Coal Mine Methane
Drained from Surface Drilled Wells in the USA—
No Longer an Unconventional Gas Resource

Coal Mining Methane Abatement Seminar
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Overview of the Unconventional Gas Revolution
Location of Sedimentary Basins of the Lower 48 States of the USA

Sources: Energy Information Administration; International Energy Agency
US Coalbed Methane Cumulative Production (BCF)
By Basin To 12/31/06

Data sources: Production from State Oil & Gas Commissions and State Geological Surveys. Basins from USGS (Tully).
Projection: Albers NAD 27

Notes: 2006 CBM production from PA and WV not yet available; assumed to be equal to 2005 volumes for this study. Forest City Basin production is entirely in KS, volumes are separated from Cherokee portion of KS but only from <3% of KS wells. OK volumes do not include CBM - conventional cased drilled completions.

Source: EIA
What Spurred the Growth of CBM Development and CMM drainage from Surface Wells?

- Access to 300,000 miles of oil and gas transmission pipelines linking production to markets
- Economic Incentives- tax credits
- Technological breakthroughs in drilling and production as an outgrowth of public-private partnerships-i.e. USDoE and oil and gas industry partners; and the Gas Research Institute and industry partners
Natural Gas Transmission Pipeline
Map of Conterminous USA

Legend
- Blue = Interstate Pipelines
- Red = Intrastate Pipelines

Source: EIA
Economic Incentives

• **1978**-First, but modest incentives under the Natural Gas Policy Act which deregulated wellhead sales price for gas shales, coal seams and geopressured brines. Section 102 of the act enabled “tight gas” to be eligible for highest ceiling price in the regulated categories.

• **1980**-Greatest incentives for unconventional gas production were contained in Section 29 of the Crude Oil Windfall Profits Tax Act. Provide significant credits for specific formations and wells drilled before December 31, 1992: about $1.00/Mcf. Tax credits expired in 2002.
Growth in Unconventional Gas Production 1990-2011
Annual Production and Sales Price—Coal and Natural Gas on Heat Content Basis
Forecast of Incremental Benefits Resulting from Improvements to Production Technology
Examples of Minable Coal Resources Drained by Wells Drilled From the Surface
Powder River Basin—Wyoming
Annual Wyoming CBM Production

Wyoming Coalbed Methane Production

Source: U.S. Energy Information Administration
Black Warrior Basin—Alabama

Jim Walter Resources
No. 4 and No. 7 Mines
Black Warrior Basin, Alabama
Annual CBM Production
Black Warrior Basin—Alabama
San Juan Basin—New Mexico
Annual CBM Production
San Juan Basin—New Mexico

New Mexico–West Coalbed Methane Production
Billion Cubic Feet

Source: U.S. Energy Information Administration
Ration Basin—Colorado
Annual CBM Production—Colorado
Observations

• Unique set of circumstances in USA have led to effective development of unconventional gas resources—which are now not so unconventional

• Economic incentives are important for development of resources, but so is access to ready market—coevolution is key to sustainability

• Low energy price coupled with tight environmental oversight is key to commodity consumption being driven toward highest use—market selectivity
Thank You

For more information...

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