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Regional energy security:
An elusive objective?

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Abstract

Energy issues are a central feature of economic and political debate. The debate focuses not only on the growing regional energy demands from China and India, but also on the cyclical and structural factors in the international energy market that are significant and that lead to considerable uncertainties about energy accessibility, prices and supply reliability. For the Asian region, considerations of supply security are increasingly part of global energy security concerns. The global debate about long-term resource availability and supply, particularly of oil and gas, centres on the questions of whether adequate resources will exist to meet growing global demands in the next twenty-plus years, or whether the resources are adequate but will not be brought to market because of underinvestment and related higher costs in the oil and gas industry. Options for alternative supply sources and alternative fuels are, at the same time, becoming constrained by concerns about the impacts on climate change and, in the case of biofuels, on food and feed supplies. Adjustments to the expected continuing increases in energy trend prices will be generally difficult for developed countries, including Australia, but especially so for developing countries including those in Asia.

Regional energy security: An elusive objective?

STUART HARRIS*

The consequences of sustained and rapid economic changes in Asia (particularly China and India) for international trade, labour and financial markets have been recognised for some years. Recognition of their effects on commodity markets has evolved more slowly, but the impacts are now seen as substantial.¹ Energy is at the forefront of this attention, in part because cyclical and structural changes have added to the considerable uncertainties in energy markets.

This paper asks, how do uncertainties in the international energy market affect Asia? It is apparent that the way we perceived energy security in the past has changed. It now needs to be seen as a more serious global issue. As the chief economist of the International Energy Agency (IEA), Fatih Birol, has argued, 'Rising global energy demand poses a real and growing threat to the world's energy security'.²

Energy market uncertainties revolve around future energy (notably oil) supply and demand, including potential oil supply adequacy, the sensitivity of oil demand to increasing prices, enhanced investment uncertainty, the changed role of the international oil companies, the increased importance of national oil companies, the role of the Organization of Petroleum Exporting Countries (OPEC), the impact of speculation, and the decline of the value of the American dollar. To these uncertainties are added environmental issues,

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¹ HM Treasury, 'Global commodities: A long term vision for stable, secure and sustainable global markets' (London: HM Treasury, June 2008).

² 'Transcript: Interview with IEA chief economist', *Financial Times*, 7 November 2007.

notably climate change, and increasing overlaps with food supply and prices.

Even before these uncertainties emerged, access to energy supplies had become a matter of high policy concern in most countries in Asia. Along with energy security concerns, predominantly about the physical accessibility to future energy supplies, have been more immediate regional concerns about rising prices and their impact on lower income sectors of national populations. Moreover, given the environmental and budgetary benefits of following market prices for oil, but given the adverse inflationary and economic stability impacts of such policies and the effects on poverty and food production, countries now face difficult choices in managing the various policy options, even if that management has only a marginal influence. These inter-relationships are especially important to Asian countries. Nevertheless, while features exist that are particularly significant in the region—such as import dependence, high energy intensity, substantial maritime transport dependence, infrastructural investment needs and limited refinery capacity—regional energy security must be examined in a global energy security context.

Although energy security can be defined in various ways, it usually relates to three supply factors: adequacy, affordability and reliability. Rapid developments in the global energy market in 2007 and 2008 make it difficult to separate short-term influences, including speculation, from cyclical and structural shifts in the energy, particularly oil, market. Cyclical and structural issues are often critical causes of short-term, sharp, price variability, as well as for the long-term. Nor is it possible to separate physical supply from price, since supply determines price, even if price does not necessarily determine supply.

ADEQUACY

Adequacy of energy supply relates to the current global supply/demand balance and how it might evolve over time. We will look, therefore, at how energy markets have changed, and what influences will affect them in the future.

