

Welcome to GMI Coal Mines Subcommittee

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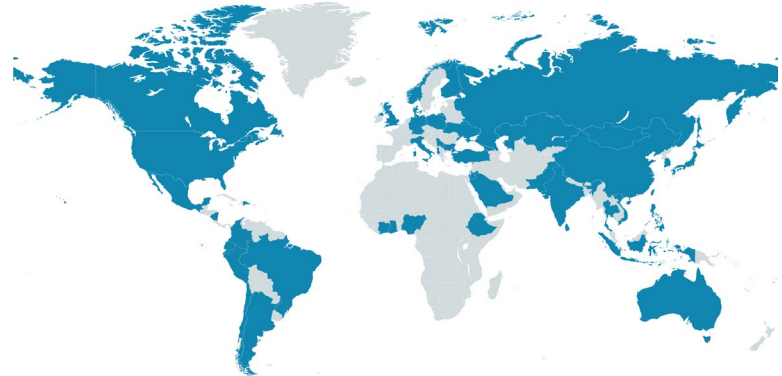
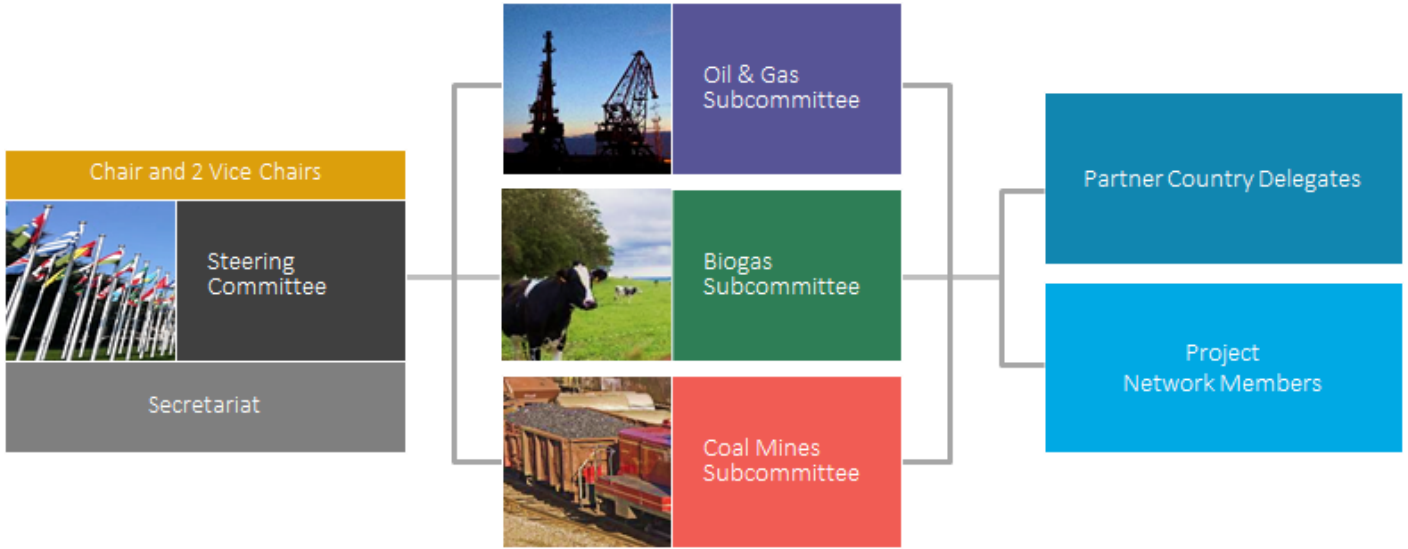
Co Mines Subcommittee Co-Chair, Central Mine Planning and Design Institute



GMI Structure and Participants

GMI is an international public-private partnership focused on reducing barriers to the recovery and use of methane as a valuable energy source.

- 46 Partner Countries
- 700+ Project Network members
- Alliances with international organizations focused on methane recovery and use



GMI Partner Countries represent approximately 75% of methane emissions from human activities.

Agenda for the Two-Day Meeting

Day 1:

- Welcome and GMI Coal Mines Subcommittee Co-Chair Updates
 - Volha Roshchanka, Co-Chair, Coal Mines Subcommittee, U.S. EPA
- GMI Secretariat Updates
 - Denise Mulholland, GMI Secretariat, U.S. EPA
- Key Take-aways from the Global Methane, Climate and Clean Air Forum
 - Clark Talkington, Advanced Resources International
- Review of CMM Project Barriers and Introduction to the Solutions Brainstorming Session
 - Volha Roshchanka, Co-Chair, Coal Mines Subcommittee, U.S. EPA

Agenda for the Two-Day Meeting

Day 2:

- Welcome and Introductions
 - Volha Roshchanka, Co-Chair, Coal Mines Subcommittee, U.S. EPA
- Overview of CMM Project Barriers and the Solutions Brainstorming Session
 - Volha Roshchanka, Co-Chair, Coal Mines Subcommittee, U.S. EPA
- Brainstorming on Solutions to Top Barriers
 - Everyone
- Summary and Adjourn

Co-Chairs Subcommittee Updates

Volha Roshchanka (U.S. EPA) on behalf of
Coal Mines Subcommittee Co-Chairs

Training on Assessing Potential of Coal Mines to Host CMM/AMM Projects

- ONLINE TRAINING
- [Conducting Pre-Feasibility Studies for CMM Projects](#): This eight-module course is now available. Six of the modules have been [translated into Chinese](#).
- [Conducting Pre-Feasibility Studies for Abandoned Mine Methane \(AMM\) Projects](#): This first five modules of this seven-module course are now available.





