

Coal Sector Action Plan – Revised January 2013

## **United States Coal Sector Action Plan for the Global Methane Initiative**

### **1) Country Background and Overview of Methane Emissions**

#### **Introduction**

The U.S. government fully supports the work of the Global Methane Initiative (GMI; formerly the Methane to Markets Partnership). The U.S. Environmental Protection Agency (U.S. EPA) is the lead U.S. government agency for the GMI, and coordinates the work of sister agencies, including the U.S. State Department, U.S. Agency for International Development, U.S. Department of Energy, and the U.S. Trade & Development Agency.

In terms of coal mine methane (CMM), the U.S. focus domestically is on overcoming regulatory, institutional, and market barriers to the profitable recovery and use of coal mine methane. U.S. EPA, through the Coalbed Methane Outreach Program (CMOP), is the nodal agency for these efforts. U.S. EPA activities include information and technical outreach and exchange.

The U.S. actively engages in activities to support the work of the GMI Coal Mines Subcommittee, as well as activities to support CMM project development at the country level. U.S. involvement (past and present) in other multilateral efforts includes the following:

- Asia Pacific Partnership for Clean Development and Climate: [www.asiapacificpartnership.org](http://www.asiapacificpartnership.org)
- Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants: [www.state.gov](http://www.state.gov)
- United Nations Economic Commission for Europe, Ad Hoc Group of Experts on Coal Mine Methane: <http://www.unece.org/energy/se/cmm.html>
- U.S.-China Strategic and Economic Dialogue: <http://www.treasury.gov/initiatives/Pages/china.aspx>

#### **Overview of Methane Emissions**

There are currently about 15 coal mine methane recovery and utilization projects at active U.S. underground coal mines and about 38 mines recovering methane from abandoned underground coal mines.

U.S. EPA develops a national greenhouse gas inventory each year to track the national trends in emissions and sinks since 1990. The Inventory of U.S. Greenhouse Gas Emissions and Sinks is submitted to the United Nations in accordance with the Framework Convention on Climate Change. According to the latest inventory<sup>1</sup>, methane emissions from U.S. coal mines (including abandoned underground mines) are estimated to be 78 million metric tons of carbon dioxide (CO<sub>2</sub>) equivalent (MMTCO<sub>2</sub>e) in 2010. This equates to over 192 billion cubic feet (Bcf) of methane.

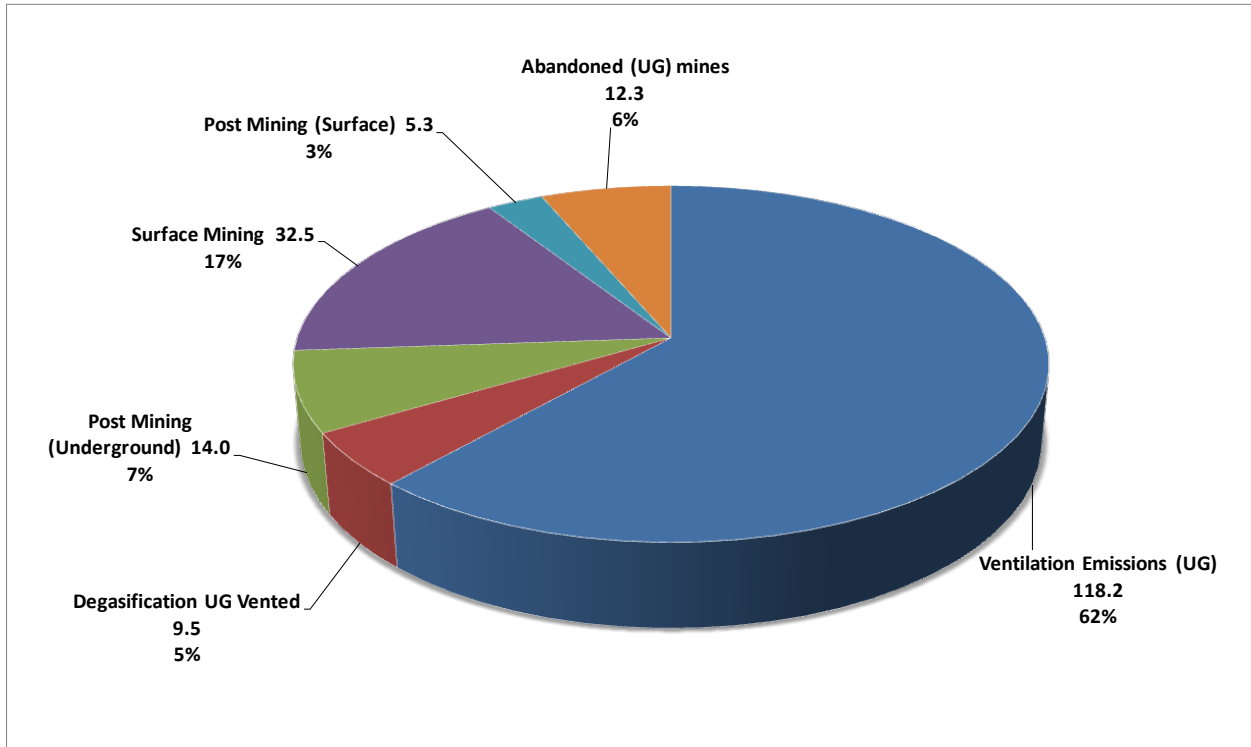
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<sup>1</sup> <http://epa.gov/climatechange/emissions/usinventoryreport.html>

