Energy price volatility in fossil fuel markets

The rising cost of energy and its effect on economic growth are often blamed on the financial markets, even though the evidence suggests the issue is a fundamental question of supply and demand

By Maria van der Hoeven, executive director, International Energy Agency

Forecasts in today's energy commodity markets are marked by uncertainty – driven on the supply side by factors both above and below ground, and on the demand side by an economic recovery threatened by high energy (particularly oil) prices. In the end, it is those high prices that all rightly worry about, even when discussing volatility. Indeed, price volatility itself, even in oil prices, is not particularly pronounced. What has changed is that prices have risen significantly since 2002, so that a few percentage points up or down now represent multi-dollar swings. But that does not mean that these increases are not costly, or that volatility does not seem or feel more pronounced to the economy and to the public. At such high levels, every small increase is cause for concern. Much has been made about how to rein in volatility, but in order to curtail such price movements it is necessary to understand their drivers.

The real role of speculators

Volatility is often blamed on the growing interdependence between the physical and financial markets for oil and other commodities. Much has been made of the huge influx of capital in the past decade into crude oil and other commodity derivatives, which breached $430 billion in 2011, compared to around $55 billion in late 2004.

Commodities emerged as a distinct asset class, and represented a good hedge against underperforming equities or dollar depreciation. Capital influx into derivatives has caused some analysts to suggest that the 'financialisation' of commodities must therefore have underpinned the concurrent general price rise and volatility – particularly for crude.

But even if speculators have never been popular and tend to attract blame, a market without speculators (to take the other side of price-hedging transactions for physical market players) would arguably be a much more volatile one. Futures markets serve the important twin functions of risk transfer and price discovery, taking opposite positions to hedgers in the physical market and improving linkages between crude oil futures prices at different maturities as participation of commodity swap dealers and hedge funds has increased. Speculators should not be viewed as adversarial agents. Rather, they are essential participants for the proper functioning of commodity derivatives markets by providing the necessary liquidity, thereby reducing market volatility.

In addition, the analysis produced by the International Energy Agency (IEA) tends to cast doubt on the ill-defined concept of 'excessive' speculation within the crude market. The ratio of speculation to hedging demand in the crude futures market is consistent with that for other commodities, and has levelled off or declined since 2008.

The supposed 'smoking gun' of speculation underpinning higher crude prices is much less evident if one considers non-exchange-traded commodities. Among them, prices rose at a greater scale and pace than that of crude oil from 2006 to 2008. Indeed, the volatility in prices during 2000–10 for most non-exchange-traded commodities either matched or exceeded that for crude oil.

That said, speculative activity does affect price volatility. However, joint IEA workshops with the International Energy Forum (IEF) and the Organization of Petroleum Exporting Countries (OPEC) have suggested that the impact is largely confined to the very short term. Over longer periods, physical market parameters and expectations about their future development play a much greater role in price determination than does derivative market activity.

The IEA supports the efforts of regulators worldwide to enhance market transparency in commodity derivative markets. But regulators must avoid moves that excessively restrict the ability of participants on the physical side from hedging their price risks – by restricting the speculators who take on that risk while performing essential roles in liquidity and price discovery.

So what drives energy price volatility, if not financial speculation? The answer, like that to most economics questions, is supply and demand. If a very inelastic supply (due to long oil-project lead times and policy uncertainties for investment) meets a very inelastic demand

(due to oil's dominance of transport and especially fossil fuel subsidies), any change in the physical fundamentals will need a very large price change to return supply and demand to equilibrium. Reducing oil price volatility therefore requires stable regulatory and investment frameworks to encourage supply, and requires scrapping fuel subsidies that hinder price signals on the demand side. In some large consuming countries, high petrol taxes may wean consumers away from overreliance on hydrocarbons over the long term, but that needs to be balanced with their shielding effect on price signals.

Although energy price volatility is most often associated with oil (particularly crude), concerns about such natural gas and coal price movements have been rising. Together, they provide almost twice as much energy as oil, and form a backbone of power generation. For natural gas, some issues are similar to oil. Inelastic supply derives from an upstream environment with often problematic investment frameworks. On the demand side, price regulation and end-user subsidies are even more prevalent than for oil.

