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Power plays

Energy and Australia's security

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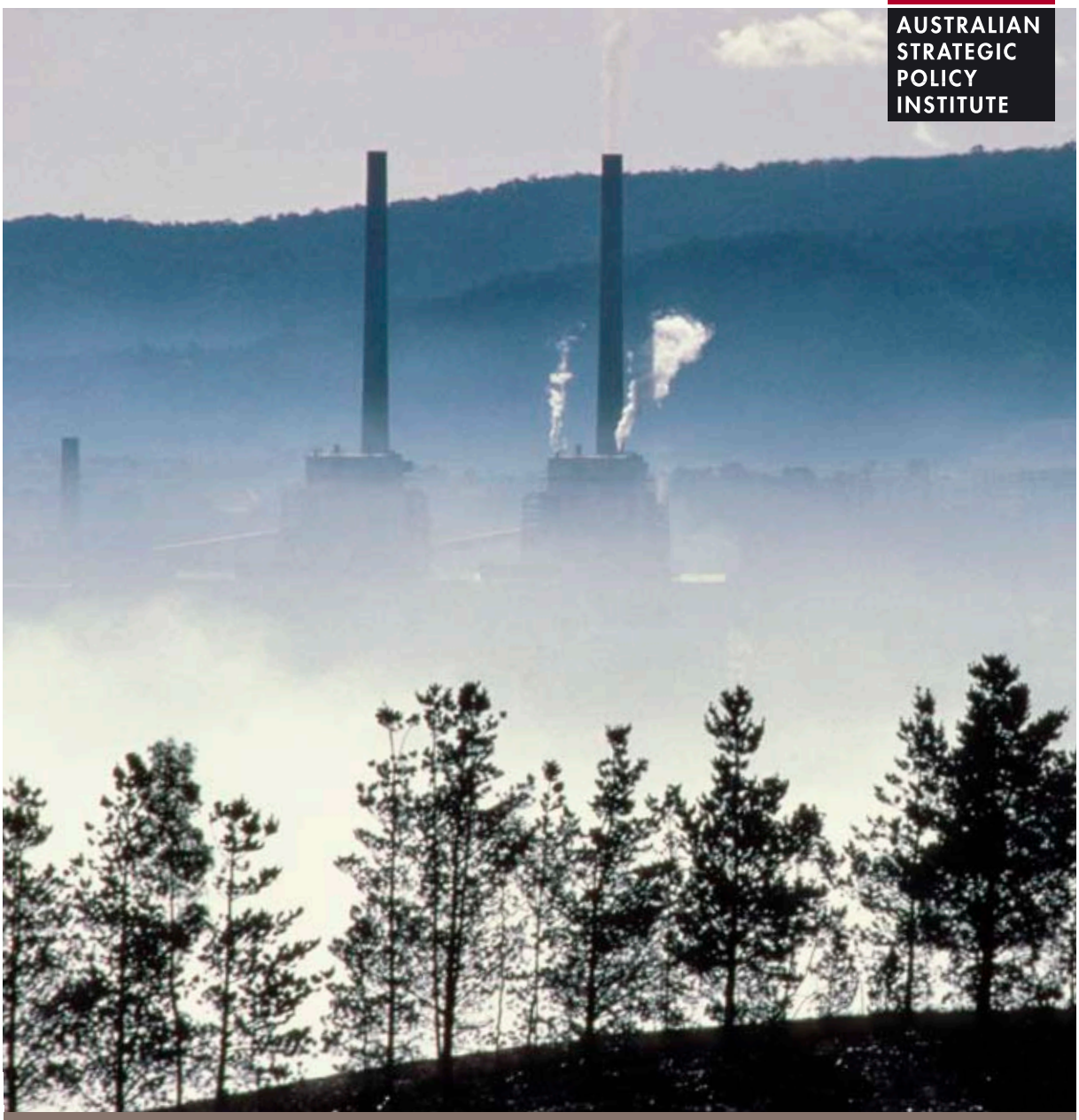

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Cover image: Wallerawang Power Station, Lithgow District, New South Wales, Australia.

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Executive Director's introduction

The politics of energy security and national energy strategies have emerged as key concerns in both developed and developing countries. They are increasingly treated as part of the traditional security agenda. The global demand for energy will grow dramatically over the next twenty years with the most rapid increases coming from Asia, particularly China and India. All governments will need to develop comprehensive policies to meet the challenges posed by growing demand for energy.

Energy security will thus become an increasingly important component of Australia's foreign and security policy agendas. The changing energy environment will impact on issues as diverse as the Middle East, East Timor, climate change, and uranium sales. Australia is a net energy exporter. As the world's largest exporter of coal, and a country with 40% of the world's low-cost uranium reserves, Australia's own role as a 'player' at the global energy table seems assured.

Moreover, as the strategic importance of energy rises, both globally and nationally, it is much more likely to be the subject of public and political debate. So we asked Professor Michael Wesley, of Griffith University, to prepare this *Strategy* report for us, and to explore the issues of energy and security in relation to both Australia and the wider Asia–Pacific region. His conclusions merit a careful reading. He argues that, in several important ways, the current energy 'shock' is substantially different from those that have occurred in earlier decades. Energy supplies are now subject to a widening range of threats, including disruption by transnational actors, economic competition, potential resource conflicts, and coercive manipulation. Australia needs to devote more focused attention to the looming problems of energy than has been our previous practice.

I am sure readers will find considerable food for thought in this well-crafted analysis, and I thank Michael for his efforts and insights. Responsibility for the views expressed in this report rests with the author and me.

Peter Abigail
Executive Director

Photo opposite: A coal fired power station near Lithgow is shrouded in morning mist. AFP/AAP/ Torsten Blackwood © 2005 AFP

Executive summary

The world is entering an era of steadily tightening energy markets. The growth in demand of the United States, China and India for imported oil and gas, and the increasing dependence of the world on supplies from unstable regions means that the adequate supply of affordable energy will become increasingly a part of most states' security calculations in the coming decades.

Access to abundant, cheap energy has become increasingly essential to the functioning of modern economies and societies and to the processes of globalisation that have driven half a century's economic growth around the world. Yet the uneven distribution of energy resources among states, and the critical need to access those supplies by all states, leads to significant vulnerabilities. The coercive manipulation of energy supplies, competition over energy sources, the proneness of energy producing countries to political instability, attacks on supply infrastructure, competition for market dominance, and accidents and natural disasters are all significant risks to global energy security. Although any one risk on its own may not cause much disruption, the coincidence of several may create serious problems.

Australia is no less dependent on a small range of fossil fuels than most other developed countries. It is in the enviable position of being dependent on imports for less than a quarter of the energy it consumes. This has led to an understandable tendency for Australian governments and society to be more sanguine about energy security than many of the other countries of the Asia Pacific.

Australia is party to a range of energy security measures coordinated through the International Energy Agency (IEA) and the Council of Australian Governments. Recent energy security measures also include the setting up of the Border Protection Command to coordinate patrols of Australia's offshore oil and gas fields to strengthen their security against terrorist attack. Australia is also committed to diversifying its energy types and sources and increasing the interconnection of energy systems, broadly in line with suggested practice within the IEA and APEC.

However, there is little reason to be complacent about energy and Australia's security. Australian society is highly dependent on road transport, which in turn is almost completely reliant on oil and gas, with little prospect of short-term substitutes. Australia's self-sufficiency in oil products is declining markedly, and like most other Asia–Pacific states, Australia will become increasingly dependent on imports from the Middle East in the next decades.

Furthermore, energy security issues are likely to substantially reshape the great power relationships in the Asia Pacific. Although energy competition among the major powers is unlikely to trigger major conflict, it may be a contributing cause to tensions and competition, particularly in the Middle East and Central Asia. Most of the fragile states in the Asia Pacific are completely dependant on energy imports, and would have little economic resilience in the face of such a major shock. The prospect of several of these states moving towards collapse at the same time would constitute a serious challenge to Australia's security policy. And a general energy crisis, even if it didn't have a profound effect on Australia directly, could do major damage to the Australian economy by virtue of its effects on other economies more dependent on energy imports.

Australia needs to factor these broader aspects of energy security into its foreign and defence policies. The Australian Government believes that a freely operating global energy market is the best guarantor of global energy security. The market diversifies risk, by making disruptions to supply anywhere in the system able to be absorbed by a general rise in price. And it matches up exporters' interests in continued demand for their energy with importers' interests in steady, affordable supplies of energy. But history shows that global energy markets can be distorted by distrust, rivalry and power manoeuvring. A comprehensive international energy security policy requires strategies to ensure that such considerations do not imperil the operation of the energy market.

As a major energy exporter, Australia has the diplomatic weight to advance a multilateral mechanism that brings together the world's major energy producers and consumers to promote cooperative approaches to managing supply problems; a reliance on the free operation of a transparent global energy market; and the development of a greater diversity of fuel types and sources. Australia's status as a maritime power also allows it to play a more vigorous role in promoting cooperative regional frameworks for the secure transit of energy supplies.


L N G

Chapter 1

INTRODUCTION

We are currently living through the third energy shock of the post-war era. Since early 2004, oil prices have risen on a scale similar to that of the first oil shock (1973–74) and double that of the second oil shock (1979–1980). But there are three important differences between the current situation and the previous two oil shocks.

We are currently living through the third energy shock of the post-war era.

First, whereas the previous two were supply-side shocks, the main drivers of the current oil price hikes are on the demand side. The world's growing thirst for oil, particularly in the US and in rapidly developing China and India, has combined with cyclical underinvestment in exploration and refining capacity to drive up the price of oil in ways that make a subsequent price decline, as occurred on the previous occasions, extremely unlikely. There are supply-side issues this time, too—disruptions to Iranian and Iraqi supplies, instability in Venezuela and Nigeria, and hurricanes in the Gulf of Mexico—but the demand-side pressures are unlikely to abate.

China's oil consumption doubled over the past decade, and India's increased by two-thirds. Given their rapid economic growth, their currently low energy consumption per capita (12% and 6.5% of the US's and 56% and 30% of the world's average for China and India, respectively) will inexorably increase, driven particularly by their rapidly expanding middle classes. The US Department of Energy estimates that China's consumption of oil will increase by 156% by 2025, and that India's will rise by 152% over the same period. The proportion of oil and

Photo opposite: LNG tanker. © Woodside

gas in the total energy mix[1] of Asia's developing economies is projected to rise, and most major economies in North, Southeast and South Asia will rely on imports of oil and gas.

Second, there's now a near-total acceptance of the severe environmental consequences of fossil fuel use. In a very short time, the process of global warming and its consequences have come to be accepted by overwhelming majorities in most western and many non-western countries. At the same time, the carbon-trading schemes developed before the Kyoto Protocol have now revealed their shortcomings as a mechanism for curbing carbon emissions. The search for alternative sources of energy that produce fewer emissions has led to renewed interest in nuclear energy as a cheaper and cleaner (in carbon emissions) option. Japan, China, India, Indonesia, the US and several European countries have signalled their intention to build new nuclear power plants in the coming decade. This has led to increasing demand for uranium, after over a decade of sagging demand and oversupply.

