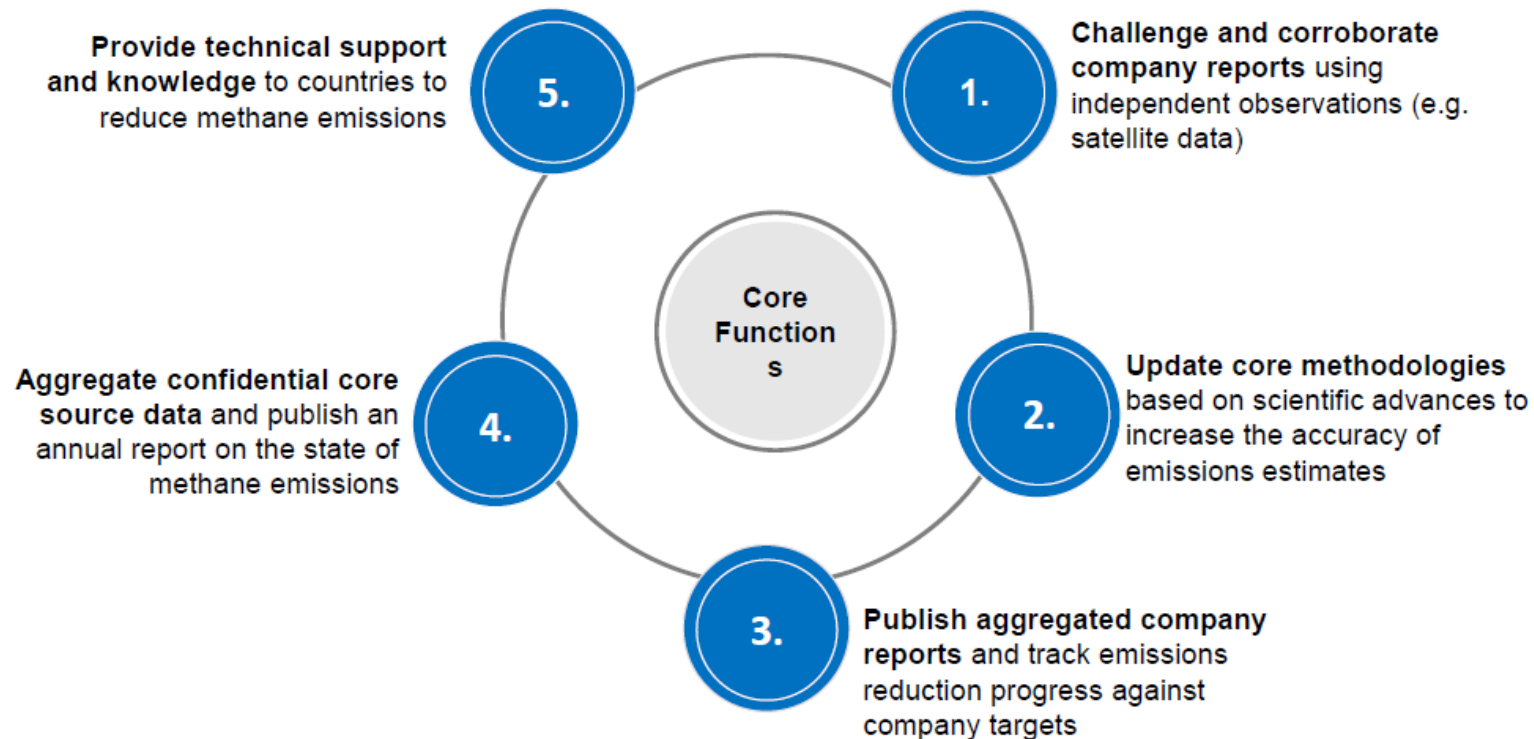
- EC Methane Strategy and implications for natural gas suppliers
- Methane emissions profile of U.S. natural gas sector
- Natural gas flaring
- DOE-led research
- Voluntary industry initiatives and public-private partnerships
- National Energy Technology Laboratory (NETL) work on lifecycle analysis of U.S. natural gas and LNG
- Current engagement with EC and path forward

Critical Opportunity to Engage with Europe on Methane

- The European Commission (EC) has indicated that addressing energy-related methane emissions will be part of Europe's commitment to reaching climate neutrality by 2050.
- EC's Methane Strategy calls for new legislation in 2021 to require EU companies to report energy-related methane emissions and repair leaks in gas infrastructure.
- EC is considering whether it can propose legislation later this year that could require natural gas suppliers to the EU to further disclose and meet robust methane emissions reduction targets.
- The UN Environment Programme (UNEP) is working with EC on "International Methane Observatory" to collect, reconcile, verify, and publish anthropogenic methane emissions data at a global level.
- DOE and other U.S. government agencies are engaging with EC to ensure that any proposed emission quantification frameworks that affect suppliers are transparent and high quality.