Global energy demand has increased because of the sustained economic growth of recent years, and is expected to continue increasing in the future, particularly in Asia, and especially in China and India. Global oil consumption increased by 10 per cent from 2000 to 2006; over the same period, consumption in Asia-Pacific increased by 16 per cent and that of

China and India by 52 and 14 per cent respectively. Although those two countries accounted for only 12 per cent of global consumption, China alone accounted for over one-third of the growth in global demand.

If past trends continue, global energy consumption will grow at an average of some 1.8 per cent a year, and by 2030 will have increased by almost 50 per cent on today's figures.³ In the same period, Asian demand will continue to grow, with China and India accounting for almost half of that growth. Coal will be an important, growing component of the energy sources needed for this energy consumption, especially in China and India. China, once a major coal exporter to other parts of Asia and beyond, will become a net importer over that period.

While natural gas and the reliability of electricity supply are energy security concerns, particularly in some parts of Asia, including China, crude oil is the centre of regional policy concern, and the most problematic prospectively. Consequently, this paper concentrates largely on crude oil.

On existing IEA projections, China and India will account for over 50 per cent of global growth in oil imports by 2030, and other developing Asian countries will account for 6 per cent. Projections of demand produced in current circumstances might be a little lower, on the expectation that higher prices will reduce demand growth, as is already happening in industrialised economies. A basic assumption, however, would also be that there will be continued growth in the Asia-Pacific, particularly in the major regional economies. Most analysts expect economic growth in this region to continue, but US economic difficulties will be a major factor, as will the issue of decoupling China's and other Asian nations economies from that of the US.

Energy supply generally has grown slowly. In particular, for liquid fuels, which are the major energy security concerns for most countries, supply has become tight. It will likely remain tight, and currently it tends to set the market outcomes for other fuels. Reflecting an investment cycle, underinvestment in the industry at all levels during the low price phase of the cycle in the 1990s meant that spare capacity in the industry was limited when demand rose, restricting the supply response; hence the price rises that

³ Drawn from the data in International Energy Agency, *World energy outlook 2007*(Paris: International Energy Agency), chapter 1.

have been experienced.⁴ Although this cyclical influence was critical in the 1990s and early 2000s, other structural features that emerged, such as the diminishing importance of the international oil companies, also increasingly influenced the energy market. Although exploration and developmental activity has increased in response to the higher prices, a variety of constraints have limited the expected response, despite apparent incentives of the continuing high prices, including rising production costs and increased political risks. In the longer term, the tight supply situation will likely continue.

The current level of uncertainty in the energy market is considerable, which then poses problems for responding to energy security concerns. The supply difficulties have contributed to speculation that higher oil prices indicate long-term resource limitations. There is substantial debate about whether the oil industry has reached, or will soon reach, the point of 'peak oil' production (where global oil production will decline). Given the non-renewable nature of the major energy resources, the question is less *whether* there will be a peak than *when* it might emerge. Various estimates suggest that the peak would be reached within the next few years. This view leads to a belief that the international 'scramble' for supply sources will intensify. Nevertheless, while economically recoverable fossil fuel resources are finite and will eventually constrain production, the main institutional analysts, including the IEA, conclude that a lack of the underlying resource will not be the major reason for supply problems in the short to medium-term future.

Despite expecting oil demand to be 37 per cent higher in 2030 (the end point of its projection period) than in 2006, in its 2007 analysis, the IEA did not expect oil production to peak in the next quarter century at least. To date, however, IEA projections have been largely demand-based, with mostly Middle East-based OPEC members expected to meet most of the added demand. The IEA has previously assumed that there are enough resources to meet growing demands at least until 2030. There is some uncertainty in the IEA about the accuracy of resource and reserves estimates following the downwards revision of some US estimates of what resources

⁴ For more detail see Stuart Harris and Barry Naughten, 'Economic dimensions of energy security in the Asia-Pacific', in Michael Wesley (ed.), *Energy security in Asia* (London: Routledge, 2007).

are still to be discovered.⁵ Proven economically recoverable reserves, however, have either kept pace with or been a little ahead of production in recent years, including a slight increase in Asia in 2007.⁶ These upward revisions may be linked to international price increases, and the existence of substantial reserves of unconventional oils in Canada and South America.