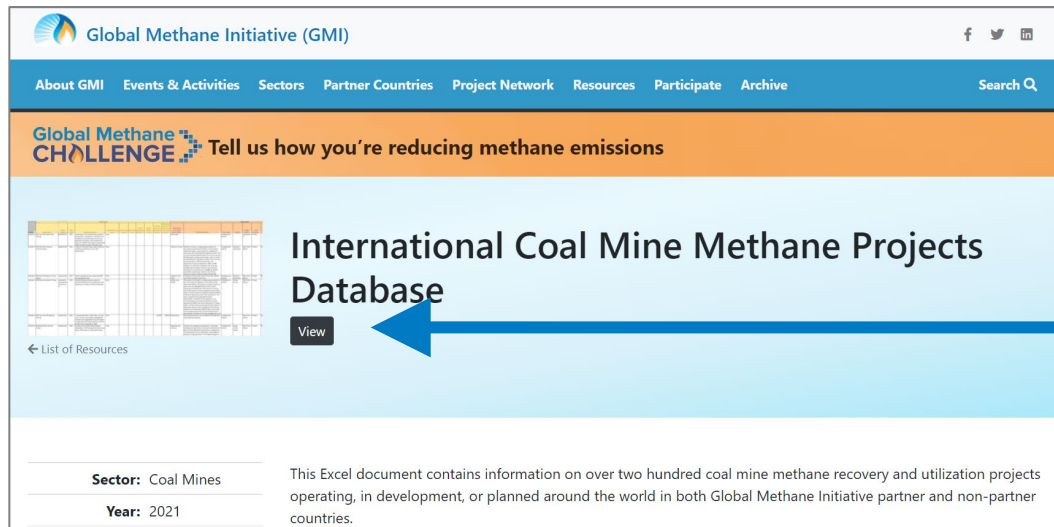
CMM Basics Training

- In 2022, the Subcommittee reviewed and released a [training](#) that covers the basic concepts of methane in coal mines, mitigation options, use of methane in coal mines, etc.
- The training is now available in Spanish!

The image shows two side-by-side screenshots of the Global Methane Initiative training website. The left screenshot is in English, showing the page title "Basics of Coal Mine Methane" and a navigation menu with options like "Course Introduction", "Basics of Coal Mine Methane", "Welcome", "Why is Methane Important?", "What is the Difference Between CMM and CBM?", "Benefits of CMM Capture", and "Basics of CMM: Course Sections". The right screenshot is in Spanish, showing the page title "Conceptos básicos sobre el metano de las minas de carbón" and a navigation menu with options like "Introducción al curso", "Fundamentos del metano de las minas de carbón", "Bienvenida", "¿Por qué es importante el metano?", "¿Cuál es la diferencia entre CMM y CBM?", "Beneficios de la captura de MMC", and "Conceptos básicos de CMM:". Both screenshots feature the Global Methane Initiative logo and a background image of a coal mine.

Int'l CMM Project Database: To be Updated in 2023

- In 2021, the Subcommittee updated and released the International Coal Mine Methane Projects Database (available on the [GMI website](#)).
- Kindly assist with updating the database this year. We will be reaching out to country experts to review existing information.