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In 2010, global methane emissions from coal mines were estimated at nearly 584 MMTCO<sub>2</sub>E, which is approximately 8 percent of total anthropogenic methane emissions. Over the next decade, CMM emissions are projected to increase by more than 15 percent, thereby providing significant potential for methane recovery from coal mines.

**Exhibit 1: United States Coal Mine Methane Emissions (Billion Cubic Feet)**



## 2) Public and Private Sector Stakeholders

Potential key stakeholders in U.S coal mine methane project development include both public and private sector entities:

### U.S. Government Entities

**USEPA** – The U.S. EPA **Coalbed Methane Outreach Program (CMOP)** is a voluntary program whose goal is to reduce methane emissions from coal mining activities. CMOP’s mission is to promote the profitable recovery and use of coal mine methane by working cooperatively with coal companies and related industries. The program helps to overcome institutional, technical, regulatory, and financial barriers to implementation, and communicates the benefits of CMM recovery to interested and necessary audiences. [www.epa.gov/cmop/](http://www.epa.gov/cmop/)

Under the U.S. EPA **Greenhouse Gas Reporting Program (GHGRP)**, owners or operators of facilities that liberate 36,500,000 actual cubic feet (acf) of methane (CH<sub>4</sub>) or more per year (equivalent to 100,000 acf of CH<sub>4</sub> or more per day) must report emissions from underground coal mines and all

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other source categories located at the mine for which methods are defined in the rule (Subpart FF). Owners or operators are required to collect emission data; calculate greenhouse gas (GHG) emissions; and follow the specified procedures for quality assurance, missing data, recordkeeping, and reporting. <http://epa.gov/climatechange/emissions/ghgrulemaking.html>

**Department of State** – The U.S. Department of State leads international climate change policy and activities. [www.state.gov](http://www.state.gov)

**HHS** -- The Office of Mine Safety and Health Research Information is a division of the **National Institute for Occupational Safety and Health (NIOSH)**, which is part of the Centers for Disease Control and Prevention in the U.S. Department of Health and Human Services. The Office of Mine Safety aims to eliminate mining fatalities, injuries, and illnesses through research and prevention. <http://www.cdc.gov/niosh/>

**MSHA** – The U.S. Department of Labor’s Mine Safety and Health Administration (MSHA) has primary responsibility for assuring the safe operation of all of the nation’s active surface and underground mines (but not abandoned mines) on federal, state, and private lands. [www.msha.gov](http://www.msha.gov)