Plans for International Methane Observatory

An International Methane Emissions Observatory will provide consistency among multiple methane programs



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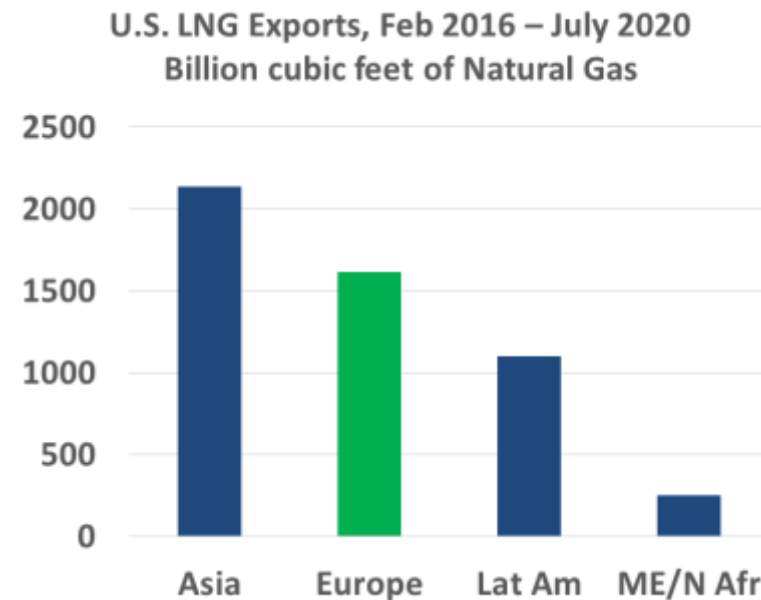
From UNEP presentation, December 2020

U.S. Natural Gas Exports and Methane Policy

Europe is the second largest market for U.S. LNG exports. Despite the current economic downturn stemming from the pandemic, Europe continues to be a strong importing region.

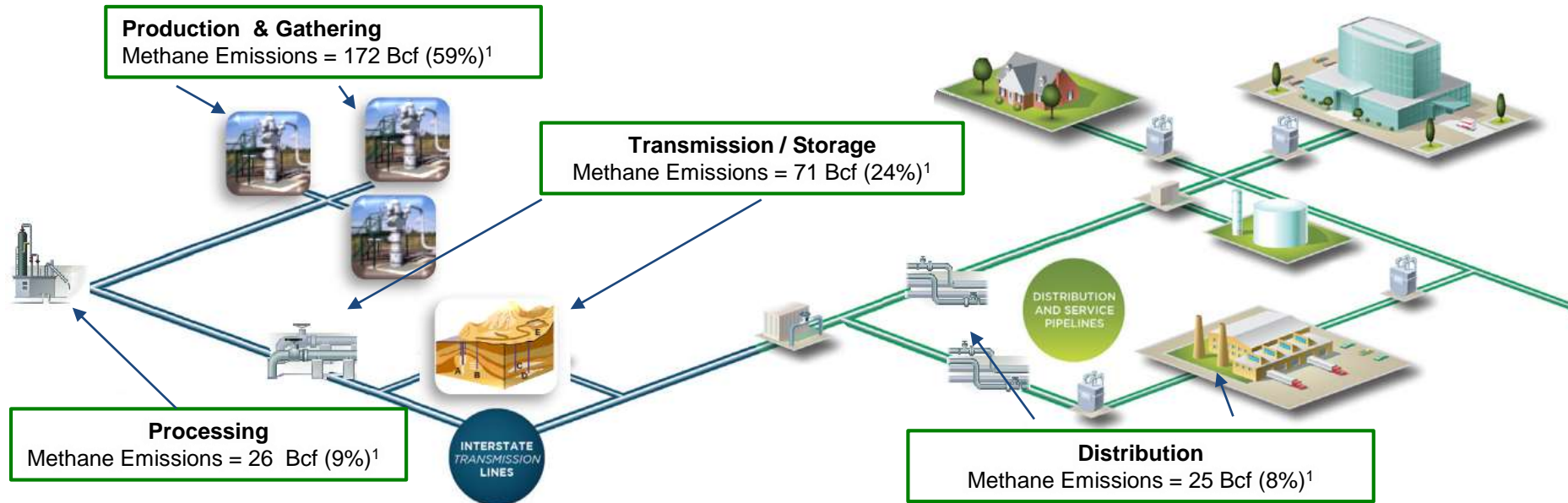
Future limitation on the European natural gas market, stemming from methane emission policies, could have consequences for U.S. LNG exports.

Other natural gas importing regions may follow Europe's lead.