Third, governmental and societal reactions to the current oil shock have been completely different from reactions to previous oil shocks. The global economy has continued to grow strongly, even through a quadrupling of oil prices since 2004. Demand for petrol has shown remarkable inelasticity to price, and the lack of panic buying and stockpiling this time around, in contrast to the previous oil shocks, suggests that consumers are concerned more with availability than price. Generally, consumers have been better able to afford the price rises because of marked rises in disposable income—which are partly a consequence of the cheap consumer goods produced by the same booming Asian economies that are contributing to the oil price rises. As a consequence, the conservation urge has been muted. Business hasn't responded as in the 1970s, with significant investment in energy conservation, new fuels, exploration and refining. Nor have states responded with the sense of urgency they displayed during the previous shocks. So far, no major international institutional responses to the oil demand squeeze have been championed, no major national initiatives (apart from rhetoric and discussion) have been launched, and no significant international tensions over energy supply and pricing have emerged. The absence of such reactions is even more anomalous given that economies have already made the easier substitutions away from oil—for example phasing out the use of oil in electricity generation—making them much more exposed in the long term to oil supply disruptions than they were after the previous two energy shocks.

Each of these aspects of the third oil shock holds important implications for Australia's energy security.

Each of these aspects of the third oil shock holds important implications for Australia's energy security. As a country with a modern economy, Australia has become greatly dependent on fossil fuels. Our economy has become so interdependent domestically and internationally that the disruption of energy supplies could lead to major economic damage and social dislocation. And, because we're a net exporter of energy (oil, coal, natural gas and uranium), our prosperity will be affected by the choices other states make about their energy and environmental security.

Concern over future demand for coal exports in the face of fears about global warming has led Canberra to spearhead a commitment to 'clean coal' technology through the Asia Pacific Partnership on Clean Development and Climate, while the renaissance of interest in nuclear power overseas has led to advocacy for expanding our uranium exports, and to the Prime Minister's suggestion that Australia has 'the makings of an energy superpower'.

However, Australia's reactions to the current circumstances, motivated almost entirely by legitimate economic and environmental considerations, risk ignoring the very real security implications of the third energy shock. This paper explores the nexus between energy and security, and Australia's own energy security position, before examining the broader implications of global energy demand and supply for our security.

Chapter 2

ENERGY AND SECURITY

Energy security occupies a distinctive place in security thinking, and an even more singular place in Australian security thinking. Abundant, cheap energy has played a crucial role in the rapid and sustained growth of the global economy since the end of World War II and in the processes of globalisation that underpinned that growth.

The growing dependence of economies and societies on access to abundant, cheap energy, to the extent that modern industrialised societies are unable to do without it, means that states have come to see access to energy as an entitlement.

Most energy consumed by humans comes in three forms: oil products (42%), gas (16%) and electricity (16%) (IEA, 2007: 492). Both have been used to achieve unprecedented mobility of people and things, and to regularise and multiply transactions among people ever further apart. The comparatively costless and seemingly limitless supply of oil products and electricity has transformed societies over the past century. Industrialised societies have become increasingly specialised and internally interdependent, to the extent that almost all of what each person consumes has been produced elsewhere, by others. In the process, each individual has become much more extensively dependent on society and the economy for the goods and services they need to live, and much less self-sufficient.

Photo opposite: A close up view of the hole caused by a blast that gutted the French-flagged oil supertanker 'Limburg' near Mukalla, Yemen October 11, 2002. © Reuters/Aladin Abdel Naby

Oil products and electricity are needed not only to link vast networks of producers and consumers, but to connect increasingly disaggregated and dispersed production and management processes. The growing dependence of economies and societies on access to abundant, cheap energy, to the extent that modern industrialised societies are unable to do without it, means that states have come to see access to energy as an entitlement. Improvements in energy efficiency in industrial countries have largely been offset by increases in absolute energy use as a consequence of population and economic growth.

Yet, for a resource so critical to the basic functioning of industrialised societies, energy has been dealt with sporadically and often sensationally in security thinking. Concern about energy security has tended to occur in sudden bursts, between which it subsides almost totally, largely following the price of oil. The Eisenhower Administration first identified the growing dependence of the US on foreign oil supplies as a security risk, when it moved in 1959 to limit America's dependence on imported oil to a maximum of 9% of future consumption (Leaver 2007).

The OPEC oil embargo in 1973 generated a great deal of interest in energy security, as did the second oil shock of 1979, and concern has grown since the rapid oil price increases of 2004, but the lack of attention to energy security between shocks was inevitable after doomsday predictions of 'resource wars' failed to come true. Despite the frequent use of societies' energy dependence as a source of international leverage, competition over energy resources has led to no serious conflict between major powers since the end of World War II. The Iran–Iraq war and the 1991 Gulf War remained regional conflicts. The relatively fast mitigation of the price and supply effects of past fuel crises has entrenched public perceptions of low-cost, limitless energy as a key attribute of continuing economic expansion, and public expectations that it will always be available.

Despite receiving such sporadic attention, the supply of adequate energy to industrialised and industrialising societies remains an enduring security issue. The ongoing supply of energy, and the conditions of its supply, are subject to great uncertainty, although neither short-term nor long-term uncertainties factor heavily in contemporary energy prices. In the short term, energy supplies are hostage to unpredictable weather events and geopolitical tensions, while the longer term availability of fossil fuels and the climatic effects of their use are the subject of vigorous debate in scientific, resources and policy communities.[2] Both short-term and long-term risks illustrate the particular security characteristics of energy supply in modern societies.

Characteristics of supply and consumption

The major and minor energy shocks during the past quarter century[3] were overwhelmingly attributable to three enduring characteristics and one basic logical feature of energy supply and use in modern society.

The basic logical feature is that the time between the production of energy and its consumption is now extremely short, and almost all electricity, gas and petroleum products are consumed soon after they are produced and delivered. A constant flow of energy is critical, as its consumption is basic to societal functioning. This ultimately manifests in the marked inelasticity of demand for energy in the face of price rises, and the exaggerated price effects that result from supply shortfalls. Economies' lack of substantial stockpiles of energy means that major supply disruptions can cause massive damage: the first oil shock, which

resulted in a supply disruption of less than 10% of the total world oil supply, led to a global recession and a protracted combination of low economic growth, high unemployment and high inflation for economies such as Australia's.

Although the declining energy intensity of developed societies (the amount of energy needed to produce each unit of GDP) has shifted the disruption threshold, a very clear economic disruption risk still applies.

Although the declining energy intensity of developed societies (the amount of energy needed to produce each unit of GDP) has shifted the disruption threshold, a very clear economic disruption risk still applies. From past experiences, states have drawn the lesson that they must restore supplies of energy relatively quickly in order to avert extensive economic damage.

This basic logic is revealed in the three enduring characteristics of energy supply to modern economies.

First, modern economies are dependent on a highly restricted range of types of energy. Electricity and oil products constitute 70% of all final energy consumed in industrialised societies. In Australia, 97% of all transport uses oil products as its energy source. And, as in most countries, electricity production in Australia is generated from a highly restricted range of primary energy sources.

Second, modern economies receive their supplies of these energy forms from highly concentrated sources. Substantial diversification of the sources of oil has occurred since the first oil shock: by 1985, 71% of the world oil market was supplied by non-OPEC sources. However, as explored in more detail below, the heavy reliance on non-OPEC oilfields and the concentration of long-term oil supplies in Middle Eastern fields have meant that over the coming decades supplies of oil will increasingly be sourced from the Persian Gulf region. By 2003, non-OPEC producers' share of the world oil market had fallen back to 63%. The supply of electricity is also heavily concentrated compared to other commodities in modern economies: large power stations supply extensive user grids along a small number of fixed supply lines. Oil products similarly rely on a relatively restricted number of maritime supply routes and terrestrial pipelines, and need to be refined at a relatively limited number of refineries. Currently, over 40% of the world's oil supplies transits the Persian Gulf, and the International Energy Agency (IEA) predicts that in 20 years the proportion will be 60%.

Third, modern economies have failed to build resilience into their energy consumption patterns. While members of the IEA are required to stockpile at least 90 days worth of oil imports, little effort has been made to find substitutable forms of energy that can be used to keep societies and economies running in the face of protracted disruptions of supply. Since the beginning of the oil shocks era, states have been more effective in diversifying the sourcing of energy than in diversifying energy consumption. The immediate imperative to restore supplies of oil and electricity is rarely followed by a longer term effort to develop different types of energy.

The concentration in types of energy used also creates problems for the long-term viability of energy supplies.

The concentration in types of energy used also creates problems for the long-term viability of energy supplies. Oil and other fossil fuels are a finite resource, and the accelerating rate of global consumption, particularly of oil, has produced an emerging consensus that world oil supplies will likely run out some time before the end of the current century. 'Peak oil' advocates argue that the exhaustion of world oil stocks is a matter of decades away, while others predict a slightly longer timeframe, into the 2050s. Many argue that accelerating demand and supply scarcities will lead to price increases large enough to spur the search for alternative fuels; their opponents counter that to wait for the price mechanism to drive the search for alternatives may be leaving it too late.

Even if substantial new oilfields are found, environmental concerns could lead to dramatic demand restraint. If consumption of hydrocarbons is heavily restricted in order to arrest the climatic effects of global warming, the continued functioning of societies and economies at current levels will depend on finding alternative energy sources. Once again, through the introduction of carbon taxing and trading schemes, the price mechanism is being relied upon to drive the search for those alternatives.

Threats to energy security

These attributes of energy supply and consumption illustrate how vulnerable modern societies' dependence on energy makes them. Six types of risk can pose significant threats to the supply of energy.

Coercive manipulation of energy supplies

States that can restrict the supply of energy to others possess a potent power resource, particularly if the states affected possess few viable alternative sources of energy. Contemporary policy makers are keenly aware that restrictions on energy flows are one of the most potent sanctions available. The US, in particular, has used its global naval dominance to threaten or apply energy supply restrictions against states it has wished to pressure. This has included both enemy states, such as Japan before the Pacific War, and allies, such as Britain and France during the Suez crisis.

After the 1973 Arab–Israeli War, Arab oil producers slowed production and embargoed the US and the Netherlands over their support for Israel; arguably, this action was a major factor in motivating European states, in particular, to adopt policies more sympathetic to the Palestinian cause. More recently, the restriction of North Korea's fuel supplies and the promise of future supplies of fuel aid played a key role in persuading Pyongyang to shut down its nuclear reactor at Yongbyon. During the various wars in the Persian Gulf, both Iran and Iraq attacked Gulf shipping to either draw in or ward off external interference. More recently, Iran has threatened to attack energy shipping in the Gulf if subjected to sanctions by the United Nations Security Council and the International Atomic Energy Agency. However, major energy exporters realise they must use such threats and restrictions sparingly. Energy embargoes can trigger countermeasures by consumers that reduce

demand for particular producers' exports over the long term, incurring major costs to exporting economies.

