

# Mechanisms for Incentivizing Coal Mine Methane (CMM) Capture and Utilization

**Meredydd Evans and Volha Roshchanka**  
Pacific Northwest National Laboratory (PNNL)

*Seminar: Coal Mine Methane Recovery and Utilization*  
*Kyiv, December 10, 2013*

# Contents



- ▶ The role of policy in coal mine methane (CMM) utilization
- ▶ Enabling conditions and policies for stimulating CMM
- ▶ Other policies supporting CMM
- ▶ CMM-specific policies
- ▶ Options and opportunities for Ukraine



**Pacific Northwest**  
NATIONAL LABORATORY

*Proudly Operated by Battelle Since 1965*

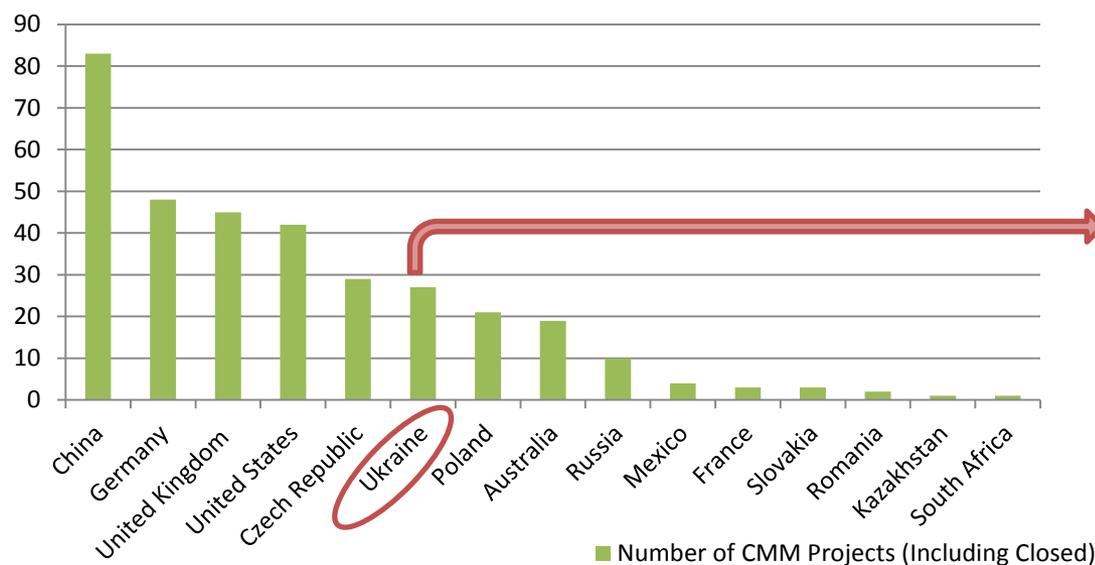


# The role of policy in coal mine methane (CMM) utilization



- ▶ Policy defines the playing field for CMM projects, creating the tipping point for project feasibility
- ▶ In several countries (Australia, Germany, Poland, UK, China), introduction of policies supporting CMM led to more implemented projects

Number of CMM Projects Per Country



- ▶ More than a half of Ukraine's CMM projects were/are supported by Kyoto's Joint Implementation (JI) mechanism
- ▶ Ukraine – the most active country in JI



# Enabling conditions and policies



- ▶ Certain geologic, market, and policy pre-conditions can help make CMM projects economic even without CMM-specific support from policymakers
- ▶ Such enabling conditions include:
  - Mine gassiness
  - Composition of gas flows
  - Cost-reflective prices for natural gas and electricity
  - Clearly defined property rights
  - Strict safety requirements
  - Access to energy (electricity and gas) infrastructure and markets



**Pacific Northwest**  
NATIONAL LABORATORY

*Proudly Operated by Battelle Since 1965*

# Enabling conditions and policies

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

## MORE POLICY SUPPORT NEEDED

CMM-specific policies

Subsidies  
Feed-in tariffs and obligations  
Tax incentives  
Strong institutional support  
Environmental taxes



vs.