U.S. Natural Gas Sector Methane Emissions

~1.1% emission rate from extraction through distribution in 2018
 22% of Total U.S. Anthropogenic Methane Emissions, 294 BCF (5,600 Gg),
 (U.S. EPA Greenhouse Gas Inventory)



Infrastructure Characteristics²

Production
 405,000 gas wells

Gathering

5,400 gathering stations
 17,500 gathering compressors
 381,000 miles of gathering pipe
 (typically 8-5/8" or less) 500 psi

Processing

667 Natural Gas Processing Plants

Transmission & Storage

302,000 Miles of large diameter
 transmission pipe 24"-48" 1,000 psi
 2,000 compressor stations
 - 7,200 engines (61 billion hp-hr)
 - 2,400 turbines (15 billion hp-hr)
 19,089 storage wells

Distribution

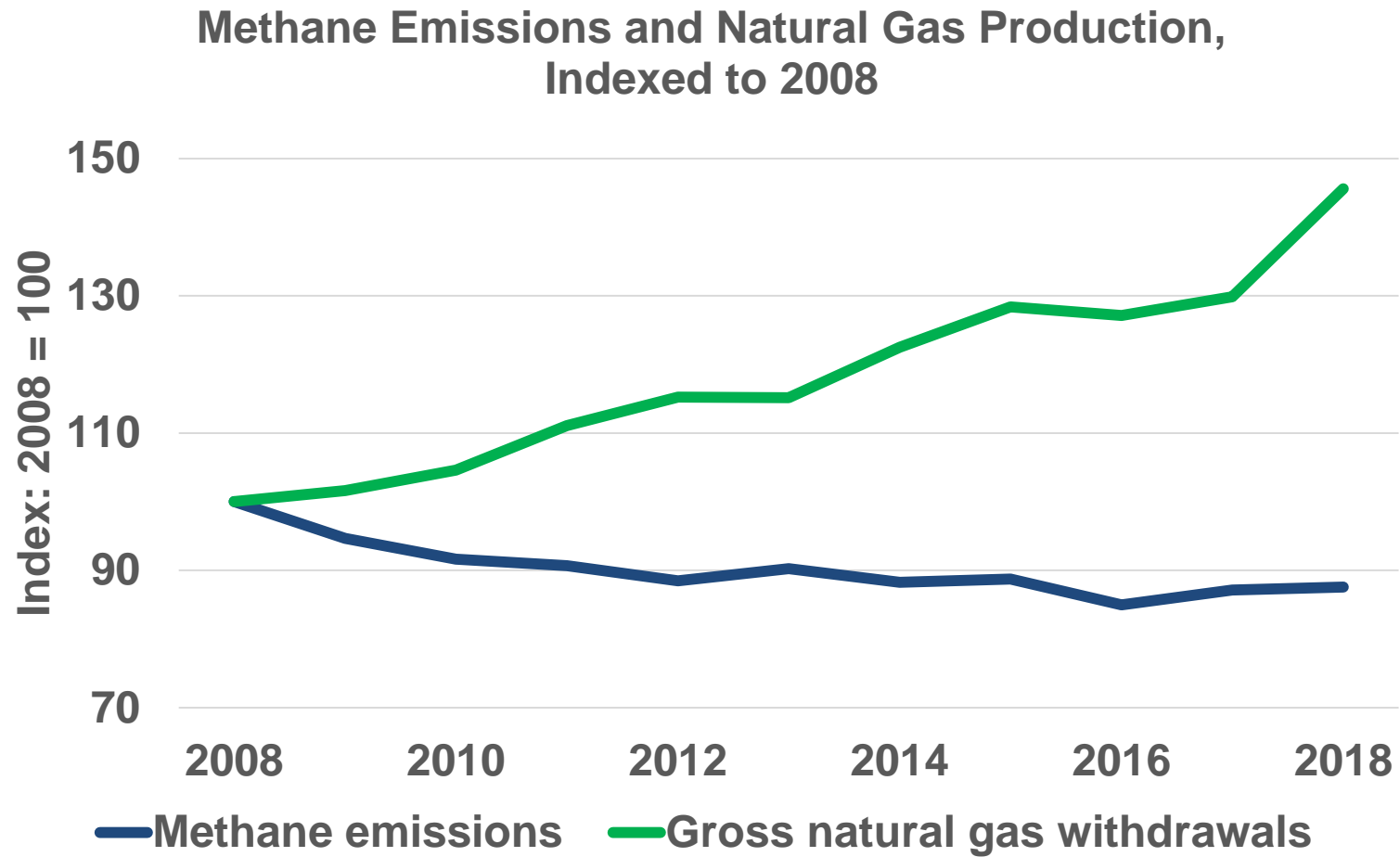
1.3 million miles of distribution

¹ EPA, 2019a. Inventory of U.S. Greenhouse Gas Emissions and Sinks. Table 2-1 and Table 3-58 (<https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks>)

² EPA, 2019b. Annex 3.6 (https://www.epa.gov/sites/production/files/2020-02/2020_ghgi_natural_gas_systems_annex36_tables.xlsx)

* Methane emission rate (1.1%) calculated by dividing EPA inventory for 2018 natural gas methane emissions (294 Bcf) by Energy Information Administration (EIA) data for total gas delivered to consumers in 2018 (27,600 Bcf).

