

MEDIUM-TERM
OIL & GAS
MARKETS

2010

**EXECUTIVE
SUMMARY**



International
Energy Agency

INTERNATIONAL ENERGY AGENCY

The International Energy Agency (IEA), an autonomous agency, was established in November 1974. Its mandate is two-fold: to promote energy security amongst its member countries through collective response to physical disruptions in oil supply and to advise member countries on sound energy policy.

The IEA carries out a comprehensive programme of energy co-operation among 28 advanced economies, each of which is obliged to hold oil stocks equivalent to 90 days of its net imports. The Agency aims to:

- Secure member countries' access to reliable and ample supplies of all forms of energy; in particular, through maintaining effective emergency response capabilities in case of oil supply disruptions.
- Promote sustainable energy policies that spur economic growth and environmental protection in a global context – particularly in terms of reducing greenhouse-gas emissions that contribute to climate change.
- Improve transparency of international markets through collection and analysis of energy data.
- Support global collaboration on energy technology to secure future energy supplies and mitigate their environmental impact, including through improved energy efficiency and development and deployment of low-carbon technologies.
- Find solutions to global energy challenges through engagement and dialogue with non-member countries, industry, international organisations and other stakeholders.

IEA member countries:

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Greece
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Luxembourg
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New Zealand
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The European Commission also participates in the work of the IEA.

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Oil and gas markets are starting to show important signs of recovery, but the impact of the recession has been different on the two energy sources. Gas demand fell by more than 3% in 2009, double the pace of decline seen for oil. This highlights the use of oil primarily as a transport fuel, where consumption is relatively inelastic. Gas on the other hand, as a major industrial and power generation fuel, was fully exposed to the decline in industrial production seen in the recession. But common to both oil and gas is the dichotomy between OECD and non-OECD markets, with continuing growth in non-OECD regions, notably China, India and the Middle East, contrasting with weaker demand in OECD and FSU countries. Last year's medium-term outlooks for oil and gas markets were written amid apparently contradictory concerns. In the midst of chronic uncertainty about prospects for the global economy, virtually at the nadir of the recession, there were nonetheless serious questions about the adequacy of upstream oil investment to meet an anticipated eventual rebound in oil demand growth. While upstream gas concerns were more muted, owing to the surge in North American unconventional gas output, and the massive expansion of LNG liquefaction plants, uncertainty about the timing and extent of medium-term investments throughout the value chain were still present.

A year later, many uncertainties persist. Regulation of commodity futures markets is still clearly on policy makers' radar and operational regulation in the physical market for both gas and oil could be overhauled, depending on results of the enquiry into the Gulf of Mexico disaster. The European debt crisis has created additional uncertainty over the resilience of the economic recovery there and further afield. Questions persist too over the impact of stimulus withdrawal and potential over-heating in the Chinese economy.

Demand

Although economic recovery has become re-entrenched, in sharp contrast to last year's back-drop, concerns persist about its strength and durability. As a result, two oil demand scenarios are again presented. Using May 2010 *OMR* data as our starting point, we have developed two contrasting views on economic growth, with the lower variant also tempered by weaker assumed efficiency gains. Common features however are the predominance of both the non-OECD countries and the transportation sector in driving demand growth. In the higher GDP and efficiency gains case (the base case for our analysis), oil demand grows by an average of 1.2 mb/d annually (1.4%), reaching close to 92 mb/d by 2015. Oil demand recovers to pre-crisis 2007 levels again by 2010. This presupposes GDP growth around 4.5% per year from 2010 onwards (in line with recent IMF projections) and a reduction in oil use intensity of 3% annually, near the level seen in the last five years.

But many voices still envisage a weaker path for global economic growth, amid world trade imbalances and the weakening impact on activity of aggressive fiscal consolidation. This suggests a lower GDP and efficiency gains case. Here, global GDP grows by a weaker 3% annually, while the progress in oil use efficiency is slowed by the weaker investment environment, pushing anticipated reductions in oil use intensity back to the 15-year average, near 2% per year. In this case, annual oil demand growth averages 840 kb/d (1.0%), taking total global demand to 90 mb/d by 2015, with the reattainment of 2007 demand levels deferred to 2011.