The IEA's concerns appear to have been less about resource scarcity in the short to medium-term, than its fears that the investment needed to provide the global supply to meet the expected demand will not be adequate. Capital requirements are large: the IEA estimated in 2007 that capital requirements amounted to some US\$22 trillion, a figure not beyond the capacity of the world's capital markets to provide even if, as seems likely, that estimate will need to be increased. Moreover, price increases have transferred an estimated additional US\$3 trillion from importing to exporting countries since 2001.⁷

The requirement for investment derives not just from the need to explore and develop new fields, but also because of the age of existing fields and past underinvestment in field maintenance. Increased expenditure is necessary to refurbish infrastructure, and to keep decline rates down and production up. Several factors lead to pessimism about whether sufficient investments will be made to bring on the additional supply required to avoid further substantial price increases. New discoveries are often made in more geographically awkward or politically sensitive areas of operation, for example, in offshore deep water, Africa or Central Asia, which adds to costs and leads to unpredictable and unstable production. Increased competition for scarce labour, technology and equipment, such as drilling ships and rigs (the production of which decreased during the low price period of the 1990s) has greatly increased costs. The Goldman Sachs Group estimates that the costs to the marginal producers of producing a barrel of oil are now around \$70 a barrel.⁸

⁵ Neil King and Peter Fritsch, 'Energy watchdog warns of supply side oil-production crunch', *Wall Street Journal*, 22 May 2008.

⁶ 'BP Statistical Review of World Energy June 2008', <www.bp.com/statisticalreview>.

⁷ Goldman Sachs Group, 'The revenge of the old 'political' economy: The sustainability of higher long-term commodity prices, Part III', 14 March 2008, p. 13, <www.fullermoney.com/content/2008-05-07/CurrieRevengeoftheOldPoliticalEconomy.pdf>.

⁸ *Ibid.*, p.12. Marginal costs of production set the market price for oil.

A major factor for pessimism, however, is that national governments now control most of the petroleum liquids reserves. The five largest, privately-owned international oil companies control just under 4 per cent of those reserves; national oil companies now control close to 90 per cent.⁹ The major private sector international oil companies have reserve to production ratios averaging eleven years, while the nine major national oil companies have an average reserve to production ratio of seventy-eight years.¹⁰

National oil companies have different incentives to those of the international oil companies, and despite their increasing revenues, many of the national oil companies have not used, or are not permitted to use, these revenues to pursue output growth. Low investment rates have been accompanied in many cases by relatively inefficient operations.

To ensure access, several Asian countries, China and India in particular, have pursued policies of 'going out' to invest in oil and gas ventures internationally. Despite concerns, especially in the US, that these investments, often in the form of shares in the output (or 'equity oil'), will in some way limit the global access to this oil, such fears are exaggerated. Oil shipped to the home country would reduce by the same amount that country's demand on the global market. In practice, most of the Chinese equity oil has been sold on the international market for quality, logistical and profitability reasons. Involvement in Sudan and Iran has been a controversial issue, especially for China. The investments in those countries have, however, added to the supply of oil on the international market.

China and India are not the only Asian countries with energy investment interests outside the home country. Japan has had a long experience of overseas energy investment and recently reinvigorated its sagging efforts. South Korea has become active in recent years. Malaysia, too, through its company Petronas, is a partner with China and India in Sudan's oil industry; and similar to a number of Association of Southeast Asian Nations (ASEAN) members, has energy interests in neighbouring Southeast Asia.¹¹

⁹ Robert Pirog, 'The role of national oil companies in the international oil market', CRS Report for Congress (Washington, DC: Congressional Research Service, 21 August 2007).