China has experienced challenges in implementing safety requirements. Government decided to encourage CMM projects as a way to improve mine safety. **Carrots tend to work better than sticks!**



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 ✓

# Policies on enabling conditions



- ▶ Examples of policies that support enabling conditions:
  - Clearly defined property rights:
    - In Germany, CMM ownership rights are automatically transferred to a coal mining company for the duration of the coal mine lease
  - Cost-reflective prices for electricity are beneficial for CMM projects—it is hard to compete against low-cost, subsidized fuel
    - Germany has the highest electricity prices in Europe
    - Ukraine has high natural gas prices



**Pacific Northwest**  
NATIONAL LABORATORY

*Proudly Operated by Battelle Since 1965*



# Policies on enabling conditions



- ▶ Examples of policies that support enabling conditions
  - Strong implementation of safety requirements boosts CMM:
    - Australia's CMM development – driven by safety concerns
    - Russia recently adopted a law specifying that a mine has to be degasified, if it has over 13 m<sup>3</sup>/t of methane
    - In China, incentivizing CMM is seen as a way to improve mine safety due to poor implementation of safety rules
  - Access to energy markets:
    - Russian law provides equal access to the grid for CMM-fueled electricity
    - Eastern vs. western United States: differences in density of pipelines network



**Pacific Northwest**  
NATIONAL LABORATORY

*Proudly Operated by Battelle Since 1965*



# Other policies supporting CMM



## ► Environmental taxation:

- In UK, CMM power is exempt from Climate Change Levy. Under 2002 Finance Act, CMM is defined as exempt renewable because of environmental and employment benefits
- In Russia, charges for methane emissions increased in recent year. Base charges: 50 RUB/t (\$1.5/t), 250 RUB/t (\$7.6/t) within temporary limits, and 1,250 RUB/t (\$38/t) for emissions above temporary limits
- Kazakhstan recently adopted GHG emission trading scheme. CMM utilization can be GHG offsetting measure



**Pacific Northwest**  
NATIONAL LABORATORY

*Proudly Operated by Battelle Since 1965*

# CMM-specific policies (1)



- ▶ Strong institutional support, i.e. designated CMM authorities and regulatory agencies, can help identify policy options, technical barriers and reduce transaction costs for CMM
  - In Australia, national government established programs, such as Greenhouse Gas Abatement Program (GGAP) and Coal Mining Abatement Technology Support Package (CMATSP). The programs provide grants and supports research on deploying newer technologies to reduce GHG emissions



**Pacific Northwest**  
NATIONAL LABORATORY

*Proudly Operated by Battelle Since 1965*

# CMM-specific policies (2)

- ▶ Tax incentives: reduced/removed royalties and/or taxes on production, income, capital purchase
  - Poland exempts CMM-based electricity from excise tax
  - Germany: no taxes on methane extraction, regardless of whether it is used or unused
  - In China, several tax rebates to encourage CMM:
    - Royalties for exploration rights and mining rights: exempted for the first year, 50% deducted for the 2nd and 3rd year, 25% deducted for the 4th to 7th year
    - Royalties: < 1 bcm royalties exempted; 1-2.5 bcm 1%; 2.5-5 bcm 2%; >5 bcm 3%
    - No income tax on CMM projects
    - VAT not applied or rebated on CMM/CBM sale



## CMM-specific policies (3)



- ▶ Feed-in tariffs and obligations can help boost investment while market for CMM develops
  - In 2000, CMM included in the German Renewable Law. CMM power is guaranteed a price of about €0.07/kWh
  - Poland: since 2011, utility obligation to purchase up to 2.3% of electricity from highly efficient cogeneration, like CMM (Purple Certificates)
  - In China, companies are offered a feed-in tariff of 0.25 yuan/kWh (\$0.04/kWh). However, implementation of this law has not been universal



**Pacific Northwest**  
NATIONAL LABORATORY

*Proudly Operated by Battelle Since 1965*

# CMM-specific policies (4)



## ► Subsidies for CMM

- China provides substantial subsidies for CMM projects, by international comparison
  - In 2005, Chinese central government offered 0.2 yuan/m<sup>3</sup> (\$0.03/m<sup>3</sup>), but in 2013 the production subsidy increased to 0.6 yuan/m<sup>3</sup>(\$0.1/m<sup>3</sup>)
  - Local subsidy is also expected with national promotion of clean energy (shifting from coal to gas)



**Pacific Northwest**  
NATIONAL LABORATORY

# CMM in Ukraine

- ▶ High energy prices in Ukraine make CMM projects attractive
- ▶ Ukraine's legislation in general supports CMM projects, but there is room for improvement
  - Coal production licenses automatically authorize coal producers to extract and emit or utilize CMM, but no easy transfer of ownership
  - Attempt at Green Tariff Law, but not specific for CMM
  - Until recently, Ukraine had no production taxes on CMM gas
- ▶ About 15 JI projects in Ukraine, most using CHP or new boilers
- ▶ Without JI, domestic policy will be definitive for CMM projects



**Thank you!**



**Pacific Northwest**  
NATIONAL LABORATORY

*Proudly Operated by Battelle Since 1965*