However, unlike with oil, due to the relative difficulties of gas transport (among other factors), there is no global market gas price. Consequently, gas price volatility is inherently regional. Among the regions, the only gas market liquid enough to see financial derivatives trading comparable to oil products is in North America – which also has the lowest gas prices. That does not support the theory that financial speculation is a primary driver of price inflation, but it does reflect the realities of market fundamentals – specifically, an abundance of unconventional supplies. Indeed, the rest of the world could well benefit from an expansion of gas trading. In Europe and, especially, Asia, relatively shallow and illiquid gas markets do not yet provide the trusted price signals that investors rely on.

More efficient gas markets will be needed as gas becomes the universal back-up fuel in an electricity sector with increasingly volatile demand. IEA research suggests that the elasticity of fuel switching is better in efficient electricity markets with adequate infrastructure. This not only enhances supply security, but also reduces price volatility.

Meanwhile, on the supply side, the most important development is unconventional gas technology. Shale gas has a very different financial profile than conventional gas: entry costs are lower and more scalable, and the majority of the financial value is realised in the first two years. All of this leads to a supply side that is more elastic. Indeed, there is empirical evidence of declining price volatility in the past three years in the United States.

Although energy price volatility is most often associated with oil, there have been growing concerns about natural gas and coal price movements

The enormous influence of China

For coal, events in one country have a particular influence on price. It is difficult to overstate the importance of China in coal markets. China's global market share in coal mining is four times that of Saudi Arabia in oil. China's share in coal demand is more than twice that of the US in oil. Chinese policy changes with regard to energy efficiency, nuclear investment or production in new mining areas can shift China's coal trade position and have profound implications for global markets. Increased visibility and better data on coal in China would have a welcome effect on reducing price volatility.

Although it may be tempting to blame financial markets and sinister speculators for energy price volatility (and indeed price rises), the evidence points to market fundamentals as the primary price drivers in oil, gas and coal markets. Policy efforts to reduce volatility should therefore work towards increasing the elasticity of both supply and demand – whether by facilitating investment or effective price signals. What they should avoid, though, are reactive and political gestures to curb those financial markets that often serve to actually reduce volatility. Even if politically expedient, poorly conceived regulation will not bring the prices down. ■

Progressing on subsidy reform: addressing the barriers

The G20 needs to champion the removal of fuel subsidies to create a level playing field for renewable energy and address climate change

By Mark Halle, director, Global Subsidies Initiative; executive director, IISD-Europe

Globally, governments spend at least $1.4 billion each day subsidising fossil fuels. The majority is spent in developing countries to lower fuel prices for final consumers. Since 2009, with the international oil price rising once again to around $120 per barrel, these subsidies have become financially unsustainable, particularly for net importers of petroleum products such as Indonesia and India. They place huge pressure on state budgets and create a fiscal liability vulnerable to volatile international oil prices. Subsidies contribute to fiscal debt, leading to deeper economic problems. In the wake of having its long-term credit rating downgraded, India has announced its intention to reduce fuel subsidies to cap the total subsidy bill (food and fuel) at two per cent of gross domestic product, down from 2.7 per cent.

Consumer subsidies are also very high in energy exporting countries, where they are used to redistribute wealth created from the country's energy reserves. However, subsidies are a very inefficient mechanism for doing so. They tend to be captured by vested interests and are not distributed equitably, with the largest share of the benefits going to those that consume the most energy. These countries, such as Saudi Arabia and Russia, have little incentive to improve energy efficiency and conservation, and therefore have very high rates of energy intensity. Although they do not involve direct government expenditure, these subsidies present a missed opportunity cost to increase energy exports.

In both cases, fossil-fuel subsidies shield consumers from market signals, stifling demand responses to higher prices that, in turn, can exacerbate price volatility. Subsidies can lead to under-investment in one or more parts of the supply chain. In India and Mexico the cost of providing subsides is shared with national oil companies, diminishing their capital available to invest in developing new resources and maintain supply infrastructure.

One barrier to reform is a genuine concern that reducing or eliminating consumer subsidies, particularly in times of high oil prices, will increase inflation. However, the economic impacts of reforming subsidies must be weighed against the impacts of maintaining subsidies. Subsidy reform may have a negative impact on inflation in the short term, but maintaining subsidies at the price of a higher fiscal deficit is likely to have a much higher impact on inflation and on economic growth in the mid to long term.

