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The Importance of 'shale gas' its global implications

Konrad Adenauer Stiftung, Berlin.

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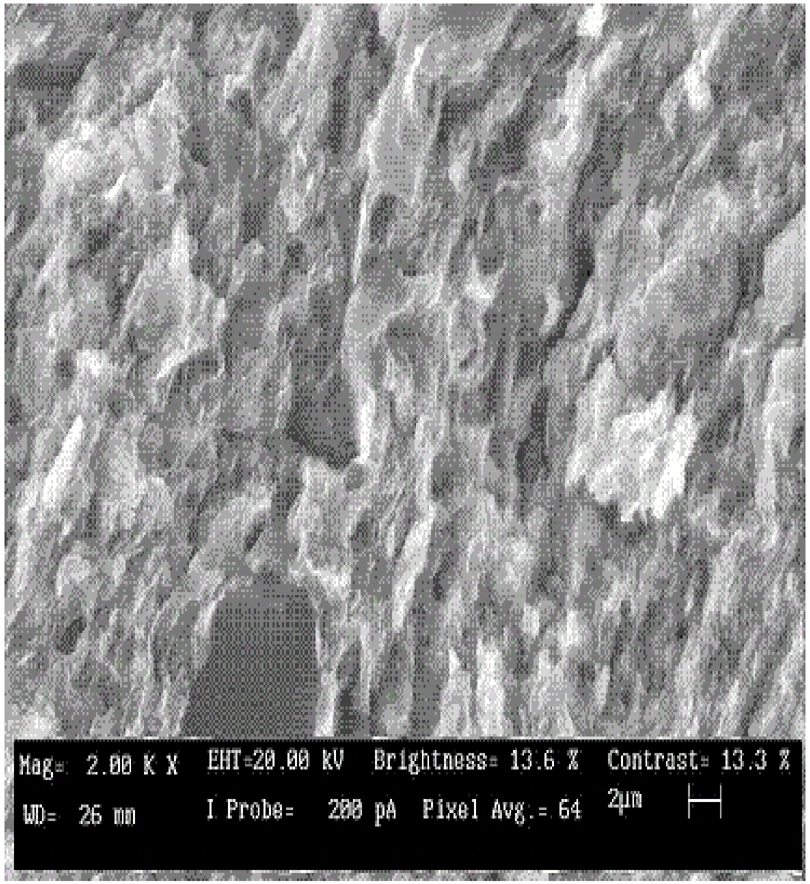
Professor Alan Riley

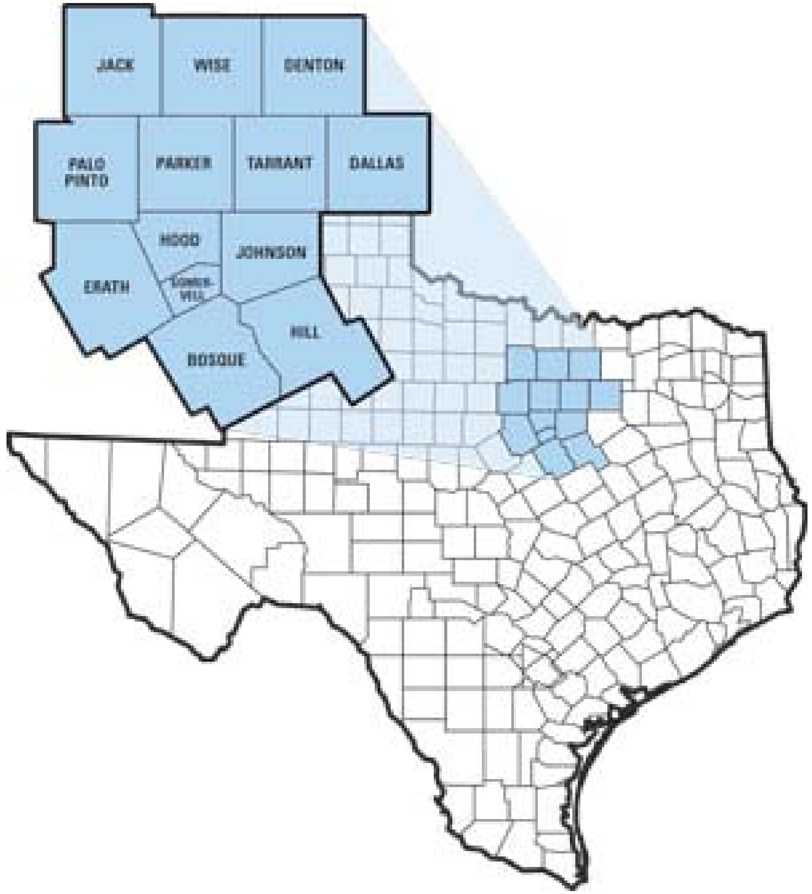
What is unconventional gas?

