



Coal Mine Methane in China: A Budding Asset with the Potential to Bloom

*Results from a New IEA Study at
Small-to-Medium Sized Mines*

*Methane to Markets Meeting, Monterrey Mexico
January 2009*

Overview

- Context
- IEA Information Paper Goals and Methodology
- Key Findings
- Next Steps/Recommendations

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International Energy Agency

Goals:



- energy security
- environmental protection
- economic growth



Activities:

- co-ordinates efforts to ensure energy security
- conducts policy analysis for G8 and member countries
- compiles energy statistics
- reviews energy policies & programs
- convenes, mobilizes science & technology experts



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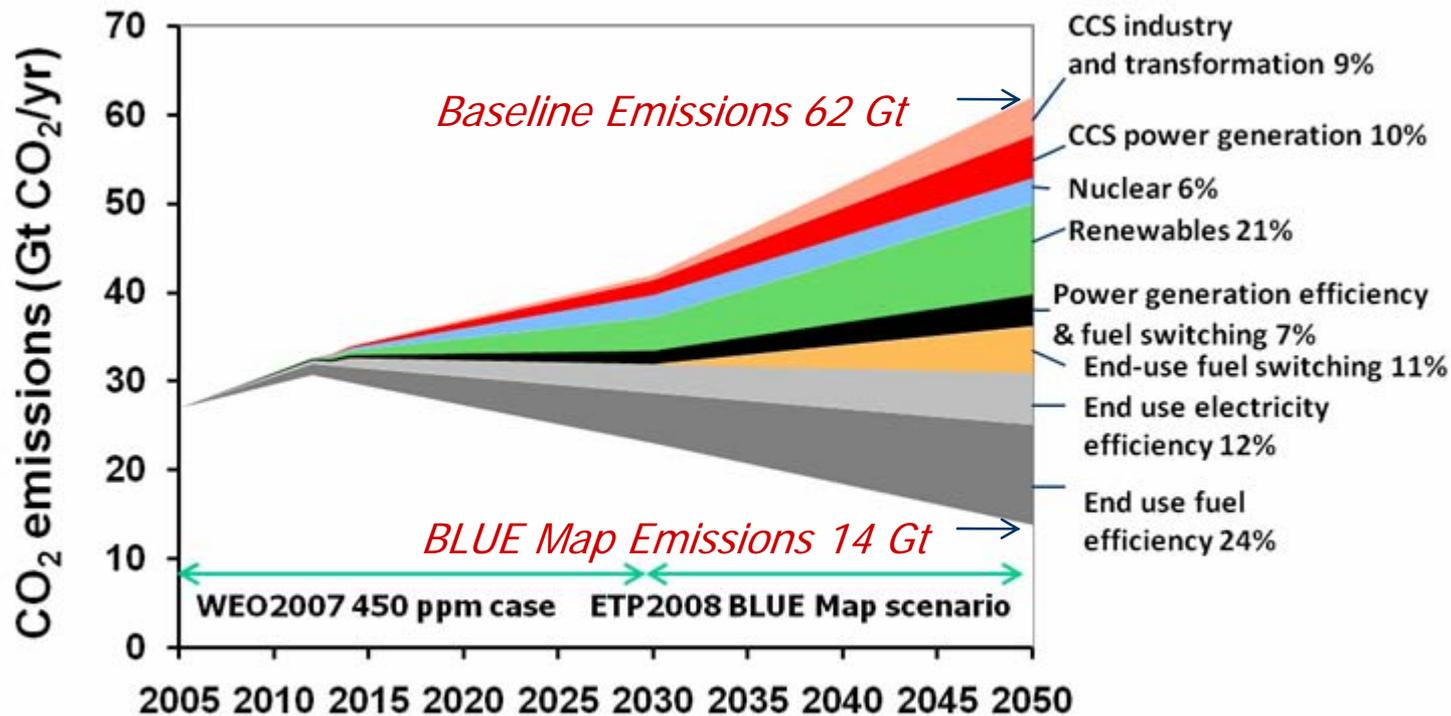
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A New Energy Revolution: Cutting Energy-Related GHG Emissions



Source: IEA, *Energy Technology Perspectives* (2008).

