

North America's unconventional energy boom  
By Economist Intelligence Unit



**What is the prospect for unconventional energy in North America?**

North America is in the midst of an unconventional energy boom that has transformed its prospects for energy self-sufficiency and helped reduce its carbon footprint in little more than five years. The expansion of shale gas production in the United States, the development of tar sands in Canada and the accelerating development of wind and solar power have not only altered the outlook for both countries, but continue to unsettle global energy markets.

While these new resources appear to be abundant, the economics of developing them remain in doubt. Most notably, to what extent are current record low natural gas prices, brought about by shale gas discovery on the continent sustainable? How will these prices affect the development of renewable energy projects and other unconventional energy sources? And what is the likely long-term impact on the geopolitical energy power balance?

**The oil and gas bonanza**

Recoverable shale gas resources have had a dramatic impact on U.S. energy markets and supply since the middle of the last decade. Shale gas accounted for more than 20% of domestic gas production in the US in 2010, up from around 5% in 2007, and is expected to make up more than 46% by 2035, according to the US Energy Information Administration (EIA).

“The resource base is enormous and it is no longer an issue of whether the gas is there,” says Guy Caruso, Special Adviser to the Center for Strategic and International Studies in Washington DC and former administrator of the EIA. Yet much of the investment in shale projects is motivated by a race to develop shale oil, for which the economics are far less clear. “Regarding oil, there is a little way to go before we get overly enthusiastic,” adds Mr Caruso.

Conservative estimates by the US Geological Survey and the EIA suggest these new sources of natural gas could provide around 80 years of supply at current levels of US consumption, says Mr Caruso, with the result that the country will soon be a net exporter of natural gas.

Indeed, notes Scott Foster, director of the Sustainable Energy Division of the United Nations' Economic Commission for Europe (UNECE), "there is an expectation now that these gas resources will be available for some time, and, as a result, everyone intending to import gas and build LNG terminals or planning to build them, has had serious reversals".

Some of the shale oil and gas deposits extend north of the border, meaning that Canada is likely to benefit from the new technology as well. It is already a large net exporter of gas and is looking to build oil and gas pipelines to transport its own liquids, most of which are currently coming from Canada's tar sands, according to Mr Caruso.

Yet, despite the huge scope of the new gas and oil resources, doubts remain about whether it will be developed to its full potential. Technical difficulties make it more costly to extract gas from shale formations, Mr Caruso says, and shale oil is even more complex.

"The abundance of shale gas and the race to develop it has led to a sharp fall in natural gas prices. This development has led to coal-fired electricity generators being replaced by gas-fired ones and helping to reduce carbon emissions. However some wells in shale deposits are still uneconomic. Canada faces similar challenges, with billions of dollars of investment and even higher costs."

In addition, there are environmental concerns associated with the hydraulic fracturing, or "fracking", process used to release shale deposits. Both Mr Caruso and Mr Foster agree that it is in producers' interest to avoid cutting corners and introduce best practice standards. Yet, with developers ranging from multinationals to small exploration companies, finding a regulatory regime that will work across the board remains a challenge.

#### **Uncertainty around renewable projects**

The renewables sector has also seen an upsurge, with the US wind industry adding 13.2 gigawatts of new capacity in 2012, up 102% from 2011, according to Bloomberg New Energy Finance.

Solar energy projects have expanded by a compound annual growth rate of 58% between 2004 and 2012, according to Bloomberg, driven in part by increasing interest among non-traditional investors who find the proven photovoltaic technology and return profiles of solar projects appealing.

Other unconventional energy sources, such as biofuels, have been more disappointing for investors, amid doubts over corn ethanol projects and whether the technology for producing fuel from cellulosic materials will ever be economically viable without heavy government support.

Analysts point out that renewables projects remain heavily dependent on local and federal government subsidies to compete in energy markets. This was one reason for the acceleration of wind turbine projects toward the end of 2012, ahead of the expiration of the Production Tax Credit, a key industry subsidy. Meanwhile, the steep decline in natural gas prices resulting from development of shale deposits is increasingly putting pressure on renewables projects such as wind, threatening to make them less economically competitive. "The willingness of politicians to provide incentives for renewables is under pressure given the current economy," says Mr Caruso.

#### **Changing the global energy balance**

The aggressive development of unconventional energy sources in North America is transforming global energy markets. "There are already some exports from US terminals instead of imports, and the fact that you are not importing changes the equilibrium, leaving that gas looking for another home," says Mr Foster of UNECE.

The impact has been most significant in Europe, where the UK, the Netherlands, France and Spain are all benefiting from additional volumes of natural gas that might otherwise have been shipped across the Atlantic.

There are other less expected repercussions playing out, adds Mr Foster. As the downward pressure on US natural gas prices has allowed gas-fired power to displace coal, it has contributed to higher emissions in countries such as Germany, which has imported some of the excess US coal supplies. While gas prices could stay depressed in the near-term, most forecasts assume they will increase gradually, says Mr Caruso. A range of factors including public policy incentives to use natural gas in transport and the prospective return of chemical manufacturing to the US, will help determine if US oil imports decline further. A gradual recovery in gas prices could also help support renewable energy projects, which are still likely to be the fastest growing segment of US energy mix in the near-term, adds Mr Caruso. The future outlook for North America's unconventional energy boom will depend on this complex interplay between market forces and incentives.