This year for the first time, we have modelled OECD gas demand into the medium term, using the same high case GDP assumptions as for the oil market projections, notwithstanding that gas data are generally less comprehensive than for oil. We see OECD demand returning to 2008 levels by around 2012, but with large regional variations, with Europe especially weak, given its sharp decline in 2009 (nearly 6%) and ongoing concerns about its recovery. OECD Europe does not return to demand levels seen in early 2008 until after 2013. The power sector is a key source of uncertainty in OECD demand, but also in some non-OECD regions, including the Middle East. OECD North America and Pacific gas demand is recovering, and can be expected to surpass 2008 levels as early as 2012, as industrial production recovers, and gas remains the fuel of choice in the power sector. Asian demand is growing strongly; Chinese gas demand doubling between 2007 and 2015 now looks conservative. Hence gas markets seem likely to tighten more quickly in the medium term in some regions, notably the Pacific, in comparison to Europe or North America.

Supply

Some of last year's concerns about medium-term oil supply prospects have eased, with baseline global supply capacity now estimated close to 91 mb/d, around 0.9 mb/d higher than anticipated in the June 2009 *MTOMR*. Stronger crude prices, lower costs and a renewed uptick in spending have helped facilitate this upturn. New project schedules have been advanced, and implied decline from baseload fields looks to have eased slightly (albeit remaining a constant drain on global supplies). Non-OPEC supply continues to grow through the outlook, concentrated on the Americas, the Caspian and biofuels which offset mature field decline, notably in the OECD countries. However OPEC crude and natural gas liquids generate the bulk of expected net growth in production capacity of over 5 mb/d through 2015. Notwithstanding perpetual supply-side risks, the degree to which OPEC is required to control spare capacity over the outlook therefore depends largely on the type of GDP/oil demand picture that emerges.

In gas, the notable expansion of North American gas output has continued apace despite subdued gas prices, adding more than 100 bcm of gas to world output, and making the United States the world's largest gas producer in 2009, and a large virtual gas exporter, as LNG supplies destined for that market are diverted to other consumers. The development of unconventional gas in North America is of global significance. Many countries are seeking to emulate this success, although the time horizons for this suggest major contributions before 2020 are unlikely, for example, in Europe. However, a number of LNG projects based on coal bed methane are advancing towards final investment decisions (FID) in Australia, and China may also be well placed to take advantage of unconventional gas. While LNG capacity has continued to expand, output is lagging, as some upstream supplies are constrained and technical problems plague new plants. But LNG output can be expected to increase by around 120 bcm by 2013, a near 50% increase over 2008.

Notwithstanding these positive developments, extended project lead times are still with us, even more so now that a brief spell of falling upstream costs in 2009 seems to have levelled off. Moreover, ongoing geopolitical and investment risks in countries such as Russia, Nigeria and Iraq affect both oil and gas, and the potential for further deepwater project delays after the recent Gulf of Mexico disaster, suggest that a degree of supply forecast conservatism remains in order.

Of course, depletion from existing fields is an issue in gas just as for oil. Decline rates, estimated at between 5% and 7.5% per year, mean that nearly half of the world's gas production needs to be replaced between now and 2030. Gas output is declining in many OECD countries, and imports from more distant, and harder to develop sources, are inevitable. Investments have to be made right through the gas value chain in a timely way, including long distance pipelines and storage facilities. Indeed these segments of the gas market are most likely to be affected by the current uncertainty.

Moreover, supply-side risks abound in both oil and gas. Firstly, there is an ever-present threat of geopolitical disruption surrounding a number of key OPEC oil producers. Secondly, the potential for the recent *Deepwater Horizon* disaster in the US Gulf of Mexico to delay substantial deepwater developments which underpin much of expected oil and gas supply growth. Efforts to improve safety and environmental standards will understandably be redoubled after the tragedy. Should the impact of those measures be widespread delays to deepwater projects, anything between 100 kb/d and 800 kb/d of new 2015 oil supply currently included in our outlook might be deferred. For gas, domestic market obligations have emerged as a key trend in producing regions, with governments reserving volumes for their own customers.