We need a portfolio of solutions, including methane capture, to meet our GHG goals

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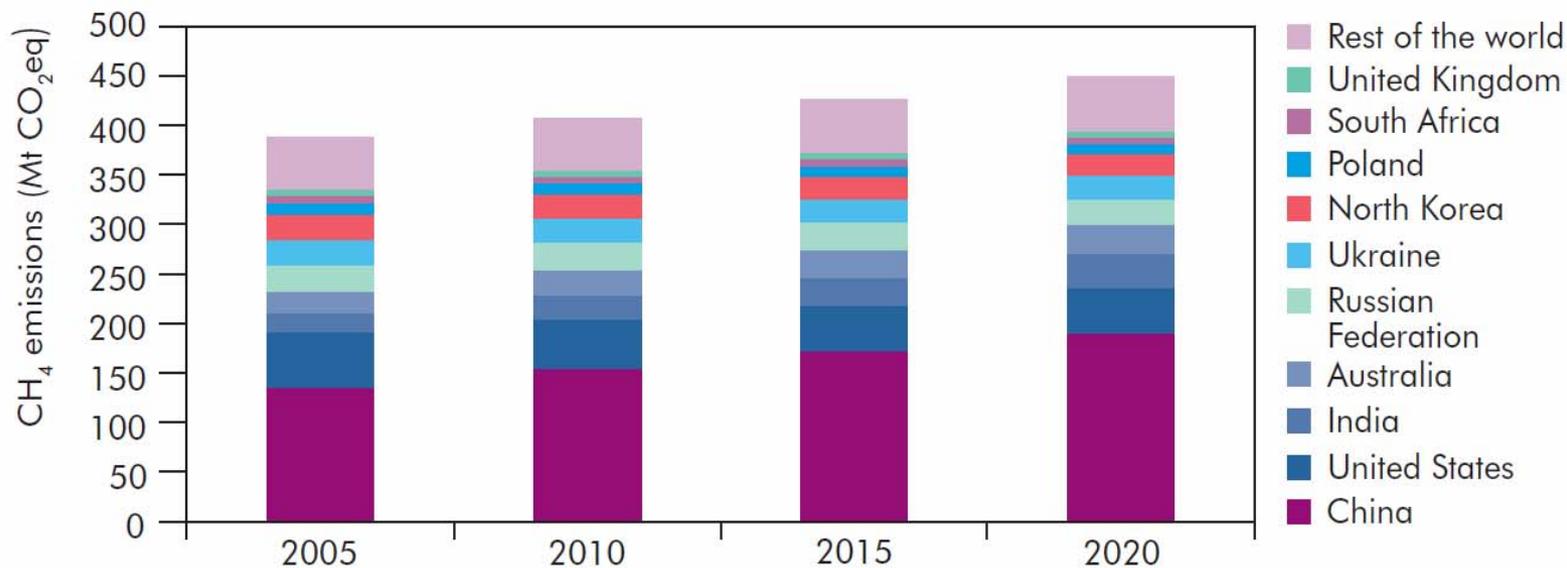
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Methane Emissions from Coal Mines (2005-20)



Sources: US EPA; IEA, *Energy Technology Perspectives* (2008).

