

Box 1

THE IMPLICATIONS OF THE RESURGENCE IN FOSSIL ENERGY PRODUCTION

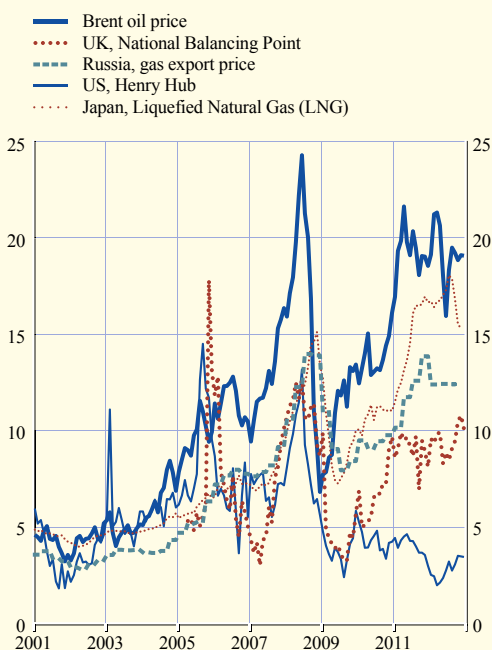
Over the past decade, technological advances have resulted in a resurgence in global fossil energy production. The combination of horizontal drilling techniques and hydraulic fracturing has provided access to large volumes of shale oil and gas trapped in shale formations of low permeability, which were previously inaccessible and the extraction of which was uneconomical with traditional methods.

As regards shale gas, production has increased substantially, mainly in the United States. According to the US Energy Information Administration (EIA), US shale gas production is expected to account for about half of total US natural gas production by 2035.¹ At these levels of production, unconventional gas will more than offset declines in conventional gas sources, with the implication that the US might become a net exporter of natural gas by 2022.

It is not only the United States, but also other parts of the world, that hold vast shale gas reserves. China may contain the largest shale gas reserves, although parts of Europe, South America and Africa may also have access to

Chart A Regional natural gas prices and Brent crude oil price

(USD/MMBtu¹⁾; monthly data)



Sources: Bloomberg, Haver and Fame.
Notes: Last observation of the price of LNG in Japan is for November 2012, and of other gas benchmarks December 2012. Quarterly data for Russia's gas export price; last observation is for the third quarter of 2012. The Brent oil price has been converted to USD/MMBtu.
1) MMBtu denotes one million British thermal units.

1 See the EIA's Annual Energy Outlook 2012.

significant unconventional resources. This implies that shale gas could play an increasingly important role in global natural gas markets.

The rise in shale gas production has caused US gas prices to drop to a ten-year low (see Chart A). Mainly as a result of high transportation costs, but also owing to regulations², there is no global gas price, and the impact of shale gas on international gas prices has so far been limited. In continental Europe, for example, most gas is delivered through pipelines and sold on long-term contracts linked to the price of oil. In Japan, gas prices are also linked to oil prices and gas is generally imported in the form of Liquefied Natural Gas (LNG). So far, high costs (in terms of liquefying, transporting and deliquefying LNG) have limited the degree to which international price differences have been arbitrated away. However, recent technological advances which are expected to reduce transportation costs, together with a potential loosening of export restrictions in the United States, could reduce the regional segmentation of markets for natural gas and thereby lead to some convergence of global gas prices.

More recently, there has also been a substantial rise in the extraction of shale oil, so far largely in North America. Other countries with the potential for an increase in extraction are China, Argentina, Mexico and Russia. According to the projections of the International Energy Agency (IEA), ultimate recoverable resources worldwide include about 250 billion barrels of shale oil – which equates to around 10% of remaining conventional resources.

The increase in shale oil production in the United States and Canada has reduced the price of West Texas Intermediate (WTI) crude oil and contributed to the widening spreads between international benchmarks such as the Brent crude oil price and the WTI (see Chart B).

Looking ahead, estimates by the IEA imply that the United States will significantly reduce its energy import dependency, which could result in a reduction in the US trade deficit.³ According to the IEA, the self-sufficiency ratio (defined as the ratio of indigenous energy production over total primary energy demand) is expected to rise to 97% by 2035, which contrasts with anticipated developments in other regions, such as the EU, which is expected to become less self-sufficient.

There is, however, considerable uncertainty as regards the volume of shale gas and oil reserves and the extent to which these will be recovered. This is crucial in determining the outlook for global energy markets. In Europe, however, stricter regulations, less experience, higher density of population and stronger environmental headwinds make a high recovery rate less likely than in the United States.

Chart B Brent-WTI spread

(USD/barrel; daily data)



Source: Bloomberg.

Notes: Last observation refers to 28 January 2013. Positive values imply smaller values of WTI compared with Brent.

² For example, in the United States natural gas cannot be exported without the explicit approval of the US Department of Energy.

³ See the IEA's World Energy Outlook 2012.

When facing energy price fluctuations, central banks must understand their nature and how they will propagate through the economy to affect output and prices. However, in an environment where there is a credible central bank, energy price fluctuations should not affect inflation expectations over the medium to long term.