On the other side of the coin, states that are major energy exporters have been able to resist others' coercive pressures and conduct provocative foreign policies in defiance of international threats of sanctions. Arguably, Saudi Arabia has been able to escape greater western pressure over the links between Wahabi charities and jihadist terrorism because of its crucial role in stabilising world energy markets, which arises from its unique (but vanishing) spare production capacity. Iran's status as the fourth-largest oil producer with the world's second largest reserves of gas has similarly punctured American attempts to pressure Tehran over its nuclear program. Not only states such as Russia, China and India, but close US allies such as Japan and Turkey, have entered into energy investment and supply arrangements with Iran, despite Washington's insistence that Tehran needs to be isolated to bring its nuclear program to heel.[4] Arguably, the inability of the US to isolate Tehran has emboldened the Iranian regime to pursue its nuclear program, as well as a more active foreign policy in the Middle East. Russia's status as the world's largest oil producer and the largest holder of gas reserves has also allowed Moscow to resist various western demands and pressures, while Venezuela's oil exports have emboldened the Chavez regime's opposition to the US.

The continuing dependence of most societies on oil imports from a small number of sources, along a restricted number of supply routes, has a potentially great impact on international security.

The continuing dependence of most societies on oil imports from a small number of sources, along a restricted number of supply routes, has a potentially great impact on international security. States such as China, whose continued economic growth and social stability are vitally dependent on access to oil imports, are likely to be only too aware of the US's propensity to use energy access as leverage, and thus are probably uncomfortable with the American role as the guarantor of all maritime energy trade.

Energy competition as a trigger for conflict

Many are concerned about scenarios in which the rising demand for oil products and their finite supply lead states to attempt to increase their energy self-sufficiency and/or wealth, and in which this impulse eventually leads to clashes over access to and ownership of disputed territories thought to have large energy reserves. Currently, the hydrocarbon-rich Caspian basin is subject to disputes among its littoral states about whether the Caspian is a sea or a lake, because different rules governing the division of ownership of seas and lakes would carry significant costs and benefits for different states. In the Pacific, territorial disputes over the South China Sea and in the Sea of Japan have acquired an added edge as several of the disputants have begun exploring for oil, and China has begun extracting gas, in disputed waters. In the Middle East, the war between Iran and Iraq, and Iraq's 1990 invasion of Kuwait, were triggered partly by disputes over oil-producing provinces at the head of the Persian Gulf.

Since World War II, no extended conflict has developed out of competition for oil-producing territory. Most contests have remained at the level of tense stand-offs and unresolved claims or, as in the case of the South China Sea, have been subjected to an agreed code of conduct among all participants. One possible explanation is that the oil supply squeeze hasn't yet become acute enough to motivate states to take on greater risks to ensure greater levels of self-sufficiency.

A more likely explanation, however, is that none of the disputed oil-rich territories (apart from those in the Persian Gulf) are likely to contain large enough resources to make much impact on the self-sufficiency of large consumers of oil. It's unlikely that states would be willing to risk armed conflict for such low stakes.

As demand surges, what's more likely is that disputant states will come to agreements allowing for the commercial exploitation of such resources as exist, along with negotiated formulas for the distribution of resulting oil and royalties.

As demand surges, what's more likely is that disputant states will come to agreements allowing for the commercial exploitation of such resources as exist, along with negotiated formulas for the distribution of resulting oil and royalties. On the other hand, it's possible that unresolved tensions over hydrocarbon-rich territory could contribute to the outbreak of conflict between states harbouring other grievances.

Supply disruptions due to political instability

Scholars such as Michael Klare have observed that oilfields tend to be disproportionately concentrated in regions controlled by unstable countries (Klare 2004). The logic of supply diversification following the first two oil shocks means that oil supplies from stable regions are being used up faster than those from unstable regions. Consequently, a growing proportion of the world's oil supplies will be sourced from unstable regions in the future.

Large exports of oil have a tendency to make developing countries more fragile by distorting economic development, intensifying the authoritarian impulses of political and commercial elites, and exacerbating internal ethnic divisions through disputes over the distribution of oil wealth. And, as Russia, Iran and Venezuela have demonstrated, large oil and gas reserves at times of high energy prices tend to further embolden pugnacious foreign policies.

As a result, general political instability in or affecting major oil-producing countries can pose an ongoing threat to energy supplies. Both international and civil conflicts have caused significant supply disruptions over the past quarter of a century. The second oil shock resulted from a revolution in Iran, while the ramifications of the 2003 invasion of Iraq have continued to disrupt production from that potentially major source of oil.

Currently, and foreseeably for as long as oil products are an essential source of energy, the energy security of oil-importing countries will be prey to political instability in oil-producing countries. There are few reasons to think that the major oil exporters will become significantly more stable in the coming decades, and even fewer reasons to be confident that substantial new oil reserves will be discovered in stable countries. The difficulties faced by

coalition forces in imposing stability on Iraq and returning its oil production to pre-war levels demonstrate how powerless the consuming world could be in the face of major instability in the Persian Gulf.

Currently, and foreseeably for as long as oil products are an essential source of energy, the energy security of oil-importing countries will be prey to political instability in oil-producing countries.

As long as outbreaks of instability remain isolated and sequential, such as in Venezuela in 2003 and Nigeria in 2004, no major or sustained disruption of oil supplies will result—although the rapid rundown of spare capacity in traditional 'swing' producers such as Saudi Arabia means the price effects of isolated instability are likely to be progressively greater.

Real and sustained disruption is more likely if instability cascades across several major producers, causing simultaneous disruptions in supply. The most likely trigger for this scenario would be an Islamist revolution in Saudi Arabia that spreads to other Gulf states, and ultimately leads to conflict with Iran. The clash of proselytising Muslim sects could see a sustained disruption in Gulf oil flows, and it isn't apparent that even extensive western intervention into the region to protect oil production could succeed.

Attacks on supply infrastructure by transnational actors

The October 2002 suicide bombing attack against the French oil tanker *Limburg* off the Yemeni coast drew immediate attention to the vulnerability of energy supply infrastructure to attacks by malevolent transnational actors. The major maritime supply routes are predictable and well known, and often traverse 'choke points' close to land, such as the Strait of Hormuz, the Suez and Panama canals, and the Malacca Strait (see Figure 1). Terrestrial energy pipelines and electricity grids are fixed and extend across great distances of isolated country, making them impossible to defend at all points. The long-term trend has been an increase in the relative importance of energy infrastructure, as more and more energy is sourced further and further from the sites of consumption.

Attacks on oil ships and pipelines can have pointed symbolic value, particularly for jihadist terror groups, who are motivated partly by the belief that western intervention in Muslim lands is driven by a desire to appropriate their oil stocks. But the insurgents in Iraq have also demonstrated that persistent attacks on vulnerable energy infrastructure can be a source of leverage against their enemies: by keeping Iraq's oil production significantly below pre-war levels, they're able to demonstrate the lack of progress by the Iraqi Government and coalition forces in reconstructing Iraq. Attacks on oil infrastructure in Iraq also ties up thousands of soldiers, absorbs millions of scarce reconstruction dollars in repairs, and promotes protectionism, corruption, racketeering and gangsterism.

In West Africa and the Sudan, criminal and insurgent groups have used attacks on oil infrastructure and personnel both to take the resource and to extort money from wealthy petroleum companies. Many terrorism specialists also worry about the possibility of a major terrorist attack on a nuclear reactor to create a 'dirty bomb'.

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With the exception of the Iraqi insurgents, transnational terrorists and criminals haven't devoted much attention to attacking the many vulnerabilities of energy infrastructure. Despite Osama bin Laden's 2005 call for attacks of energy infrastructure, jihadist terrorists seem to value large, bloody, spectacular attacks over more prosaic strikes that could do major damage to the economies and societies of their enemies. However, the attack on the *Limburg* demonstrates that some cells in al Qaeda's decentralised networks might decide to focus on disrupting oil and gas supplies to the West. There are many vulnerabilities in energy infrastructure and transport flows, yet as the failure of a major al Qaeda attack on Saudi Arabia's Abqaiq refinery in February 2006 shows, significant measures have been taken to harden vulnerable facilities and chokepoints against attack. Yet the extent of energy supply infrastructure also means that achieving a substantial disruption is very difficult. So far, even including insurgent attacks on energy infrastructure in Iraq, the effect of transnational terrorists and criminals on global oil supplies has been largely frictional, and is factored into most estimates and business projections in the energy sector.

The question remains whether a more concerted campaign by a jihadist network could bring about a significant and sustained disruption in energy supplies from the Middle East and the Caucasus. Currently, there's little to suggest that such a campaign is being planned within al Qaeda or its affiliates, and there's some debate about whether such a concerted campaign could be mounted by its distributed networks. However, terrorists and criminals remain significant potential threats to energy production, transport and refining infrastructure.

Figure 1: Global and regional maritime choke points

Market competition

For most major oil and gas producers, the energy and related sectors provide the majority of their gross domestic product. Many rely on the steady inflow of energy revenues to ensure social stability and regime security. Recognition of the importance of their energy resources has led most OPEC countries to nationalise oil production, to the extent that over 80% of all global oil assets are currently in state hands.

The surge towards nationalisation of oil assets accelerated after the passing of the 1963 United Nations General Assembly Resolution 1803 on permanent sovereignty over natural resources, but was reversed during the 1970s and 1980s when oil and gas reserves were developed in non-OPEC countries, largely by private companies. However, the extensive renationalisation of the huge Russian oil and gas industry since 2000 has underlined the overwhelming dominance of state-owned firms in the global energy trade.

Such 'energy nationalism' is both a result and a driver of the need to ensure the steady inflow of energy revenues into national coffers. The 'reverse oil shock' of the mid-1980s, when oil-consuming countries' efforts to reduce oil usage and source their oil from non-OPEC suppliers led to a collapse in the price of oil, gave rise to a growing concern about demand security, particularly among Arab OPEC producers. Through OPEC, Saudi Arabia has pursued a policy to regulate the supply of oil onto the global market at a rate that ensures sufficient price returns to producers, but doesn't see oil prices rise to levels that motivate consumers to search for alternative sources of energy. With the largest known reserves, Saudi Arabia and the Gulf states have a strong interest in sustaining global demand for oil and gas for decades into the future, while regulating oil production at a rate that extends the life of their reserves for as long as possible. Riyadh has repeatedly used its significant capacity to increase its production of oil to discipline both OPEC and non-OPEC oil producers when they have tried to take advantage of OPEC's agreements to increase their own profits. See Table 1 for a breakdown of world oil producing countries.

Pipeline and distribution agreements have been negotiated in ways intended to frustrate the EU's ambition to construct a common, liberalised energy market in Europe.

