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The Changing Geopolitics of Global Oil and Gas

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The disaster of the BP Deepwater Horizon well in the Gulf of Mexico has brought to the attention of the world the extremely challenging conditions in which oil exploration and production is now being pursued, and the associated risks. The general view is that the low hanging fruit of oil production has already been plucked, and we are now driven to recover oil from more difficult environments.

Although by and large correct, this is not entirely so. Just along the coast from the Deepwater Horizon location, in Mexican waters, is the vast Cantarell field, producing from shallow waters. This massive field is now in decline, but there is potential for new technologies to be applied to enhance oil recovery and prolong its life; and for exploration and development of new fields in the area. This is not happening. Why? Because embedded deep in the national psyche of Mexicans is a belief that the agony of their revolution in the early 20th century was prolonged by rivalry between British and US oil companies. They believe the companies backed differing factions and leaders, and there were many of them, to secure advantage. The accusations thrown at the time by US investors at a particular British enterprise gave plenty of room for such belief, and sufficient cause for concern to the British Government, keen to bring the US into World War I, that it launched a serious diplomatic initiative to allay US fears. But perception is everything and today the Mexican Constitution prohibits the participation of foreign investors in oil exploration and development. Recent attempts by Governments to modify this, even modestly, have been met with adamant parliamentary opposition.

I tell this story to make the point that from its earliest days, the oil and gas industry has been embroiled in international politics. Daniel Yergin, in "The Prize", provides the most readable account. He identifies no less than six crises from 1945 to 1990.

In recent years crises have been about price rather than supply, but oil and natural gas have continued to feature in international affairs. The growth in oil prices from 2000 to 2008 was central to what may yet prove to have been a very brief resurgence of post-Soviet era Russia under Putin. It is hard to convince the average person that the invasion of Iraq was not about oil. The quest for energy supply security is central to China's foreign policy and global diplomacy. It has

been quite explicit about that. Its moves to address that security are causing the US to re-set its foreign and defence policy strategies and objectives. If the 20th century can be called the century of the Atlantic, indicators are that the 21st century will be the century of the Pacific. And events in Iran today raise once again the fear of supply disruption.

Two other factors add to the centrality of oil and gas supply and demand in international affairs. First, financial markets, fed by substantial uncommitted short-term capital and sophisticated investment and trading programmes, are generating large and frequent swings in commodity prices. For many countries, particularly small and developing economies without their own oil resources, this makes economic management virtually impossible. For example, today the energy import bill of the Caribbean nations of the Lesser Antilles is 130% of their export revenues. Nearer home a similar situation prevails among in the South Pacific.

The second factor is climate change. The use of hydrocarbon fuels is a major source of CO₂ emissions, a primary contributor to global warming. This is leading to a focus on the development of alternative sources of energy. It is clearly important that the potential of alternative and renewable energies is developed to the maximum. However it has been less clearly recognised that renewable and other forms of energy cannot in the short and medium term provide a practical or affordable alternative to the use of hydrocarbons to meet global energy needs. The world remains dependent on oil, and increasingly natural gas, for the foreseeable future.

In its World Energy Outlook for 2011 the International Energy Agency foresees a growth in global primary energy demand between 2010 and 2035 of 4300 million tonnes of oil equivalent. Of that growth, just a little less than half will come from oil and gas. Together they will represent about 50% of total primary energy supply, barely changed from today's share. Note that this is notwithstanding predicted growth in supply of renewable energy of 80%.

Headline press reports may create a different impression. In addition to its annual long-term outlook, the IEA also produces monthly forecasts for demand for the calendar year. Last week, for the sixth month running, it reduced its projection for the growth in oil demand in 2012. These forecasts are invariably represented in the media as predicted cuts in demand for oil. I am sure this audience is not misled. They are cuts in projections of the growth in demand for oil.

So whether we like it or not we will remain dependent on hydrocarbons, in particular to fuel our transport but also to underpin renewable power generation. Let me throw in a first personal view here. I think in fact there will be more growth in renewables than the IEA foresees, and a stronger slow down in oil demand growth. There is still huge scope for improved efficiencies. But even if I am right, oil and in particular natural gas, will remain dominant.