Steady Decline in Methane Emissions Intensity of U.S. Natural Gas Sector 2000 - 2018



Source: U.S. EPA Greenhouse Gas Inventory (GHGI),
Table 3-58, and EIA

Methane Emissions: Reporting, and Voluntary Initiatives in the U.S.

U.S. Environmental Protection Agency's (EPA) Greenhouse Gas Reporting Program (GHGRP)

- ~ 8,000 facilities required to report emissions yearly (some more often)
- Reported data are made available to the public on an annual basis
- EPA reports that in 2018, only ~1.1 percent of methane escaped from extraction through distribution

Voluntary EPA Public-Private Partnerships

- Natural Gas Star
- Methane Challenge

ONE Future

- Voluntary coalition of 31 companies in natural gas sector
- Reduce methane emission intensity to 1% or less by 2025
- Reports published in May 2018 and August 2020 show that ONE Future's average CH₄ emission intensity is below 1%

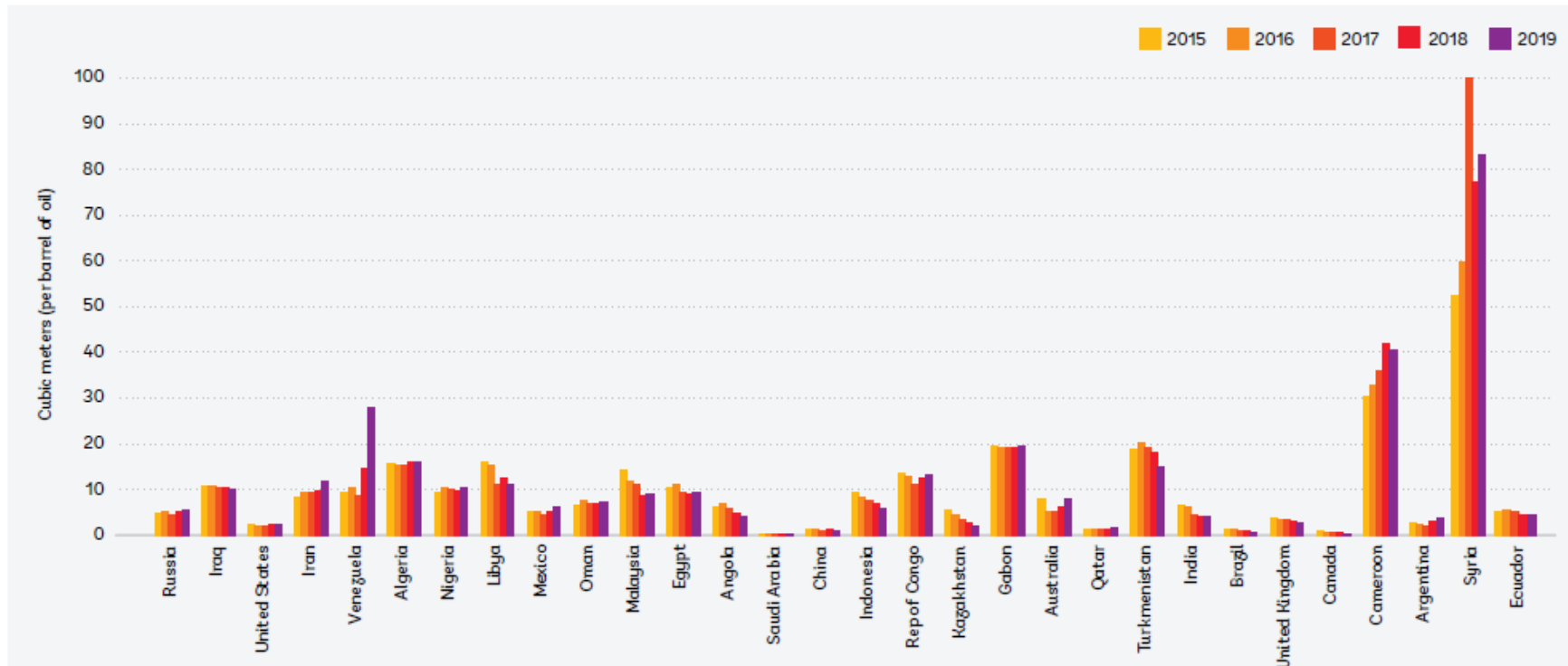


Natural Gas Flaring

- Natural gas flaring in the U.S. is of great concern to European stakeholders
- EC may consider legislation to prohibit routine flaring and venting within the EU in 2021.
 - Unclear whether any legislation affecting non-European suppliers will touch on flaring
- DOE is working to educate stakeholders on the U.S. record - natural gas flaring intensity in U.S. is low compared to other producers
- Four nations are alone responsible for almost half of all flared gas. The largest flaring country is Russia. Other large sources of flaring are Iran and Iraq.
- New U.S. gas pipeline capacity providing significant takeaway infrastructure outlets for supply increases has started to come online in 2020, which will reduce flaring.