With the international oil price rising once again to around $120 per barrel, these subsidies have become financially unsustainable, particularly for net importers

This is not just a developing country issue. Almost all energy-producing countries, including the United States, Canada and Australia, provide subsidies for the exploration and production of oil, natural gas and coal. In times of austerity, it is difficult to justify handouts – to the tune of over $100 billion per year worldwide – to an already lucrative industry whose products are a major contributor to human-created greenhouse gas emissions. If these governments want to be seen as credible leaders in combating climate change, at the very least they need to remove subsidies to create a level playing field for renewable energy. At a cost of over $500 billion per year, subsidies that encourage production and consumption of fossil fuels fly in the face of efforts to address climate change.

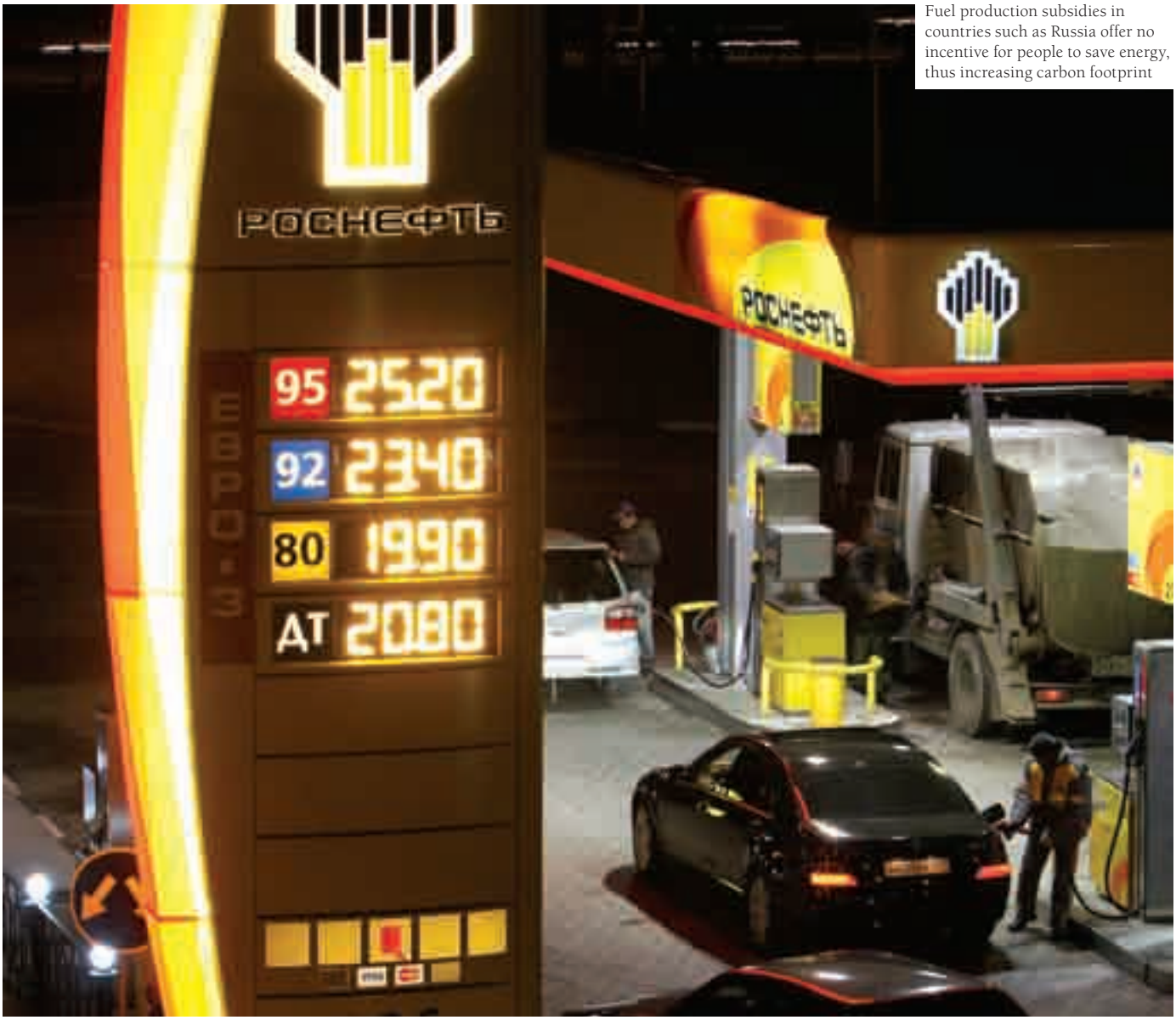
Since 2009, when the G20 first committed in Pittsburgh to phase out inefficient fossil-fuel subsidies, the global economy has faced increasing oil prices, tougher austerity measures to ward off economic crisis and a growing sense of urgency to reduce greenhouse gas emissions. Yet little progress has been made by G20 leaders to turn their commitment into effective national reforms.