**USAID** – The U.S. Agency for International Development provides important technical expertise in the economic reform of energy sectors to create markets that support private sector projects in developing countries and those with economies in transition. [www.usaid.gov](http://www.usaid.gov)

**USDA** -- The U.S. Department of Agriculture’s **U.S. Forest Service** manages surface-disturbing operations within the National Forest System, including roadless areas. This impacts a number of coal mines, especially in western U.S., specifically with respect to their ability to expand and maintain their degasification and gas collection infrastructure. [www.usda.gov](http://www.usda.gov)

**USDOE** – The U.S. Department of Energy contributes valuable expertise in natural gas and coal mine methane technologies. Through joint action plans with a variety of nations such as India, Kazakhstan and Russia, DOE organizes Energy Working Groups that promote cooperation on a broad range of energy-related subject areas, including coal mine methane emissions reductions. U.S. EPA, through the GMI, is the coordinator of efforts related to CMM under these working groups. [www.energy.gov](http://www.energy.gov).

The **National Energy Technology Laboratory (NETL)**, part of DOE’s national laboratory system, implements a broad spectrum of energy and environmental research and development (R&D) programs, including CMM and CBM. <http://www.netl.doe.gov/>

**USDOI** – The U.S. Department of Interior’s (DOI’s) **Bureau of Land Management (BLM)** and **Bureau of Ocean Energy Management, Regulation, and Enforcement’s (BOEMRE’s)** (formerly Mineral Management Services) Mineral Revenue Management Program, administer mineral leases on public lands. As required under the National Environmental Policy Act (NEPA), BLM (or the U.S. Forest Service [USFS]) generally serves as the lead agency for preparing environmental assessments of potential impacts of CMM emissions reductions project development on public lands. <http://www.blm.gov/>

**USGS** – The U.S. Geological Survey provides information on the health of our ecosystems and environment, natural hazards, natural resources and the impacts of climate and land-use change. Some of their work includes the development of models to accurately assess potential U.S. coalbed methane (CBM) resources. [www.usgs.gov](http://www.usgs.gov)

**USTDA** – The U.S. Trade and Development Agency facilitates development in emerging markets by promoting U.S. partnerships in high priority overseas projects. The agency conducts desk studies and definitional missions to research the technical and financial aspects of infrastructure projects in the developing world. Many of these have been focused on both CBM and CMM, in such countries as India, Mexico, Colombia, Kazakhstan and Ukraine. [www.ustda.gov](http://www.ustda.gov)

### **Associations, Networking Groups and Private Sector Stakeholders**

Numerous companies, industry associations and groups represent the interests of the U.S. private, public, non-profit and finance communities in CMM recovery and utilization:

**GMI Project Network** – GMI Project Network members active in the U.S. consist of more than one thousand organizations from industry, the research community, financial institutions, state and local governments and other expert stakeholders with an interest in developing and supporting methane capture and use projects. <http://www.globalmethane.org/project-network>

**CMOP Network Members** –As part of its outreach efforts, EPA maintains contact with the U.S. and international CMM / CBM industries and encourages interaction between industry participants through the CMOP Network. [www.epa.gov/cmop/networkcontacts](http://www.epa.gov/cmop/networkcontacts)

**Associations** – The following are examples of national associations that represent the interests of the U.S. mining community, including those companies involved in the CMM / CBM industry:

- National Mining Association: [www.nma.org](http://www.nma.org)
- North American Coalbed Methane Forum: <http://www.nacbmforum.com>

**Additional Stakeholders** – The U.S. Coal Mine Methane Country Profile identifies additional, potential key stakeholders such as mining companies, equipment manufacturers, and universities. [www.globalmethane.org/documents/toolsres\\_coal\\_overview\\_ch36.pdf](http://www.globalmethane.org/documents/toolsres_coal_overview_ch36.pdf)

### **3) Challenges to Mitigation or Abatement of Methane Emissions**

Key challenges to reducing methane emissions from coal mining activities in the U.S. include:

- Ownership, leasing authorities on federal lands remain unclear.
- A lack of infrastructure (e.g., pipelines) in certain regions of the country (i.e. particularly in the west) to move CMM from mines to natural gas markets.
- Low power prices (electricity) in some parts of the country (e.g., the west) that make CMM power generation projects unattractive from an economic perspective.
- A weak domestic voluntary offsets market due to extremely low carbon prices.

