

Overview of North American GHG Markets Opportunities for CMM

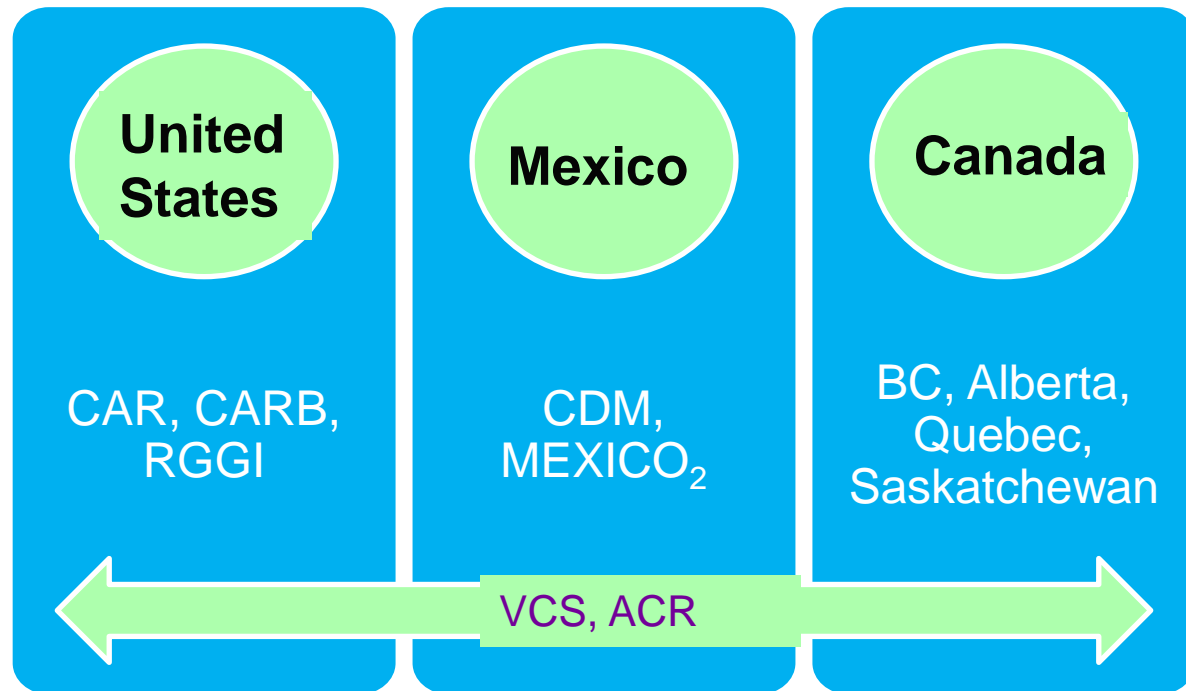
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on Coal Mine Methane
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Current GHG Markets – North America

Up to 11 Different GHG Programs to Consider!



Current GHG Markets – United States

Voluntary Programs for CMM Projects

- American Carbon Registry (ACR)
 - Will accept projects located in the U.S. as well as internationally
- Verified Carbon Standard (VCS)
 - Uses its own methodologies and accepts CDM and CAR methodologies
 - VMR0001 – Pre-drainage from Open Cast Mines
 - 2 completed U.S. projects
 - VMR0002 – Methane Capture from Abandoned Coal Mines
 - 3 current U.S. projects
- Climate Action Reserve (CAR)
 - Uses its own Coal Mine Methane Project Protocol
 - U.S. underground coal mines only
 - 2 VAM projects (1 completed, 1 registered)
 - 3 methane drainage projects (2 registered, 1 listed)



Current GHG Markets – United States

Compliance (Mandatory) Programs

- California Air Resources Board (ARB) Program
 - Approved the Mine Methane Capture (MMC) Project Protocol in April 2014 which includes:
 - Underground Coal Mines (CAR Protocol)
 - Surface or Open Cast Coal Mines (revised VCS Protocol)
 - Abandoned Underground Coal Mines (revised VCS Protocol)
 - Accepting offset projects located in the U.S. only
 - Officially linked with Quebec January 1, 2014
 - Use ACR, CAR, and VCS (new in 2014) as offset project registries
 - CMM projects registered in CAR or VCS by end of 2014 may be considered for “early action” in ARB program
 - Starting July 1, 2014, new CMM projects can be registered directly in ARB offset program
 - First reporting period through 2020



Current GHG Markets – United States

Compliance (Mandatory) Programs

- California Air Resources Board (ARB) Program
 - Two noteworthy projects transitioning from CAR
 - McElroy VAM Project (160,000 scfm)
 - Elk Creek 3 MW Power Project
 - Offset Protocol language considered *legislation*
 - Protocol updates are lengthy process
 - Variances from protocol not allowed
 - “Nonproducing Mines” currently not included
 - Offset credit liability with buyer of credits
 - Standard liability 8 years (CCO8)
 - Can be reduced to 3 years (CCO3)
 - Double verification
 - Increased verifier rotation



