



Shale Oil/Gas Outlook

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Presentation outline

- What is the “Shale Gas Revolution”?
- Why did it happen in the USA?
- Can it continue in the USA and if so with what implications for US liquids production?
- Can the experience be replicated elsewhere?

The “Shale gas revolution”

- What is it?
 - Increased shale gas production in the last few years
 - BUT ... long time (over 20 years) in the making
 - Based on using technology – horizontal drilling + fracking
 - Triumph of private enterprise (the Momma and Poppa companies) and open markets? YES BUT...
- Why did it happen in the USA?
 - Favourable conditions

Favourable characteristics in the USA

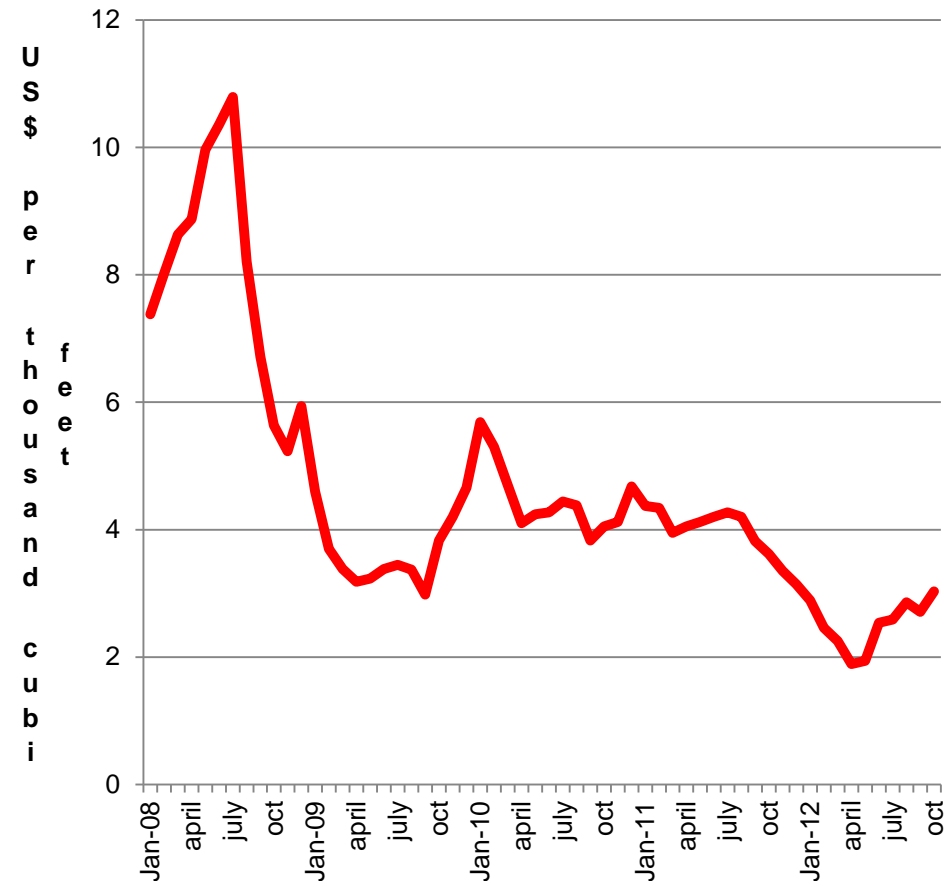
Characteristic	USA
Favourable geology	Yes
Lots of drill core data to help identify “sweet spots”	Yes
Weak environmental regulation for fracking	Yes
Tax credits + Intangible drilling cost expensing	Yes
Property rights to the landowner	Yes
Pipeline access easy –large network + common carriage	Yes
Selling gas into a “commodity supply” market very easy	Yes
Dynamic and competitive service industry	Yes
Population familiar with oil and gas operations	Yes
Licensing large areas with vague work programs	Yes
Significant government investment in R & D	Yes
Much of the shale gas has high liquids content	Yes

Can it continue in the US?

There are current US concerns

- Low domestic gas price.
But ...
 - Hedging
 - High Liquid content
- Environmental concerns
 - The “Halliburton Loophole and EIA’s
 - Fugitive methane emissions and greenhouse gas levels
 - But driven by the urge for “Energy Independence” - North Dakota = the next member of OPEC