Exhausting the resource base is not the issue, but instead the ability of the oil and gas industry to respond quickly enough with adequate investment. This will be the case especially if demand should recover more quickly than envisaged here, either through a more broad-based recovery, or in the case of gas, more rapid expansion of gas-fired power generation, which has become the favoured option in many regions. So in the higher GDP base case, and in spite of an assumed ongoing improvement in oil use intensity, effective OPEC spare crude capacity begins to decline again from next year. Although the estimated 2015 level of 3.5 mb/d remains more comfortable than prevailed for much of 2002-2008, the declining trend itself, to well below 5% of global demand, suggests more nervous markets could re-emerge after a prolonged spell of relative price stability in the last year.

Lower economic growth, or perhaps more importantly, a sustained impetus to improve oil and gas end-use efficiency and diversify transportation and electricity energy sources, could maintain oil spare capacity closer to recent levels, and prolong the period of comfortable gas supplies. In both cases however, the call on producers outside OECD will increase.

Prices

Against this backdrop, prices in the two energy commodities have followed different paths. Crude oil prices soared from the trough of \$35/bbl in February 2009 to reach \$85/bbl in May 2010. In contrast, gas prices have remained subdued, falling to levels at or below one-third of oil prices on an energy content basis over the last year. For oil, comparatively benign prompt market fundamentals following the economic recession look to have been over-ridden by other factors, with crude oil prices having remained within a steady range at a historically high \$65-\$85/bbl. The macro-economy, currency swings and expectations about longer-term market fundamentals have all helped shape recent oil price trends, over and above the influence of more traditional physical drivers.

However, uncertainties within the physical oil market also persist. Reliable demand and stocks data are lacking for the non-OECD portion of the market that will soon surpass 50% of global demand. Fears of potential renewed supply tightness are offsetting downside demand risks from economic market uncertainty. A common feature for both the physical and financial markets for oil is the

relative paucity of reliable, timely, market-wide data and information. Achieving sustainable price stability needs greater visibility for the prompt market, allied to greater clarity about market prospects and policy measures for the future.

Some of these comments apply equally to gas. A little less than half of OECD gas demand is priced directly off oil, with varying time lags and linkages. In 2009, these markets, including Japan, Korea, and most of continental Europe saw prices averaging about \$9/MBtu. In North America and the United Kingdom, prices averaged less than half this level, on an energy basis around one-third that of oil. Unsurprisingly, this dichotomy has led to gas buyers, especially in Europe, seeking access to lower priced spot gas, and placed enormous pressure on long-term take-or pay-contracts. For the moment, both these features of the continental market, long-term contracts and oil indexation, remain, although producers have made significant concessions to buyers. Again, and arguably even more so than for oil, data is a real issue, particularly for countries outside the OECD, which already account for more than half of global gas use. Even within the OECD, up-to-date gas data are sadly deficient. A number of parties are working to rectify this, including industry bodies. The IEA is actively working to improve this situation with initiatives such as the recently released European gas map, which shows monthly cross-border gas flows in Europe. Much more remains to be done, however, if markets are not to be subjected to unnecessary uncertainty and volatility.

The individual overviews of oil and gas markets at the beginning of the two sections will provide a more detailed summary of our analysis for both markets.

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Critical questions persist over the key oil and gas market drivers likely to prevail in coming years. Are economic and energy demand outlooks clearer than in mid-2009? In oil markets, have we seen a genuine structural shift in demand patterns? Will a nascent recovery in upstream spending evident in 2010 be sustained? How long will current levels of OPEC spare capacity persist? And for the gas market, will demand recover from its collapse in 2009? How long will the gas glut last? Will unconventional gas revolutionise gas markets outside North America? And how are China, Russia and the Middle East changing their approach to gas use?

The new combined IEA publication, *Medium-Term Oil and Gas Markets 2010*, tries to answer these questions, presenting a comprehensive, annual outlook for oil and gas market fundamentals for the next few years. The detailed oil market analysis develops two oil demand scenarios, given the ongoing uncertainties about the path of economic recovery after the worldwide slow-down in 2008/2009. Market balances are generated on a bottom-up basis, derived from detailed analysis of upstream investment projects, oil field decline rates, product-by-product demand trends, and refinery investment and operations. The gas market analysis provides a broader overview, assessing prices, unconventional gas, future demand developments, LNG markets as well as investment in all parts of the gas value chain and regional trends. It focuses on key producers, including Russia, the Caspian region, the Middle East and rising LNG exporters like Australia, and looks at the implications for global gas markets.