¹⁰ *Ibid.*

¹¹ More detail is available in Vincent. S. Pérez, 'Who wins in the Asian scramble for oil?', in *Energy Perspectives on Singapore and the Region* (Singapore: ISEAS, 2007).

AFFORDABILITY

Given the increase in energy (especially oil) prices, the perspectives on what constitutes affordability has changed. In mid-2008, oil prices reached record levels in real terms. Whilst the high prices are hardly affordable for the industrialised countries,¹² they are bad news for developing countries in Asia, as elsewhere, and very bad news for the poorer countries among them. The continued use of subsidies to help those on low incomes is becoming a financially unsustainable burden. Estimates put the budgetary cost of global energy subsidies in 2005 at around \$250 billion.¹³ Around one-third of this is in Asian countries, and a number of regional countries—Indonesia, India, China and Malaysia—have already cut existing subsidies, thus allowing energy prices to rise.

The news about the future may not offer much relief. The evidence suggests continued upward pressure on prices from the growth in demand from China, India and other parts of Asia in particular. For the long-term, the IEA has said that were a level of per capita income to be realised in China and India comparable to that of the industrialised countries, on today's (resource intensive economic) model, it would require a level of energy use beyond the world's energy resource endowment.¹⁴ It would also be beyond the capacity of the world's ecosystem to absorb the associated carbon emissions. The IEA suggested that all countries, including China and India, would have to pursue a different development path to that adopted in the West.¹⁵ Policies to achieve an early outcome of that kind may seem improbable; in the meantime, the more likely outcome is a continuing rise in the trend price of oil and other energy resources across the globe.

Crude oil prices are set on an international market. While production is not determined on an open competitive basis, once produced and available for sale internationally, crude oil is priced competitively.

¹² However, the industrialised countries are better placed to cope with high prices than they were at the time of the previous high oil price peak in 1980, when comparable prices in real terms were experienced.

¹³ International Energy Agency, *World energy outlook 2006* (Paris: International Energy Agency, 2006), Section 11.

¹⁴ International Energy Agency, *World energy outlook 2007* (Paris: International Energy Agency, 2007), p. 215.

¹⁵ *Ibid.*

Energy security is also concerned with rapid and unexpected price hikes. The increased volatility of oil prices has particular problems for the fiscal and monetary authorities in developing countries, problems additional to those already resulting from the high trend levels of prices. Many factors can contribute to short-term price variability. The market is supplied by fewer suppliers and there is a greater reliance for supplies on the Middle East, which in the past has been a significant source of instability. Moreover, there is now less price elasticity so that with continuing price increases, demand falls back only slowly.

A major cause of price variability is that spare capacity in the energy industry is limited and any political disturbances, such as rebel attacks in Nigeria, climatic events, such as Cyclone Katrina, or attacks on an oil-producing country, such as Iraq, lead to price spikes. Price spikes were frequent in the past in response to disruptions in the international and domestic supply of crude oil, such as the Arab oil embargo in 1973, the Iran/Iraq war in 1980, the war in Iraq, unrest in the Niger River delta region of Nigeria, and hurricanes in the Gulf of Mexico, but to a degree the situation is now even more volatile.

There is much argument that the international market for crude oil is affected by the fall in the value of the US dollar and by speculation. Since crude oil is usually priced in US dollar terms, falls in dollar values do make some difference to posted prices, but for those consuming countries with currencies not tied to the US dollar, that effect is offset to the extent that their currencies have appreciated against the dollar. There are more extensive debates about the effects of financial speculation on price levels. Pension and hedge fund operators and other financial speculators in the US, and, to a lesser extent, the futures markets in Britain, may in the short-term exaggerate the price rise. Price variability is likely to increase in part because of speculative activity, but more because tight supply leaves little room to compensate for unexpected movements in supply or demand.

