

Coalbed Methane Outreach Program (CMOP)

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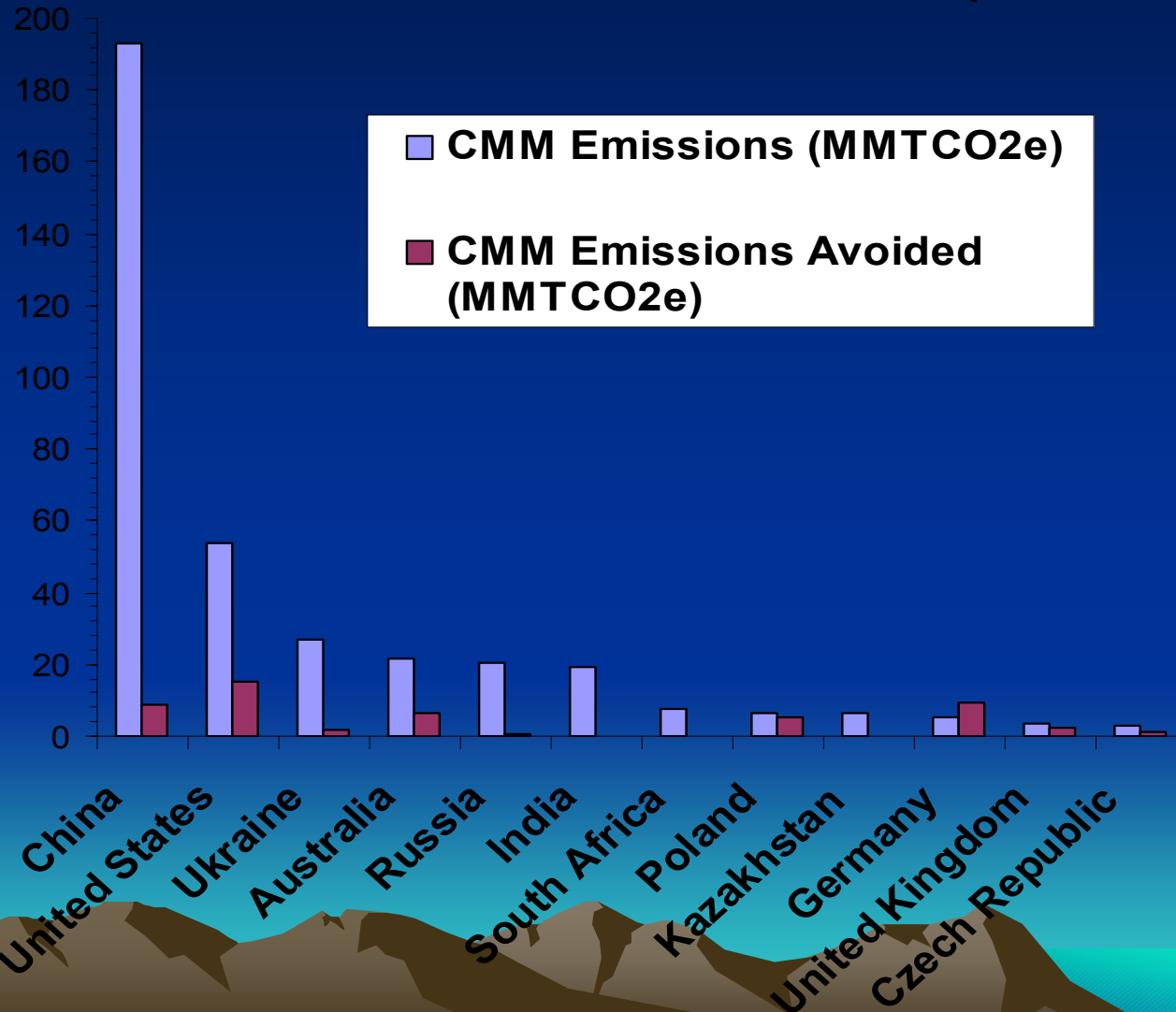


Global Emissions of Coal Mine Methane (CMM)

- CMM emissions represent ~8% of global anthropogenic methane
- China and US are leading emitters
- Ventilation systems are most significant source of CMM emissions
- M2M Partners account for about 85% of all ventilation air methane (VAM) emissions



Global Emissions of Coal Mine Methane (CMM)



Benefits of Recovering and Utilizing Coal Mine Methane (CMM)

- Provides local clean energy source
- Improves air quality and mine safety
- Reduces greenhouse gas emissions
- Generates revenue
- Increases mine productivity



CMM Recovery and Use

- Drained gas
- Abandoned mines
- Surface mines
- Gob gas
- Ventilation air methane



CMM End-Use Opportunities

High-Quality Gas

- **Natural gas pipelines**
- **Vehicle fuel (LNG)**
- **Local distribution**

Medium-Quality Gas

- **Power generation**
- **Combined heat & power**
- **District heating**
- **Industrial applications**
- **Fuel cells**
- **Coal drying**
- **Boiler fuel**

Low-Quality Gas & Ventilation Air Methane

- **Oxidation**
- **Combustion air**
- **Lean burn turbines**





CMM and CBM in India

- **CMM emissions: 6th globally**
 - 14.3 MMTCO₂e (estimated 2005), ~ 1 billion cubic meters
- **Ranks 3rd in global coal production**
- **About 15% of production is from underground mines**
 - ~24 underground mines classified as “Degree III” gassy mines
- **Estimated CBM resource base: 1.5 to 2 trillion cubic meters**
 - Leased CBM blocks; >30 core holes drilled; 2 pilot wells drilled
- **Challenges for CMM/CBM development include:**
 - Technology development due to cost and lack of investment capital
 - Lack of natural gas transportation infrastructure
 - Ambiguous policies regarding CMM development



India

- **Currently no CMM projects operating, but some drainage in place**
- **Noteworthy projects / activities**
 - Global Environment Fund project: to demonstrate commercial feasibility of utilizing methane gas recovered before, during, and after coal extraction. CMM to be used for power generation and CNG for mine vehicles.

Coalbed Methane Outreach Program (CMOP)

- Voluntary climate change program
- Promote the profitable recovery and use of coal mine methane.
- Support Coal Mine Methane (CMM) project development
- International Methane to Markets Partnership





CMOP Activities in India



- US EPA and Government of India to establish an India CBM / CMM Clearinghouse
 - Memorandum of Understanding signed in Washington, DC November 16, 2006
 - Ministry of Coal to take lead on CMM issues
 - Ministry of Petroleum & Natural Gas to take lead on CBM issues
 - EPA to provide multiple year funding through a cooperative agreement
 - Clearinghouse to become in-country source of expertise for project developers, investors, and technology vendors through technical training, building of database, study tours, website
 - US Trade & Development Agency to support a kickoff event (tentatively scheduled mid-2007)

Carbon Dioxide Equivalents



**Coal fired
Power plant
300 MW_{th} =**

1/2 million cars =

**Coal mine VAM
800 000 m³/h, 1%
(50 000 t CH₄/yr)**

For more information, please contact us!

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