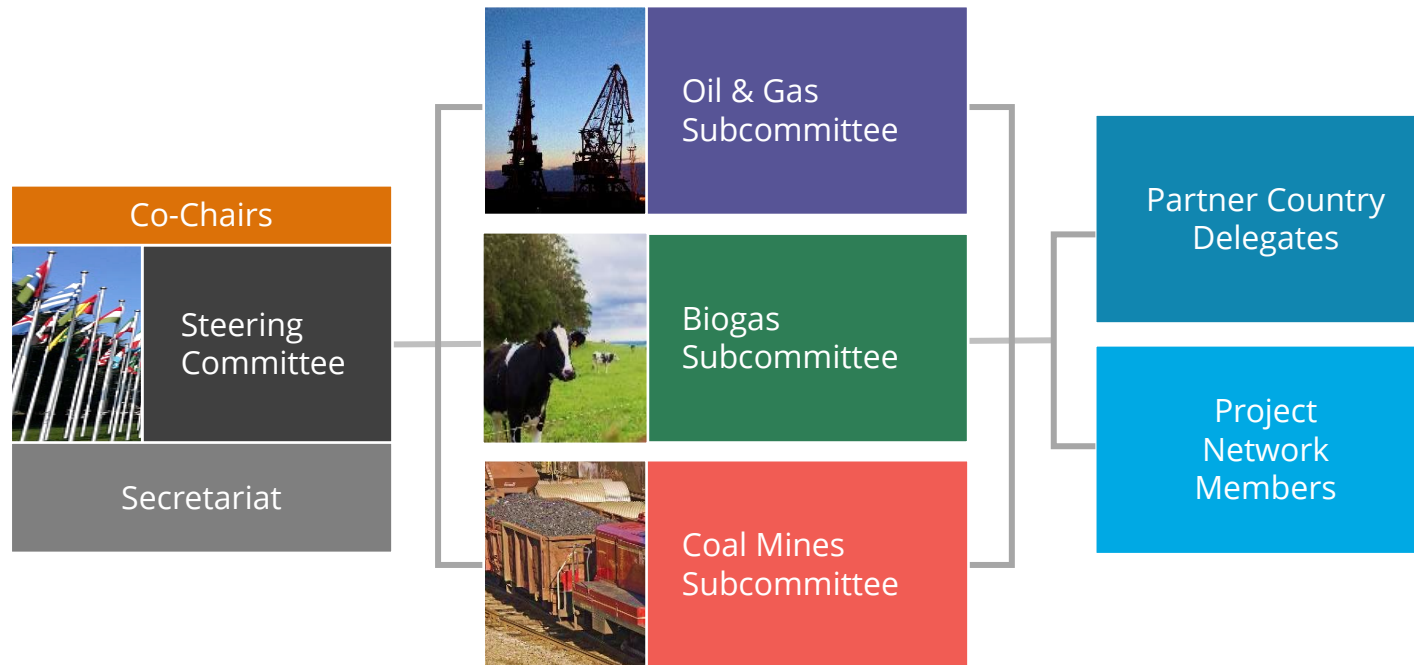
Country	Project Name	Project Status	Start Year	Project Description	Project End Use Type(s)	Gas Flow to Project	Gas Flow Unit	Rated Capacity of Equipment	Rated Capacity Units	Annual Emissions Reductions (MTCO ₂)	Cumulative Emissions Reductions thru 2019 (MTCO ₂)	Mine Name (incl. other known name)	Mine Description
Australia	2012 Coal AUS Oaky Creek Flaring	Operational	2012	Installation of enclosed flares planned for Nov 2012. The plant will consist of six Hofstetter enclosed flares and six ring seal vacuum pumps, with the ability to deal with 12,000 l/sec of gas and generate 30kg through the Oaky Creek gas pipe.	Flare							Oaky Creek	
Australia	2012 Coal AUS Tahmoor Colliery Flaring	Operational	2012	Three (3) enclosed flares used to destroy methane drained from mine. See attachments	Flare							Tahmoor Colliery	Tahmoor Colliery is located approximately 70 kilometres South West of Sydney in the Southern Highlands region, consisting of an underground mine and Coal Handling and Preparation Plant. The colliery produces approximately two million tonnes of high quality coking coal per year, which is railed to Port Kembla for the export market. The mine was commissioned in 1979 by Clutha Coal, and production of coal commenced in 1982. In 1986 longwall mining was introduced. The mine has changed hands several times during its 30 year history and is currently fully managed by Xstrata Coal NSW, operating as Tahmoor Coal Pty Ltd. Tahmoor currently employs approximately 440.
Australia	2013 Coal AUS Appin Colliery Flares	Operational	2012	Flares installed at wells draining CMM from gob/goaf areas.	Flare							Southern Coal Field	The Appin Colliery and Tower Colliery are located within the Southern Coal Field.
Australia	2013 Coal Aus Ashton Flaring	Planned/In Development/Construction	2013	Enclosed flares planned to destroy drained methane from underground coal operations. Number of flares undefined.	Flare							Ashton Coal Project	The Ashton Coal Project is located approximately 14 km north-west of Singleton in the Hunter Valley, New South Wales. The project includes an open cut coal mine, an underground coal mine, a Coal Handling and Preparation Plant and a rail siding. The Ashton Open-Cut and Underground Coal Mines have a current production capacity of approximately 3.9mtpa of high quality Semi-Sort Coking Coal. This coal is predominantly exported to Asian steelmakers. The Ashton Coal operation is an unincorporated Joint-Venture between Yancoal Australia Ltd (90%) and Tochu Corporation of Japan (10%). Yancoal Australia Ltd acquired the interest in the Ashton Open-Cut and Underground Coal Mines effective from December 2009 through its purchase of Felix Resources Pty Ltd. Yancoal Australia Ltd is the operator of these mines and manages the joint http://centennialcoal.com.au/Operations/Operatio
Australia	2013 Coal AUS Mandalong Flaring	Operational	2013	1-2 enclosed flares. 2019 notes: Flaring is still active, and the gas management systems were upgraded to accommodate increasing natural gas production. ER fell by 28% when compared to 2018.	Flare					142,857	888,571	Mandalong	http://centennialcoal.com.au/Operations/Operatio
Australia	Blakefield Mine Flaring Project	Operational	2010	Currently 3 enclosed flares (Energex-Hofstetter), 5 LMS Energy decommissioned flares. 2022 plans to install goaf flares.	Flare							Bulgia Mining Complex	Surface and underground operations. The Bulgia Underground Operations comprise the Beltana No. Mine and the Blakefield South Mine. Underground mining operations are undertaken using longwall retreat mining techniques. The longwall blocks at

GMI Secretariat Updates

Denise Mulholland
Director, GMI Secretariat

Global Methane Initiative (GMI)

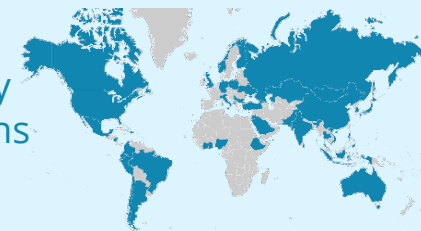
GMI is an international public-private partnership focused on reducing barriers to the recovery and use of methane as a valuable energy source.