Within the IEA numbers I have quoted there are two significant trends. First, although oil demand grows in total, its consumption actually declines in the OECD economies. That decline is, however, more than offset by growth in the emerging economies. The second development is a strong growth in natural gas demand. This is what accounts for the predicted maintenance of the share of oil and gas hydrocarbons in total primary energy supply in 2035. The share of natural gas increases by 50%, offsetting a decline in the share of oil of about 15%. In fact on some scenarios gas will overtake oil as the leading primary energy source.

Back in 2002 I represented the oil companies on gas issues at the IEA. I well remember showing as slide showing this possibility. It had been produced by Shell as part of its five- year scenario planning process. My chart was met with disbelief, if not consternation. At that time Europe was struggling with the prospect of huge dependence on Russian gas supplies. I might say that my oil colleagues in Shell were also not very happy with me doing this. They were in the habits of still referring to “gas –risk” in their prospects. Today Shell, the biggest player in LNG, is close to producing and supplying more natural gas than oil in energy terms. The IEA published a last year a report titled “The Golden Age of Gas”, outlining a scenario in which gas demand could grow even more strongly than currently predicted.

Two things have driven this growth in gas demand. The first is an increase use in electricity generation. This was always going to happen given the efficiency and flexibility of gas turbines. But the fiasco at Fukushima has provided a big boost. The IEA outlook projects a decline of almost 50% in the share nuclear generation in energy supply by 2035.

Secondly, new standards for fuel emissions are driving the world’s largest ports and the maritime industry to consider the use of natural gas, in the form of LNG, as an alternative to marine fuel oil and heavy diesel oil in ships. As well as being free of particulates, natural gas also general less CO2 emissions then oil products. On the back of this, and the development of low cost, small- scale liquefaction capability, a small scale LNG distribution infrastructure is emerging. This will provide a framework upon which LNG can also be supplied into the land based vehicle market, in particular heavy road vehicles and locomotives, and to commercial and domestic consumers not connected to pipeline systems. China is already using thousands of road tankers to truck LNG up to 1600 kilometres for supply into city gas reticulation systems. The gas is produced from shale gas fields. I will have more to say about shale gas shortly.

Let me finish with small scale LNG by saying it is currently dear to my heart. About two years ago I became involved with some US partners in developing transport technology for small scale LNG. Then it was directed to some rather specific applications. Today we are pursuing a range of projects around the world. I am pleased about that, as I believe that increased use of natural gas is a key part of a practical pathway to a lower carbon future.

So what then are the geopolitical implications of all this, and who am I to discuss them. I think the implications are profound, but before looking at these let me deal briefly with my second question? It is not entirely rhetorical!

I am lucky to have enjoyed an extremely varied career in a major international oil company, Shell. It has involved me in a wide range of highly political activities. Let me mention some. I do not do so as an act of immodesty, but to give you an idea of the background and experiences from which I am speaking. These experiences have included: contesting two major, somewhat politicised legal claims, relating to activities in Southern Africa and the US, lobbying the first Thatcher Government on taxation issue critical to the continued development of the North Sea, negotiating under crisis conditions the renewal of a major LNG supply contract to Japan incorporated (represented by Tokyo Electric), launching the first successful oil and gas project in post Soviet Russia (with much US Government engagement in the process), grappling with the logistics and politics of Russian and Central Asian gas supply to Europe and China, failing to launch a major integrated offshore oil and onshore LNG project in Chavez's Venezuela, and advising governments and investors on the developments of gas policies and projects in Nigeria. Each of these has given me experiences that inform my thinking. In discussion I would be very happy to talk about any of these specifically. They were all fascinating, at least in hindsight. I could talk about each for a long time. If you are not careful I will.