Natural Gas Flaring Intensity in U.S. is Low Compared to Other Producers

Flaring intensity for the top 30 flaring countries from 2015 to 2019 (Ranked in order of the top 30 flaring countries)



Source: World Bank Global Gas Flaring Tracker Report, July 2020

DOE's Natural Gas Methane Initiative

- **Office of Fossil Energy** has \$18 million for research programs on Methane Emissions Mitigation leak detection and sensing technologies, and Methane Emissions Quantification field studies that better quantify methane emissions from natural gas gathering compressor stations, gas storage operations, and marginal natural gas wells to inform EPA Greenhouse Gas Inventory. Also funds an independent field test site in Colorado (FY 2020)
- **ARPA-E** manages the \$33 million REPAIR program that seeks to reduce natural gas leaks from distribution pipes by developing a suite of technologies to enable the automated construction of new pipe inside existing pipe. (FY 2020)
- **FERC** established a process to allow interstate natural gas pipelines to recover certain capital expenditures made to modernize system infrastructure through a surcharge mechanism (April, 2015).
- **DOE-NARUC partnership** for technical assistance to State public utility commissions was extended for FY 2020 to 2025. (May 2020)
- **NETL Life Cycle Analysis** modeling capability establishes a transparent national natural gas value chain for methane emissions quantification that enable science based technology and regulatory policies. (April 2019)
- **Stakeholder action is also key.** We continue to work with stakeholders (ONE Future Coalition) that pursue voluntary action to quantify and reduce methane emissions.

NETL Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States (2019)

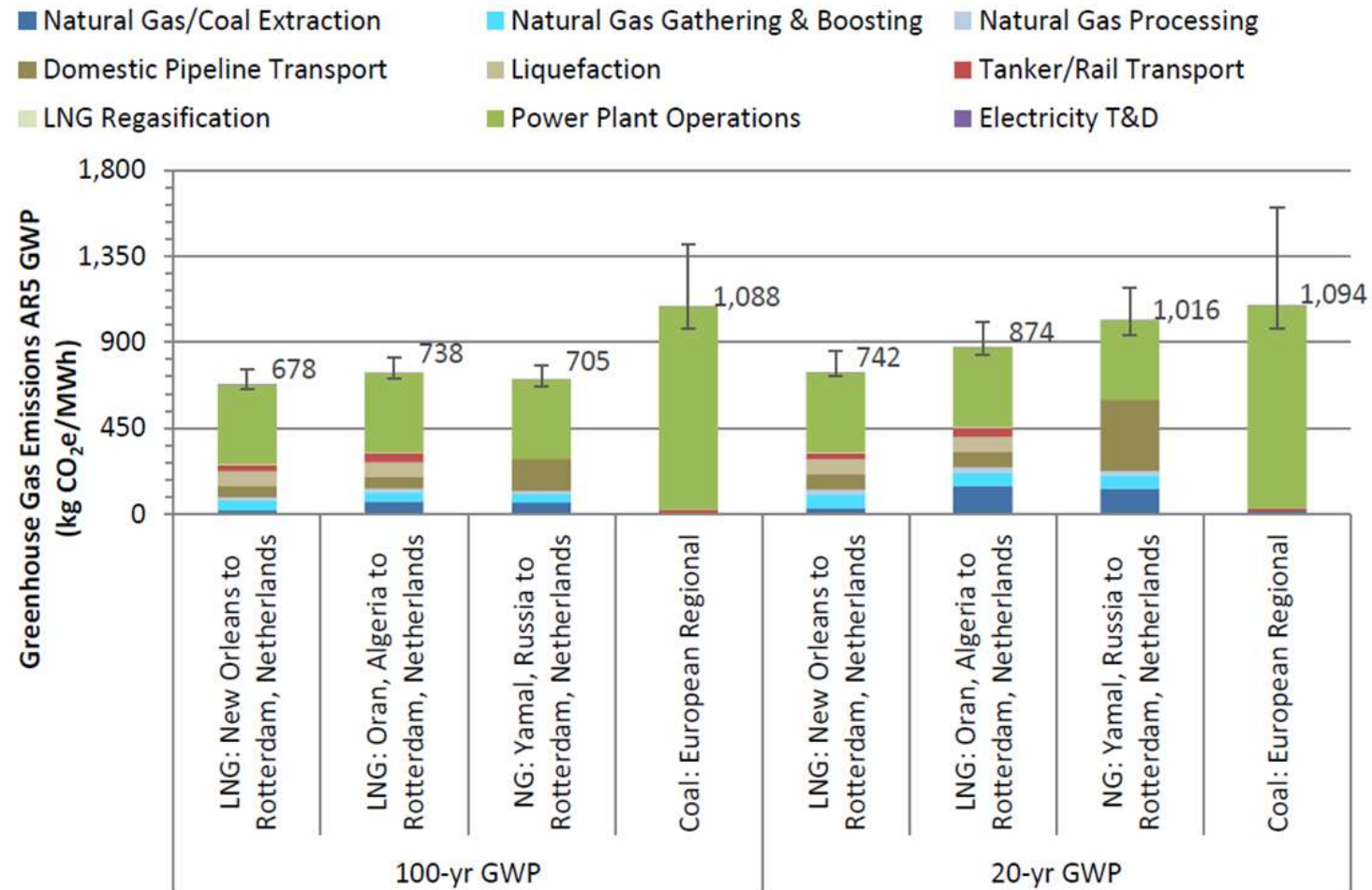
- Update of 2014 report
- Scenarios:
 - Destinations in Europe and Asia
 - Comparative LNG scenarios with gas from Australia and Algeria
 - Comparative pipeline NG scenario with gas from Russia
 - Comparative regional coal scenario
 - Functional unit is 1 MWh electricity delivered