From the late 1990s, the Russian oil and gas sector has emerged as a major competitor to OPEC dominance. As OPEC cut production to underwrite prices during the soft energy markets of 2001 and 2002, Russia quietly increased its market share at OPEC's expense.[5] Although the post-2004 price rises and the continuing increases in demand from East and South Asia have largely muted this conflict, the potential remains for competitive supply manipulations among oil producers to introduce significant instability into global energy markets.

Of the major oil and gas exporters, Russia has emerged as the most assiduous exponent of 'geoeconomics', defined by Edward Luttwak as 'the pursuit of adversarial goals with commercial means' (Luttwak 1990). In recent years, Russia has used the price of its gas exports to former Soviet republics to encourage their alignment with Moscow and to punish those it perceives to be turning towards the West. The most dramatic example was

the Ukrainian gas crisis of January 2006, when Gazprom dramatically reduced supplies through a gas pipeline running through Ukraine as a response to mounting tension between Moscow and the western-leaning Yushchenko administration in Kiev.[6] The belief that former Soviet bloc members of the European Union are encouraging a more assertive European posture towards Russia has prompted Moscow to protect its dominance of gas supplies to the continent, and on occasion to threaten to use this dominance against the EU (see Svedberg 2007).

Table 1: World oil producing countries*

Opec	Production (1000 tonnes)**	Non-Opec	Production (1000 tonnes)
Saudi Arabia	444667	Russia	446088
Iran	195698	United States	268014
Venezuela	143309	Mexico	178280
Nigeria	122948	China	175873
Kuwait	117957	Norway	144627
United Arab Emirates	112922	Canada	102564
Iraq	98127	United Kingdom	87516
Libya	75280	Brazil	75509
Algeria	60154	Kazakhstan	50672
Indonesia	49492	Oman	41029
Angola	49443	Malaysia	36758
Qatar	35902	Argentina	35551
		India	33981
		Egypt	29040
		Ecuador	27511
		Colombia	27310
		Australia	25800
		Syria	23300
		Vietnam	20298
		Yemen	19356
		Denmark	19262
		Azerbaijan	15348
		Sudan	15000
		Congo	11209
		Gabon	10736
		Brunei	9695
		Bahrain	9393
		Turkmenistan	9350
		Thailand	7177
		Cameroon	6637
		Trinidad and Tobago	6336
		Romania	5462
		Italy	5445

*Production over 5,000,000 tonnes

**2004 Statistics

Source: IEA Energy Statistics

The big Russian energy companies, such as Gazprom, have been playing a highly strategic game in order to preserve Europe's dependence on Russian gas. Pipeline and distribution agreements have been negotiated in ways intended to frustrate the EU's ambition to construct a common, liberalised energy market in Europe. Other sources of oil and gas in the former Soviet Union, as well as pipelines through transit countries, have been sewn up in agreements designed to ensure that rival gas producers, such as Iran and Turkmenistan, can't viably compete with Russian supplies to Europe. President Putin has mooted expanding Russia's oil and gas exports to Asia as a way of pressuring the EU to allow Gazprom into European downstream markets (Wishnick 2007). A world energy market featuring several large, competing oil and gas consumers has dramatically strengthened the hand of oil and gas producers such as Russia, while magnifying the vulnerability of states and regions such as the EU, which find themselves heavily dependent on a small number of energy sources as a result of past decisions.

Accidents and natural disasters

Hurricanes Katrina and Rita, which struck the Gulf of Mexico in September 2005, caused extensive damage to a region that produces a third of the US's total oil output and a fifth of its gas production. Damage to refineries clustered in Louisiana and Texas caused a drop in oil production of 600,000 barrels per day and a 7.06% increase in the price of oil on US markets. In July 2007, the Kashiwazaki–Kariwa nuclear reactor in Japan was damaged by an earthquake, resulting in the leaking of radioactive material and the prolonged shutdown of the reactor.

Such events demonstrate the vulnerabilities caused by the concentration of supply, production and refining of energy in modern economies, particularly given the unpredictability of natural disasters and accidents. Despite extensive safety procedures and strengthening of power plants and refineries, they remain subject to major disasters, and improvements in security and resilience are always balanced against higher flow-on costs to consumers. The concentration of supply, production and refining for economic reasons (particularly the cyclical reduced investments in refining capacity) magnifies the effect of even relatively localised disasters.

Relative likelihoods

These six risk types include intentional and non-intentional threats, have different probabilities of occurring, and would entail different scales of consequences for the global energy market.

Although it's risky to try to predict trends, it seems that international conflict triggered by energy competition, while likely to have serious consequences, is probably less likely to occur than a rise in market competition or terrorist attacks on supply infrastructure.

One consideration to keep in mind, however, is that these risk types aren't alternatives: it's entirely possible that two or more will occur simultaneously. Indeed, it's likely that one risk type may precipitate one or more others. Therefore, while particular events in isolation might have marginal effects on global energy markets, a combination of events that together affect a broad range of energy sources could cause extensive damage to economies and societies dependent on continued energy flows.

Chapter 3

AUSTRALIA'S ENERGY SECURITY POSITION

How vulnerable is Australia to these six energy security risks? To answer this question, we need to distinguish between *vulnerability* and *sensitivity*: the former refers to a society's exposure to extensive damage if supplies are disrupted; the latter concerns costs resulting from supply interruptions that can be mitigated through appropriate policy responses.[7]

Whether a state is vulnerable or merely sensitive to energy supply disruptions depends on a combination of variables:

- the dependence of the state's economy and society on a few energy sources
- the concentration and location of supply of externally sourced energy
- the security of energy supplies and supply routes
- the capacity of the state to restore supplies of energy quickly
- the ability of the society and economy to absorb the price and scarcity effects of disruptions of supplies.

Security behaviour is also the product of the interaction of an objective security situation and the subjective security perceptions of policy makers and societies (Wolfers 1962). To measure Australia's energy security, we must both assess its vulnerability or sensitivity to the disruption of supplies and ponder policy makers' general perceptions about energy security.

Photo opposite: An aerial view of the huge Caltex oil refinery on the Kurnell Peninsula near Sydney. AFP/AAP/Torsten Blackwood © 2005 AFP

Australia's energy use

The latest IEA statistics report that Australia's total primary energy supply (fuels used to make energy) is 115.8 million tonnes of oil equivalent per year, with coal, oil and oil products, and gas accounting for over 95% of the total (see Figure 2).[8] Annually, Australia's energy consumption (energy transformed into non-energy uses) is 73.9 million tonnes of oil equivalent, with petroleum products, electricity and gas constituting nearly 90% of energy consumed (see Figure 3). This statistical snapshot reveals a concentration on a small number of energy sources for the vast majority of Australia's energy supplies and needs. However, Australia's energy requirements are reasonably diversified in comparison to most other OECD economies, even though it does not use nuclear power.

The dominance of the transport and industry sectors in energy consumption emerges from a further breakdown of these statistics (see Figure 4). In a country as large as Australia, the transport sector is a crucial component of the national economy. Between 2000 and 2005, the transport sector's contribution to the Australian economy rose by 20%, with road transport increasing by 29%. Just over 97% of all transport in Australia is fuelled by petroleum products. Road transport, which amounts to 34.8% of the sector's contribution to the national economy, consumes 77% of the total energy used in the sector. Transport

Figure 2: Australia's primary energy supply

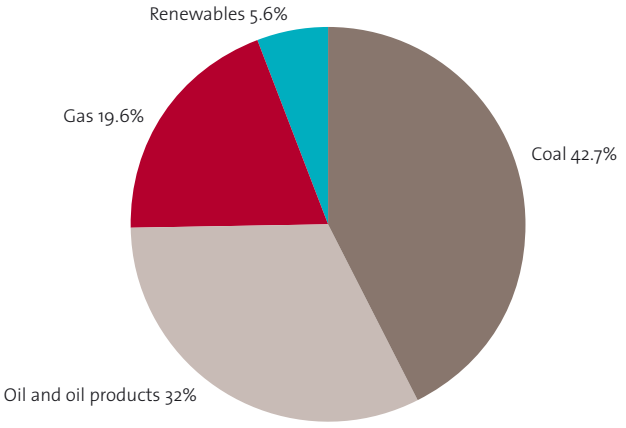
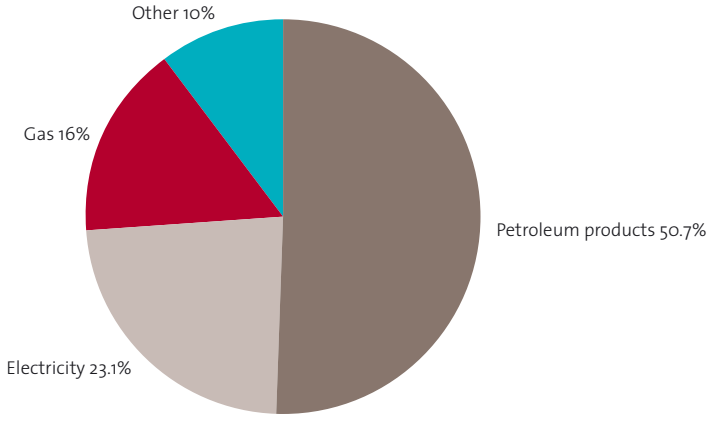


Figure 3: Australia's energy consumption



Source: IEA Statistics

energy consumption has grown most rapidly in Queensland and Western Australia, due to resources-powered economic growth and large distances.

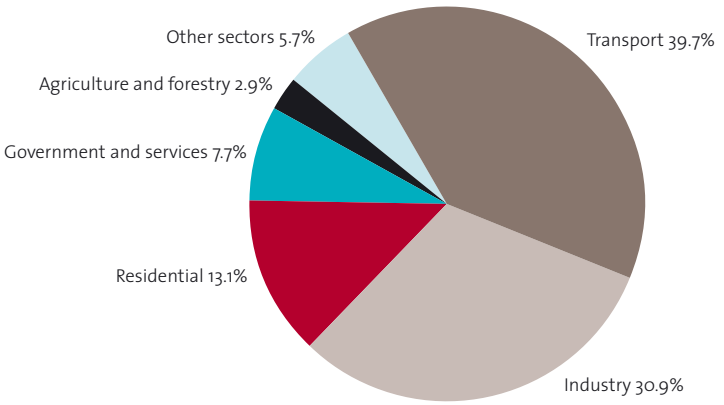
Importantly, 62% of all energy used in road transport powers passenger motor vehicles; despite the increasing use of public transport, car dependence in Australian cities is rising markedly (Dodson and Sipe 2005). Car traffic growth in Australia is slowing, reflecting modest population growth and car ownership saturation, but non-commodity truck freight, driven by an expanding economy, is growing rapidly. This is partly because petrol prices in Australia are the third lowest in the Organisation for Economic Co-operation and Development (OECD), after the US and Canada, and Australian diesel prices are the fifth lowest (Australian Institute of Petroleum 2006).

In a country as large as Australia, the transport sector is a crucial component of the national economy.