When, as in mid-2008, investment funds such as Goldman Sachs predicted \$200 per barrel of oil by the end of that year, markets would be expected to respond; industry participants would seek forward cover for their business needs while financial investors wanting to move from a falling dollar would see oil futures as a promising alternative. In practice, both types of financial actions have contributed to record levels of activity in futures markets on the New York Mercantile Exchange. Until adequate

counter speculators who want cover against, or are betting on, price falls, emerge, as they will in due course, oil futures prices will continue to rise. In general, however, speculators follow rather than shape the market.

OPEC previously had a significant influence on prices by setting upper production limits on its members who produce about 40 per cent of the world's crude oil. OPEC members possess about two-thirds of the world's estimated crude oil reserves, but only Saudi Arabia has spare production capacity and that seems to be substantially of heavy crude, for which global and Asian refining capabilities are limited. There is considerable debate about Saudi Arabia's reserves and its actual and spare production capacity, and this leads many analysts to believe that OPEC will be less able to influence the market in the future than in the past. When Saudi Arabia in May–June 2008 promised to increase output by half a million barrels a day, no perceptible impact on prices was observed. China's announcement shortly after, however, that it was raising domestic prices of petrol by some 17–18 per cent seemingly did get a positive market reaction.¹⁶

While the long-term price trend is likely to be upwards, some movement back from the high prices of 2008 is likely as demand slows and investment increases stimulate added production. There is little basis for judging where the trend price might end up, however, except that it is unlikely to move back to below levels of three or four years ago. Various estimates for short-term prospects range widely, mostly around \$100 a barrel. For more substantial reasons, including continued growth not only in developing Asia, but also in the Middle East where demand has grown by 35 per cent since 2000, the underlying trend level of prices is likely to continue upward at levels substantially above those of recent experience.

Because international distribution of oil is a competitive process, access to crude oil will normally be available on the international market at the going price. That price is sensitive to short-term shocks not only because of limited spare capacity, but also because at current high prices the incentive to hold stocks, except for speculative purposes, is low; there is little evidence, however, unlike peak in the early 1980s, of oil being held back in order to profit from rising prices.

¹⁶ Ariana Eunjung Cha, 'After hike in China, global oil prices fall', *Washington Post*, 20 June 2008.

RELIABILITY

Various factors could interfere with the reliability of the supply of oil, including political coercion, natural disasters, military conflicts and terrorism. Much of the concern in the region relates to the security of sea lines of communications (SLOC). Nearly 40 per cent of global crude oil shipments go through the Malacca Straits; more than 40 per cent goes through the Straits of Hormuz. Consequently Asian states, China, Japan and India in particular, worry about their vulnerability.

Any blocking of the Hormuz or Malacca Straits would have a regional and global impact on oil markets. There is no practical alternative to the Straits of Hormuz for the Gulf countries, who supply a substantial portion of global oil and oil imported into Asia. Consequently, the market has responded sharply to any periodic threats of hostilities towards Iran. There have already been naval skirmishes between the US and Iran in the Straits where the two countries, neither of whom have ratified the Law of the Sea convention, differ over maritime borders.

China has a particular concern that if it had a major difference with the US, the US could block oil shipments to China. It may be less concerned today than in the past, in part because of improved Sino-US relations. In practice, however, interdiction would be very difficult; moreover, any move to interdict crude oil shipments would have significant short-term impacts not just on China but on all involved in the international oil trade as well as major, long lasting, impacts on the global shipping and insurance industries.

Regional sea lane concerns, however, have mainly reflected effects of piracy and the possibilities of terrorism. Intensified activity by the littoral states—Indonesia, Malaysia and Singapore—including coordinated patrols and ‘eye in the sky’ aerial surveillance seems to have reduced the incidence of piracy, now increasingly limited to smaller vessels. The International Maritime Bureau noted a drop in the number of attacks in the Malacca Straits from thirty-eight in 2004 to seven in 2007.¹⁷

Terrorism remains a possibility, but one not easily undertaken; possible scenarios have included sinking a large tanker to block the Straits or