But now I wish to consider some broader issues. Beginning with oil, I would like to look at the US, the largest oil importer, but not for long. The IEA Outlook indicates that the US will import about 40% less oil in 2035 than it does today, due to greater fuel efficiency, and growth of alternative energies and new energy. Last week, the Energy Information Agency of the US Government reported that domestic oil production in the US grew more strongly than anticipated last year, and is projected to continue to grow strongly until 2020. This is largely due to production of tight oil using new fracturing and horizontal drilling technology. This will further reduce the amount of US oil imports to less than 6mbd, about one third of consumption. Although it is very unlikely the US could get close to oil self-sufficiency, it is very possible that, with new supplies from Canada and Brazil, its dependence on oil from the Middle East can be eliminated. In fact the US imports 40% less oil from Saudi Arabia than it did in 2005. The strategic importance of the Middle East for the US is diminishing.

Over the same period, oil imports will be rising strongly in non-OECD countries. China will soon overtake the US as the largest importer. In 2035 it will consume nearly 70% more energy than the US. Yet its energy consumption per capita will still be less than half that of the US! Growth in India and other Asian countries will be even stronger. Over 80% of this oil will need to be imported, and 90% of this will need to come from the Middle East and North Africa, along vulnerable shipping lanes. The investment needed is estimated to be in the order of \$38trillion, more than \$100bln a year. If there is a shortfall in this investment of 30% the IEA foresees the oil price increasing to \$150(2012 dollars) in the near term. So China, India and Asia generally have a major strategic interest in the Middle East.

Turning to gas the outlook is even more dramatic. I have already outlined the strong growth foreseen in gas demand. Increasingly national energy policies are directed at growing the share of gas in primary energy consumption. Turning again to China, its 12th 5 Year Plan for 2011-16 calls for an increase in the share of gas in its primary energy supply from 3.8% to 8.3%, and additional 175 BCM of gas a year. This demand is being matched by the discovery and development of new sources of gas, both conventional and unconventional. Major new gas discoveries have been made in Africa, Brazil and the Near East. More significantly, developments in technology have seen a huge surge in production of coal bed methane and shale gas. In Queensland, as you well know, at least four major coal bed projects are in various stages of development. They are aimed at supplying LNG to the Asian market. Projects are being considered in Indonesia, Brazil and South Africa.

The most astounding development has been the growth in production of shale gas in the United States, where the techniques of fracturing reservoir rock with water pressure, and horizontal drilling to capture the released gas has resulted in a surge in domestic gas production. New shale gas discoveries have added 542TCF to US gas reserves, now equivalent to more than 90 years of consumption. Shale gas production grew from less than 1% to 23% of US domestic gas production between 2005 and 2010. The US Energy Information Agency projects this share to grow to 49% by 2035. The price of gas in the US has fallen to \$2.5mmbtu, completely disconnecting it from the price of oil. As recently as 2005, the price of gas in the US went as high as \$16mmbtu as buyers scrambled for supply in the face of apparently long term decline in domestic production. Admittedly such high prices represented spikes in a fully open market, but the general view was that the underlying US price would be in the order of \$8-10mmbtu. On this basis many new LNG import facilities were built. Today they mostly sit idle, and indeed some owners are seeking permits to convert them re-develop them as LNG export facilities. All is not roses. The gas price is well below the long run marginal cost of producing from this great new resource. So it will go up again.

The emergence of shale gas in North America is beginning to have significant global implications. Unlike oil, there is not a single global market for gas. It simply cannot be distributed, parcelled and stored easily. There are in fact three regionally based markets. In the US pricing is based on a fully traded open market similar to that for oil. This is possible because of the extensive pipeline distribution network and the availability of physical volumes of gas for trade at various hubs. In Europe natural gas has been priced under long term supply contracts, primarily with Russia, on an oil index basis, oil being the alternative energy. This has been changing in recent years as the EU presses for an open and transparent gas distribution system, LNG imports have increased and greater inter-connectivity is enabling for larger volumes of traded gas. In Asia virtually all gas has been, until recently, imported as LNG under individually negotiated long agreements, with pricing indexed to a cocktail of Japanese crude oil imports.