- 46 Partner Countries
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Steering Committee and GMI Partner Countries

-  Canada (Chair)
-  India (Vice Chair)
-  United States (Vice Chair)







Steering Committee Members

-  China
-  Colombia
-  Ecuador
-  Finland
-  Ghana
-  Indonesia
-  Nigeria
-  Saudi Arabia
-  Serbia
-  Turkey

Other GMI Partner Countries

- | | | |
|---|---|---|
|  Albania |  Georgia |  Pakistan |
|  Argentina |  Germany |  Peru |
|  Australia |  Israel |  Philippines |
|  Brazil |  Italy |  Poland |
|  Bulgaria |  Japan |  Republic of Korea |
|  Chile |  Jordan |  Russia |
|  Cote d'Ivoire |  Kazakhstan |  Sri Lanka |
|  Denmark |  Mexico |  Thailand |
|  Dominican Republic |  Mongolia |  Ukraine |
|  Ethiopia |  Nicaragua |  United Kingdom |
|  European Commission |  Norway |  Vietnam |

GMI Accomplishments Since 2004

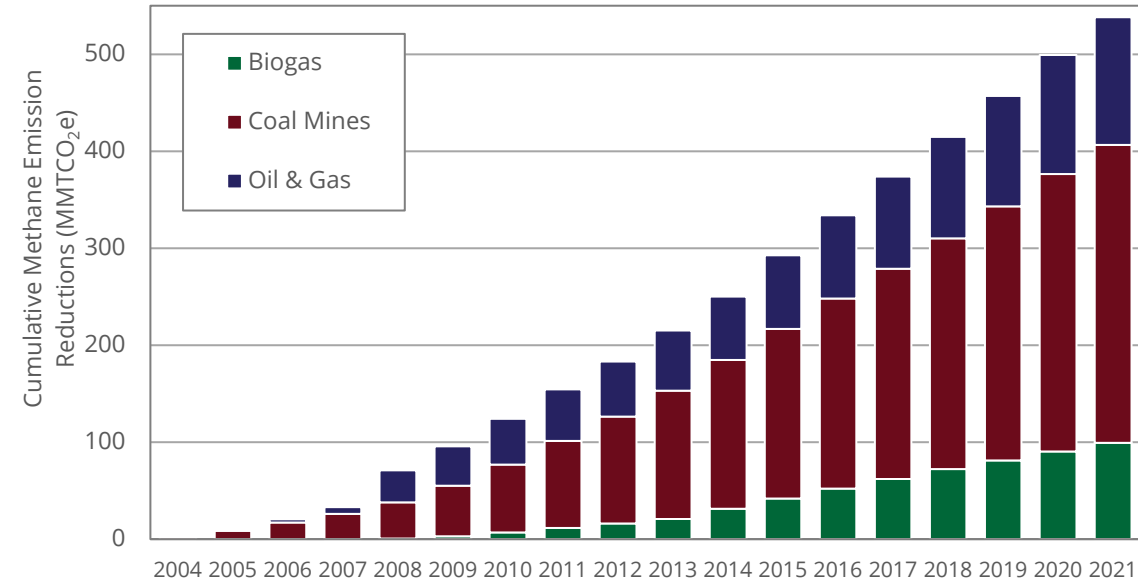
-  Grown from 14 to 46 Partner Countries
-  More than \$650 million in leveraged funding for projects and training
-  More than 700 Project Network members
-  Conducted thousands of assessments, pre-feasibility studies, feasibility studies, study tours, and site visits
-  Provided trainings for more than 50,000 people on methane mitigation
-  Developed more than 60 tools and resources for methane mitigation



Since 2004, GMI has reduced CH₄ by nearly

540 MMTCO₂e

including approximately 40 MMTCO₂e achieved in 2021



540 MMTCO₂e is approximately equivalent* to the CO₂ emissions from any one of the following:



230 Billion
liters of gasoline
consumed



270 Billion
kilograms of coal
burned



65.4 Trillion
smartphones
charged

* epa.gov/energy/greenhouse-gas-equivalencies-calculator

GMI

“By the Numbers” for 2021

- Leveraged virtual platforms to maintain and increase engagement with stakeholders
- Expanded direct communications with social media
- Promoted GMI’s technical expertise

Through GMI in 2021:

11
countries

supported activities where more than

1,100
people

received a total of approximately

1,000
hours

of training about reducing methane emissions and capturing methane for productive uses



Capacity Building/Information Sharing
fostering best practices

3

Workshops/Trainings

China, European Commission, United States, and Partnership-wide

9

Manuals/Websites/Other Outreach

India, Mexico, Serbia, Partnership-wide



Assessments

identifying opportunities for emission reductions

7

Reports/Tools/Models

Partnership-wide

7

Study Tours/Other Technical Assistance

Colombia, India, Indonesia, Serbia

11

Measurement/Pre-feasibility Studies

Poland, Ukraine, United States



Partnerships

building relationships to foster action

12

GMI Meetings (Steering Committee/Subcommittees)

Virtual meetings hosted from the United States

2

Conferences

Virtual conferences hosted from Switzerland and the United States



Global Methane, Climate and Clean Air Forum

a joint event sponsored by GMI and CCAC

Forum Highlights

- 400 in-person attendees from 60 countries and 450 virtual attendees from 29 countries
- 5 high-level plenary sessions on global efforts to reduce emissions from methane and other short-lived climate pollutants
- 36 technical sessions bringing together practitioners, policymakers and technical experts
- 3 site visits to an anaerobic digester, landfill, and wastewater facility