¹⁷ ICC International Maritime Bureau, ‘Piracy and armed robbery against ships: Annual report 1 January–31 December 2007’, (London: ICC International Maritime Bureau, January 2008), Table 1, p. 5.

blowing up a liquefied natural gas (LNG) tanker—referred to, somewhat dramatically, as a ‘floating bomb’. Speculative scenarios often see the possible linking of pirates and terrorists. Each of these possibilities cannot be totally ruled out, but is generally thought unlikely, as is the possibility of blocking the Straits given the width of the Malacca Straits even at their narrowest part.¹⁸

Even so, any blockage of the Malacca Straits would pose major but not insuperable problems. There are alternative routes. Problems would arise from the added shipping capacity requirements because of the longer distances. They also point to the significance of sea lane security more widely in maritime Southeast Asia. Around the Indonesian straits, for example, the number of attacks remains high but is declining.¹⁹

THE SEARCH FOR ENERGY SECURITY

For countries in Asia, energy security issues arise from rapidly rising energy demand, increasing dependence on imports in an increasingly uncertain international environment, a volatile and high priced market, and inadequate investment in many producing countries in energy production, processing and transport.

A variety of general measures would have beneficial effects in limiting both short and long-term energy insecurity, whether physical interruptions to supply or through price volatility. These include energy conservation, increased energy efficiency in processing and transport facilities, diversification of supply and energy sources, increased stockholding; increased domestic production (where possible) including of renewable substitutes, removal of market impediments, better data and information and their greater transparency, good relations with supplying countries, and increasing international cooperation.

Conservation measures to reduce oil, gas and coal consumption, including increasing the efficiency of energy use, are perhaps the least expensive way to improve energy security for both short and long-term benefit. Asian developing countries have the advantage of being able to

¹⁸ Sam Bateman, ‘Assessing the threat of maritime terrorism: Issues for the Asia-Pacific region’, *Security Challenges*, 2(3) 2006.

¹⁹ Forty-three in 2007 compared with 94 in 2004.

draw on existing conservation technologies that would make possible significant progress.

Pricing energy at global levels is a first step, particularly for oil which will increasingly be used primarily for motor transport. Japan and Hong Kong have long had high petrol prices, with substantial taxes on transport fuel. Elsewhere in Asia, consumer petrol prices have generally been low in global terms. China has high motor vehicle fuel efficiency standards and although until recently its prices for transport fuels have been low, in 2008 it brought prices closer to market levels.

While this paper does not discuss the climate change issue at length, in this case the implications for climate change problems would be positive. Nevertheless, few would expect conservation alone to reduce oil and other fossil fuel use absolutely in the near future. Motor vehicle car numbers are likely to grow rapidly in rapidly developing Asian countries. Nevertheless, enhanced conservation measures would help.

Apart from conservation, a standard response to concerns about energy security is to argue for greater diversification of supply sources and fuels. To the extent that it is possible, this would help provide some added degree of security. In most cases these methods are now more difficult to achieve sufficiently to make a major difference. Indeed, as the exporting countries of Asia increase their own demand, as in Vietnam, or their productive fields decline, as in Malaysia and Indonesia, the region's supply is increasingly likely to depend upon the Middle East for much of its crude oil.

Diversification of fuels is being pursued in a number of directions. The constraints limits, however, on switching to other energy sources, apart from its practicability, are often major. For electricity generation, natural gas is increasingly used mainly because of its lower carbon emissions, but it requires substantial capital investment for transport and storage infrastructure and for industrial and power generation uses. How far that investment is made depends on its expected profitability given that natural gas prices have moved up sharply along with oil. Natural gas is a regional resource, but regional reserves are extensive and a number of countries in Asia have domestic resources. China, India and Korea, however, are expected to import around half of their requirements within two decades or so, with transport processes as vulnerable as those for oil.

China and India are looking to rely increasingly on coal. Coal use in China is expected to increase by over 50 per cent by 2030, while India's coal use will treble from present levels. Coal consumption elsewhere in the region will double over the same period, posing obvious problems for efforts to reduce carbon emissions.

