



U.S. Government's International Methane Mitigation Activities

2018 Accomplishments

Highlights from U.S.-Supported Methane Mitigation and Recovery Efforts around the World



Methane Emission Reductions

The United States provides key leadership for two international methane emission reduction efforts: the Global Methane Initiative (GMI) and the Climate & Clean Air Coalition (CCAC). With support from the U.S. Environmental Protection Agency (EPA) and the Department of State, these efforts resulted in the implementation of more than 1,100 methane mitigation projects from 2005 through 2018. These projects have reduced methane emissions by more than 409 million tonnes of carbon dioxide equivalent (MMT_{CO₂e}), including 39.4 MMT_{CO₂e} in 2018, as shown in Figure 1. Since 2005, U.S. efforts under the auspices of GMI have also identified additional possible mitigation projects with an estimated cumulative potential to reduce another 576 MMT_{CO₂e}. Figure 2 shows the 2018 methane emissions reductions by industry sector. These activities benefit the United States because they reduce methane emissions to the atmosphere, create opportunities for U.S. businesses and investors, and support U.S. diplomatic efforts.

Figure 1. Methane Emission Reductions from U.S. Government-supported Projects

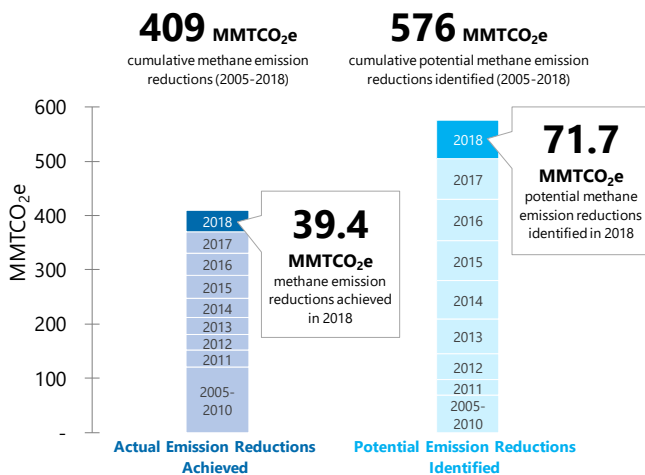
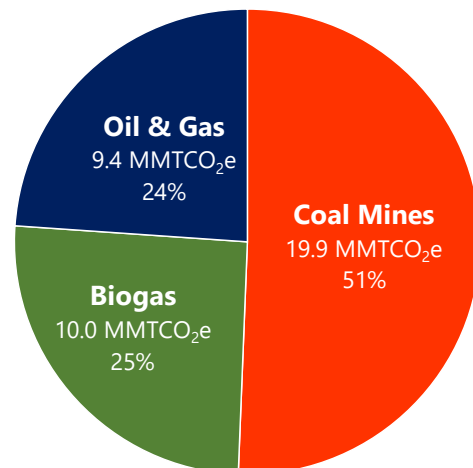


Figure 2. Methane Emission Reductions from U.S. Government-supported Projects in 2018



Note: Data are compiled from the GMI's database of project activities. These data represent the best available yet conservative estimates of emission reductions, including actual emission reductions from projects supported by the U.S. Government and potential emission reductions from other projects identified through U.S. Government efforts.

Funding and Methane Mitigation Activities

Since 2005, U.S. Government funding for methane mitigation activities has totaled more than \$101 million. This funding enables technical assessments of emission reduction opportunities, information sharing and capacity building on methane emissions management, and GMI partnership-related activities, including in-person and virtual meetings and workshops. U.S. support has leveraged approximately \$655.6 million in additional funding from other sources (see Figure 3). Figure 4 shows the percentage of U.S. Government funding in 2018 by activity type, and Figure 5 lists 2018 activities, where they took place, and quantitative impacts.

Figure 3. U.S. Government Funding and Leveraged Funding, FY 2005-FY 2018

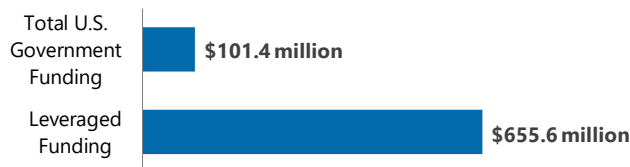


Figure 4. U.S. Government Expenditures by Activity, FY 2018

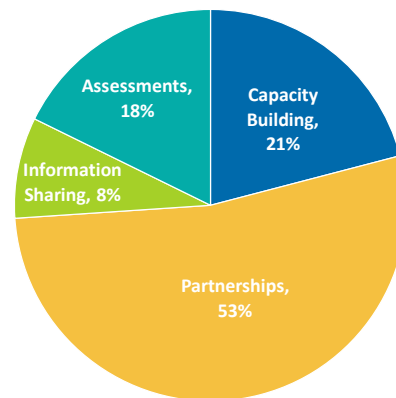


Figure 5. International Methane Mitigation Activities and Impacts Supported by the U.S. Government in 2018

Capacity Building/Information Sharing: fostering best practices

- 19** Workshops/Trainings – Canada, China, Colombia, India, Israel, Kazakhstan, Mexico, Switzerland, Ukraine, United States
- 5** Manuals/Websites/Other Outreach – All Partners