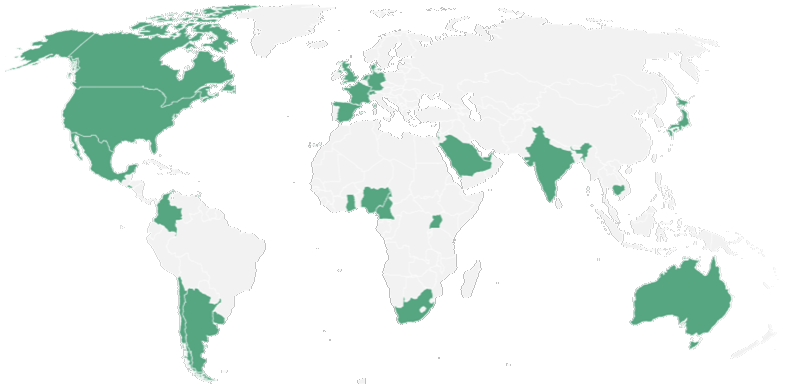
Overview of Participation

Virtual Attendees

29
countries

were represented by
approximately

450 virtual
attendees

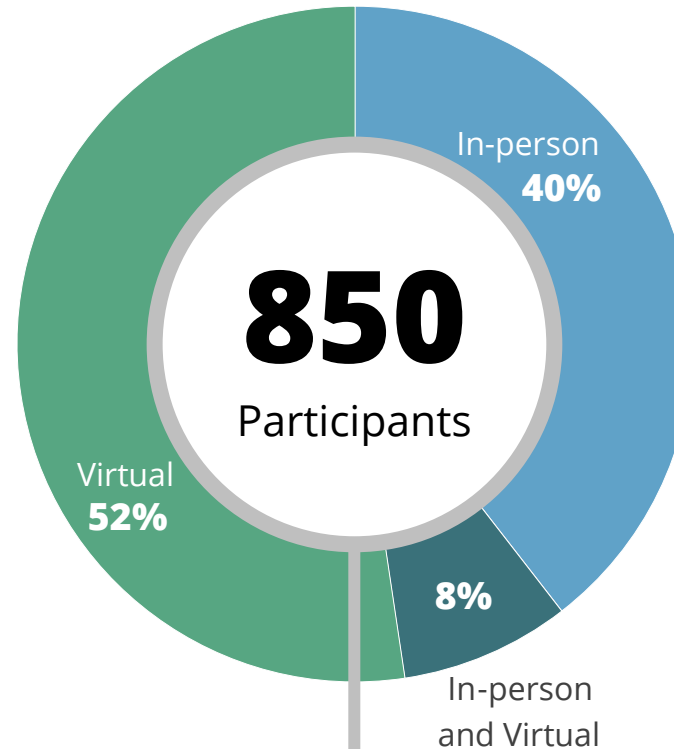
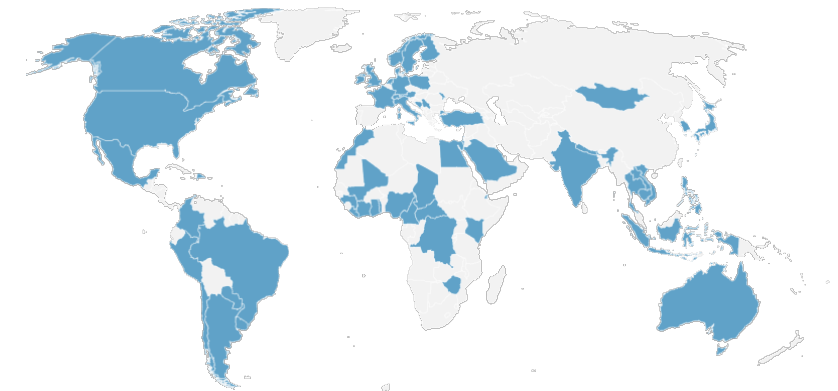


In-Person Attendees

60
countries

were represented by
more than

400 in-person
attendees



Participants
from more than
350
Organizations

Secretariat Priorities Through 2023

- Provide support to countries that are working to aggressively reduce methane emissions, including signatories of the Global Methane Pledge
- Support Subcommittee Co-Chairs to expand GMI Subcommittee membership
- Enhance promotion of GMI through targeted communications
- Leverage strategic partnerships to improve collaboration
 - For example, with the United Nations Economic Commission for Europe (UNECE), Climate and Clean Air Coalition (CCAC), and Global Methane Hub
- Plan the 2024 Global Methane Forum



Geneva, Switzerland
March 2024

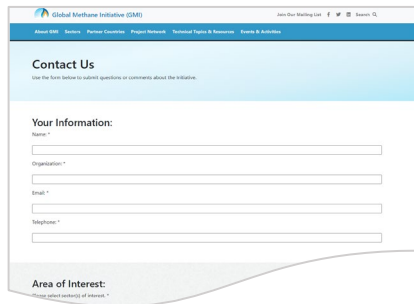
Global Methane Pledge Support and Implementation

Global Methane Pledge



- 30% reduction of methane emissions by 2030, compared to 2020 levels
- Leverage momentum
- Engage and connect stakeholders to analyze needs and jointly develop tools and resources
- Provide technical support and capacity building

Engage with GMI

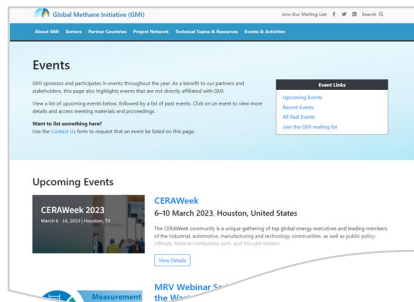


The screenshot shows the 'Contact Us' page on the Global Methane Initiative website. It includes a navigation bar with links like 'About GMI', 'Services', 'Partner Countries', 'Program Initiatives', 'Technical Topics & Resources', and 'Events & Activities'. The main content area is titled 'Contact Us' and contains a form with the following fields: 'Your Information' (Name, Organization, Email, Telephone) and 'Area of Interest' (a dropdown menu).

