COAL MINE METHANE AND ITS STRATEGIC ROLE IN CLIMATE CHANGE MITIGATION – CMM POLICIES IN COLOMBIA

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BACKGROUND

CHARACTERIZED BY GREAT DIVERSITY OF ECOSYSTEMS

- 3 mountain ranges
- 6 geographic regions
- Large cultural diversity

CLIMATE DEPENDENT ECONOMY; HIGHLY VULNERABLE AND SENSITIVE TO ADVERSE IMPACTS OF CLIMATE CHANGE

Representative Concentration Pathways (RCP)
CLIMATE DEPENDENT ECONOMY

- Electricity generating capacity is dominated by hydropower
- Due to the effects of El Niño, hydropower is operating at 60% of capacity
- Between 1998 – 2012, 90% of disasters were related to hydro-climatological phenomenon
- Droughts impact agriculture and livestock production

Total Generation for 2014: 64,327.65 GWh
CLIMATE DEPENDENT ECONOMY

• First South American country to release New Climate Plan ahead of Paris COP 21

• Current and future impacts of climate change on Colombia:
  - Economy – agricultural, livestock, the need to import energy
  - Energy security – energy independence
  - National security – peace building among Colombians i.e., increases the separation of social classes
  - Poverty –
    • 22% of the population: multidimensional poverty i.e., poverty beyond income-based factors to include education, health and living standards
    • 29% of the population: monetary poverty
THE ENERGY SECTOR CHALLENGES

Diversity in the energy mix is necessary, but there are challenges to diversification

• The Economist Intelligence Unit projects fossil fuels will continue to play a large role in Colombia’s energy mix for the coming decades
  • New coal and natural gas-fired power plants are planned

• Additional large hydro-plants will be brought online in the next couple of years, but will still be adversely impacted by climate change (drought)

• Renewable sources will need to comprise a larger percentage of the energy mix
  – Several of the large population centers are located in mountainous terrain, where solar and wind power generation systems are impractical
COAL IN COLOMBIA

COAL FIELDS

COAL PRODUCTION

- Colombia’s estimated proved reserves are 6,746 million tonnes (2015) - anthracite and bituminous
- Produced 87.2 million tonnes (2016)
- 92% of production is from three companies (2016)
  - Cerrejón
  - Drummond
  - Prodeco
- Production continues to rise because of hydropower’s fluctuating performance and new coal-fired power plants coming online with plans for more
- Majority of coal produced from surface mines, but mining will move underground

ENERGY MINISTERIAL AND 8TH INTERNATIONAL FORUM ON ENERGY FOR SUSTAINABLE DEVELOPMENT
13 JUNE 2017  ASTANA, KAZAKHSTAN
GREENHOUSE GAS EMISSIONS

NDC BASELINE COUNTRYWIDE EMISSIONS

- CMM emissions are 12.2 percent of total energy GHG emissions in 2010

COAL MINE METHANE EMISSIONS

NOTE: *estimated, **forecasted
COLOMBIA’S COMMITMENT TO REDUCING GHG EMISSIONS

• NDC Commitment: reduce emissions by 2030 through mitigation and adaptation actions by increasing resilience (reducing poverty) and reducing the carbon intensity in the economy
  - 20% reduction compared to business as usual (BAU)
  - 30% reduction with international support

• Estimated per capita emission in 2030
  - BAU: 5.8 TCO$_2$e
  - Compliance with NDC (20% reduction): 4.6 TCO$_2$e
EXISTING CLIMATE CHANGE POLICIES AND REGULATIONS

• Since 2010 development of the following climate policies:
  - Policy Document CONPES 3700
  - Colombian Low Carbon Development Strategy (CLDS)
  - National Strategy for Reducing Emissions from Deforestation and Forest Degradation (ENREDD + Strategy)
  - National Adaptation Plan for Climate Change

• Since 2013 working on developing a system for monitoring, reporting and verifying of GHG emissions reductions and climate financing

