



CO-OPERATION IS KEY

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What options exist for Europe to reduce its demand for fossil fuels, and why is encouraging this decline important?

In order to reduce its consumption of fossil fuels, Europe will need to focus on fostering investment in renewables and facilitating their integration into the power system. The European Union has been a pioneer in renewables development, most recently because of the Renewable Energy Directive. This has catalysed deployment and stimulated significant cost reductions. Wind and solar technologies are now being widely exploited in emerging markets as cost-competitive contributors to meeting growing power demand.

That leadership has come at a cost to Europe – with the heavy lifting concentrated in a few countries. But it is also seeing the benefits of this investment, for example reduced gas imports, improved energy security, and a developing green economy. Progress is in danger of stalling because of policy cost concerns. But with so much of the hard investment work behind us, it would not make sense to cut and run as the costs of future deployment shrink.

Key to adapting to higher energy prices, as well as the principal contributor to sustainability and reducing the use of fossil fuels, will be energy efficiency. While Europe is a leader in this field, uncertainty remains around energy efficiency regulation and deployment, and the extent to which it will be integrated with the other main parts of the climate and energy package, to ensure policy coherence.

The European Union will now need to decide how to frame energy and climate policy to 2030, particularly given the increasingly visible and potentially catastrophic impacts of climate change and long-term energy security concerns. Long-term policies are key to secure investment and green growth, and so 2030 is important as a bridge to 2050. I will refrain from commenting on the details in the Commission's proposals, particularly as we

prepare our own review of European Union policies. But in a world where clean energy technology development and deployment will be a much less European story, and where higher costs of transition risk eroding European competitiveness, the answer lies in close co-ordination, interconnection and market integration.

Given lower costs of refining in the United States, what is the outlook for refining in Europe and the Middle East?

Rarely has the contrast between “winners” and “losers” in the refining world been more pronounced than in 2013 and 2014, when new global players disrupted the traditional order. Refiners in mature economies in Europe and the Pacific continue to confront challenging market environments, while those in the United States are profiting from the region's supply-side revolution. In less than a decade, the United States has gone from being one of the world's largest product importers to its largest product exporter. Investment plans are being drawn up to further take advantage of regional supply growth.

By contrast, in the non-OECD, tides are turning against the refining industry. A marked slowdown in Chinese apparent demand growth has prompted a large-scale reassessment of refinery expansion plans in the very region where most of the growth had been coming from in the last 10 years, and which until recently had been expected to contribute most of it in the medium term.

While the fortunes of Asian refiners are waning, the start-up of Saudi Arabia's Jubail refinery last year is a signal of coming changes in the Middle East oil profile, as crude producers move up the value chain and increase their focus on domestic markets.

How will South America's oil production affect global oil markets in the short to medium term?

South America's oil production (all liquids) was about 7.25 million barrels per day (b/d) in 2013,

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South America's daily liquids production in 2013 About 7.25 million	South America's share in global supply represents 8 percent	Mexico daily oil production target by 2018 3 million b/d
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approximately 8 percent of global supply. Most of this supply comes from five countries: OPEC members Ecuador and Venezuela, and large non-OPEC producers Argentina, Brazil and Colombia.

In the short term (2014), we are not expecting the production outlook overall for the continent to change, assuming flat production in Venezuela and Ecuador (the IEA does not forecast OPEC production levels). Hence, given the growth in global supply and demand, the role of the continent in global oil markets would diminish slightly. South American oil demand was about 6 million b/d in 2013, so the continent is a net exporter, but given expectations of some demand growth in the continent, net exports could also be expected to decline slightly in 2014.

In the medium term (2014-2019), Argentina and Brazil are expected to see production growth and, in the case of Venezuela, production capacity growth, particularly towards the end of that period. Although South American demand will also have grown by then, the continent does have the potential to become more important to world oil markets if the Brazilian oil sector is able to successfully implement its planned massive offshore projects.

How could Mexico’s recent regulation on foreign exploration change the global oil supply and demand equation?

In the IEA’s latest (2013) *Medium-Term Oil Market Report*, there was no assumption of regulatory change in Mexico, and hence, continued gradual output decline was forecast for the medium term. While the recent regulatory changes will not affect the outlook for 2014, it is possible that further out into the medium term, 2014-2019, participation of new companies in the upstream sector would bring increased investment as well as additional capabilities for deepwater or unconventional plays, which could change our forecast.

The Mexican government, in its plans from this past autumn 2013, had issued a goal of 3 million b/d of crude oil production by 2018. This is some 600,000 b/d higher than our expectation for Mexican crude oil output for that year prior to these changes. While the tail-end of our upcoming medium-term forecast for Mexican production will likely be higher, it is unlikely to be as high as the Mexican government’s initial 2018 target. This additional output will be welcome in a world market of ever-growing demand into the medium term, but will not decisively affect the global supply and demand balance.

What may happen – or what should happen – in the medium term that could bring LNG prices down for buyers?

Oil-indexed long-term contracts have traditionally played a major role in both Europe and Asia. In North America, the dynamics of supply and demand play a greater role in price setting. Yet, efficient markets do not necessarily mean low prices.

In the decade before the shale revolution, depleting United States conventional gas led to a tight supply/demand balance and very high prices. But in such an environment this counts as a market success

– those price signals were key to incentivising shale development. Without the means to export, that shale revolution turned North America into a veritable gas island with lower prices.

But Asian price differences with Europe require more explanation. In this case the reason is not physical, but contractual and institutional: destination clauses and take or pay contracts lock in suppliers, and a lack of a trading hub in Asia makes it difficult to execute trades.