Submit a Contact Us Request

Let us know how we can help you:

globalmethane.org/contact-us/



The screenshot shows the 'Events' page on the Global Methane Initiative website. It features a navigation bar and a main content area with the following sections: 'Events' (introductory text), 'Event Links' (a table with links to 'Upcoming Events', 'Recent Events', and 'All Past Events'), 'Upcoming Events' (a list of events, including 'CERAWeek 2023' and 'MRV Webinar Series'), and 'Measurement' (a link to 'the Measurement').

Share Events or Resources

Recommend items to publish on the GMI website:

globalmethane.org/resources/recommend.aspx



The screenshot shows the 'Join the GMI Mailing List' form. It features the GMI logo and a form with the following fields: 'First Name', 'Last Name', 'Organization', and 'Sector of Interest (Check)'. There is also a checkbox for 'I agree to receive emails from GMI'.

Join the GMI Mailing List

Receive updates from GMI by joining at:

eepurl.com/ggwT3T

Follow GMI



www.facebook.com/globalmethane/



twitter.com/globalmethane



www.linkedin.com/company/global-methane-initiative-gmi/

Thank you!

Denise Mulholland

Director, Secretariat

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secretariat@globalmethane.org



[**globalmethane.org**](http://globalmethane.org)



Global Methane, Climate and Clean Air Forum 2022 Coal Session Summary

Clark Talkington
Advanced Resources International, Inc.

Global Climate and Clear Air Forum 2022: Coal Sessions

5 Sessions on Coal Mining (in Addition to Brainstorming):

- Best Practices in Policies for Coal Mine Methane (CMM) Mitigation
- Methane Mitigation in Action: Opportunity for CMM in India, China and Other Countries
- Technologies for CMM Mitigation
- Data and Measurement of Methane Emissions for Coal Mining
- Tackling Methane Emissions from Coal Mining: Reconciling Strategy and Ambition

Detailed agenda:

<https://www.epa.gov/gmi/global-methane-climate-and-clean-air-forum#methane-mitigation-in-action>

Recordings of each session:

<https://globalmethane.org/2022forum/recordings/index.html>

Major Themes Discussed During the Coal Sessions

- During the 3 days of coal technical sessions, key themes emerged:

Methane is a popular topic

Renewed interest in CMM

Wide range of stakeholders

Sound MRV is essential

Top-down monitoring

CMM and carbon markets

Methane Emissions from the Energy Sector are a Hot Topic

- Responsible for 1/3 of temperature rise since pre-industrial times
- Increasing emissions
- Short-live climate pollutant with a high GWP
- Low-cost mitigation opportunities – many at negative cost
- Expanding solutions beyond mitigation to Greenhouse Gas Removal (GGR), e.g., production of plastic substitutes using waste methane

Many initiatives focused on CH₄ emissions

<i>Paris agreement</i>	<i>Global Methane Initiative</i>	<i>Global Methane Pledge</i>
<i>International Methane Emissions Observatory (IMEO)</i>	<i>UNECE Groups of Experts</i>	<i>Climate & Clean Air Coalition</i>
<i>International Energy Agency</i>	<i>World Bank</i>	<i>Oil & Natural Gas Methane Partnership</i>
<i>Australia reporting regulations</i>	<i>U.S. reporting and emission control regulations</i>	<i>EU proposed reporting and control regulations</i>

Attention to Coal Mine Methane (CMM) is Growing

- Coal mining likely to continue for a period of time
- Limited number of easily identified point sources
- Growing interest in open cast mines and surface mine methane (SMM)
- Abandoned mine methane (AMM) emissions are growing
- CMM projects can match carbon GHG mitigation of capture & storage (CCS)
- Emission reductions (ERs) are market ready
- Range of technology options

Broad range of stakeholders

Working together, a broad range of stakeholders can deliver CMM emission reductions:

**Coal
Companies**

**Equipment
and Service
Providers**

**Project
Developers**

Civil Society

Governments

**International
Organizations
and Initiatives**

**Carbon
Registries**

Sound, Robust Monitoring, Reporting & Verification (MRV) is Essential

- Currently rely on “bottom-up” monitoring methods
 - Emission factors – least accurate but most widely used
 - Site-specific measurements
 - Periodic sampling
 - Continuous emissions monitoring (CEMS) – most accurate but limited use
- Growing interest in top-down monitoring methods
 - Satellite
 - High altitude airborne
 - Low altitude airborne
 - Ground-based

Why focus on ensuring robust MRV programs for CMM?