### 4) Policy, Market and Legal Drivers to Advance Methane Project Development

Coal mine methane (CMM) is a major source of anthropogenic methane emissions. In the United States (U.S.) alone, 2010 CMM emissions from active and abandoned coal mines reportedly exceeded 190 billion cubic feet (Bcf). Considerable progress in the U.S. has been made to date in reducing CMM emissions, which by 2010 had dropped 14 percent below 1990 levels.

In response to the recent recession and to growing concerns about greenhouse gas (GHG) emissions and energy independence, U.S. federal and state governments - individually and collectively through regional partnerships - have taken important steps to further job creation through development of clean energy and carbon emission reduction projects that address climate change concerns.

Specific U.S. GHG programs and policies include:

- Government efforts to reduce GHG emissions (including CMM).
- Voluntary GHG registries and carbon markets.
- State alternative energy and renewable energy programs—such as those in Indiana, Pennsylvania, West Virginia, Ohio, and Utah—that expressly include CMM as a targeted energy resource.<sup>2</sup>
- Federal and state capital investment, loans, and tax benefits and credits for CMM Recovery Project development.
- Regulatory incentives in the form of royalty relief and other rights granted in coal or oil and gas leases and amendments allowing mine operators' to utilize or destroy CMM.

In addition, in response to the FY2008 Consolidated Appropriations Act, EPA issued the Mandatory Reporting of Greenhouse Gases Rule (74 FR 56260)<sup>3</sup>, which requires reporting of greenhouse gas (GHG) data and other relevant information from large sources and suppliers in the United States. The purpose of the rule is to **collect accurate and timely GHG data to inform future policy decisions. In general, the Rule is referred to as 40 CFR Part 98 (Part 98). Implementation of Part 98 is referred to as the Greenhouse Gas Reporting Program (GHGRP).**

Suppliers of certain products that would result in GHG emissions if released, combusted or oxidized; direct emitting source categories; and facilities that inject CO<sub>2</sub> underground for geologic sequestration or any purpose other than geologic sequestration, are covered in Part 98. Facilities that emit 25,000 metric tons or more per year of GHGs are required to submit annual reports to EPA.

As mentioned in Section 2, owners or operators of facilities that liberate 36,500,000 actual cubic feet (acf) of methane (CH<sub>4</sub>) or more per year (equivalent to 100,000 acf of CH<sub>4</sub> or more per day) must report emissions from underground coal mines and all other source categories located at the mine for which methods are defined in the rule. Mines which were subject to Subpart FF in 2011

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<sup>2</sup> <http://www.epa.gov/cmop/docs/cmm-financial-regulatory-incentives.pdf>

<sup>3</sup> <http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>

(the first year of monitoring) reported their data in September 2012. Mines subject to the rule are required to report their 2012 emissions by April 1, 2013. For more information on the rule, go to <http://epa.gov/climatechange/emissions/subpart/ff.html>. For the GHG Data Publication Tool, see <http://www.epa.gov/ghgreporting/index.html>

### 5) Priorities

The United States is a leader in CMM recovery and continues to work domestically and internationally to share information, expertise, and technology to promote CMM project development.

In the near term, the United States will continue to focus on these key action items:

- **Reduce greenhouse gas emissions.** The U.S. will continue to actively support coal mine methane recovery and use and abatement opportunities both domestically and internationally, in key partner countries (i.e. countries with significant CMM emissions) to reduce greenhouse gas emissions from coal mining activities. The U.S. will continue to work collaboratively with the private sector and other stakeholders to identify and implement methods to recover and use CMM instead of emitting it to the atmosphere. The U.S., through the EPA Greenhouse Gas Reporting Program, will also use emissions information reported by active coal mines to highlight areas of the country with sizeable potential for CMM recovery and use projects.
  - The U.S. requests that partner countries develop action plans in FY13 in order to streamline goals and activities related to coal mine methane recovery and use and abatement.
  - The U.S. would like to request that partner countries share information on funding that they are receiving or obligating towards CMM recovery and use and abatement projects in order to better coordinate assistance and activities to maximize project opportunities and emissions reductions.
  