Assessments: identifying opportunities for emission reductions

- 3** Reports/Tools/Models – All Partners
- 3** Study Tours/Other Studies – China, Italy
- 2** Pre-Feasibility Studies – Colombia, India
- 2** Measurement Studies – India, Kazakhstan

Partnerships: building relationships to foster action

- 8** GMI Meetings (Steering Committee/Subcommittees) – Canada, Switzerland
- 7** Conferences – Australia, Belgium, Canada, Kazakhstan, Poland
- 4** Site Visits – India, Malaysia
- 3** Presentations – Canada, United States
- 23** Other Meetings – Australia, China, France, India, Kazakhstan, Malaysia, Mexico, Serbia

15
Countries
hosted activities
where more than

3,650
people
received a total of
approximately

15,860
hours
of training about
reducing methane
emissions and
capturing methane
for productive uses

Project Highlights in 2018

Oil & Gas Workshop and Site Visit to GAIL (India) Limited Compressor Station

EPA collaborated with Cairn Vedanta, an Indian oil and gas company, hosting a workshop focusing on methane leak detection and a site visit of GAIL's compressor station in Chhainsa, Haryana. The program featured discussions led by facility managers and videos of methane leak detection efforts using infrared cameras. During the site visit, the site managers identified the locations of the leaks and reviewed how the facility addressed them. Facility managers provided information to the participants about the process flow and general operations of the facility. EPA made recommendations to site managers about how to further reduce methane emissions using other technologies. Collectively, the project increased awareness about available technologies to detect and correct methane leaks effectively.



Participants listening to a presentation.



A site manager views mitigation measures.



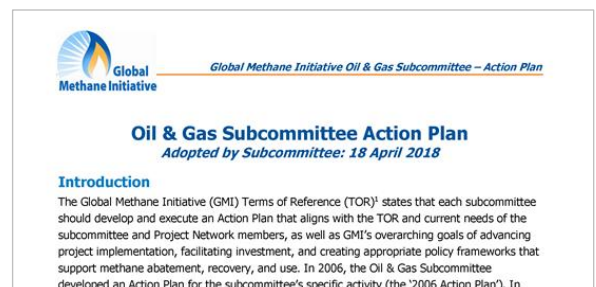
Pumpjack extracting crude oil.

Oil & Gas Ecopetrol CCAC Oil and Gas Methane Partnership (OGMP) Methane Reduction Workshop

EPA and the CCAC OGMP collaborated with Ecopetrol to conduct a training for Ecopetrol employees. The training, held in Bucaramanga, Colombia, focused on reducing gas emissions in areas of crude production and recovering the gas for use as a valuable product. The workshop conveyed information about key methane emissions sources from oil and gas productions. Participants in the training included production staff, scientific research personnel, and corporate operations executives. Emphasizing real-life operating issues, the workshop increased the capacity of oil and gas operators in Columbia to reduce and recover gas from crude production operations.

Oil & Gas GMI Oil & Gas Subcommittee Action Plan

EPA supported the development of the GMI Oil & Gas Subcommittee Action Plan, which provides an action-oriented framework for the identification and deployment of practical and cost-effective methane mitigation technologies and practices to reduce or eliminate emissions from oil and natural gas systems.



GMI Oil & Gas Subcommittee Action Plan

BIOGAS Workshop on Advancing Agricultural Biogas Projects in India

EPA collaborated with The Energy and Resources Institute and the Skill Council for Green Jobs to conduct a workshop on technical, policy, and financial opportunities to advance biogas project development in the agriculture sector in India. With 75 attendees and presentations by the Indian Ministry of New and Renewable Energy, Indian Oil Corporation Ltd., and biogas project developers, the workshop demonstrated how specific tools and resources can overcome project development barriers. Based on workshop stakeholder input, EPA is developing an Anaerobic Digester Project Screening Tool and a Biogas Project Risk Assessment Checklist.



Workshop participants presenting on opportunities for advancing biogas projects.



Study tour participants at a water reclamation facility in Los Angeles County, California.

BIOGAS Wastewater Treatment Facility Study Tour

Working with the China Environment Forum, EPA coordinated a study tour of wastewater treatment facilities in Southern California and the Mid-Atlantic for delegates from China. The delegates included representatives from wastewater treatment facilities, government agencies, financial institutions, and a policy research institute. The study tour introduced delegates to best practices for methane recovery from wastewater treatment facilities, including opportunities for co-digestion of food waste with wastewater. EPA introduced the delegates to organizations and associations that support wastewater biogas project

development in the U.S. The delegates also had the opportunity to share their perspectives during a [roundtable at the Woodrow Wilson Center](#).

BIOGAS Tools and Resources for the Solid Waste Sector

EPA produced several tools and resources under the auspices of the Climate and Clean Air Coalition [Municipal Solid Waste Initiative](#). These include:

- Version 2.0 of the [Solid Waste Emissions Estimation Tool](#). This tool quantifies methane and black carbon emissions mitigation opportunities in the waste sector. EPA provided technical support to tool users in cities around the globe.
- Version 2.0 of the [OrganEcs model](#) for calculating costs associated with managing source-separated organic waste.
- A new resource, [Organic Waste Separation: Program and Policy Options](#), to help cities identify opportunities and best practices for diverting organic waste from landfills.
- A [webinar](#) on best practices for conducting waste characterization analyses.