• In 2014 formulated its National Climate Change Policy - developing mitigation and adaptation actions
  - Develop its National Development Plan (NDP) 2014 – 2018 which includes a Green Growth Strategy: will submit under the global agreement being negotiated under the UNFCCC

• Eight Sectoral Mitigation Action Plans (SMAPs) aimed to maximize the carbon-efficiency of economic activities at the national and sectoral levels which contribute to social and economic development
NDC IMPLEMENTATION APPROACH

• Create a network between universities and research groups to strategize on issues to achieve proposed mitigation and adaptation goals
• Promote private investment, private-public partnerships and seek foreign investment with an emphasis on scientific research and technology transfer
• Develop an agenda that would promote research, innovation and technological development on climate change topics
• Integrate national institutes and other entities with relevant UNFCCC mechanisms for technology transfer
• Create network between other Latin American countries to share knowledge regarding adaptation and mitigation to climate change
• Integrate the National Government with regional governments to formulate and implement comprehensive climate change plans that foster competitive and sustainable cities
• Work with the financial sector to develop solutions to the country’s environment and social challenges; identify financing sources and define a climate-finance strategy
CBM/CMM IN COLOMBIA

• Drummond is producing methane from coals located within their coal license as well as Cerrejón's coal license

• Gecelca drilled test borehole in Córdoba Department to characterize coal measures for potential CBM/CMM development

• Water monitoring wells located within coal leases in Córdoba Department displayed evidence of gas bubbling to the surface

• Methane explosions at underground mines
  - 2010 methane explosion at the San Fernando mine in Boyacá Department, killing 73 miners.
  - In 2011 methane explosion at the La Preciosa Mine in Norte de Santander Department, killing 20 miners. In 2007, at the same mine 31 miners were killed due to methane explosion.
  - In 2015, four miners were killed in a methane explosion at the San Patricio Mine in Boyacá.
  - The biggest loss of life in a mining accident in modern Colombia occurred in 1977 when 85 people died in another mine in Boyacá.
INCLUDING CMM IN ENVIRONMENTAL STRATEGIES

• Government of Colombia offers incentives for unconventional gas development (Law 756 of 2002)
• Assembled a working group to investigate and address underground CMM emissions – MME, ANH, ANM and UPME
• Energy Mining Planning Unit (UPME), attached to the Ministry of Mines and Energy – currently investigating technologies that are applicable to VAM
• Colombia Geological Survey hosting a series of seminars on CBM and CMM
GMI’S ROLE IN SUPPORTING CMM MITIGATION STRATEGIES IN COLOMBIA

• Colombia is a member of GMI
• Currently developing a countrywide energy market report
• Host workshops in-country promoting CMM development through dissemination of information about existing projects and technologies
• Assistance with development of proposed legislation/regulation - Resolution 90325 of 2014
BENEFITS OF CMM PROJECTS

• More sustainable development of natural resources

• Tangible and intangible effects measured on both regional and countrywide scale
  - Provides access to and creates a market from additional sources of affordable and clean energy
  - Employment and educational opportunities improve, thereby reducing inequalities between rural and urban populations, alleviating poverty/increasing resilience
  - Benefits from new industry and infrastructure established
  - Reduction of GHG emissions that are the result of capturing methane that would otherwise escape to the atmosphere during coal mining – surface & underground mining
  - Support the United Nation’s Sustainable Development goals, which Colombia has adopted
NEXT STEPS?

• Begin to focus on emission reductions from surface mines – the majority of coal production comes from surface mines
• Continue education, dissemination information about technology and policies in place that encourage development of CMM resources
• Promote the development of the co-located coalbed methane and natural gas with the coal resources in active and future coal licenses
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Reference:
Climate Change Projections in Latin America and the Caribbean: Review of Existing Regional Climate Models' Outputs - See more at: https://publications.iadb.org/handle/11319/7746#sthash.VwxSjwg1.dpuf
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