- **Promote use of a clean energy source.** The U.S. will continue to work cooperatively with the coal mining industry worldwide to promote the utilization of coal mine methane. Through the development and dissemination of technical documents, informational webinars, conferences focusing on CMM recovery/use opportunities, study tours, and trainings, the U.S. will continue to work with partner country governments, the private sector and other stakeholders to promote the use of CMM as a clean energy resource.
  - The U.S. requests that partner countries designate appropriate representatives to attend GMI Coal Subcommittee meetings, of which the U.S. is a Co-Chair.
  - The U.S. requests that partner countries host GMI Coal Subcommittee Meetings.
  
- **Achieve the profitable recovery and use of CMM.** Through the development of pre-feasibility studies, full-scale feasibility studies, financial models and other tools, the U.S. will

continue to identify strategic opportunities for CMM project development worldwide. The U.S. will also continue to disseminate information on best practices for methane recovery and use, and will continue to provide technical expertise and assistance to move projects forward.

- Through the Global Methane Initiative, the U.S. seeks to identify shovel-ready, bankable projects for the 2013 Expo in Vancouver, Canada. The U.S. is actively seeking participation from key partner countries to highlight project opportunities and success stories in the coal sector.
- The U.S. also seeks the assistance of project developers and other involved parties to update the *Global Methane International Coal Mine Methane (CMM) Projects Database*, which is designed to serve as the comprehensive repository of data and information on all CMM recovery and use projects in operation and development around the world (<http://www2.ergweb.com/cmm/index.aspx>).

### 6) Activities to Promote Methane Mitigation and Abatement

Since 1994, the U.S. has worked cooperatively with the coal mining industry to reduce CMM emissions by helping to identify and implement methods to recover and use CMM instead of emitting it to the atmosphere. Between 1994 and 2010, U.S. CMM emissions reductions have effectively removed the equivalent of more than 357 million metric tons of carbon dioxide from the atmosphere. These avoided emissions are equivalent to 883 billion cubic feet of methane – 808 from active underground mines and the remaining 75 from abandoned underground mines.

In an effort to advance project development, the U.S. identifies, evaluates and promotes CMM recovery and use opportunities; provides support for technology demonstration projects; and develops technical documents, tools and resources.

U.S. EPA has developed numerous resources focusing on U.S. mines and opportunities including:

- Reports on key technical, economic, and legal issues - [http://www.epa.gov/cmop/resources/policy\\_finance.html](http://www.epa.gov/cmop/resources/policy_finance.html)
- Detailed profiles of 50 active underground coal mines that represent opportunities for recovering and using coal mine methane - [http://www.epa.gov/cmop/docs/profiles\\_2008\\_final.pdf](http://www.epa.gov/cmop/docs/profiles_2008_final.pdf)
- Interactive map and matrix of CMM project and opportunities at active U.S. mines - <http://www.epa.gov/cmop/resources/map.html>
- Assessments for project opportunities at abandoned underground coal mines and surface coal mines - <http://www.epa.gov/cmop/resources/index.html>
- Ventilation Air Methane (VAM) resources and case studies - <http://www.epa.gov/cmop/resources/vam.html>

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- Coal Mine Methane Project Cash Flow model allowing users to evaluate the financial viability of potential recovery and use projects - [http://www.epa.gov/cmop/resources/cashflow\\_model.html](http://www.epa.gov/cmop/resources/cashflow_model.html)
- Greenhouse Gas Reporting Program (GHGRP), Subpart FF - <http://epa.gov/climatechange/emissions/subpart/ff.html>

The U.S. conducts its international activities under the auspices of the Global Methane Initiative (GMI). On behalf of GMI, the U.S. has developed comprehensive profiles that characterize the coal and CMM sectors in nearly 40 countries and has established an online database of more than 200 global CMM projects.