Before 2008 most pundits were predicting that the global gas market would integrate and there would be price convergence. Whilst this is still likely in the long term, in the short term the opposite has happened. Prices have diverged. In Asia the high oil price and the increase in demand for LNG in Japan as a consequence of Fukushima, have resulted in the price of incremental volumes of LNG as high as \$18mmbtu. Japan and Korea have been paying these prices. China, with ample coal reserves, and little gas penetration has been able to resist. But all three countries are paying for their long- term volumes an oil related price several times that of the US gas. In Europe imported LNG and regional pipeline gas from the North Sea is traded through the UK and Zeebrugge at about \$8mmbtu. Although higher than US prices this is significantly lower than the oil linked prices being paid in Europe for pipeline gas from Russia by Gazprom. As a result Gazprom has come under pressure to change its pricing formula. This has been intensified by a sharp fall in demand in the midst of Europe's financial travails, and the diversion to Europe from Qatar of relatively cheap LNG, originally destined for the now non-existent US market. Additional pressure on Russia comes from the search in Europe now for shale gas. Just last week, after two years of denial Gazprom conceded a reduction in its long term prices.

I have mentioned that China's 5 year plan aims to increase the role of gas in its primary energy supply. Yet it has refused to buy additional gas from Qatar, diverted from the US. This illustrates the relative flexibility that China has in managing its energy requirements. In the case of gas it has been quite slow to commission LNG import terminals. There are several in operation or under construction and more are planned. But China has been careful to also develop pipeline supply too. In 2010 a line from Turkmenistan in Central Asia was commissioned. Hitherto Turkmenistan has been totally dependent on Russia for exports. This pipeline feeds into a west-east pipeline in China that is seen as a key piece of infrastructure binding the nation. Expansion is already being planned. China is also constructing a pipeline from Myanmar, with Korean investment support. I have already referred to its shale gas production potential. So China seems to be positioning itself as a price- maker rather than a price-taker in the gas market.

This is illustrated by its protracted negotiations with Russia on the pricing of gas through two separate pipelines planned from Siberia. Russia has been insisting on gas pricing similar to that which it has enjoyed hitherto in Europe. China is resisting this and has felt no pressure to compromise. Russia's recent agreement to reduce its prices to Europe will no doubt re-enforce China's stand.

So, from all this, what conclusions do I draw about the future direction of energy and global politics. Let us look at the major players in turn.

The United States has encountered an incredible piece of good fortune. It has moved in the space of a few year from the prospect of ever increasing dependence on imported oil, mostly from politically insecure regions, to the real possibility that if push comes to shove it can disregard energy supply in its strategic. I am not saying it will do so. It will remain dependent on a significant volume of imported oil. But this need not be from the Middle East. Is it therefore

likely to continue to engage in the Middle East to the extent it has done so to date? In the short term the answer is yes. It seems committed at this time to confronting Iran. But to what extent is this an historical legacy, going back to the embassy siege, and reflecting a strong but perhaps weakening Israeli lobby in US, and a rapidly outdated commitment to a Saudi regime that is itself coming under regional pressure. Will the American people have the appetite for another military engagement when they are enjoying abundant domestic energy supply and natural gas prices that are many times less than those of the rest of the world. Right now there is a major debate in the US as to whether the export of natural gas should be permitted for fear they will lead to an increase in US domestic prices. I am amazed that economic commentators have as yet failed to recognise the huge boost to the US economy that low gas prices are generating. Surely this is a factor in the recent encouraging signs of more robust US economic growth.

Europe faces a rather constrained future. North Sea oil production is in decline. The prospects for shale gas in Europe are, for several reasons, not as significant as in the US. Economic pressures and the eurozone crisis will constrain its drive for alternative energies and its aspirations with regard to climate change initiatives. It will remain heavily dependent on imported energy. Pressure of competition for supply from the Asian economies will ensure this energy is not cheap.