If we factor in the importance of the transport sector to crucial Australian industries, such as agriculture (which contributed 16.9% of Australia's export earnings in 2005) and mining (41.1% of export earnings in 2005), the dependence of the Australian economy on petroleum products becomes apparent; when we acknowledge the growing car dependence of Australian society, our reliance on petroleum becomes even more obvious. Furthermore, we have made little effort to develop viable alternative fuels for transport, or to develop more energy-efficient infrastructure, such as subways in the major cities. This means that a substantial disruption to petroleum supplies would bring much of Australia's transport sector to a grinding halt, with major economic and social dislocation.

Most of Australia's petroleum products (77%) are produced by domestic refineries. Our seven major operating refineries—at Bulwer Island and Lytton in Brisbane, Clyde and Kurnell in Sydney, Altona in Melbourne, Geelong, and Kwinana in Western Australia—were all built in the 1950s and 1960s. Although repeatedly upgraded since, they're dwarfed by more recently constructed refineries in Asia, which are better equipped to produce higher quality products to meet environmental standards. Singaporean refineries supply 59.9% of Australia's

Figure 4: Energy use in Australia by sector



Source: Australian Bureau of Statistics

petroleum products, while Taiwanese refineries supply 11%. It's likely that refineries in Asia will supply the bulk of Australia's growing petroleum product imports into the future.

Electricity consumption in Australia grew by 54% in the 14 years after 1990, compared with the 31% increase in Australia's total energy use during that period.

Australian society's dependence on electricity has also increased markedly. Electricity consumption in Australia grew by 54% in the 14 years after 1990, compared with the 31% increase in Australia's total energy use during that period. In 2005, Australia's power stations produced 248 billion kilowatt hours of electricity, 60% more than in 1990 and growing at 3.2% per year. This rapid growth is partly explained by Australian electricity prices, which are among the lowest in the OECD. Residential prices are 36% of those in Japan and a little over half of those in most of Europe, while industrial prices are 30% of Japan's and 60% of most European countries' prices.

Electricity production in Australia is heavily dependent on coal: coal generates 76.7% of our electricity generated, gas accounts for 14.2% and hydroelectric, 6.8%.[9] Although Australia has 40% of the world's low-cost uranium reserves, nuclear power has never been used here to generate electricity. Following the release of the Switkowski report in October 2006, however, the Howard Government has signalled its intention to move Australia to nuclear-powered electricity generation in the coming decades; the Labor Opposition opposes such a development.

Most of Australia's electricity is produced in large power stations clustered near the main population centres. The southern and eastern states' electricity generation systems are connected by a national electricity grid. Only Western Australia is yet to be connected to the national grid. About 80% of Australia's electricity is produced from 57% of total generating capacity, which suggests that there's a substantial surge capacity in the case of supply shortfalls.

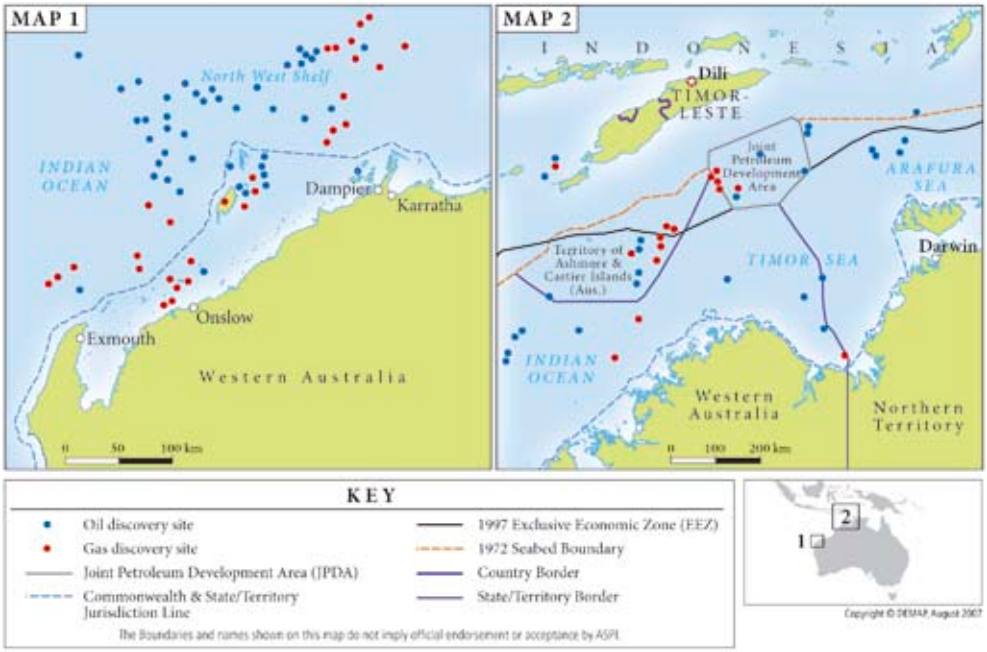
The sources of Australia's energy

In absolute terms, Australia is largely self-sufficient in the fuels needed to provide energy to its economy and society. All coal and gas used for energy in Australia is produced here. The only significant exception is oil and petroleum products, which make up just over half of all energy consumed in Australia and 97% of the energy used in the vital transport sector.

In 2004–05, domestic production of oil and naturally occurring petroleum gas supplied 59% of Australia's total liquid fuel consumption. As measures of total oil self-sufficiency, these figures are misleading: for commercial reasons (the North West Shelf is close to the big refineries in Asia and produces light sweet crude that fetches premium prices on world markets), Australia exports 56.4% of its oil and petroleum production and imports 75.8%—meaning that, theoretically, our oil production could supply over 80% of our needs. The maps show the oil and gas sites in the North West Shelf and Timor Sea (see Figure 5).

But Australia is becoming progressively less self-sufficient in oil and petroleum products. Oil production from our major fields has begun to decline (production in 2006 was the lowest

Figure 5: Oil and gas production, North West Shelf and Timor Sea



Source: WA Department of Industry and Resources

for 23 years), and no major new field has been discovered since the 1960s (see Figure 6). There's little prospect of major new finds in Australia, not least because oil companies are less and less interested in exploring here, and even major Australian resources companies are spending most of their exploration budgets overseas (Wilson 2006). The slow increase in oil imports and significant rises in oil prices meant that in 2006, for the first time since the 1960s, the total dollar value of our energy imports exceeded the value of our energy exports (Wilson 2006).

Australia is becoming progressively less self-sufficient in oil and petroleum products.

Geoscience Australia predicts that Australia's net self-sufficiency in oil will decrease from 84% to 20% over the next twenty years. The Australian Bureau of Agricultural and Resource Economics is more optimistic, predicting a decline to 50% over the same period. Either way, we face a dramatic rise in our dependence on imports for oil and petroleum products (Cuevas-Cubria and Riwoe 2006).

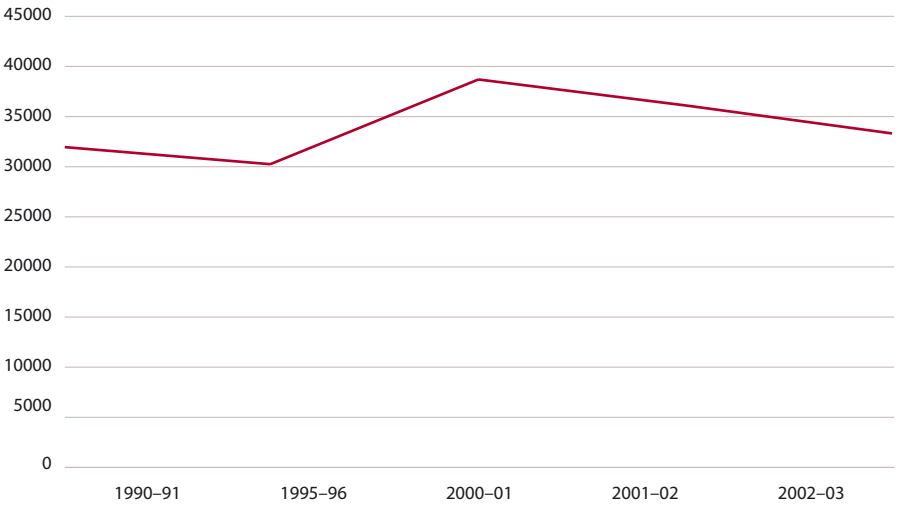
Our major overseas oil suppliers are Vietnam, which supplies 27.5% of Australia's crude oil imports, Malaysia (16.3%), Indonesia (16.0%), Papua New Guinea (9.8%) and Saudi Arabia (6.6%) (ABARE 2007a; see Figure 7).

In terms of refined oil products, Singapore dominates with 55.9%, Taiwan supplies 11% and the Republic of Korea supplies 6.6%. These figures show that our energy imports come mainly from countries in our region: Southeast Asia and the Pacific supply 75.6% of crude oil imports, compared with 14% from the Middle East, the next nearest oil-producing region.

This is good news, given the relative stability of our region compared to the Middle East, Central Asia or West Africa; it also means that most of our oil supplies are delivered along relatively safe maritime supply routes.

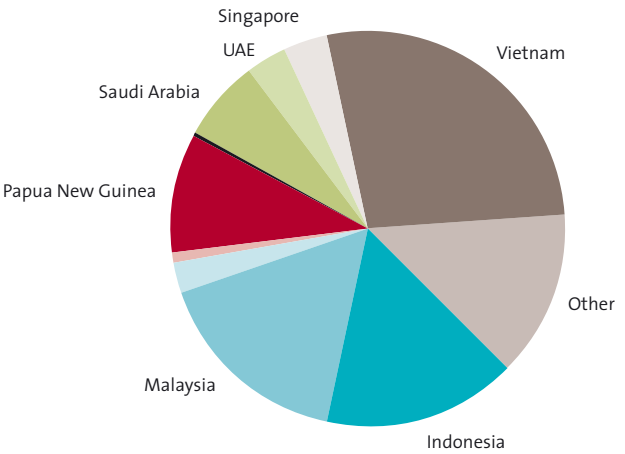
However, this situation probably won't last. The Asia–Pacific region's rapid rates of projected economic growth mean that oil exporters in Southeast Asia will increasingly consume more of the oil products they produce. IEA figures show that, since 1992, Vietnam's oil consumption has nearly tripled, Indonesia's has nearly doubled and Malaysia's has risen by nearly 50%. The agency's projections are for an annual increase in oil consumption in developing Asian countries of 2.7% per year for the next two decades (IEA 2007). Consequently, Australia, like the rest of our region and the world in general, is set to become more dependent on the more unstable Middle East for our increasing oil and petroleum imports.

Figure 6: Total Australian oil production (ML)



Source: Australian Bureau of Statistics

Figure 7: Sources of Australia's oil imports, 2005–06



Source: ABARE

Australian society: vulnerable or just sensitive?

Given Australia's patterns of energy production and consumption, and the sources of our fuels, how vulnerable or sensitive are we to supply disruptions? The Australian economy shows marked concentration in the fuel types it relies on: 89.8% of our energy consumption comes from petroleum products, electricity and gas. In terms of fuel sources, this means that 84.4% of energy consumed in Australia is supplied by oil, coal and gas.