Energy poverty

Organisations such as the International Energy Agency (IEA), the Organisation for Economic Cooperation and Development (OECD) and the Global Subsidies Initiative (GSI) have supported the G20, and governments more widely, by providing better estimates of the scale of subsidies, analysis of their impacts and policy advice for progressing reform. The B20 – a group of business leaders engaged in a process parallel to the G20 – have consistently called upon the G20 to "take faster and broader action" to make good their pledge to phase out fossil-fuel subsidies. At the 2011 B20 meeting in Cannes, on the eve of the G20 summit, the B20 called upon the G20 to provide a thorough report of all fossil-fuel subsidies prior to the Los Cabos Summit and to eliminate those subsidies within the next five years, while also taking action to address energy poverty.

Technical challenges

So why have governments not jumped at the opportunity to cash in their subsidies and claim the credit for taking action to combat climate change? While there are some technical challenges to implementing reforms, such as how to restructure and target support for those who need it, the barriers are largely political. Subsidies are captured by powerful vested interests – such as the oil and coal industries, and the middle classes. Governments also find subsidies a useful tool for winning favour from constituents, or an easy (albeit ineffective) solution to tough



Fuel production subsidies in countries such as Russia offer no incentive for people to save energy, thus increasing carbon footprint

problems, such as increasing energy access for the poor. One of the most useful actions governments can take, to start to overcome these barriers, is to report more information about the subsidies: how much they cost, who foots the bill and who reaps the benefits. Increasing public awareness about subsidies, their true costs and impacts will help to generate a demand for change and turn the political tide in favour of subsidy reform.

So, what can the G20 do at Los Cabos to make its pledge effective?

G20 members need to report their subsidies. A dismal effort was put forth by some G20 members at the 2010 Toronto Summit to report a few of their subsidies. Since then, reports by the IEA, OECD, the GSI and others, have clearly identified a large number of subsidies not reported by G20 members. And yet the G20 has not publicly released any reports to improve upon and update the national reports. A common argument from G20 members is that they are only required to report those subsidies they deem to be 'inefficient' or 'encourage wasteful consumption'. Indeed, identifying, measuring and evaluating subsidy policies are the first steps to reform. But, as a fundamental element of good governance, governments should report against all subsidies in order to be held accountable for public expenditure.

Tracking progress

The G20 should set a time frame for reform. The B20 has called for reform within five years. The Global Sustainability Panel recommended that countries reform fossil-fuel subsidies by 2020.

National circumstances will determine over what time period subsidies should be removed in order to allow the economy and consumers time to transition to higher energy prices. But by setting a time frame, the G20 will provide a focal point for the reform efforts and a milestone against which to measure progress. The G20 should establish an independent body to facilitate and support fossil-fuel subsidy reform. The body could be tasked with providing regular reports on subsidies and tracking progress of reform, undertaking new analysis on subsidy issues, and facilitating dialogue and the sharing of best practice among policy makers.

The G20 should champion fossil-fuel subsidy reform at the Rio+20 summit. That event presents an opportunity to extend the G20's commitment to all United Nations member countries, thereby creating a global pledge to phase out fossil-fuel subsidies.

As the first movers on fossil-fuel subsidy reform, the G20 should demonstrate leadership in Rio to secure a high-impact outcome that can generate significant economic, environmental and social benefits.

