Getting it Right: Policies that Provide a Solid Foundation for the Development of CMM/AMM and VAM Projects

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Workshop on Best Practices in Coal Mine Methane Capture and Utilization

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Outline

- Range of policy options for Coal Mine Methane (CMM): ownership rights, incentives and carbon policy
- Policies for VAM (Ventilation air methane) and AMM (Abandoned Mine Methane)
- Two country examples
- Conclusions
Policy is Important to Address Growth in Emissions

- CMM emissions follow the coal production
- AMM emissions grow even if coal production and CMM decline

Source: Model for Calculating Coal Methane (MC2M) emissions; Preliminary data
Range of Policy Options

- Less supportive enabling conditions require more policy support for to make CMM projects feasible

MORE TARGETED POLICY SUPPORT NEEDED

- Specific CMM policies
  - Subsidies
  - Feed-in tariffs and obligations
  - Tax incentives
  - Environmental taxes

VS.

LESS TARGETED POLICY SUPPORT NEEDED

- Underlying policy framework and conditions
  - Strict safety requirements and implementation
  - Access to energy markets
  - Cost-reflective prices for natural gas and electricity
  - Clearly defined property rights
  - Composition of gas flows
  - Mine gassiness
The Importance of Clear Rights in CMM/AMM Utilization

- **Ownership is a form of incentive for CMM**
  - Poorly defined ownership and leasing rights can create conflicts and obstacles to utilization

- **Clear rights reduce uncertainty, risks and costs**
  - Basis for producing and selling CMM-based electricity
  - Clear rights is key to multi-party projects
Incentives Can Speed Project Implementation

Examples:
- Carbon price
- Feed-in tariff (FIT)
- Reduced taxes or royalties

Illustrative example: Impact of carbon price and FIT on project economics
VAM Projects Have Specific Policy Needs

- Majority of CMM is VAM (60~70% of CMM emissions)
- At least 6 projects in Australia, China and the U.S.
- Projects usually not self-financing from energy
- Carbon price or offsets are important (only one known project did not use carbon credits)
- Permitting rules affected initial VAM timelines and costs

Blue Creek Mine #4 Mine, Alabama, USA
2009-2013

Marshall County Mine, West Virginia, USA
First commercial-scale project, commissioned in 2012
Key AMM Policy Actions for Success

- Enact clear procedures for obtaining AMM ownership rights
- Allow for transfer of methane rights from the mine to the gas developer
- Set royalties at a low level to encourage investments
- Offer reduced taxes or other incentives to support AMM projects
- Consider including AMM as a renewable energy resource

## AMM Case Studies: Key Findings

<table>
<thead>
<tr>
<th>Country</th>
<th>AMM utiliz. rate</th>
<th>Royalties</th>
<th>Key Policies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>99%</td>
<td>10%</td>
<td>• Clear gas rights and licensing process&lt;br&gt;• Feed-in tariffs/market premium for AMM</td>
</tr>
<tr>
<td>UK</td>
<td>58%</td>
<td>Taxes instead</td>
<td>• Clear rights and licensing procedures&lt;br&gt;• Fairly high taxes&lt;br&gt;• AMM exempted from climate change levy</td>
</tr>
<tr>
<td>Australia</td>
<td>31%</td>
<td>10%</td>
<td>• AMM is not defined as a resource&lt;br&gt;• Flaring is prohibited</td>
</tr>
<tr>
<td>US</td>
<td>29%</td>
<td>12.5%</td>
<td>• Royalty relief (some states)&lt;br&gt;• AMM in Renewable Portfolio Standards (some states)&lt;br&gt;• Carbon offsets</td>
</tr>
</tbody>
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Case Study 1: Germany

- Rights to CMM are provided to coal companies
- Feed-in-tariff (and later market premium incentives) for CMM and AMM
  - Primary factor driving active project development
- As of December 2017, active AMM projects utilized up to 99% of AMM
Case Study 2: Ukraine

- **Variable tax policies: royalties**
  - 29% of royalty tax for CMM capture (July 2016)
  - Revenues (savings) from CMM utilization became taxable
  - Mines stopped flaring
  - CMM utilization decreased by one third

- **Tax Code was amended in December 2017**
  - No royalty tax
  - No income tax by 2020
  - Penalties for venting have been increased
Conclusions

▪ AMM /CMM emissions will likely grow in the future
▪ Countries use a mix of policy instruments to encourage coal methane projects
▪ Clearly defined property rights reduce risks
▪ Projects can be profitable but incentives are important
▪ Consistent policies are critical to project success
Thanks and Contact Information

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Backup slides
Australia

- Each state sets its own regulation
- Companies should apply for a petroleum title
- Royalty rate is 10%
- Australia utilizes 31% AMM emissions

Graph:
- Gas Electricity Certificate scheme (Queensland)
- Mining Act 1992 (New South Wales)
- Mineral Resources Act 1989 (Queensland)
- Carbon pricing mechanism
- Gas Electricity Certificate scheme repealed
- Carbon pricing eliminated
Germany

- Policy is important!

- Germany utilizes 99% of AMM

- Methane, Mt CO$_2$e

- Federal Mining Act, 1982

- First AMM project, 1997

- Renewable Energy Sources Act, 2000

- AMM production licenses in North-Rhine-Westphalia

- Market premium for AMM and CMM, 2016
United Kingdom

- **Clear defined property rights**
  - Petroleum Act of 1998
  - License fees are relatively low
- **Little tax incentive for AMM**
- **No royalties for extracting AMM**

AMM utilization rate is about 60%
United States

- No federal incentives
- Some states provide royalty relief
- Some states included AMM in Renewable Portfolio Standards
United States: AMM projects

- Illinois: 6 AMM projects
- Indiana: 1 AMM project
  Clean Energy Portfolio Standard, 2011
- Ohio: 1 AMM project
- Pennsylvania: 2 AMM projects
  Alternative Energy Portfolio Standard, 2004
- Virginia: 6 AMM projects
- West Virginia: 6 AMM projects
  Alternative Energy Standard, 2009
  Clean Energy Portfolio Standard, 2012

- Colorado: 1 AMM project
  Colorado Renewable Energy Requirement Initiative, 2004
- Alabama: 1 AMM project