China, India and Australia are expected to have the largest growth in emissions

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IEA's Methane Recovery Work

- **Analysis on costs and benefits**
 - Chapter in ETP 2008 publication
- **Targeted reports on specific issues/countries**
 - Coal mine methane at medium-to-small mines in China (report February 2009; workshop April 2009)
 - Coal mine methane regulatory issues in Russia (report and workshop April 2009)
 - Global LFGE policy review (January 2009)
 - Global policy report (May 2009)

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IEA Study on CMM at Small-to-Medium Mines in China

- **Purpose:** to study specific barriers faced by smaller mines in China
- **Sources:** on-site interviews at 12+ mines, meetings with national and provincial policy makers, international expert review
- **Part of larger IEA effort to raise awareness about energy sector methane sources and solutions**

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China's Coal Use and Emissions

- Coal demand in China will exceed 3B tonnes/year by 2010
- China rapidly developing new coal mines to meet this demand
 - Production capacity of 2.5 Bt in 2008; an additional 1.1 Bt under construction
- Country continues to close smaller, unsafe, inefficient mines
- Today, there are 10-15,000 mines operating; down from nearly 100,000 mines in the mid-1990s

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CMM Emissions in China

- **China is the world's largest CMM emitter – 40% of global total**
 - **In 2005, emissions exceeded 135 Mt CO₂_{eq.}**
- **CMM resources vary widely by region**
- **Data on CMM and coalbed methane (virgin resource) are often mixed**
 - **It was difficult to separate the two clearly for this report**

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CMM Recovery and Use in China

● CMM development in 4 periods

- **Pre-1990:** focused on safety, CMM drained (not captured for use).
- **1991-96:** perceptions on CMM use began to change, with increased international information exchange and support. First demos underway.
- **1996-2004:** after positive results from demos, government shifted focus from safety to CMM recovery and use. Large mines expanded their CMM efforts.
- **2004-today:** establishment of CMM industry. Largest CMM project in the world operating in China. Several dozen projects operating. Still less focus on smaller mines.

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Focus on Smaller Mines: Different CMM Practices

- **Very few mines with high-concentration CMM**
- **Low-concentration CMM the most prevalent resource**
 - **Safety concerns due to explosivity**
 - **International project developers reluctant to develop**
 - **Chinese mines beginning to develop their own technologies**

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CMM Technology Adaptation at Smaller Mines

- Computer tools to adapt to variable methane concentration
- Use of low-concentration CMM for power generation
 - Injection of water vapour
- Automation and remote operation
- Beginning to look at VAM
- Modifications to international practices common

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CMM Project Financing

- Private sector replacing traditional government role in financing
- CMM CDM projects
 - 95% of world's CMM CDM project registrations are in China
 - Low success rate to date – only 2 projects of 59 submitted have actually received GHG credits
 - Lack of integration of CMM drainage into overall CMM project a problem
 - Smaller mines have more difficulty in taking advantage of CDM financing

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Important CMM Policies

- Higher-level policies advance mining efficiency/consolidation
- **2006 CMM Extraction and Utilisation Policy**
 - Confirmed the priority of gas extraction prior to mining
 - Require M&V
 - Mines must have drainage systems
 - Enforcement by local authorities
- **2008 Emission Standard of CMM policy**
 - Coal mines with drainage systems with CMM concentration of 30% or higher are prohibited from emitting methane
 - If concentration is less than 30%, methane may be released

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CMM Policies Cont'd.

- Favourable land use, tax policies for CMM projects
- NDRC *Notice on Executing Opinions on Generating Electricity with CMM*
 - Provides priority sale of CMM to electricity utilities
 - Provides for a subsidy from the power companies
 - No evidence that this policy is being enforced

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IEA's Recommendations

- Continue to expand government support
 - Particularly with provincial and local authorities and at smaller mines
 - Raise the profile of CMM at NDRC
- Be careful about implementation of new CMM regulations
 - Mines may have an incentive to dilute CMM to avoid recovery and use requirements
- Involve stakeholders in CMM subsidy development
 - Electricity companies did not support subsidies; should be consulted and engaged more actively
- Capacity building is needed at smaller mines

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For More Information

Contact

Tom Kerr, IEA; Tom.kerr@iea.org

*Report available for free download at
www.iea.org/textbase/subjectqueries/methane.asp*

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