Energy security: The supply side of the equation

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Many stakeholders in the energy sector talk about security. Industrialised economies sometimes use the expression to speak about the need to expand the energy mix in order to reduce reliance on imported fossil fuels. Developing countries speak of energy security when referring to the challenge of energy poverty.

However, an examination of the concept of 'energy security' as it relates specifically to the oil market suggests a different understanding. For the oil producing Member Countries of OPEC, for example, energy security involves a delicate balance between 'security of supply' and 'security of demand.'

Assessing both parts of this security equation is important. As providers of more than 40 per cent of the world's crude oil production, OPEC's Member Countries must continually assess the supply side of the equation by monitoring global economic conditions and, especially, analysing the demand side.

Given current projections, the world will increasingly need more energy in the long-term. Although uncertainties about the strength of the global economic recovery persist, aggregate demand for energy — and, in particular, oil — is set to increase. OPEC's 2010 World Oil Outlook sees energy use increasing 40 per cent by 2030 — even under scenarios in which significant energy efficiency gains are assumed.

The Energy Mix

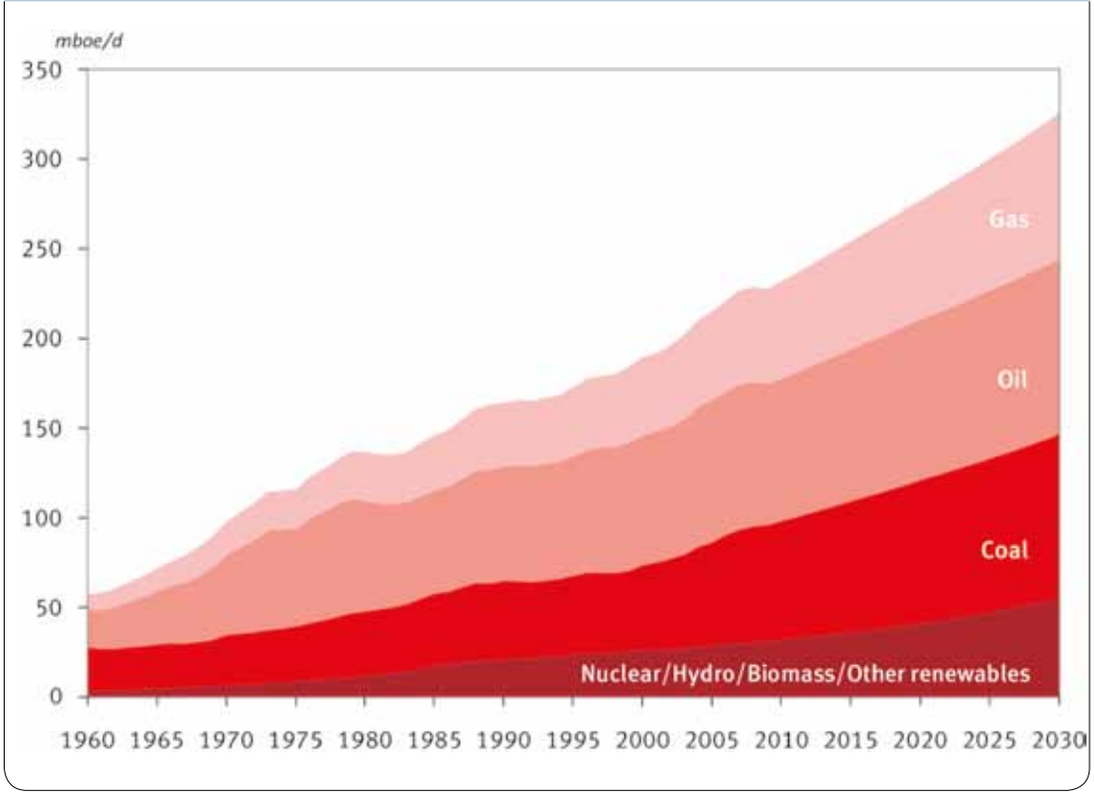
Fortunately, there is a broad, diverse and continually expanding energy mix (see Figure 1). In addition to fossil fuels, alternative forms of energy are also seen as increasing, with nuclear, hydropower, biomass and other renewables all expected to play a complementary role in meeting the world's growing energy needs.

Renewable forms of energy — like solar and wind power — are actually expected to grow more than 7 per cent per year, in part due to government support and tax incentives. But given the growth of other energy sources, their overall share in the global energy mix is expected to remain at 2-3 per cent.

Alternative energies are a welcome and necessary component of the global energy mix. But their practical limitations are worth keeping in mind. Solar and wind power, for example, both have high unit costs and a low energy density. They are also both rather site-specific — and even then, can be quite intermittent in nature.

The contribution of biofuels is also significant, despite the high costs involved. Second generation biofuels can even overcome, to some

Figure 1: Continually expanding energy mix



extent, the potential impact of first generation biofuels on food prices, crop biodiversity and water resources. But they are still far from being available for commercial use.

There is also nuclear power, of course, which has been a reliable source of energy, despite high up-front costs and long lead times. Its future growth, however, is now in question in the wake of Japan's Fukushima nuclear disaster.