Although our heavy hydrocarbon dependence points to a major reorientation in the event of policy initiatives to curb carbon emissions, our concentration in fuel types is mitigated by the sources of our main fuels. All electricity and gas consumed in Australia is produced from locally sourced fuels, as is nearly 60% of petroleum and liquefied natural gas consumed. Australia's sources of oil and petroleum products are concentrated in the Southeast Asian and Pacific regions, but are reasonably well distributed in comparison to some other industrialised countries' sources.

Australia's growing dependence on oil and petroleum imports exposes us to several energy security risks.

Australia's growing dependence on oil and petroleum imports exposes us to several energy security risks. One is the concentration of maritime supply routes: 62.3% of oil imports and 75.7% of refined oil products come to Australia through the Indonesian archipelago. Should Jakarta decide to close certain crucial straits to the navigation of Australia-bound shipping in the course of a bilateral crisis, the closure could potentially lead to serious petroleum product supply shortfalls in Australia—although any protracted closure could be countered by rerouting through the Indian Ocean or Pacific Ocean. Such rerouting would have an appreciable impact on LNG exports, which rely on the fast transport to distribution facilities before there is a degradation of the gas. In the less likely scenario of conflict breaking out over the South China Sea, Australia could see 43.8% of its imports affected if Vietnam and Malaysia were involved.

Despite some concern about transnational terrorists attacking oil production terminals on the North West Shelf, or petroleum refining and electricity infrastructure, the likelihood of attacks on such geographically remote installations creating major and ongoing supply disruptions is relatively low.

On balance, Australia is more sensitive than vulnerable to energy security risks—although we remain very exposed to the global economic effects of a world energy crisis. Isolated disruption to electricity generation or distribution could most likely be mitigated quickly through production surges and compensating supplies delivered through the national electricity grid, though numerous, coordinated attacks along the network would cause major disruptions. Given our extensive use of coal and gas for electricity generation, any disruption in electricity supply would almost certainly be the result of disaster or malfunction, and would therefore be fairly isolated; thus, the probability of large-scale fuel supply disruptions is minuscule.

Interruptions to oil imports could be partly offset by diverting exports to domestic production, but this would entail the cost of moving a commodity from a high-return market to a lower return market. The conclusion of an agreement between Canberra and Dili in January 2006, on the sharing of energy and revenues from the Timor Gap, has provided certainty for Australia's access to those fields—at least for the 50 years for which the resolution of maritime jurisdictions has been deferred (see Schofield 2007). In the event of the need to divert domestic production to domestic consumption, there would, however, be other major transition costs: gas and oil from the North West Shelf would have to be shipped to refineries in the east; and some refineries would experience difficulties with the added volume of oils of a different viscosity and sulphur content than they usually refine.

The past few years have demonstrated that, at times of strong economic growth underpinned by high commodities prices on world markets, the Australian economy is able to absorb significant oil price increases and continue growing strongly. In the absence of those conditions, however, price increases might not be so easily absorbed. In gloomier economic times, such increases are likely to produce a fall in output in the non-energy sectors of the economy, particularly in the agriculture, minerals, retail and services sectors, and lead to a fall in export demand (Brain and Schuyers 1981).

Prolonged disruption to oil and oil products supplies would be even more serious. The overwhelming (97%) reliance of the Australian transport sector on oil products for fuel means that, in the event of major oil product supply disruptions, the sector wouldn't be able to switch to alternative fuels in the near to medium term. Given the importance of transport to Australia's economy and society, the country is highly sensitive to oil supply interruptions.

Early indications from the energy sector suggest that Australia's refineries will be converted into import facilities over the next decade, removing our capacity to divert oil exports to domestic consumption in the event of a disruption.

Early indications from the energy sector suggest that Australia's refineries will be converted into import facilities over the next decade, removing our capacity to divert oil exports to domestic consumption in the event of a disruption. Over the medium term, our rising dependence on imported oil and petroleum products would start to see our sensitivity to disruptions slide into vulnerability—a consideration that should spur more serious and extensive development of non-oil derived transport fuels than has occurred so far.

Australia's energy security perceptions

At one level, this assessment of Australia's objective energy security position accords with official perceptions. According to the Australian Government's 2004 White Paper on energy:

> Australia enjoys a very high level of energy security ... [its] access to domestic energy resources is amongst the best in the world. Australia has sufficient stationary energy sources to meet its electricity and heating needs for hundreds of years, significant petroleum resources, and good access to imported petroleum products. (Australian Government 2004)

Canberra's general approach to short-term energy security promotes the diversification of energy consumption and fuel sources. The longer term energy security challenge is taken to be one of meeting surging demand with adequate, low environmental impact supply: 'Australia's major long-term security challenge will be to attract timely large-scale investment in sustainable supply systems to meet growing demand for energy' (Australian Government 2004).

There's a strong tendency to see energy sustainability in terms of commercial opportunity. The 1996 Green Paper on energy argued:

> The aim of developing a sustainable energy policy with a 25 year perspective is to establish a framework which will ensure that the Australian energy sector is well placed to capitalise on the economic and environmental opportunities and challenges that will emerge domestically and internationally over the next 25 years. (Commonwealth of Australia 1996)

The general optimism and commercial bent of the government's outlook on Australia's energy security reflects, in part, the country's singular experiences with energy security after 1973. The Bass Strait oilfields were discovered and developed during the late 1960s, helping Australia to move from 10% to 70% self-sufficiency in the five years before the first serious oil supply disruptions in 1973. An added bonus came with Japan's efforts to switch from oil-powered electricity generation to coal-fired and nuclear-powered plants, both of which were supplied by imports from Australia (Leaver, forthcoming 2008). Japan's creation of the LNG industry after the first oil shock added a third boost to Australia's resource exports.

... disruptions of energy supplies haven't affected a broad enough proportion of the Australian population badly enough or visibly enough to become an enduring public concern.

Consequently, despite the economic downturn that followed the oil shocks, Australians didn't have the same experience of energy insecurity as the Japanese or western Europeans. This is reflected in statistics that show that Australia's improvements in energy efficiency were among the lowest in the OECD between 1974 and 1994, but that we were one of the OECD's top performers in expanding energy usage over the same period. It is also reflected in the almost negligible impact that the substitution of non-oil energy sources has had on the transport sector. In other words, disruptions of energy supplies haven't affected a broad enough proportion of the Australian population badly enough or visibly enough to become an enduring public concern. Most Australians' thoughts about energy security seem to be in the form of a general disgruntlement about petrol prices.

Some players in the public debate in Australia have wondered about the economic impact on Australia of growing global concern about global warming, suggesting that sagging demand for fossil fuels in world markets might hit Australian energy exports hard. However, that isn't a likely scenario. Even relatively optimistic forecasts of the replacement of coal, oil and gas with non-hydrocarbon fuels admit that the gross demand for energy in the developing world will result in a net expansion of coal, gas and oil demand over the coming decades, even if the developed world drastically reduces its hydrocarbon consumption (Anon 2007c; Trainer,

no date). In other words, exports of low-cost Australian coal and gas face a healthy future, even in the face of the demand-side effects of concerns about global warming.

A strict focus on the situation in Australia makes for optimistic viewing, but a broader conception of energy security creates grounds for significantly greater caution about Australia's energy security outlook. Because our security and prosperity have always been intimately linked to broader regional and global developments, it makes little sense to confine consideration of energy security only to the island continent. It's important to remember that the main effects of the first two oil shocks on the Australian economy came not directly, through the Australian energy sector, but via the impact of the shocks on the general global economy.

Australia's extensive trade dependence and our membership of regional security arrangements mean we continue to be exposed to economic instability or security crises, particularly in the Asia–Pacific region. For example, the effect of energy scarcity on fragile states in Australia's region could vastly complicate Australia's security outlook. And there are important reasons to suspect that energy security in the region could worsen considerably in the coming decades, with significant effects on our security and prosperity.

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Chapter 4

ENERGY SECURITY IN AUSTRALIA'S REGION

Other countries in the Asia–Pacific region are turning their attention to energy security, as the region's demand for energy burgeons with accelerating economic development. Asia's great energy consumers are deeply interested in the great power politics of the Middle East and Central Asia, and some are on the verge of becoming players in their own right.

Asia's oil thirst

The Asia–Pacific region will experience a greater surge in energy demand than any other region in the coming decades, driven mainly by Asia's developing economies. The most dramatic demand increases are for oil and its products. In the first quarter of 2007, when global oil consumption increased by 0.5%, China's oil consumption increased by 5.7% (ABARE 2007b). Over the past three decades, Asia–Pacific economies' collective improvements in energy intensity (the energy needed to produce each unit of GDP) have been more than offset by absolute consumption growth, driven by industrialisation, infrastructure construction and rising standards of living.[10]

The Asia–Pacific region has around 3% of global oil supplies, and currently contributes 9.8% of total global oil production, compared to its share of world oil consumption of 28.9% (BP 2007). The region's accelerating demand for oil outstrips its modest 1.7% annual growth rate in the production of oil. The gap between primary energy production and consumption in the region more than doubled between 1992 and 2004. Its oil import dependency has increased from around 65% in 1990 to over 70% today and will continue to grow. Over 80% of the increased oil demand will have to be met by imports.

Photo opposite: View of the Bibi Heybat Mosque near oil derricks on the shore of the Caspian Sea just outside Baku, Azerbaijan. MLADEN ANTONOV/AFP/Getty Images © 2005 AFP

APEC and energy security

The 8–9 September 2007 APEC meetings in Sydney drew attention to the role of APEC in promoting regional energy security and addressing issues of global warming.

Energy security has been on the APEC agenda since 1990, when the body established an Energy Working Group (EWG). Several sub-working groups sit underneath the EWG, and APEC also established its own Energy Research Centre (APERC) which publishes publicly-available research on energy issues in the Asia–Pacific region.

APEC leaders adopted the EWG's Energy Security Initiative (ESI) in October 2001. Under the ESI, APEC members agreed to work towards improving the transparency of the global oil market; monitor efforts to strengthen sea-lane security; implement a real-time emergency information sharing system; and encourage Member Economies to have emergency mechanisms and contingency plans in place. Over the longer term, through the ESI, members agreed to facilitate investment, trade and technology cooperation in energy infrastructure, natural gas (including LNG), energy efficiency, clean fossil energy (including carbon capture and geological sequestration), renewable energy and hydrogen and fuel cells.

The 2007 Sydney Declaration draws explicit links between energy security, global warming, and the Asia Pacific's capacity for continued development and economic growth. Drawing inspiration from one of APEC's original functions, to move forward the agenda of difficult global negotiations, the Sydney agenda attempted to set out 'aspirational' targets for addressing energy security and efficiency and global warming after 2012. APEC leaders set the region several aspirational targets: to reduce regional energy intensity by a quarter on 2005 levels by 2030; and to increase all types of forest cover in the region by 20 million hectares by 2020. They also agreed to establish an Asia–Pacific Network for Energy Technology to strengthen collaboration on energy research in our region, particularly in areas such as clean fossil energy and renewable energy sources; establish an Asia–Pacific Network for Sustainable Forest Management and Rehabilitation to enhance capacity building and strengthen information sharing in the forestry sector; and launch further measures in trade in environmental goods and services, aviation transport, alternative and low carbon energy uses, energy security, the protection of marine biological resources, policy analysis capabilities and a co-benefit approach.