For more information about the IISD's proposed pledge to phase out fossil-fuel subsidies at Rio, visit www.iisd.org/gsi/gsi-policy-brief-high-impact-initiative-rio20-pledge-phase-out-fossil-fuel-subsidies ■

Creating a sustainable renewable energy infrastructure

Renewables sector in Mexico: the potential of wind energy

For the third consecutive year, Mexico's installed wind energy generation capacity increased substantially, with 354 MW of generation capacity added in 2011 to the 519 MW of generation capacity installed at the end of 2010. This is an amazing achievement, especially considering wind energy development only recently started in Mexico. Renewable energy sources account for approximately 24 per cent of Mexico's total installed power generation capacity, mainly from hydro and geothermal plants. Thanks to the efforts of President Calderón's administration, the wind energy sector has experienced exponential growth, moving from 3 MW in 2005 to more than 870 MW in 2011 (*source: GWEC-Global Wind Energy Council*).

The wind energy sector in Mexico has a bright outlook: the Mexican government estimates the country's wind energy potential at around 71 GW, mainly in the states of Oaxaca, Baja California and Tamaulipas.

The 396-MW Mareña Renovables project

Macquarie Group ("Macquarie") has been actively involved in the development of the wind energy sector in Mexico. In February 2012, Macquarie successfully closed the long-term debt and equity financing for Mareña Renovables, a 396-MW wind farm that is being built in the state of Oaxaca, southeast Mexico. At the Mexican peso equivalent of US$1 billion, the financing is one of the largest on-shore wind farm financings in the world to date and the wind farm will be, when finished, the largest wind farm in Latin America. The project does not rely on any government subsidies and is owned by an equity consortium comprising the Macquarie Mexican Infrastructure Fund, Mitsubishi Corporation, and PGGM.

This wind farm illustrates Macquarie's ability to originate, develop and finance complex infrastructure projects in extremely challenging markets.

Development of the project required Macquarie to:

- Negotiate and register land access agreements with more than 210 separate landholders;
- Obtain more than 60 separate federal, state and local government permits and authorisations;
- Negotiate a turnkey contract with Vestas WTG Mexico for the construction, and operation and maintenance, of the wind farm;
- Develop positive dialogue with local communities and establish sustainable, long-term solutions through active community engagement, in compliance with Equator Principles, IFC Performance Standards and IADB Safeguard Standards;
- Structure a debt package with a group of international, local, development, multilateral banks and an export credit agency;
- Secure long-term equity commitments for the construction of the project; and
- Negotiate an eight-year, fixed-price forward sale of Carbon Emission Reduction certificates.

This transaction has established a number of landmarks for Mexico:

- Largest wind farm in Latin America upon completion;
- Largest Mexican peso-denominated debt-raising for a Mexican energy project; and
- One of the largest private investments in the State of Oaxaca.

About Macquarie and infrastructure

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Macquarie, through its Macquarie Funds Group ("MFG") and Macquarie Infrastructure and Real Assets ("MIRA") divisions, is recognised as a leading global investor and manager of infrastructure and real estate. MFG-MIRA manages more than 100 assets and 115 properties worldwide, representing more than US$90 billion in enterprise value (at December 31, 2011).

In December 2009, MIRA launched the Macquarie Mexican Infrastructure Fund ("MMIF"), the first Mexican peso-denominated fund solely focused on infrastructure investment in Mexico, with initial commitments of MXN 5.2 billion (US$410 million) from Macquarie, Mexican pension funds, and FONADIN (the Mexican National Infrastructure Fund).

As an owner and manager of significant assets, Macquarie works closely with communities to deliver essential services that benefit them, and to achieve high environmental standards. Macquarie's aim is to responsibly and profitably manage, on behalf of its investors, the assets in which it has investments. Infrastructure investments managed by Macquarie include in the renewable energy, regulated power and utility, transportation and telecommunications sectors, as well as social infrastructure.

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Macquarie has long been recognized as a pioneer in infrastructure investment, financing, management and advisory. Today, with one of the largest dedicated infrastructure teams in Latin America and a string of global awards, Macquarie combines independent funds management and advice with unrivalled sector expertise. Whatever your infrastructure challenge, the solution is Macquarie.

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FORWARD thinking

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