An environmental view of fracking

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Fracking is driving down natural gas prices
Shale gas boom helps slash US emissions

By Guy Chazan

The shale gas boom has led to a big drop in US carbon emissions, as generators switch from coal to cheap gas.

According to the International Energy Agency, US energy-related emissions of carbon dioxide, the main greenhouse gas, have fallen 450m tonnes over the past five years – the largest drop among all countries surveyed.

Fatih Birol, IEA chief economist, attributed the fall to improvements in fuel efficiency in the transport sector and a “major shift” from coal to gas in the power sector. “This is a success story based on a combination of policy and technology – policy driving greater efficiency and technology making shale gas production viable,” Mr Birol told the Financial Times.

Shale gas has transformed the US energy landscape, with surging production pushing gas prices down to 10-year lows and heralding an industrial renaissance. But it is also the subject of a heated environmental debate, with critics alleging...
Lower gas prices have impacted CO₂ emissions
Coal-fired power plants are closing due to fracking
CO₂ emissions from coal power are dropping due to greater use of gas plants.
Thermal cooling uses half of water withdrawals
Natural gas uses less water than coal for cooling...

...and emits less CO₂...

Source: NETL.
...as well as fewer conventional pollutants.
Marcellus water use is expected to be ~1% of consumption approved for power sector.
Life-cycle GHG estimates vary
Well inspections vary widely by state

Regulatory requirements also vary widely

Wells mapped against air quality monitoring in PA

Legend

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<th>Air Quality Index</th>
<th>Count</th>
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Source: CNA, derived from Jerz et al. (2008); GIS data from EPA, National Atlas, and ESRI. Air quality data from EPA. Well and permit data from Pennsylvania Department of Environmental Protection.

Marcellus Wells - 5,150
Marcellus Permits (Unconiled) - 2,482
Figure 18: Forecast for Marcellus Natural Gas Production, 2009-2020

http://www.alleghenyconference.org/PDFs/PELMisc/PSUStudyMarcellusShale072409.pdf
Medium Development Scenario
(10,000 new well pads by 2030 with an average of 6 wells per pad)

Projected Pad Locations
Probability Surface
High
Low

Source: Johnson, et al., PA TNC, 2011
Shale gas reserves are extensive

GLOBAL GAS RESERVES
Using fracking to access shale gas would vastly increase gas resources in many countries. Russia and the Middle East are not included because their large reserves of easily accessible gas will render shale gas less important there.
World Natural Gas Trade Flows, 2010 (bcf)

Source: BP Statistical Review of World Energy 2011