Despite the seeming ambition of the Sydney Declaration, it reflects far too low a threshold of Asia Pacific solidarity and common purpose to make any impact on moving post-Kyoto global negotiations forward. The logic of the rapid development of India and China will see a net expansion in the consumption of fossil fuels in the next decades, even given a rapid and broad expansion of nuclear energy generation. And the strong focus of many APEC members on economic development makes the APEC forum an unlikely body to drive forward drastic action on climate change.

Exacerbating these problems are shortfalls in refining capacity, as growth in capacity struggles to keep pace with demand growth.

Partly because of their increasing dependence on imports, but mainly because of strategic cultures arising from traditionally suspicious rivalries, most major Asian powers are inclined to take a strategic view of energy issues and factor energy security into their national security and foreign policy calculations (Manning 2000). Given their higher energy intensities, less diversified economies and higher proportions of manufacturing and agricultural industries, Asia's developing countries are especially vulnerable to energy supply disruptions or price rises. The major developing net oil importers are aware of their vulnerability to major disruptions to regular supplies of oil.

As the second and the fifth largest primary energy-consuming countries, China and India have had the highest oil consumption growth rates: in 2004, the world's primary energy consumption increased by 4.3% from the previous year, while China's increased by 15.2% and India's by 7.2%. While both have significant domestic energy resources (hydroelectric, nuclear and coal), they're relatively poor in stocks of oil and natural gas. Once the world's fifth largest oil producer, China became a net oil importer in 1993. The dependence of both countries on energy imports has increased significantly—China's dependence on oil imports increased from 6.8% in 1994 to 47.8% in 2004, while India's averaged 60.4% for the decade. While coal remains the major contributor to primary energy consumption (67% in China and over 50% in India), oil consumption doubled in China in the past decade and increased by 60% in India. And their energy demand will continue to rise due to their low energy consumption per capita (12% and 6.5% of the US's and 56% and 30% of the world's average for China and India, respectively).

Beijing and New Delhi realise that the continuation of their rates of consumption growth of hydrocarbons will have major effects on the global environment and the long-term supply of energy.

Both countries need to manage the serious social dislocations caused by economic reform and rapid industrialisation. In particular, they are aware of the need to cater to the rising aspirations of their burgeoning middle classes, which are crucial to much of their economic growth and which demand access to 'modern' energy (petroleum and electricity). China is the world's largest market for new vehicles, with sales growing at around 25% year on year. Beijing is very aware that major disruptions to energy imports would threaten the economic growth rates that provide the social glue during China's wrenching economic transition, and that major supply disruptions could well result in internal chaos. And Beijing and New Delhi realise that the continuation of their rates of consumption growth of hydrocarbons will have major effects on the global environment and the long-term supply of energy.

The global energy trade is steadily regionalising, due to the increasing transparency and extension of energy markets, which make transport costs and logistical considerations the major shapers of energy commerce (Odell 1997). Consequently, the major oil importers in East and South Asia are increasingly relying on the Middle East for supplies, as North America

moves towards Atlantic basin supplies and Europe towards Central Asian, African and Atlantic basin supplies (Salameh 2003).

The Persian Gulf has emerged as the 'natural' supplier of Pacific Asia, which imports 80% of its oil from the Middle East. The Asia–Pacific countries take 60% of the Middle East's oil and gas production and two-thirds of its exports (APEC ERC 2003). New refineries being built in South, Southeast and East Asia are being designed specifically to refine heavier, higher-sulfur grades of oil from the Persian Gulf to the higher environmental emissions standards required on global petroleum markets.

These rising energy trade intensities between the Middle East and East and South Asia are also being matched by interdependent investment patterns, with East Asian economies beginning to invest in upstream energy-producing operations in the Middle East, and Middle Eastern investors buying into downstream refining and distribution in East Asia (Salameh 2001). Energy importers in South and East Asia are also showing increasing interest in Central Asian sources of oil and gas production. Although lagging behind the trade and investment with the Middle East, the East and South Asian presence in Central Asian energy markets is growing (see Ogutcu 2003, Daly 2004, Blank 2005).

Japan, China, the Republic of Korea, Malaysia and India have all begun to invest directly in fossil fuel production regions through state-owned or semi-state-controlled energy companies.

As the major developing Asian powers' energy demand grows at rates equal to or exceeding their GDP growth rates, several countries have embarked on vigorous campaigns to acquire equity in oil production across the globe. Japan, China, the Republic of Korea, Malaysia and India have all begun to invest directly in fossil fuel production regions through state-owned or semi-state-controlled energy companies. In August 2007, Seoul announced its intention to increase the proportion of oil imported from Korean-owned production sites from 3.2% to 28.0% by 2020. At the same time, Russia, Japan, China, India, Pakistan, Iran, Turkey and various Central Asian states have engaged in protracted competition over the routes of pipelines transporting oil and gas to export markets.

To strategic planners in these countries, acquiring 'equity oil' has several advantages:

- It reduces market risk by allowing an investor to predict accurately the amount of fuel received over the life of the field, and promises cheaper fuel through transfer pricing (Downs 2004).
- It provides a sense of psychological security against price fluctuations and supply disruptions, although experience suggests that equity oil's marginal share of the global oil market means it will have a limited impact either on price volatility or in compensating for supply disruptions.[11] Much of the investment in equity oil has been criticised for distorting energy investment flows and making the financing of exploration and production less efficient.

There's also evidence that competition for equity oil has developed its own zero-sum logic among Asia's consuming powers. For example, Indian Prime Minister Manmohan Singh is reported to have said to Indian energy companies at the beginning of 2005:

> I find China ahead of us in planning for the future in the field of energy security. We can no longer be complacent and must learn to think strategically, to think ahead, and to act swiftly and decisively. (Quoted in Klare 2005a)

There are signs that Asia's major energy consumers are not simply leaving to state-owned oil companies the task of building partnerships in the vital Middle East and Central Asian regions.

Washington's strategic purpose in the Middle East is less to capture the region's energy resources for itself, as the conspiracy theorists suggest, than to prevent the development of destabilising competition in the region among other great powers ...

Manoeuvres in the Gulf

The past five years have seen a steady intensification of diplomatic and security links between Asia's energy-thirsty great powers and Middle Eastern states. This challenges the decades-long arrangement whereby the US remained the major external influence in the region, and provided a security guarantee to its maritime-borne energy exports.

Washington's strategic purpose in the Middle East is less to capture the region's energy resources for itself, as the conspiracy theorists suggest, than to prevent the development of destabilising competition in the region among other great powers:

> The United States is less interested in feeding its oil thirst and in gaining contracts for powerful energy-sector companies than it is in the impact of oil security—or insecurity—on world politics as a whole. Because the United States has both the power and the will to maintain the security of the world oil trade, other countries see no adequate reason to develop their own independent military capabilities to secure their oil supplies. A world with half a dozen powers duelling for influence in the Middle East, with each power possessing the will and the ability to intervene with military force in this explosive region, would be a less safe and less happy world than the one we now live in, and not only for Americans. (Mead 2004)

Maintaining its position as the leading guarantor of the maritime energy trade provides a powerful rationale for the general American strategic purpose of ensuring peace through overwhelming strength, as set out in the 2002 National Security Strategy (US Government 2002). This policy also plays a crucial part in the US's ability to maintain its international

hegemony, as US control over maritime energy supply routes is powerful leverage against the rise of a strategic competitor:

> In this respect, control of oil may be seen as the centre of gravity of US economic hegemony and thus the logical complement of its declared strategy of permanent, unilateral military supremacy. (Bromley 2005)

The internal logic of the American policy on the world energy trade is to maintain its position as the leading guarantor of global energy transit by bringing most energy supply routes ultimately under its security umbrella.

The internal logic of the American policy on the world energy trade is to maintain its position as the leading guarantor of global energy transit by bringing most energy supply routes ultimately under its security umbrella. Its long-term aim to include its allies and trusted states in maintaining maritime security has been formalised in the proposal to develop a Global Maritime Partnership, designed to enhance the interoperability of the US Navy and those of coalition partners.

The other crucial strand of US energy security policy is to play the role of sole guarantor of the regional order in the Middle East, which contains 63% of the world's oil reserves. Since the end of World War II, the US has tried to achieve this through a mixture of supporting key allies and isolating and pressuring states unwilling to comply with the American-supported order in the region. For many years, Washington's policy was based on the 'twin pillars' policy of supporting Saudi Arabia and Iran as the guarantors of regional order. After the Iranian revolution, and with Iraq becoming increasingly belligerent, the 'twin pillars' strategy was replaced by a policy of 'dual containment' of Iraq and Iran. Both strategies were unstable and relatively short-lived.

The 2001 war in Afghanistan and the 2003 invasion of Iraq heralded a new phase in American involvement in the region, premised on selective direct intervention and the establishment, for the first time, of major and ongoing American military bases and troop commitments in the region. It's likely that a major troop drawdown in Iraq will see the US attempt to negotiate the continuing presence of large military bases (such as it left in Germany and Korea) as a guarantee of the regional order and as a foil to the aspirations of Iran.

Whether or not this latest iteration will be successful, Washington's objectives remain constant through the evolution of tactics:

- promoting a regional order most conducive to the operation of a free market in energy
- retaining its role as the leading guarantor of the global energy trade—though sharing the patrol and enforcement burden with coalition partners
- seeking to isolate and change states opposed to its role and preferred subregional order.

The US sole guarantee of maritime energy security appears to offer many advantages to Asia's energy hungry powers. With Washington determined to play the role of sole provider of maritime security, the world's energy importers are, in effect, being invited to ride free on a public good paid for by the American taxpayer. Yet there are signs that several Asian states, including several of Washington's allies, aren't completely comfortable with this arrangement.

Some states have begun to worry about the effects of American policy commitments on stability in the Muslim world.

Some states have begun to worry about the effects of American policy commitments on stability in the Muslim world. In the context of Washington's prosecution of the global war on terror, its invasion of Iraq and its involvement with the Israeli–Palestinian dispute, and with anti-Americanism rising, several Asian powers have begun to worry whether, by acquiescing to the American energy security umbrella, they're leaving themselves vulnerable to collateral damage from Arab anger at American policies. This sentiment is of a kind with that reportedly expressed by a Japanese businessman during the Iranian revolution:

> Why is it that we who have had nothing to do with the causes of the Iranian revolution, nothing to do historically with the Arab–Israel conflict, and nothing to do with American interests in Iran, have to suffer this? (Quoted in Dowty 2000)

Just as the general effects on the global energy trade of Arab anger at Washington's support for Israel in the 1973 Yom Kippur War led many European capitals to adopt policy approaches to the region independently of Washington's, nervousness about the drift of American policy in the region may be causing a similar independence on the part of Asia's great powers.