- Gas found in pockets in rock
- Rock shale
- Coalbed
- Sandstone
- Far greater quantities of gas available from unconventional sources
- 19th Century Extraction Failed-Deemed Uneconomic



Unconventional Gas Development

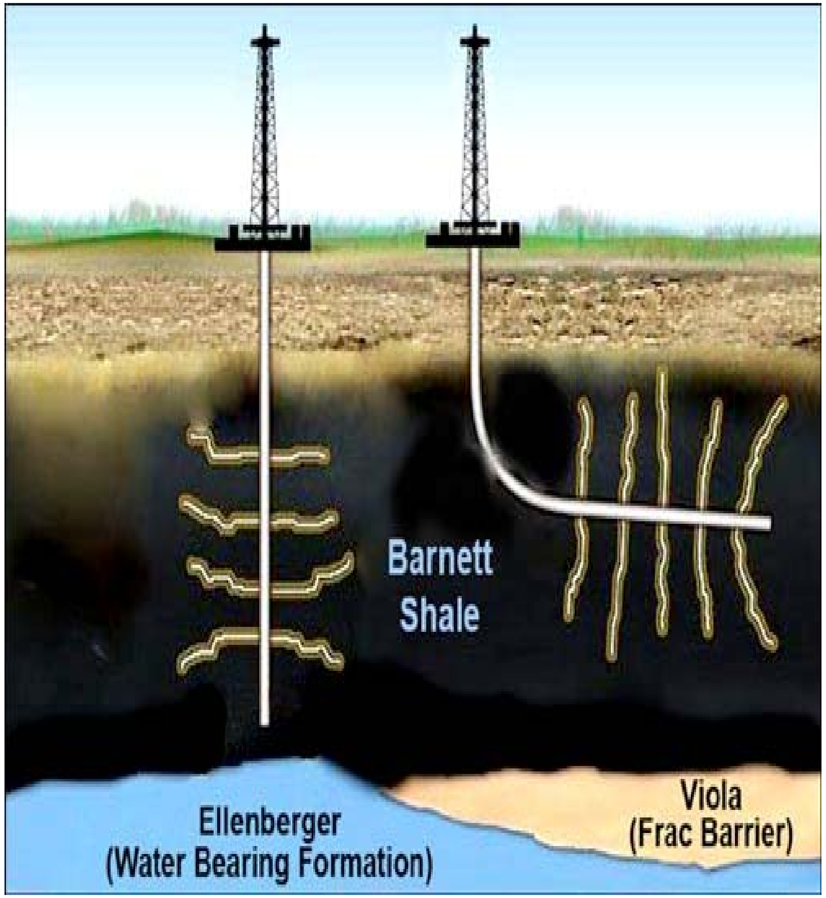
- US Federal Government Programme
- Support Development of extraction from rock shale, coal bed methane and tight sands
- Barnett Shale in Texas first major development