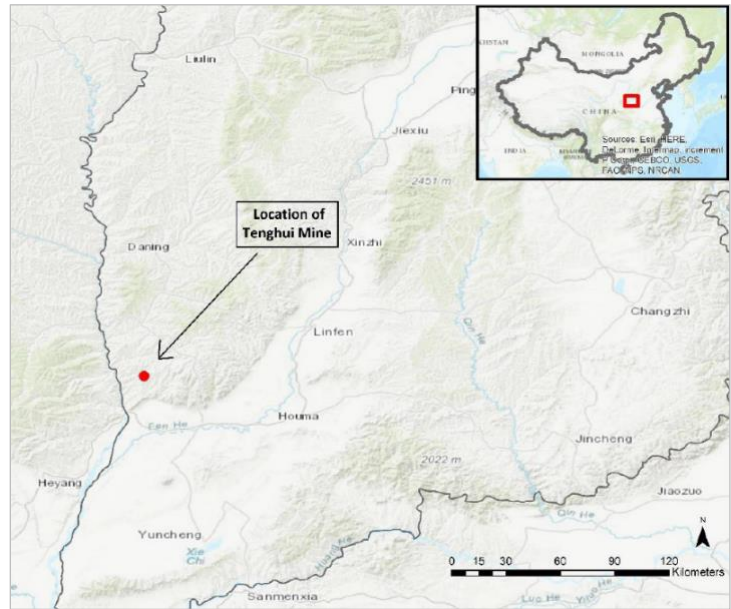


Organic Waste Separation: Program and Policy Options.

These tools will advance reductions of methane emissions from the solid waste sector by making it easier for project developers to identify reduction opportunities and finance effective projects.

COAL Pre-Feasibility Study and Integrated Best Practices Training for Methane Drainage and Utilization at the TengHui Coal Mine, Shanxi Province, China

During 2018, EPA conducted a pre-feasibility study at the TengHui Coal Mine as part of an integrated best practices training program for the China International Centre of Excellence on Coal Mine Methane (ICE-CMM). Through this study, EPA provided training to the coal mine community in China about how to conduct studies from start to finish. This training program involved three classroom training sessions in Shanxi province, China; a site visit to the TengHui Mine including visits to the surface and underground operations; and a visit to an operating CMM power project at the Duerping Mine near Taiyuan, China. The technical and financial analysis determined that a CMM power project at the TengHui Mine was technically feasible, which led to a recommendation for conducting a full-scale feasibility study. The training program advanced the China ICE-CMM to become a self-sustaining organization with the capability to identify and evaluate opportunities for CMM recovery and use, and to disseminate best practices in methane capture and utilization in coal mines.



Map showing the location of the TengHui Mine.



Ventilation Air Methane Catalytic Turbine that traps fugitive methane from the exhaust ventilation air of underground coal mines. Photo Credit: [CSIRO](https://www.csiro.au)

COAL Advancing Action on Ventilation Air Methane

The United States and other GMI Partners collaborated with the Commonwealth Scientific & Industrial Research Organization (CSIRO) of Australia to host the Expert Dialogue on Ventilation Air Methane (VAM) in October 2018 in Melbourne, Australia. VAM is the largest source of methane emissions from coal mines, and the objective of the Dialogue was to bring international experts together in an open, collaborative environment to explore the technical, market, and policy barriers inhibiting VAM project implementation. This dialogue began in September 2018 at the GMI Coal Subcommittee Meeting. As a result of these dialogues, the GMI Coal Mines

Subcommittee identified achievable tasks and actions to increase VAM project development, including recommendations to address safety concerns as well as policy, legal, and market barriers.

About the Global Methane Initiative

The Global Methane Initiative (GMI) is an international public-private partnership focused on reducing barriers to the recovery and use of methane as a clean energy source. GMI's 45 Partner Countries and more than 700 Project Network members exchange information and technical resources to advance methane mitigation in three key sectors: Oil & Gas, Biogas, and Coal Mines.

- **GMI provides technical support** to deploy methane-to-energy projects around the world. Since 2004, GMI support has enabled Partner Countries to launch hundreds of methane recovery and use projects.
- **GMI is an information resource** for Partner Countries, Project Network members, and other stakeholders. GMI's website serves as an online library with extensive information on methane-to-energy projects, best practices, and technical tools and resources.
- **GMI collaborates** with other international organizations focused on methane recovery and use, including the CCAC, UNECE, and the International Energy Agency (IEA).



About the Climate & Clean Air Coalition

The CCAC is a voluntary partnership committed to improving air quality and reducing emissions of methane, black carbon, and hydrofluorocarbons. CCAC comprises over 120 state and non-state partners and coordinates activities across 11 different initiatives. CCAC and GMI collaborate on methane activities in the agriculture, oil and gas, and waste sectors. For more information, see ccacoalition.org.