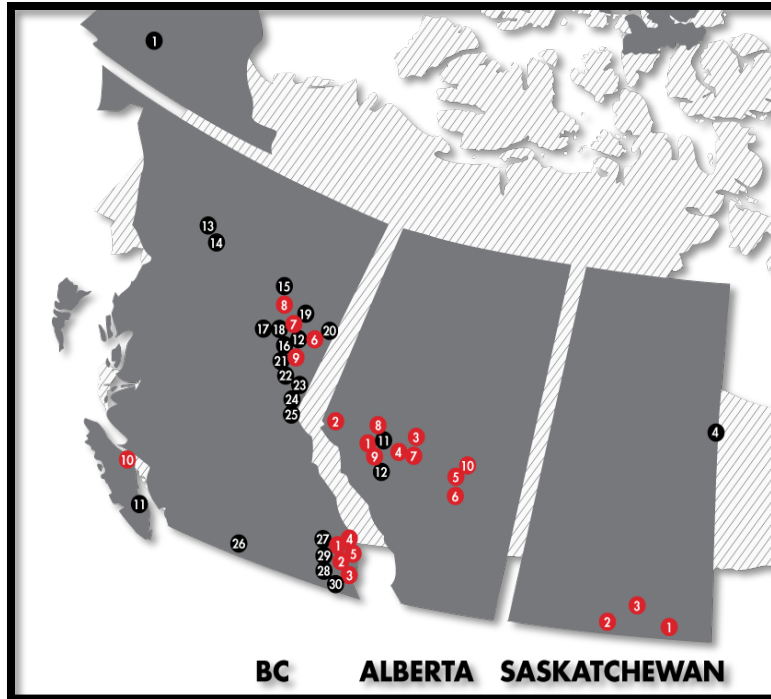
Current GHG Markets - Canada

Compliance (Mandatory) Programs

- Saskatchewan
 - Emerging GHG offset market in 2014
 - Possible linking with Alberta and British Columbia programs
 - Current offset types include agriculture, O&G, and renewable energy
- British Columbia
 - August 2014 – Pacific Carbon Trust was folded into Ministry of Environment's Climate Action Secretariat, Climate Investment Branch
 - Uses new methodologies and accepts CDM, VCS, and CAR methodologies
 - October 2014 – Set carbon intensity for LNG facilities (could double demand for offsets)
- Alberta
 - Specified Gas Emitters Regulation (SGER)
 - Based on industry-specific carbon intensities
 - Can meet targets through three ways:
 - Improve carbon intensity performance, purchase offset credits (no limit), pay into Technology Fund
- Quebec
 - Linked with California



Current GHG Markets - Canada



Best GHG markets, but little CMM project opportunity

- **British Columbia**
 - 1 underground and 9 surface coal mines
- **Alberta**
 - 1 underground and 8 surface coal mines
- **Saskatchewan**
 - 1 surface mine
- **Quebec**
 - No coal mines
 - Decided not to add CMM in 2014



Current GHG Markets - Mexico

- **General Climate Change Law**
 - Passed by Mexico's Congress in April 2012
 - Establishment of high-level climate commissions → create domestic carbon market
 - Possibility of domestic emissions trading system (ETS) development
 - Platform in place MEXICO₂ <http://www.mexico2.com.mx/>
 - Carbon tax supposed to be effective 2014
 - Pending secondary legislation (was scheduled for June)
 - Price set at only \$3/tCO₂e
 - Preference for CERs?
 - Efforts to link with California's C&T program this year
 - May 2014 - IETA Business Partnership Meeting,
 - July 2014 – California Governor's Meeting,
 - November 2014 - Developing Mexico CAR ODS Protocol
- **Coal Mine Methane Projects**
 - Currently 5 projects operating or under development at Mimosa Coal Mines in state of Coahuila
 - 3 power generation (1 abandoned), 1 flaring, and 1 boiler fuel



Summary of North American GHG Markets

- Compliance carbon credit prices vary widely
 - \$3.00 - \$25.00/tCO₂e
- Continued efforts to link GHG programs
- U.S. CMM opportunities
 - Maybe 20+ VAM sites with higher carbon price
 - 8-10 mines still vent some or all drainage gas
 - Abandoned underground mines
 - Northern Appalachian coal basin, Illinois coal basin, Western basins
 - Surface coal mines in Powder River Basin
- Little CMM opportunity in Canada
- Ownership barriers with CMM opportunity in Mexico
 - Low carbon price



Thank you for your attention!

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