- Transparent and reliable verification and reporting procedures provide confidence in the data and underpin its use
- Basis for national greenhouse gas (GHG) accounting and development of accurate GHG inventories
- Supports informed and effective policymaking to realize GHG emission reductions, encourage economic development, and support a just transition in the coal sector
- Necessary for an effective emissions trading framework

Growing Interest in and Application of Top-down Monitoring Methods for CMM Emissions Monitoring

- Several high-profile cases publicized in recent years: Australia, U.S., Russia, Ukraine, Poland
- Small but increasing number of providers
- Improving resolution and detection limits
- Can be used to reconcile bottom-up measurements
- May be a more cost-effective monitoring tool in some cases

Top-down Monitoring Methods Characteristics






Potential Strengths

- Change detection
- Identification of super-emitting or anomalous events (focus on intermittent rather than persistent sources)
- Check-and-balance on estimates from bottom-up methods
- Potential for area-wide estimates for AMM, facility-specific estimates for open pit mines and facility-specific/source-specific estimates for underground mines
- Increasing launch of satellites will lead to large operational constellations

Potential Weaknesses

- Cloud cover, ground cover, and weather can impede monitoring
- Must factor in dispersion models and incorporate other data including water vapor, temperature, and pressure, which add to uncertainty
- Temporal variability
- Limited number of providers and limited data on costs
- Proprietary nature of algorithms for some providers limits transparency
- Emissions produced by aerial surveys
- Stakeholder capacity

Key Market Messages for CMM

-  ■ CMM ERs trade successfully as carbon offsets in compliance (California (CA) Cap-and-Trade) and voluntary markets (ICAO CORSIA, bilateral over-the-counter transactions)
-  ■ Exponential growth in CMM offsets traded in CA market by American Carbon Registry, from 250K tonnes/yr in 2014 to 2.5 million tonnes/yr in 2023
-  ■ Flaring is a generally accepted mitigation option, but could displace higher volume use or destruction options, such as gas pipeline injection, resulting in more CMM projects but fewer ERs (e.g., U.S.) in recent years
-  ■ VAM projects are technically challenging, but can be viable at highest concentration shafts and where economic incentives exist
 - Safety features
 - 2 operating projects in the U.S., with 2-3 more coming online in 2023
-  ■ Carbon Index (CI) scores are becoming popular in carbon offset markets, but CMM projects have low CI scores

Thank You

**Presentation supported by U.S. EPA
under the auspices of GMI**

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Review of Project Barriers and Tomorrow's Brainstorming Session

Volha Roshchanka (U.S. EPA) on behalf of
Coal Mines Subcommittee Co-Chairs

Brainstorming on the Barriers to CMM Project Development

Global Methane, Climate and Clean Air Forum

a joint event sponsored by GMI & CCAC

26-30 September 2022, Washington, D.C.

A brainstorming session on barriers to CMM project development

Participation from more than 35 people representing more than 10 countries

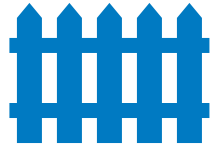
The grid displays 12 video recording thumbnails for various sessions of the Global Methane, Climate and Clean Air Forum. Each thumbnail includes the date and time, a session title, a category, a video preview image, and a 'Watch on YouTube' button.

- 27 September - 08:30 AM**
 - Plenary Session**: High Level Plenary: A Call for Fast Climate Action
- 27 September - 14:00 PM**
 - Agriculture and Food Systems**: Role of Biogas to Obtain a Circular Economy
- 27 September - 14:00 PM**
 - Waste and Wastewater**: Emerging Action Areas in the Municipal Solid Waste Sector
- 27 September - 14:00 PM**
 - Coal**: Challenges and Opportunities to Implementation at a Country Level
- 27 September - 14:00 PM**
 - Oil and Gas**: Challenges and Opportunities for Implementation - Country Updates
- 27 September - 16:00 PM**
 - Agriculture and Food Systems**: Sustainable Food Cold Chain
- 27 September - 16:00 PM**
 - Waste and Wastewater**: MSW – Small-scale Solutions to Prevent and Valorize Organic Waste, Including New Business Models
- 27 September - 16:00 PM**
 - Coal**: Best Practices in Policies for CMM Mitigation
- 27 September - 16:00 PM**
 - Oil and Gas**: Scoping Emissions
- 28 September - 8:30 AM**
 - Plenary Session**: High Level Plenary: Policy and Planning to Achieve Fast Climate Action
- 28 September - 14:00 PM**
 - Waste and Wastewater**: Or...

What are the Barriers to CMM Project Development?

Legal/Regulatory	Technical	Market	Other
Need for regulatory framework to help conduct projects	VAM concentration forecasting	Forecasting the price of carbon credit	Lack of awareness that it will take time to transition
Lack of supporting policy or regulatory framework; perverse incentives	Low permeability of coal; Hard to predict pockets of gas	Focus on increasing coal production	Ownership issues – who takes charge of the project?
Lack of coordination among actors to work on climate emissions removal	Lack of infrastructure / market	Recovery of VAM is expensive	Methane capture & use is not a core competency of coal companies
Lack of clarify on gas ownership	Net pressure drop on VAM technology	Financiers shy away from coal (stigma issue), including abandoned mines	High concentration seams are in populated areas
Prescriptive requirements on gas drainage	Dust in VAM required to capture the particulates (minerals melt and increase cost of VAM tech)	Lack of access to finance	Methane is perceived as a liability; stigma keeps actors from strategically planning on transition
Safety regulations can be an impediment for VAM	Need to destigmatize, show projects can make money, and are technically feasible	Pricing isn't a driver	Nobody wants to develop a new/creative project; lack of knowledge re different opportunities
PHMSA deletes data after 10 yrs	Need for a roadmap to project development and educate on opportunities available	Lack of carbon credit markets	Greenwashing is a risk of more emissions to be captured
	Lack of reliable data worldwide	Lack of money to coal industry when being forced out of business – who will provide money for CMM	Lack of awareness of VAM project opportunities
	Lack of coordination among coal industry to overcome barriers		Lack of accessible measured data; lack of experts at universities who can teach (or other tech topics) in depth
			Relationship between coal industry and environmental orgs