But it is fossil fuels — coal, natural gas and oil — that offer the best current prospects for meeting the world's growing energy needs. They have distinct advantages given the prevalence of existing infrastructure around the world, and the relative affordability of upstream and downstream projects.

According to OPEC data, fossil fuels are expected to contribute at least 80 per cent to the global energy mix over the next two decades. And while natural gas availability promises to grow, overall trends suggest that crude oil's overall share in the global energy mix will remain strong — though falling from 35 per cent to around 30 per cent by 2030.

The Supply Outlook

The recent global outlook for oil has been strong. It remains so, with more than enough supply to meet demand levels well into the future. Estimates of total world crude oil and Natural Gas Liquids, for example, in 2009 were around 3.5 trillion barrels. Of this total, 2.1 trillion barrels were in OPEC Member Countries and 1.4 trillion in non-OPEC countries.

Global inventories, too, have been and remain high. US commercial oil inventories in July were at a comfortable 19.5 mb/d above their five-year average and commercial inventories in the OECD have similarly been above recent averages.

Additionally, product stocks have shown modest surpluses. In the US, for example, gasoline stocks in July were 4.5 mb above their five-year average and distillate stocks were at 6.1 mb above the seasonal trend. In the OECD, product stocks have similarly been above recent seasonal averages.

Turning to OPEC's Member Countries, we note that overall resource endowments continue to grow. As of 2010, proven crude oil reserves in Member Countries were nearly 1.2 trillion barrels, representing about 81 per cent of the global total and a 12 per cent increase over the previous year.

Furthermore, in terms of total oil production, most OPEC Member Countries continue to produce at healthy levels. And in 2011, despite some instability in the Middle East and North Africa region, OPEC supply has remained at high enough levels to provide significant forward cover. While recent events have affected spare capacity in some countries, Member Countries collectively continue to hold enough spare upstream capacity to meet the market's needs.

The Importance of Investments

Underlying these figures is the important factor of upstream investments. Today's resources — and future security of supply — depend on timely and well-planned investments. They are the lifeblood of the industry and are the key to ensuring future supply.

OPEC Member Countries remain committed to future investment plans to expand upstream capacity. In the medium-term, between 2011 and 2015, Member Countries are expected to invest an estimated US$310 billion in upstream projects to both maintain current capacity and provide additional spare capacity. Member Countries also continue to invest in downstream projects, both at home and abroad, as well.

Of course, OPEC is continually reviewing the status of these projects. Given the magnitude of investments, an appropriate price environment is necessary. But a certain level of demand certainty and predictability — what we call security of demand — is also required, especially given the oil industry's long lead times and high capital costs.

Security of Demand

Security of demand is the other side of the energy security equation. Without it, ensuring security of supply through investments loses its rationale. But there are a variety of sources of uncertainty that pose challenges to security of demand.

The rising costs of raw materials and industrial commodities, for example, have made many upstream investment projects difficult.

In terms of the global economy, too, doubts persist over the medium- and long-term prospects for economic growth. This uncertainty has been exacerbated by continuing problems in the US and the outbreak of the European debt crisis.

In addition, proposed environmental policies in several oil consuming countries — which aim to favour the development of alternative sources of energy — may also have an adverse effect on future oil consumption and overall demand.

These challenges require concerted efforts to dispel uncertainty and provide the security of demand that

investments need. For example, clear, accurate and timely data — about upstream and downstream activities, as well as the fiscal health of major oil consumers — could help to provide some demand certainty.

But also knowing more about the potential impact of environmental policies in consuming countries could help reduce uncertainty. Additionally, continuing to improve the environmental credentials of oil — both in its production and in its use — through technological advances can help sustain demand among consumers concerned about oil's environmental impact.

The Price Environment

One of the most important conditions required for security of demand is a stable and enabling price environment. This means having crude prices at an appropriate and reasonable level, without extreme fluctuations.

We have seen periods of both record high and low prices, most recently in 2008 (see Figure 2). These experiences have been a reminder that extreme prices benefit no one. Prices that are too high or too low can both be detrimental to investment plans.

Extremely low crude prices, for example, can result in a decline in revenues which can force an oil producer to cut budgets and implement austerity measures, leading to the scaling back of upstream projects through the deferral of engineering, procurement and construction contracts.

Similarly, extremely high prices can be detrimental as they can dampen oil consumption, bring future crude demand levels into question and threaten current investments in expanded supply.

OPEC's Commitments

Recent episodes of price volatility have made it clear that ensuring balance in the market — and working to ensure security of demand as well as of supply — is necessary. One cannot achieve a balanced and well-supplied oil market by focusing on only one side of the energy security equation. Security of demand is needed to maintain security of supply. These go hand in hand.

OPEC remains committed to making investments to meet the world's energy needs and ensure future security of supply. This is one of the pillars of its 51-year old mission. But it continues to stress the need for security of demand, which is necessary to avoid wasting financial resources on unneeded capacity — and prevent a highly damaging situation of oversupply in the future.

It is only with demand security that OPEC can continue ensuring supply security for the benefit of all, with actions that are forward-looking, oriented toward stability and guided by an over-arching interest in balance. ❑

Figure 2: Oil price volatility, January 2006 - July 2011