<https://www.energy.gov/fe/life-cycle-greenhouse-gas-perspective-exporting-liquefied-natural-gas-united-states>

NETL Study Results

European Destinations



NETL Study Results, Continued

- The study shows that the use of U.S. LNG exports for power production in European and Asian markets will likely not increase GHG emissions from a life cycle perspective when compared to regional sources of LNG and Russian pipeline natural gas.
- The study also shows a comparative advantage to regional coal extraction and consumption for power production.
 - U.S. LNG use in Europe could result in 23 percent to 56 percent less greenhouse gas emissions than regional coal use for power production on a life cycle basis, based on the 100-year global warming potential.
- NETL's study has advantages for policymakers
 - More comprehensive analysis of upstream emissions
 - Transparent estimates of methane emissions during pipeline transportation
 - Some recent European studies lack these elements

Recent Engagement with EU and Path Forward

U.S. Government Agencies

- DOE Office of Fossil Energy
- National Energy Technology Laboratory
- Environmental Protection Agency
- U.S. Department of State

Late 2020: Initial discussions with EC experts on Methane Strategy

- EC experts seek U.S. expertise in methane quantification
- Seek to avoid disruption of transatlantic LNG trade

Early 2021: Briefings by U.S. experts for EC on topics of interest

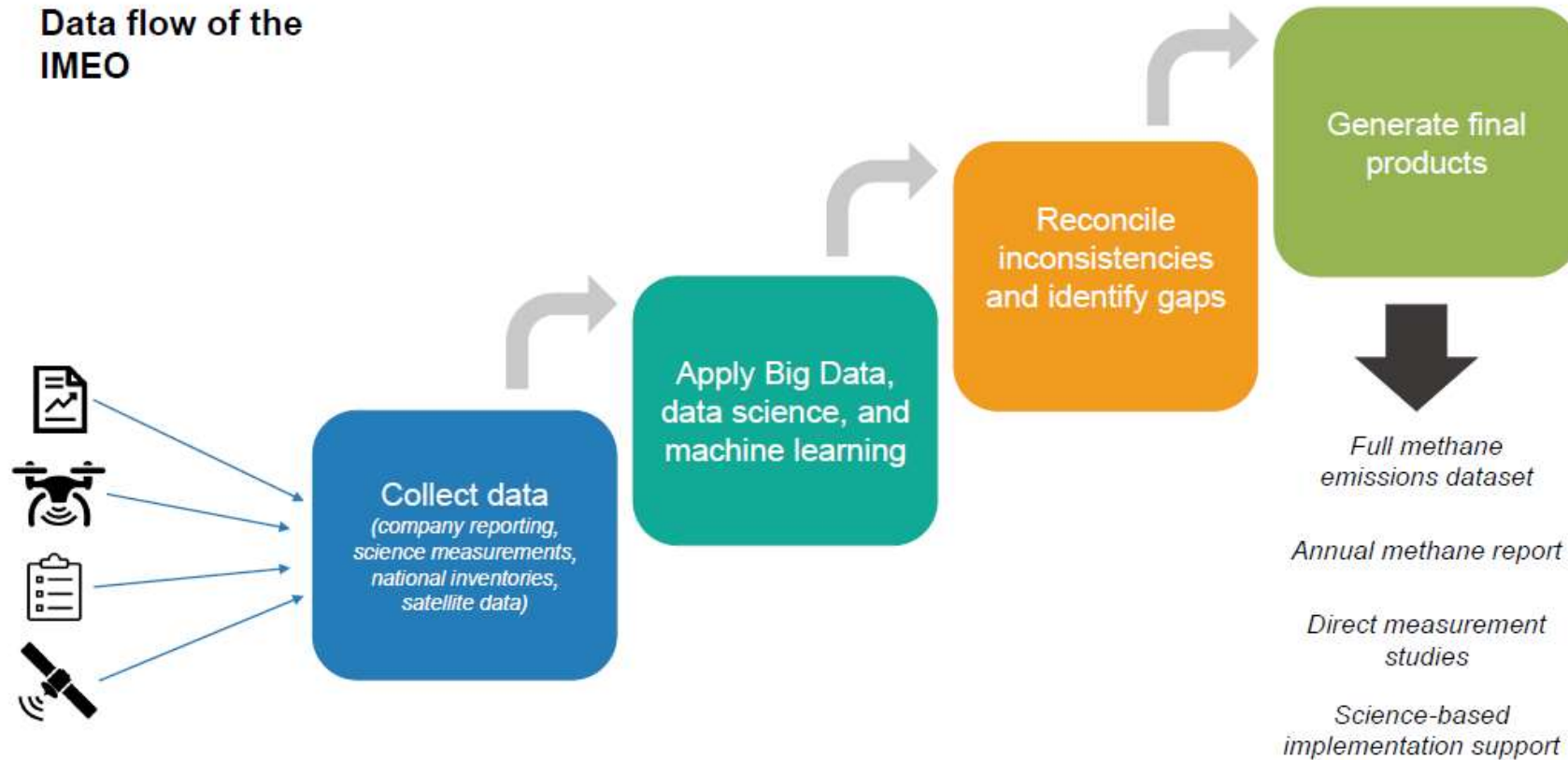
- Methane emissions quantification and lifecycle analysis (scheduled)
- EPA Greenhouse Gas Inventory (TBD)
- Best practices among U.S. state regulators (TBD)