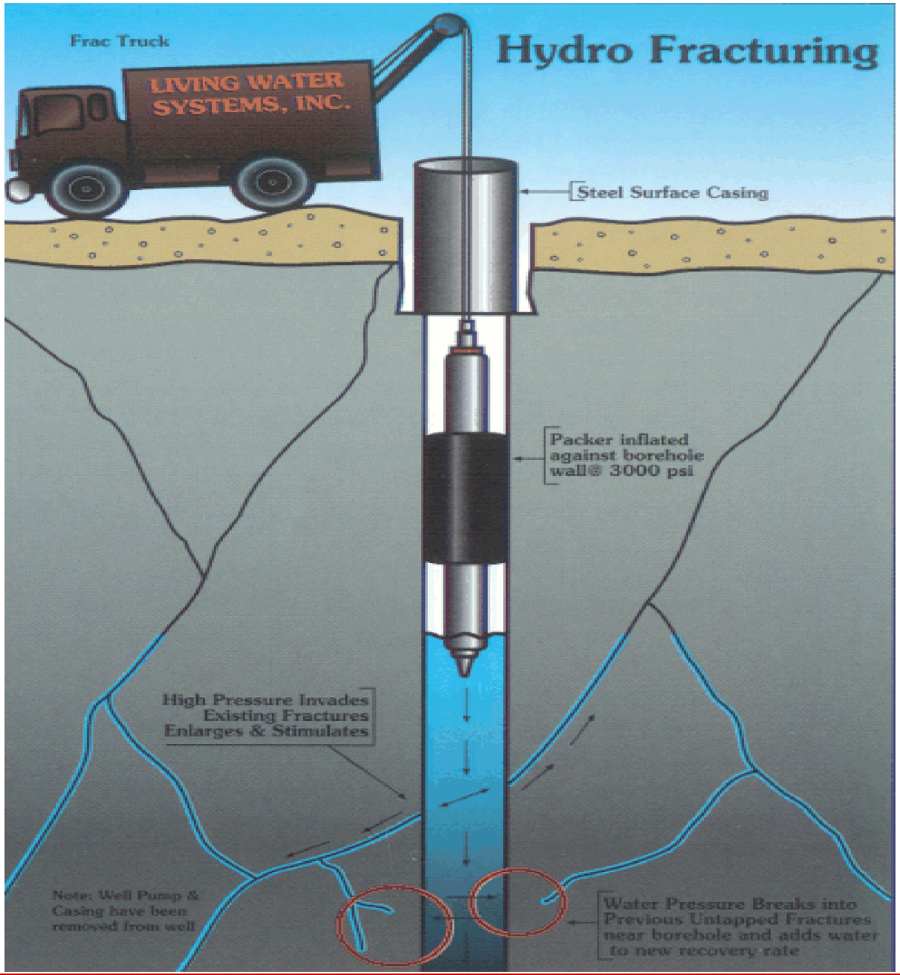


The Unconventional Gas Revolution

- George Mitchell recognised the potential of unconventional resources
- As early as 1981.
- Made fundamental technical and knowhow breakthroughs
- Sold Mitchell Energy to Devon in 2002 $3.5 billion

Key New Technological Developments





Impact on US Market

- Step by step innovation transformed industry
- Significant impact on US gas production over last 5 years
- 2008 Unconventional Gas 50% US gas production, 2015-65%?
- XTO acquired by Exxon for $41 billion, Dec 09.