The use of biofuels internationally, notably ethanol from grains and biodiesel from oil seeds, has increased liquid fuel availability, accounting for almost one-third of increased liquid fuel production in 2006 and 2007. Often in receipt of subsidies, these first generation biofuels compete with food and feed production. Estimates indicate biofuel use for transport has contributed to increased global food prices of 30 per cent of average grains prices and a regionally significant 22 per cent in rice prices.²⁰ Together with other factors affecting food production, including increased costs of energy and energy-based fertilisers, the distress to those on lower incomes is already substantial and likely to limit the extent of biofuel substitution for other liquid fuels.

For power generation, regional interest in nuclear power has increased in the region. Six Asian countries have nuclear plants under construction,²¹ and China and India have major plans for expansion of their nuclear industries. Australia has started to export uranium to China under safeguards agreements signed with China, but it has not agreed to sell uranium to India, a non-Nuclear Non-Proliferation Treaty country. Although a positive factor on the climate change front, public concerns about nuclear safety, costs and the possibilities of proliferation of nuclear weapons continue to be a factor in many decisions about nuclear energy.

Overall, then, scope for increasing energy security by diversifying supply sources and fuels, while positive, is subject to substantial constraints.

Emergency stocks can be an important weapon against short or medium-term supply and price shocks. In September 2005, IEA members collectively agreed to release 60 million barrels of oil and oil products over a month to offset the price effect of Hurricane Katrina. Japan and Korea released stocks from their emergency stockpiles in accordance with their

²⁰ Mark Rosegrant, 'Biofuels and grain prices: Impacts and policy responses' (Washington, DC: International Food Policy Research Institute, 7 May 2008).

²¹ China, India, Indonesia, Japan, South Korea and Taiwan.

membership obligations in the IEA. Although not an IEA member, some years ago China also established an emergency stock, filling of which began in 2005. India has also started to build a crude oil stockpile.

To gain the full benefit of stock releases, stocks should be released cooperatively with others. If a single country does so unilaterally, the market effect is widely dispersed. While all market participants gain a little, including the country releasing the stocks, that country nevertheless carries the full cost. A 'tie up' with the IEA in this process would be a constructive step.

WHERE DOES AUSTRALIA FIT?

Australia's dependence on imports for transport fuels will grow. Its net oil self sufficiency is expected to drop from the present 58 per cent to 33 per cent by 2015, absent further substantial discoveries.²² Australia presently imports oil predominantly from Asia. Its main regional suppliers are Vietnam, Papua New Guinea, Malaysia and Indonesia. Only a limited amount now comes directly from the Middle East, although its imports of petroleum products from Singapore presumably include Middle East oil. It is likely to source more oil from the Middle East in the future as its import needs grow and as Asian exporters' once ample reserves run down and their own demand increases.

With its extensive resources of natural gas, coal and uranium, Australia is a major energy exporter to Asia. It is a large exporter of coal; around 90 per cent of its coal exports and a large share of its LNG exports go to Asian countries. Within the region, Australia is presently a significant uranium exporter to Japan, Korea and Taiwan. Much of its coal and LNG exports currently go through Indonesian (Lombok) straits and this energy trade is expected to increase. Sea lane reliability is an important security interest that Australia shares with other regional countries.

Australia has an obvious economic interest in contributing to Asian resource security. The impact on Australia's economy of the market for Australian resources in China, and also over a longer term Japanese demand for Australia's resources, has been marked. Japan has long invested in

²² Ian Mc Farlane, Minister for Industry, Tourism and Resources, 'Data room to boost search for oil reserves', Media release, Canberra, 18 July 2007.

Australian resource industries and China has shown substantial similar interest.