The effects are not trivial. Even without making any assumptions on North American LNG, the Japanese yearly import bill is over \$10 billion higher than what we could see in a properly integrated LNG market. As a result of the flexible nature of LNG, economic developments and policy decisions introduce significant uncertainty into the LNG demand outlook of any given country, raising investment risk. A well functioning market can reduce those risks and aid investment. Over the long term, this could help to mitigate the relatively high prices we see in Asia.

In the shorter term, while Asia can certainly not rely on American gas to lower prices by providing sufficient physical supplies, even after exports commence, the prospect of even relatively small amounts of spot-priced American LNG exports and greater regional competition can impact negotiations for long-term gas contracts, providing downward price pressure.

Can a natural gas price hub be developed in Asia?

Natural gas has the potential to improve energy security and economic and environmental performance in the Asian-Pacific economies. But its regional market conditions must be such that supply and demand fundamentals play a stronger role in price setting.

Thanks to relatively weak international pipeline options, developing an Asian LNG trading hub is a key step towards developing the wider regional market. This gas market would need to meet institutional and structural requirements which inspire confidence among market players to use such a hub for balancing of their portfolios, and which attract new participants such as financial institutions. That means separating transport from commercial activities; price deregulation at the wholesale level; sufficient network capacity and non-discriminatory access; and a competitive number of market participants.

The prospects are there, but even the prime candidates will need to do more. China’s fast-growing domestic gas network is still underdeveloped, and the entire production chain remains heavily regulated. Japan has a great potential to act as a hub, but it will have to take some important steps, such as improving infrastructure access and further developing its domestic power market. Externally, it also means engaging with exporters to affect the terms of gas contracting to improve efficiency while maintaining energy security.

Singapore’s small domestic market means that to grow as a hub it must rely on re-exports, which are hindered by regulation. However, it is already a globally important oil-trading hub, and some of its broader



strengths such as location and a supportive legal environment will be applicable for LNG. Singapore has pipeline interconnections with the traditional suppliers of Malaysia and Indonesia, and Asia's first genuine open access LNG terminal is under construction there. Singapore already has ample LNG storage facility and arrangements that make it possible to re-export LNG from the storage tanks, and its financial institutions are already experimenting with LNG swaps.

Globally we are starting to see the long-term prospect for a world natural gas market. But integrating and deepening regional markets is a first step to addressing major global price mismatch. That would benefit Asian consumers, Asian economies, and the millions of Asian citizens choked by industrial smog.

In September 2011, you took charge of the IEA. How would you describe your tenure as Executive Director so far?

The global energy map has been changing at a rapid pace over the past several years, and this has created unique challenges in terms of our modelling and projections, but also in terms of energy governance, our co-operation with emerging economies, and our approach to energy security and sustainability. When the IEA was founded, our member countries accounted for more than three quarters of global oil demand. That share is now less than half, and such a shift has highlighted the importance of deepening our relationships with key non-member partners.

Also, our conceptions of energy security have widened to include the entire range of fuels, as well as to account for the increasing interdependencies between fuel markets. We are meeting that challenge by developing a multilateral framework of association with key partner countries, as well as with other international organisations.

Those partnerships also allow us to better tackle the global challenges of energy sustainability and climate change mitigation, both of which are becoming only more critical with each passing year, as evidenced most recently by the latest *Intergovernmental Panel on Climate Change* report. During my tenure I am pleased to report that this has been one of our most important missions, and we continue to stress its importance in consultations with industry, policy makers and the wider civil society.

What challenges have the agency and the global energy economy encountered that you did not foresee?

The distinction was once famously drawn between "known-unknowns" and "unknown-unknowns." We are aware that some issue areas are bound to dramatically affect the international energy landscape,

but we cannot predict precisely how. Geopolitical developments are a prime example.

The IEA is regularly exercising its ability to rapidly react to energy security threats and developments, and to stay flexible given the broad range of scenarios that might arise. The past few years have seen unique tensions in the international energy market deriving from the Middle East, Africa, Eurasia, and elsewhere. Such issues and incidents cannot necessarily be foreseen, but I am proud of our ability to respond with rapid analysis and a well-maintained international network for political and economic consultation.

"Unknown-unknowns" are by nature more difficult to prepare for. I would describe these as "game-changers" that may arise from technological breakthroughs, economic tipping points, unexpected policy shifts, and more. Often they are the result of a combination of those, and the unconventional gas revolution in the United States is one example.

While that shift was well underway by the time I arrived, it has continued to have sometimes unforeseen implications far beyond the United States and the gas market. For example, the large variations we see in international gas and electricity prices have long-term impacts on relative competitiveness, and contribute to new energy trading relationships in gas but also in coal and power. IEA analysis recognised very early the coming "golden age of gas," and we were one of the first to highlight its impacts globally. Still, game changers can have great impacts on our scenarios and across our analysis, so we have to remain constantly vigilant to them.

What is your most important goal to accomplish at the IEA before the end of your tenure, whenever that may be?

I mentioned how dramatically the energy economy has changed since the IEA's founding in 1974, and how they are accelerating. The dichotomy between energy consumers and producers is blurring, with major consumers like the United States seeing rising production and the prospect of exports, and traditional producers in the Middle East and elsewhere experiencing rapidly rising domestic demand.

Meanwhile, the impact of major emerging economies on global supply-demand patterns cannot be underestimated. It is in the interest of the IEA to continue to develop its co-operation with key partner countries, particularly in the association framework I mentioned earlier. Instituting that kind of deep co-operation within the framework of a global discussion on energy governance is not a task that can be completed overnight, but I hope and expect to see meaningful outcomes in the near future. ■

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<p>The organisation has 28 member states</p>	<p>Japan's yearly LNG import bill More than \$10 billion</p>	<p>The IEA was founded in 1974</p>
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