Russia has encountered a severe dose of reality! The structure of its major export revenue earner, gas, faces unrelenting challenge. It built up a substantial strategic reserve fund during the boom years of high oil and gas prices before 2008, but dissipated this on trying to protect the rouble and the Moscow stock market. It shows little capacity to invest in the modern social and physical infrastructure it badly needs to remove it from dependency on resource exports. Moreover it appears to be heading for six year of a new Putin presidency the legitimacy of which is already challenged. It is the world's largest oil exporter and holder of the world's largest gas reserves but its dependence on these and its domestic issues suggest to me it will be a price taker, not a price maker.

China will be critical. It will be very dependent on oil imports. Its foreign policy will continue to be directed to securing these through positive diplomacy and the direct participation of its several state owned oil companies in projects in Africa, South America and elsewhere. It will be so important to suppliers as a market, and their supply will be so important to it that China will not be able to maintain its much vaunted policy of non-interference. This will be particularly true in the Middle East. We have already seen its ambiguous approach to events in Libya, its equivocation over Iran, and its veto of the UN resolution with regard to Syria. To what extent and in what manner will it take over from the US as a would be regional policeman, for want of a better word? One thing we can be sure of is that it will be very sensitive to perceived threats to the security of its energy supply lines.

Mention should be made of India as a potentially desperate importer to oil and gas and of Brazil as a probable major producer. But time prevents that.

I will conclude by commenting on what I think it all means for New Zealand. Like the rest of the world, indeed more so than most since we like our travel (and it has to be long distance) and we have limited public transport, we will remain dependent on oil for our transport needs. We are blessed with considerable renewable primary energy resources but they were not sufficient on their own to meet our power needs, and in any case will need back-up capacity, which can only be supplied by natural gas generation. Our proven reserves of oil and gas are limited. We therefore face the prospect of competing with others for oil and gas imports, with the disadvantages of requiring relatively small volumes to be transported over a long distance. History tells us we can expect periodic but regular price and supply instability in securing these imports.

We do, however, have considerable under-explored offshore oil and gas reserve potential. Given the cost and limitations of alternative energy sources, especially for transport, and given the exposure to global politics that comes with import dependence, we owe it to ourselves to do what we can to identify this potential. Only then can we decide if and how it can be developed. If the potential turns out to be real, development will face many challenges. The first may well be the challenge of convincing ourselves as a nation that should undertake such projects. That will require a rational, balanced debate about the benefits and risks of doing so. In the light of my analysis I am in no doubt about the potential benefits. I am not sure these benefits are more widely understood. That needs to be addressed.

With regard to the risks, there are several and they are all challenging. They too need careful assessment. We will not have the financial resources to develop these projects on our own. We will need to attract foreign investors. Can we do that without losing control of the resources. I do not see why not. There are many new project development structures emerging that we can learn from. Can we ensure that wider benefits accrue to the economy? Again, in principle, this should be possible. It will however require planning and the timely direction of research and investment into relevant areas. Perhaps our focus should be on the development of intellectual skills in specific technologies and areas of managerial skill. One example is environmental management.

I began by referencing the shocking events surrounding the Deepwater Horizon well in the Mexican Gulf. This highlights the potential tragedy and environmental degradation that can arise from the mismanagement of such complex projects as offshore oil and gas production, the risk that is perhaps of concern to most people. I take two big lessons from the Deepwater Horizon disaster. The first is that health, safety and environmental issues require vigilant management on a day-to-day basis at all levels in these projects. The potential always exists for the most unfortunate combination of circumstance to arise despite well thought out policies and procedures. I know that resource developers have taken that lesson. Given the consequences of such events it is in the best interest of their shareholders to do. The second lesson I take is that in that these issues can be and are managed vigilantly. The Deepwater Horizon well was just one of thousands that have been drilled and developed in similar conditions and facing

similar risks. They were managed successfully. Deepwater Horizon should not have happened, and need not have happened.

Perhaps if New Zealand becomes an offshore oil and gas production province, it can build on its already well developed capabilities in environmental management to create a world leading global expertise in further enhancing policies, technologies, techniques and processes, to manage the environmental and other social risks associated with large scale resource extraction projects.

There will be plenty of global opportunities to market such expertise.

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