Additional Information

Additional Information - Plans for International Methane Observatory

How will IMEO answer the methane emissions data problem?

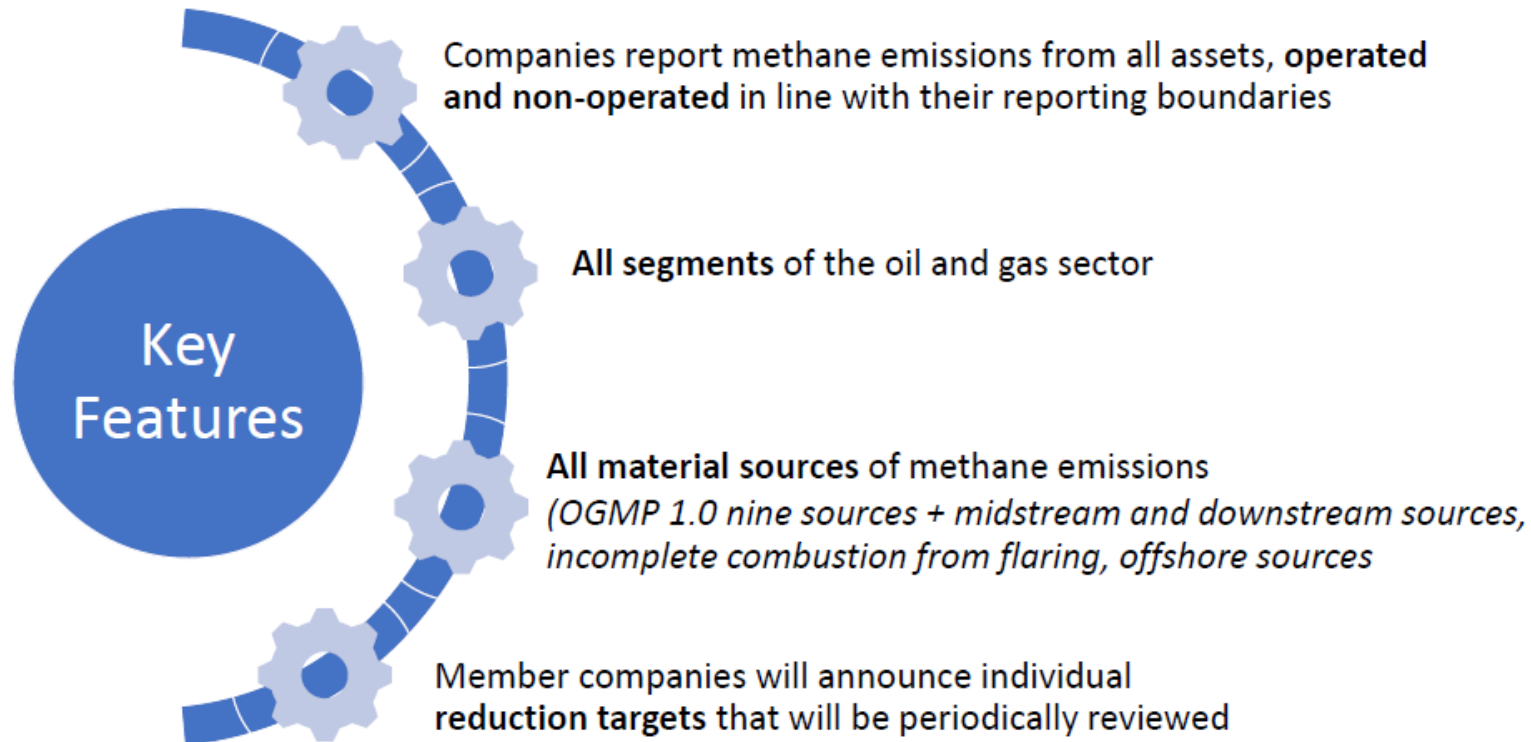
Data flow of the IMEO



From UNEP presentation, December 2020

Additional Information - Plans for International Methane Observatory

OGMP 2.0: The new “gold standard” of methane reporting

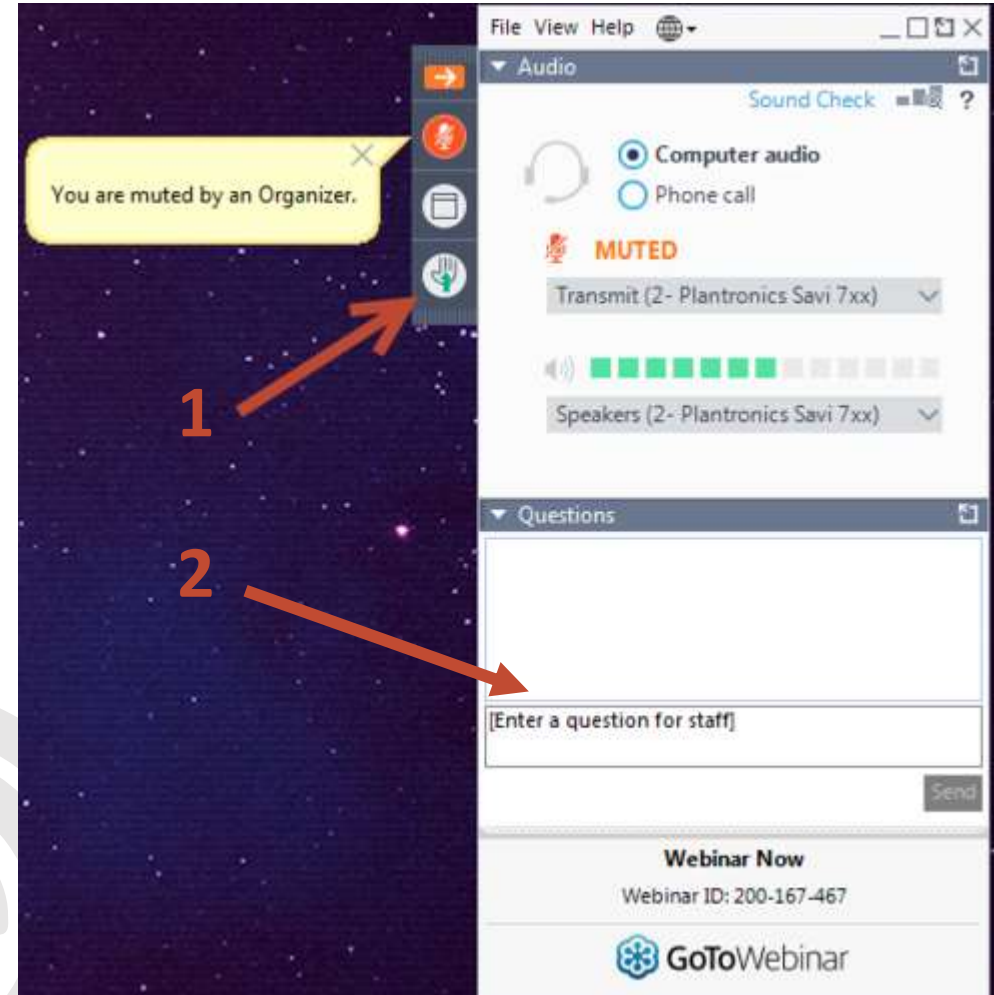


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COMMITTEE ON GAS AT THE NARUC WINTER POLICY SUMMIT

- Natural Gas and Decarbonization, Feb. 4
- Pipeline Safety updates, Feb. 4
- Three-part Committee on Gas workshop on LNG, Feb. 9 – 10
- International LNG and Climate Policy, Feb. 9
- Exploring Gas Sector Resilience, Feb. 10



THANK YOU

Register for the NARUC Winter Policy Summit:

<https://www.naruc.org/meetings-and-events/naruc-winter-policy-summits/2021-winter-policy-summit/>

Early bird prices end on Jan. 22.

Expect calendar invites for future monthly committee / NGP webinars.

