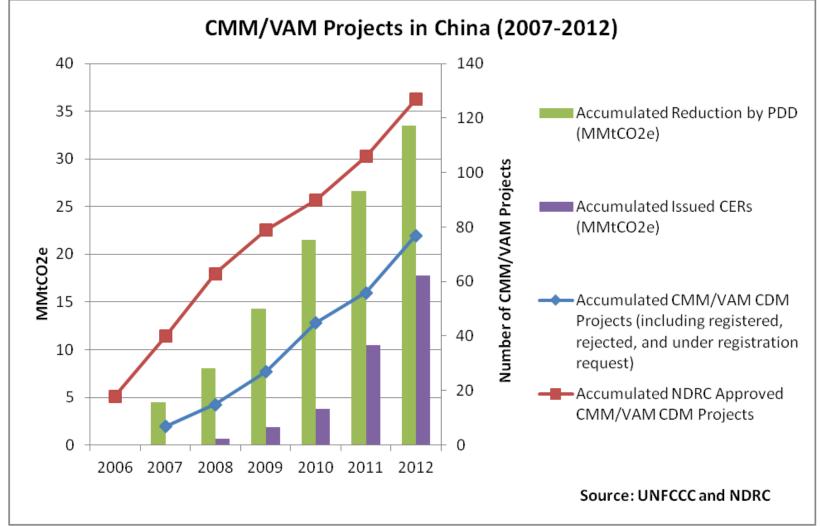


#### Business Models for CMM Utilization after the Kyoto Protocol

Boni Jiang Guizhou International Cooperation Center for Environmental Protection Vancouver, March 2012

# Success during Kyoto Protocol Period (2006-2012)



### What Contributed to the Success

- Technology development
  - Low concentration CMM power generation
  - VAM destruction or utilization
- Policy and regulation changes
  - Government pressure on emission reduction
  - Other incentives: subsidies, tax credit etc.
- Carbon credit incentive

# **Business without Carbon Credit**

- What has been observed?
  - 127 NDRC approved CMM/VAM utilization projects, only 29 got CERs issuance.
  - Unknown number of projects did not even go through NDRC and CDM.
  - CMM gas engine companies continue to sell more units.
  - Several CMM to natural gas projects are under development without considering CDM.
- What does it mean?
  - Most CMM utilization projects can survive without carbon credit.

#### **Business Model Matters**

Key Partnerships	Key Activities What are the	Value Proposition What value do we deliver to the customer? Solve customer's problem, or meet the needs?		Customer Relationships	Customer Segments
Who are key partners? What they do?	important activities?			Customer expectation?	For whom are we creating value?
	Key Resources			Channels	
	To create value and reach customers.			How do we reach our customer?	
\$ Cost Structure			\$ Revenue Streams		
What are the important cost and expensive resources?			For what value are the customers really willing to pay?		

Ref: Osterwalder & Pigneur, 2010

#### Previous Success Analysis: CMM to Power as an Example

Key Partnerships •Power grid (permit for connection) •CDM consultant and CERs buyer	Key Activities  •Power generation •CDM process  Key Resources  CMM	Value Proposition •Cheaper electricity •Environment al commodity: CERs		Customer Relationships Supplier-buyer Channels •Power grid •CDM	Customer Segments •Coal mine internal user •Power grid •Carbon credit buyer
<ul> <li>\$ Cost Structure</li> <li>•Power plant investment and operational cost</li> <li>•CMM is free</li> </ul>			<ul> <li>\$ Revenue Streams</li> <li>\$0 from internal use, Mining cost is reduced though.</li> <li>Electricity sales to grid (rare)</li> <li>CERs sales</li> </ul>		

# The Core of Success: CMM to Power Example

Key Partnerships •Power grid (permit for connection)	Key Activities <ul> <li>Power</li> <li>generation</li> </ul>	Value Proposition •Cheaper electricity		Customer Relationships Supplier-buyer	Customer Segments •Coal mine internal user
	Key Resources •CMM			Channels •Power grid	
<ul> <li>\$ Cost Structure</li> <li>•Power plant investment and operational cost</li> <li>•CMM is free</li> </ul>			<ul> <li>\$ Revenue Streams</li> <li>•A penny saved is a penny earned.</li> <li>•Coal mine can save 60-70% of their electricity bill.</li> </ul>		

CMM to power for coal mine internal use is the corner stone of success.

# CMM Power to Grid: Why it did not work

Key Partnerships	Key Activities	Value Proposition •Cheaper electricity? •Better stability? •Any problem solved and needs met? •NO		Customer Relationships	Customer Segments
	generation			Supplier-buyer	•Power grid
	Key Resources			Channels	
	•CMM •Power grid access			•Power grid	
<pre>\$ Cost Structure •Power plant investment and operational cost •CMM is free</pre>			\$ Revenue Streams <ul> <li>Electricity sales + government subsidy</li> </ul>		

Coal mine does not create any value for the only customer: power grid.

#### BUSINESS MODELS POST KYOTO PROTOCOL

## Model 1: CMM-to-Gas Markets

Key Partnerships •CMM purification tech. provider	Key Activities •High quality CMM drainage •CMM purification Key Resources •CMM •Drainage technologies	Value Proposition •Cheaper natural gas for pipeline. •Transportable gas products: CNG/LNG		Customer Relationships Supplier-buyer Channels •CNG-LNG •Pipeline network	Customer Segments •Natural gas company or distributer
\$ Cost Structure <ul> <li>Drainage and gas purification</li> <li>investment and operational cost</li> <li>CMM</li> </ul>			\$ Revenue Streams <ul> <li>Gas sales</li> <li>Government subsidies</li> </ul>		

# Why CMM-to-Gas Model Will Work?

- Transportable and cheaper CMM-based natural gas creates value for its customers, thus creates value for coal mines.
- Gas markets are much more open than the power market.
- Infrastructure (pipeline network) is improving rapidly and the market keeps growing.
- CMM reaches its maximum value as natural gas: this model is financially self sustaining.

# Zhongliangshan: A Great Example

- Coal production: 500,000 t/a
- CMM production: 50 million m<sup>3</sup>/a
- CMM supplies more than 40,000 households and commercial users
- CMM sales becomes significant revenue source for coal mine

Zhongliangshan slogan: "Mining coal preserves our rice bowls, pumping gas makes us well-off". CMM-to-Gas Market Model: Barriers and Recommendations

- CMM quality and quantity need to be improved.
- Gas purification technology should focus on CMM above 30%.

# Model 2: CMM-to-Power (Internal Use)

- CMM to power for internal use model will continue to succeed in China.
  - There is not any barrier for this model.
  - Low concentration CMM power generation has become mainstream in China.
  - This model does not encourage high quality CMM drainage practice and can only utilize limited amount of available CMM.

# Model 3: CMM Power to Grid

- How to create value for power grid in order to get the access:
  - Cheaper electricity seems to be the only choice.
  - Coal mines need to be ready to share profit with the power grid.
  - Grid related companies are positioned to become CMM-to-power project developer.

# Model 3: CMM Power to Grid

- What can government do:
  - Subsidy of 0.25 RMB/KWh goes straight to the CMM power plant owner instead of going through the grid.
  - Electricity sales price shall be negotiated between the power plant and the grid, leaving profit margin for the grid company.

# Summary

- CMM-to-gas markets model shows great potential for post-Kyoto time.
- CMM to power for coal mine internal use will continue to be the core of CMM utilization in China.
- CMM based power to grid is possible, but changes need to happen.

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#### Thank You!

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