US Wellhead monthly gas price
2008-2012



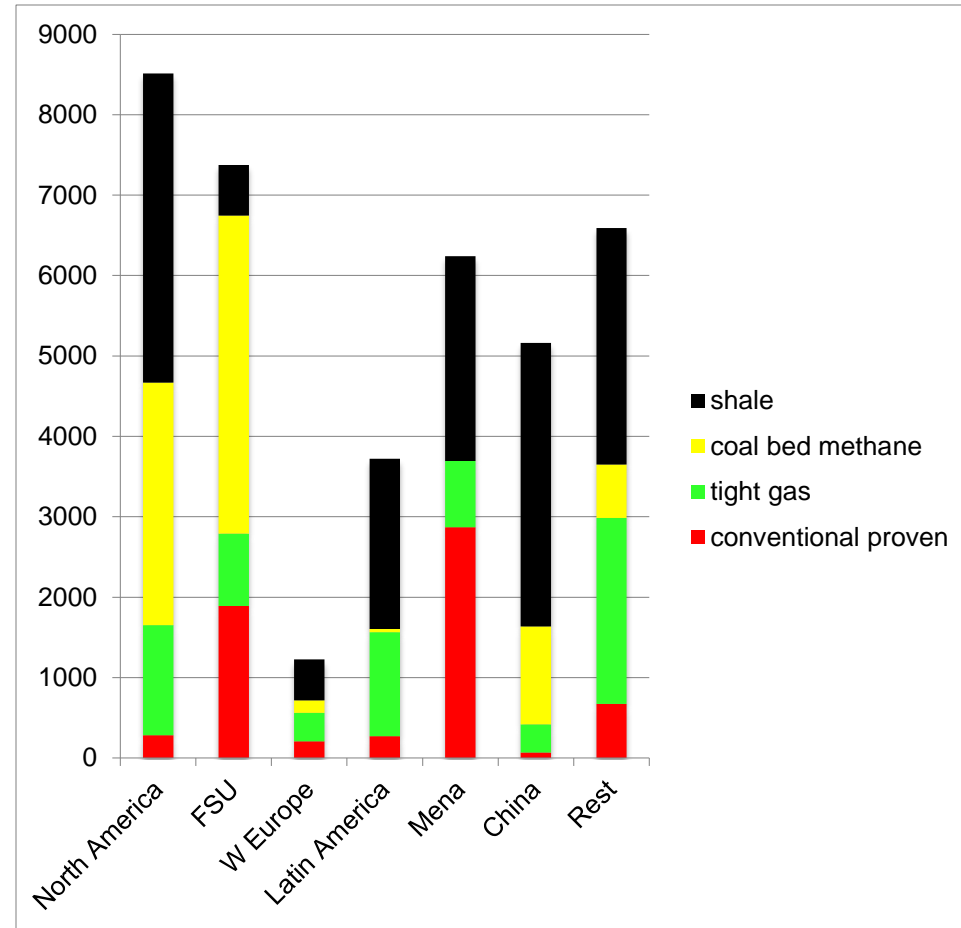
Implications of a continuation in the USA

- Rising liquids production from shale gas, shale oil and fallow oil fields = reduced import dependency
 - Considerable macro economic consequences – half the US current account deficit from oil
 - Mythologies regarding policing the sea lanes and intervention in the Middle East
 - But how will this be seen in China?
- Increased gas availability and lower gas prices
 - Potential impacts on demand for transport fuels
 - Revitalization of US petrochemicals
- USA increasing coal exports especially to Europe

“The Shale Gas Revolution” Can it be replicated elsewhere?

LOTS OF RESOURCES

- Naughty slide –reserves and resources
- But beware estimates of “resources”
 - POLAND



Conventional proven: BP Statistical Review of World Energy 2008

Others: NPC Unconventional Gas Topic Paper 29 July 2007

Favourable characteristics Elsewhere?

Characteristic	USA	EU	???
Favourable geology	Yes	No	?
Lots of drill core data to help identify “sweet spots”	Yes	No	?
Weak environmental regulation for fracking	Yes	No	?
Tax credits + Intangible drilling cost expensing	Yes	No	?
Property rights to the landowner	Yes	No	?
Pipeline access easy –large network + common carriage	Yes	No	?
Selling gas into the market very easy	Yes	No	?
Dynamic and competitive service industry	Yes	No	?
Population familiar with oil and gas operations	Yes	No	?
Licensing large areas with vague work programs	Yes	No	?
Huge government investment in R & D	Yes	No	?
Much of the shale gas has high liquids content	Yes	?	?

Conclusions on the possibility of replication?

- For Europe – don't hold your breath! 5 to 10 years no
10 to 15 years possibly
- Elsewhere – for example China – perhaps more hopeful but there are barriers
 - Geology?
 - Water?
 - Domestic gas prices?
 - Etc.?
- Implications for global liquids production?

Thank you for your attention

- Recent relevant publications from www.chathamhouse.org
 - Paul Stevens – The “Shale Gas Revolution”: Hype and Reality. Chatham House Report October 2010
 - Paul Stevens - The “Shale Gas Revolution”: Developments and Changes. Chatham House Briefing Paper, August 2012