Measures that enhance energy supply security are commonly of a global public good. International cooperation is more effective when undertaken collectively with other countries. It will often pay for countries to act together for various energy security purposes—joint stock management, swap arrangements, data provision, technology development in conservation, clean energies, fuel switching and pipeline and electrical transmission systems.

Reference has already been made to multilateral cooperation among oil-importing economies in order to reduce oil consumption, especially through policy intervention that promotes fuel efficiency that addresses the national and global external diseconomies of oil consumption, notably global warming. Bilateral, regional and international energy cooperation will help to develop more effective policies in order to reduce regional energy insecurity. A constructive bilateral example was a Sino-Japanese agreement for China to import Japanese conservation technology and Japan to import coal from China.²³

Regional countries have been active in pursuing energy security through the APEC Energy Security Initiative. This initiative encompasses short and long-term measures under five headings: energy supply disruptions, energy investment, energy efficiency in use, diversification, and technology innovation.

The resultant perspective would be useful in resource security discussions in line with those in IEA, the G20, the G8 and the ASEAN Regional Forum. Australia and other regional countries are involved in other energy related initiatives, such as carbon sequestration (Carbon Sequestration Leadership Forum), the hydrogen economy (International Partnership for the Hydrogen Economy) and the methane partnership (Methane to Markets Partnership).²⁴ Other examples of cooperation are in clean coal research through, among other mechanisms, the Asia-Pacific

²³ Xinhua News Agency, Beijing, 5 December 2005.

²⁴ National Petroleum Council, *Facing the hard truths about energy: A comprehensive view to 2030 of global oil and natural gas* (Washington, DC: National Petroleum Council, 18 July 2007), chapter 4, p. 22.

Partnership on Clean Development and Climate, which involves six regional countries and the US.

CONCLUSION

The Asian region cannot avoid being involved in the global energy market and indeed has had to move closer to it. That market is clouded with many uncertainties. The argument that high prices are due to developing Asian economies overlooks the contribution of two major influences: an investment cycle and structural change. Because of underinvestment in all aspects of the industry since the mid-1980s, energy producers had difficulty coping with the increased demand that came with economic growth in the early 2000s, to which the Asian developing countries certainly contributed substantially. That cyclical process has now reversed itself, but structural changes, including most reserves now being in the hands of national oil companies and production decline in a number of the major existing fields, have also become important. The investment that would normally have followed the price increase will now be constrained by national policies of producing countries, geopolitical risks and rapidly rising costs. This slow supply response has contributed markedly to the rising trend prices of oil and other energy sources, and it seems likely to continue to do so.

There are many uncertainties about future energy demand, but perhaps more so about future energy supply, providing problems for decision-makers. Among the major uncertainties is how soon basic resource constraints will affect the market. In practice, however, for the next two decades, whether the resource constraints become real or the problem is in underinvestment and other induced supply constraints, how the problems show up will not differ greatly.

This will have important political consequences. It is not likely that any 'scramble' for oil would lead to overt conflict where sovereignties are well established, although conflict over energy resources has by no means been unknown in the past. Nevertheless, provided the distribution of oil remains competitive, this remains a more efficient means of gaining access. Yet, where sovereignties are uncertain or disputed, possibilities of conflict are greater.

The scope for destabilisation within all countries is likely to be substantial. In developed countries, increased prices of energy, food and other energy-related products, and the associated required reduction in

demand, will be very unpopular. Consequently, the substantial process of adjustment that appears inevitable could be disruptive in domestic politics. That close to comparable price levels for energy have been experienced in the past and that the costs of energy have been declining in price for much of the post-Second World War period will hardly be a persuasive counter-argument in developed countries. It certainly will not be in developing countries. The extent of political discontent in the latter could stimulate major tensions, especially in those developing countries with less robust governing systems. In exporting countries, particularly those with differing ethnic or religious communities, the distribution of wealth from energy receipts could split communities and lead to civil, possibly violent, conflict.

Ensuring reliable and affordable energy in these circumstances will be an elusive global objective, and no less so regionally.

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