Process for CMM Project Development Barriers Identification



**Brainstorm
barriers to CMM
project
development**

(done)
27 Sept 2022



**Review feedback
from Coal Mines
Subcommittee
Delegates and
Project Network
members**

(done)



**Coal Mines
Subcommittee
Co-Chairs
identify and
prioritize
actionable
barriers**

(done)



**Co-Chairs share
prioritized
barriers with
Delegates and
Project Network
members**

(done)



**Brainstorm
potential
actions to
address priority
barriers during
Coal Mines
Subcommittee
Meeting**

22 Mar 2023



**Develop GMI
Resources for
identified
actions**

(next steps)

Prioritization of the Barriers to CMM Project Development

Co-chairs ranked all 36 barriers and identified the 3 barriers with the highest score.

The barriers with the highest scores were:

Barrier	Category	Influencer?	Priority for Action	Influence?	Priority for Action	Influence?	Priority for Action	US Co-Chair Score	China Co-Chair Score	India Co-Chair Score	Total
CMM/AMM project developers/hosts often face unhelpful regulatory framework	Legal/Regulatory	Yes	High Priority	Yes	Medium Priority	No	Medium Priority	3	2	0	5
Policymakers need data on how the coal sector can contribute to decarbonization so that they can realize the sector's mitigation potential (and develop supporting policies or regulatory frameworks)	Legal/Regulatory	Yes	High Priority	Yes	Medium Priority	Yes	Medium Priority	3	2	2	7
Climate mitigation actors/policymakers are not coordinated on their work	Legal/Regulatory	Yes	Low Priority	No	No	No	Medium Priority	1	0	0	1
Project developers/coal mines lack clarity on ownership of CMM/AMM; difficult to get access to the rights	Legal/Regulatory	Yes	High Priority	Yes	High Priority	No	Medium Priority	3	3	0	6
Prescriptive requirements on gas concentration (for safety) create a perverse incentive to dilute gas that could be drained (and venting as VAM)	Legal/Regulatory	Yes	Medium Priority	Yes	Low Priority	Yes	Medium Priority	2	1	2	5
There are limited regulations on mine closure and how to close mines to assist with subsequent utilization	Legal/Regulatory	Yes	High Priority	Yes	Medium Priority	No	Medium Priority	3	2	0	5
Existing regulations/ administrative processes can create disincentives or create perverse incentives for achieving mitigation; companies/project developers do not have clear regulations to follow when implementing projects	Legal/Regulatory	No	Medium Priority	Yes	Low Priority	Yes	Medium Priority	0	1	2	3
In some countries, there are prescriptive requirements for how to drain gas, which result into sub-par (or explosive range) methane concentrations of drained gas	Legal/Regulatory	Yes	High Priority	No	Medium Priority	No	Medium Priority	3	0	0	3
The sector is low on priority list for policymakers	Legal/Regulatory	No	Medium Priority	Yes	Low Priority	Yes	High Priority	0	1	3	4
Project developers have difficulty forecasting (for 6 years or more) local VAM concentration with precision required by financial institutions and carbon crediting agencies	Technical	No	Medium Priority	Yes	High Priority	Yes	Medium Priority	0	3	2	5
Project developers cannot drain gas easily in low permeability coal deposits; it is hard to predict or extract pockets of gas at mines, which also create an explosion or hazard	Technical	No	Medium Priority	Yes	Low Priority	No	Medium Priority	0	1	0	1
Lack of infrastructure/market for captured CMM/AMM	Technical	No	Medium Priority	Yes	High Priority	Yes	High Priority	0	3	3	6
In VAM technology, dynamic methane concentration and flow rates translate into big pressure drops, which eat up the net GHG benefit of technology	Technical	No	Medium Priority	Yes	Medium Priority	Yes	High Priority	0	2	3	5
Dust in VAM required to capture the particulates (minerals melt and increase cost of VAM tech)	Technical	No	Medium Priority	Yes	Low Priority	Yes	Medium Priority	0	1	2	3
Need to destigmatize, show projects can make money, and are technically feasible	Technical	Yes	Medium Priority	Yes	Medium Priority	Yes	High Priority	2	2	3	7
There is need for a roadmap for project development and education about available opportunities	Technical	Yes	High Priority	Yes	Low Priority	No	Medium Priority	3	1	0	4

- **Legal/Regulatory**: Policymakers need data on how the coal sector can contribute to decarbonization so that they can realize the sector's mitigation potential (and develop supporting policies or regulatory frameworks)
- **Legal/Regulatory**: Project developers/coal mines lack clarity on ownership of CMM/AMM; difficult to get access to the rights
- **Technical**: Need to destigmatize, show projects can make money, and are technically feasible

Thank you!

Thank you for participating today.

**See you tomorrow in person
(Room XXV) or online!**



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