Incentives for CMM/AMM Projects in the United States

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Advanced Resources International

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The United States Coal Industry

- Coal accounted for 14% of U.S. energy consumption in 2018.

- Total coal consumption has dropped 29% in the past decade; similarly, production has dropped 28%.

- Since 2009, number of active mines has decreased 51%; number of underground mines has decreased 56% from 540 to 236.

Sources: EIA, BP 2019 Statistical Review, Greenhouse Gas Inventory
Underground CMM Emissions

CMM emissions from active coal mines in the U.S., 2000–2017

Source: EPA
Incentives for CMM/AMM projects

- Institutional development
- Informational support
- Carbon markets
- State-level RECs
- Project financing assistance
Greenhouse Gas Markets

- Two market types:
  - Voluntary Markets
  - Compliance Markets

- Projects listed on registries:
  - California Cap-and-Trade
California Regulated Carbon Market

- Reduce 2020 emissions to 1990 levels
  - target of reducing 2050 emission to 80% below 1990
- Regulated entities must deliver allowances (tradable permits = 1 tonne $\text{CO}_2$) or offsets (up to 8% of emissions) equal to annual emissions.
- Mine methane capture projects can generate offset credits
Historical Carbon Prices

Carbon Price of California Carbon Allowance and Offset

$/Tonne CO$_2$e


CCA  CCO-0  CCO-3  CCO-8
US CMM/AMM Projects

- Generation of offset credits from methane destruction/use:
  - Marshall County VAM Abatement Project (WV)
    - Previously named Verdeo McElroy VAM Project
  - Corinth AMM Recovery Project (IL): AMM pipeline
  - Elk Creek Mine (CO): Onsite power generation
# CA Cap-and-Trade Emission Reductions

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Project Type</th>
<th>Location</th>
<th>Credit Type</th>
<th>Credits Issued</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verdeo Marshall County VAM Abatement Project</td>
<td>VAM</td>
<td>WV</td>
<td>Early action</td>
<td>197,411</td>
<td>5/4/2012</td>
<td>10/31/2013</td>
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<td></td>
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<td>Compliance</td>
<td>1,045,923</td>
<td>11/1/2013</td>
<td>12/31/2017</td>
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<tr>
<td>Vamox® Demonstration Project at JWR Shaft No. 4-9</td>
<td>VAM</td>
<td>AL</td>
<td>Early action</td>
<td>80,766</td>
<td>3/6/2009</td>
<td>2/28/2013</td>
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<tr>
<td>Elk Creek Coal Mine Methane Destruction and Utilization Project</td>
<td>CMM</td>
<td>CO</td>
<td>Early action</td>
<td>432,609</td>
<td>1/1/2014</td>
<td>12/31/2014</td>
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<td>Compliance</td>
<td>266,263</td>
<td>1/1/2015</td>
<td>1/31/2016</td>
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<td>Elk Creek Permit Area Abandoned Mine Project</td>
<td>AMM</td>
<td>CO</td>
<td>Compliance</td>
<td>420,398</td>
<td>2/1/2016</td>
<td>1/31/2018</td>
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<td>Compliance</td>
<td>744,290</td>
<td>1/1/2015</td>
<td>12/31/2017</td>
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<td>Cambria 33 Abandoned Mine Methane Capture and Use Project</td>
<td>AMM</td>
<td>PA</td>
<td>Early action</td>
<td>107,064</td>
<td>1/1/2011</td>
<td>12/31/2014</td>
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<td>Corinth Abandoned Mine Methane Recovery Project</td>
<td>AMM</td>
<td>IL</td>
<td>Early action</td>
<td>490,456</td>
<td>1/1/2010</td>
<td>12/31/2014</td>
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<td>Compliance</td>
<td>504,214</td>
<td>1/1/2015</td>
<td>12/31/2017</td>
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<tr>
<td><strong>Total CARB credits issued for MMC as of October 2018</strong></td>
<td></td>
<td></td>
<td><strong>Early action</strong></td>
<td><strong>2,879,684</strong></td>
<td><strong>3/6/2009</strong></td>
<td><strong>12/31/2014</strong></td>
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<td><strong>Compliance</strong></td>
<td><strong>2,983,324</strong></td>
<td><strong>1/1/2013</strong></td>
<td><strong>10/24/2018</strong></td>
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<td></td>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>5,863,008</strong></td>
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Source: EPA CMM Developments in the US
New Projects

- Bailey Mine Flare (WV/PA)
- Baker Mine AMM Flare (KY)
- WMMC AMM Flare (WV)
- Bear Canyon AMM Flare (UT)
- Marshall County Mine Flare (WV)  
  - Project commenced June 2019
- Perennial CMM, LLC Projects (WV)  
  - Pursglove No. 15 Mine Project
  - Osage No 3. Mine
  - Consol No. 9 Mine Project
  - Project commenced January 2018

Source: ACR
Renewable Energy Credits

Several major coal producing states have alternative energy and renewable energy programs that include CMM as a targeted renewable or clean energy source

<table>
<thead>
<tr>
<th>State</th>
<th>Definition of CMM</th>
<th>Incentives and Programs</th>
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<tbody>
<tr>
<td>Colorado</td>
<td>CMM is a renewable energy resource if the end-use electricity is GHG-neutral</td>
<td>Renewable Energy Standard</td>
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<td>• RECs</td>
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<td>Indiana</td>
<td>CBM (coalbed methane) is defined as an alternative energy source and clean energy</td>
<td>Voluntary Clean Energy Portfolio Standard</td>
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<td>resource</td>
<td>• Incentives to help pay for compliance projects</td>
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<td>Ohio</td>
<td>CMM/AMM is a renewable energy resource</td>
<td>Alternative Energy Resource Standard</td>
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<td></td>
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<td>• Renewable energy certificates (RECs)</td>
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<td>• Advanced Energy Program</td>
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<td></td>
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<td>• Forgivable and non-forgivable loans</td>
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<td>Pennsylvania</td>
<td>CMM is an alternative energy resource</td>
<td>Alternative Energy Portfolio Standard</td>
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<td>• Alternative energy credits</td>
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<td>Utah</td>
<td>CMM is a renewable energy resource</td>
<td>Renewable Portfolio Standard</td>
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<tr>
<td></td>
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<td>• RECs</td>
</tr>
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Other Incentives for Energy Projects

- Accelerated depreciation
- Regulatory incentives
  - Royalty relief in CO, UT, WY
  - Lease amendments in CO, UT
- Previous tax credits
  - Section 29 Tax Credit
Tax Credits: Section 29

- Tax credit to owners/operators of wells recovering unconventional gas (CMM included)
- Encourage domestic energy technology (enacted 1980)
  - Wells drilled before 1993
  - Production Value = US$1/Mcf (US$35/ m³), a value equal to nearly half of prevailing wellhead gas prices.

U.S. Coalbed Methane Production (Billion Cubic Meters)

Source: EIA
Acknowledgements

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Thank You!

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