Through the GMI, the U.S. has been actively engaged for many years in helping to promote recovery and utilization of coal mine methane in many key coal-producing countries, including China, India, the Russian Federation, and Ukraine. The U.S. has maintained strong relationships with these countries and has focused strategically on reducing methane emissions through a wide variety of activities, including: the development of CMM/CBM Clearinghouses; pre-feasibility and comprehensive studies assessing the technical and financial feasibility for CMM projects at candidate mines; technology demonstration projects; and numerous activities aimed at technology and knowledge transfer, capacity building and technical assistance. The U.S. looks forward to working collaboratively with others to advance the goal of reducing emissions from coal mining activities in these key countries. More information on specific activities, resources and collaborating organizations can be found on the U.S. EPA web site:

<http://www.epa.gov/cmop/international/index.html>

Also through GMI, the U.S. government and the United Nations Economic Commission for Europe (UNECE) published the report *Best Practice Guidance for Effective Methane Drainage and Use in Coal Mines*. This new document was developed by an international group of technical experts and peer-reviewed under the auspices of the UNECE's Ad Hoc Group of Experts on Coal Mine Methane. The Best Practice Guidance provides a genuine contribution to improving mine safety practices at active underground coal mines and encourages the use of CMM to reduce GHG emissions and utilize otherwise-wasted energy resources. In an effort to disseminate the information in the report, the U.S. and the UNECE Ad Hoc Group of Experts have conducted technical seminars targeting coal mine owners and operators in China, Kazakhstan and Ukraine.

<http://www.unece.org/energy/se/cmm.html>

With regards to methane abatement, U.S. EPA staff helped prepare a policy white paper on *Flaring of Coal Mine Methane: Assessing Appropriate Opportunities*, which summarizes the approach of the GMI Coal Subcommittee towards coal mine methane (CMM) projects that involve mitigation-only of drained gas through flaring. [http://www.globalmethane.org/documents/toolsres\\_coal\\_flaring.pdf](http://www.globalmethane.org/documents/toolsres_coal_flaring.pdf)

### 7) Additional Information - Emission Sources, Mitigation Potential and Successful or Potential Projects

U.S. EPA Coalbed Methane Outreach Program – [www.epa.gov/cmop](http://www.epa.gov/cmop)



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Coal Mine Methane Recovery at Active U.S. Coal Mines: Current Projects and Potential Opportunities - <http://www.epa.gov/cmop/resources/map.html>

Global Anthropogenic Emissions of Non-CO2 Greenhouse Gases 1990-2020 and Global Mitigation of Non-CO2 Greenhouse Gases reports - <http://www.epa.gov/climatechange/economics/international.html>

Global Methane International Coal Mine Methane Projects Database - <http://www2.ergweb.com/cmm/index.aspx>

Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010 - <http://epa.gov/climatechange/emissions/usinventoryreport.html>

U.S. Government's Global Methane Initiative Accomplishments reports - <http://www.epa.gov/globalmethane/accompreport.htm>

U.S. EPA Greenhouse Gas Reporting Program, Underground Coal Mines Fact Sheet: <http://www.epa.gov/climatechange/emissions/downloads/infosheets/UndergroundCoalMines.pdf>

U.S. EPA Greenhouse Gas Reporting Program, Underground Coal Mines Webinar Training Slides: [http://www.epa.gov/climatechange/emissions/downloads12/training/Subpart-FF\\_Subpart-C\\_2-8-12.pdf](http://www.epa.gov/climatechange/emissions/downloads12/training/Subpart-FF_Subpart-C_2-8-12.pdf)

U.S. EPA Greenhouse Gas Reporting Program Data: <http://epa.gov/climatechange/emissions/ghgdata/index.html>