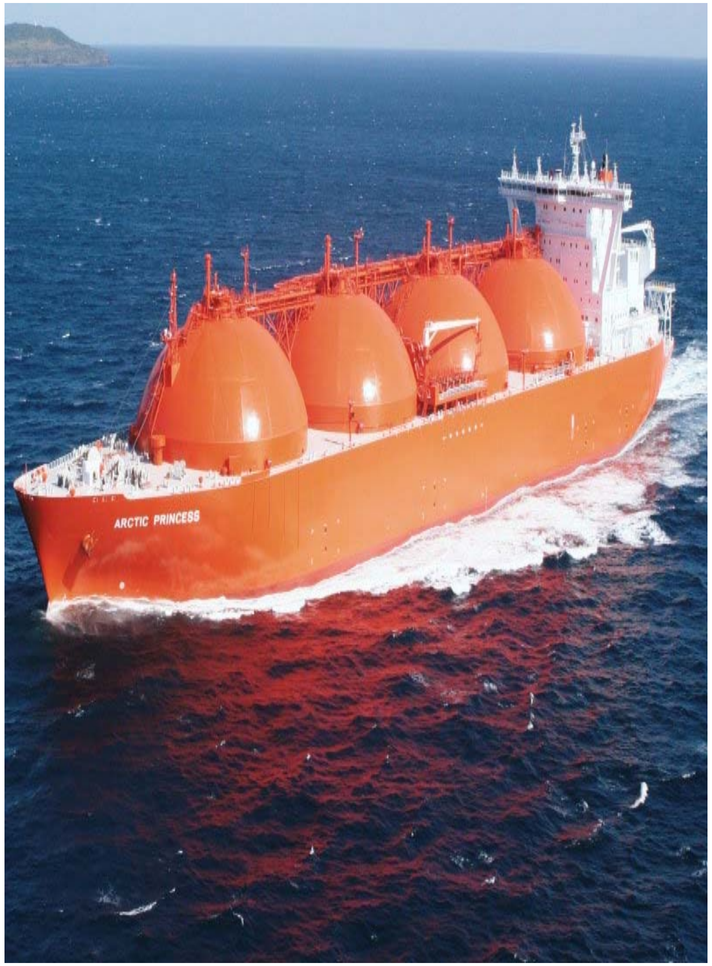
XTO ENERGY

Global Potential of Unconventional Gas

- US/Canada 233TCM, WE 29TCM, CEE 7TCM, exUSSR 155TCM, Central Asia/China 144TCM (IEA WEO, 2009). CF Russian conventional reserve 47TCM.
- Warning: on the one hand not all resources accessible
- But on the other hand figures may underestimate the resources available

LNG Impact on Unconventional EU Debate

- Global LNG Production 2008-240bcm to 2013-410bcm
- At same time US LNG market collapse due to unconventional gas-increasing EU energy security-'LNG Effect'
- Potential reinforcement of 'LNG Effect" with Chinese development of unconventional gas
- "LNG Plus": unconventional gas is exported as LNG



European Potential

- Unconventional Exploration across Europe, UK, France, Austria, Hungary, Germany, Sweden & Poland
- Most immediate direct development is likely to be for coalbed methane.
- Poland-50 licences principally SE Poland awaiting drilling results. Current estimates 1.5tcm
- Potential of Ukraine. Startling results from Eurogas Donetsk Basin 12tcm from 5 concessions

Environmental Issues

- Greater density of wells to produce gas-’operational footprint’ much greater than conventional gas
- Effective water collection and treatment systems for liquids in hydro fraccing
- Water table protection-danger of drilling through aquifers
- Flaring when testing the wells.
- European Adaptation?

Market Impact of Unconventional Gas

- Even if relatively small development within the EU still significant
- LNG Effect-Most LNG for Europe and Japan
- LNG Plus-Europe becomes a gas sales target for unconventional gas shipped by sea
- Significant gas liquidity-greater development of spot markets.
- Fundamental break in link with oil price

Uncoventional gas & the Single Market

- Unconventional gas makes EU single market in gas much more credible
- No bottleneck at supply level-now diverse gas supply available
- New gas market entrants will seek to use EU third party access rules
- New entrants will finance new interconnections reinforcing single market

Impact on Russian Gas Exports

- Significant competition for Gazprom from LNG
- Shale and coalbed gas produced locally would be cheaper than Siberian gas
- Are Yamal & Shtokman economic in a more liquid gas market?
- In a more price-focussed market access to cheaper pipelines count
- Will Southstream undermine Russian access to EU markets?

Saving Gazprom

- Gazprom has cheaper gas-secondary fields & unconventional near existing infrastructure
- It needs to lever that massive resource base to maintain market power
- To succeed Gazprom needs to function in a market structure which focuses on efficient pricing and capital allocation
- This approach would require a significant degree of liberalisation and EU investment

C02 Impact

- Enormous gas resource base
- Potential for switching from coal to gas & cutting C02.
- EU requirements to close oldest polluting coal plants-gas replacement?
- Gas bridge to low carbon future
- Danger of gas resource so large we are seduced by gas we become “stuck on the bridge”

Beyond Gas: GTL Question

- If resource base is so large and accessible will Gas to Liquid Technology come of age?
- Do the IOCs see unconventional gas resources as a means to redress the balance with the NOCs?
- Will the IOCs also promote mobile electricity to further reduce the power of the NOCs and increase reliance on gas power generation?