The growing integration between Middle Eastern and East and South Asian energy markets and the high vulnerability of many developing Asian economies to energy price fluctuations have led Asia's rising great powers—China, Japan and India—to realise they have a significant stake in the political order in the Middle East.

China's strategists worry about vulnerabilities to a US energy embargo in the event of Sino-American tensions as much as they worry about the effect of energy price rises on China's economic growth and domestic stability (Downs 2004). As a result, Chinese energy companies have launched a campaign to buy equity in oil and gas production operations in the Middle East, North and West Africa, and Latin America, and Beijing has been building diplomatic links with West Asian states (see Dannreuther 2003, Ogutcu 2003, Daly 2004, Bajpaee 2005). China has paid particular attention to forging close political and commercial links with Middle Eastern regimes isolated by the US and thus outside of the American-sponsored regional and market orders, such as Iran and Saddam's Iraq (Feigenbaum 1999). The tempo of official visits between Beijing and the Gulf States has been quickening since Jiang Zemin's visit to Riyadh in October 1999.

Given that its dependence on Persian Gulf-sourced energy imports has climbed above 1973 levels, Japan has also become more proactive in the Middle East. Tokyo worries about its vulnerabilities to supply disruptions, and about the effects that an interruption of oil supplies from the Persian Gulf might have on China's behaviour in relation to oilfields in the Asia–Pacific region (Myers-Jaffe and Manning 2001). Given its close alliance with the US, Japan has a stake in trying to moderate American policy towards West Asia (Lesbirel 2004). Prime Minister Koizumi's groundbreaking decision to deploy Self Defence Force engineers to Iraq's al-Muthanna province in December 2003 needs to be seen in this broader context. In recent years, Japan has begun to build 'extended security' relations with several Middle Eastern states (Calabrese 2002), particularly concentrating on peace, governance and stability building (Dowty 2000), in a clear effort to differentiate itself from American policy in the region, but without cutting across Washington's interests there.

India's interests in the Middle East are both commercial and strategic. Its growing demand for fossil fuels and proximity to the Middle East dictate a close economic interest in the region. Its broader intention to strategically break out of South Asia and its aspiration to play the role of a maritime power in the Indian Ocean increase its stakes, especially in the Persian Gulf (Blank 2004). India's interests in combating terrorism and isolating Pakistan have also drawn it diplomatically towards West and Central Asia (Parthasarathy and Kurian 2002). In recent years, India has intensified its diplomatic, economic and defence linkages with West and Central Asian states. In addition to the quest for equity oil and gas, India signed a defence cooperation agreement with Iran in 2003 and negotiated an air base deal with Tajikistan. New Delhi realises that these links have begun to translate into diplomatic coin in Washington. During her March 2005 visit to New Delhi, US Secretary of State Condoleezza Rice urged India to abandon negotiations on a major deal to import natural gas overland from Iran. Washington's offer of civil nuclear technology was, in large part, motivated by a similar concern about India–Iran ties.

While Asia's rising great powers—whether allied, rival or unaligned with Washington—are hedging against the American advocated and guaranteed order in the Middle East, other regional powers, such as Russia and Iran, also have a major stake in Middle Eastern developments.

In particular, Iran's platform for a broader role in the region has been strengthened by the fall of the Baathist regime in Iraq and the expulsion of Syria from Lebanon. And while West Asian states such as Saudi Arabia have for many years been willing to buy American-guaranteed military security in exchange for their agreement to cooperate with US demands on energy market pricing and production and the subregional order, Washington's demands after 9/11 may be becoming too onerous.

America's allies in the region may start to become more open to alternative suitors. In tones that alluded to more than just the economics of the global energy trade, Saudi Arabia's powerful former Oil Minister, Sheikh Yamani, commented in 1999 that 'Asia can play a crucial role in helping to improve OPEC's prospects' (quoted in Manning 2000).

While no overt challenge to Washington's role in the region appears imminent, the record shows that Asia's energy-hungry great powers have compelling interests in the Middle East. Any loss of American resolve in the wake of the Iraq experience could see these players attempt to carve out a greater role for themselves.

In the meantime, Asian states' pursuit of energy equity makes less sense as a tool to achieve absolute energy security than as an attempt to establish a large enough market presence to ensure that their interests are taken into account in any prospective reshaping of the global energy market.

Pipeline politics

The dissolution of the Soviet Union brought statehood to a string of former Soviet republics through Central Asia and the Caucasus. In the context of rising energy prices, these states have acquired a new importance because of their significant oil and gas reserves and their position astride possible alternatives to maritime transport routes between West Asia and East and South Asia.

For external powers, the nature and stability of the regimes of the post-Soviet Central Asian states add another element of interest in the region. Most have emerged as secular authoritarian governments, plagued by domestic instability and territorial disputes, subject to great power (mainly Russian) interference, and threatened by growing Islamist grassroots movements. For those with significant oil and gas reserves, those resources simply exacerbate many of these problems by heightening territorial competition among states and increasing domestic resentment over the inequitable distribution of oil and gas rents. In many Central Asian states, the patterns and dilemmas are reminiscent of those in the Middle East: the choice between authoritarianism and theocratic populism, the growing urgency felt by regimes to capture oil and gas rents, and the increasing stakes of outside powers in the domestic make-up of the states.

The US wants to create opportunities for Central Asian energy producers to access the global energy market without having to depend on routing through Russian territory or pipelines.

As a result, Central Asia has become the site of intense great power interest and rivalry. For Washington, energy complements and draws together its other main strategic interests in Central Asia: terrorism and proliferation (Klare 2005b). Its main objectives in Central Asia are to draw the region's regimes into the western orbit, particularly in the energy trade and the War on Terror, to intensify economic links with Western Europe, to isolate Iran, and to curb Russian and Chinese influence (Myers-Jaffe and Manning 2001). The US wants to create opportunities for Central Asian energy producers to access the global energy market without having to depend on routing through Russian territory or pipelines.

Most of these goals put Washington in direct competition with Russia and China. Moscow sees the region as part of its traditional sphere of influence and is deeply opposed to interloping great powers. Energy transfers and security assistance have been two of its main levers for exercising influence over its 'near abroad'. Russia has several objectives in seeking to gain influence over Central Asia's energy exports. Russian nationalists cite the Soviet role in developing oil and gas fields in Central Asia and the Caucasus, and demand a cut for Russia of all subsequent production. More dispassionately, Moscow has sought to influence the routing of pipelines through its territory as a way of offsetting its own vulnerabilities, as its

western distribution of Russian energy production runs through the territory of various US allies. Moscow and its energy companies have also been engaged in a game of extensive strategic positioning, with the aim of prolonging Europe's heavy dependence on Russian energy exports and ensuring that the export of energy to Europe takes place in ways that most benefit Russia.

In addition to realising their mutual vulnerabilities, Russia and China have also found common cause in limiting US influence in Central Asia. Beijing realises the potential for Russian and Central Asian energy to relieve its dependence on maritime supplies. In recent years, Russian and Chinese policy towards Central Asia has increasingly been coordinated into a joint strategy for limiting US influence through the Shanghai Cooperation Organisation, which links Russia and China with Kazakhstan, Uzbekistan, Tajikistan and Kyrgyzstan. The organisation has developed its own counter-terrorism training and joint exercises and has promoted economic integration among its members—each component of which seeks to counter a US objective. Moscow and Beijing are unambiguous in their support for Central Asia's authoritarian regimes in their struggles against separatism and Islamist populism. This seems to have provided an edge over the US, whose support for democratic reform in the region left it vulnerable to a Sino–Russian campaign seeking to dislodge US bases from Uzbekistan and Kyrgyzstan in mid-2005.

The other power of growing influence in Central Asia is Iran.

The other power of growing influence in Central Asia is Iran. As a greenhouse-worried planet moves towards natural gas, Russia and Iran, with 60% of world gas deposits, will find their leverage rise in the years ahead. Iran's energy reserves, plus its geographic position as a potential strategic 'hub' linking Central Asian energy fields with maritime distribution through the Persian Gulf, as an alternative to routing pipelines through Russia, have enhanced its strategic coin substantially. Not only have China and India negotiated major energy supply deals with Tehran (China became Iran's largest export market by the end of 2004), but so have significant American allies such as Japan and Turkey.[12] In an era of rising oil prices and vanishing surplus capacity, some foreign companies are undeterred by the US's Iran–Libya Sanctions Act, which threatens embargoes against companies doing business with Iran; indeed, some have been willing to challenge the Act's World Trade Organization compatibility. A newer uncertainty, however, is the impact and bite of United Nations Sanctions against Iran. Iran's growing links to Russia, China and India are increasingly subverting isolation. And Tehran now has a range of deterrents against direct US attack either in hand or very close to hand: terrorism in the Levant; order and disorder in Afghanistan and Iraq; and it is closing in on a nuclear weapon.

Ramifications for Australia

There's little evidence to suggest that major conflict over energy is about to erupt in either the Middle East or Central Asia. The major participants in the global energy trade realise that they have significant converging interests in the efficient functioning of the global energy market, and that aggression or excessive mercantilism over energy supplies would risk disrupting many of their other interdependent interests. But the combination of rapidly

expanding energy demand, intense competition between state-linked energy companies, and rivalry for access to energy fields and pipeline routes adds an incendiary element to the relations among Asia's emerging great powers.

Australia's security is intimately bound up in the evolution of this broader great power rivalry, in which energy is increasingly important. It's this broader perspective that's lost in the general discussion of energy security issues in Australia, which tends to focus narrowly on the adequacy of Australia's energy reserves and the price of petrol.

It was partly due to this narrow conception of energy security that Defence Minister Brendan Nelson's remarks in July 2007, about the reasons for persisting in Iraq, caused such a furore. Nelson was referring to the danger of destabilising competition in the Persian Gulf in the event of a coalition withdrawal, but many commentators took it to be an admission that a narrow commitment to keeping petrol prices down was motivating the pursuit of coalition objectives in Iraq (see Tingle 2007).

Most of the fragile states in the Asia Pacific are completely dependant on energy imports, and would have little economic resilience in the face of such a major shock.

Furthermore, Australia needs to acknowledge that, while its own energy self-sufficiency is relatively high, that of many of the major states in the world economy is low. The average dependence on oil, gas and electricity in the OECD is 94%, and the dependence on energy imports averages 72% across the OECD, meaning that general supply shortfalls with a lower immediate impact on Australia's energy security have the ability to pass on major impacts to the Australian economy.

In its own region, some of Australia's neighbours are deeply vulnerable to the impact of energy shocks. Most of the fragile states in the Asia Pacific are completely dependant on energy imports, and would have little economic resilience in the face of such a major shock. The prospect of several of these states moving towards collapse at the same time would place enormous strain on Australia's security forces.

The growing importance of energy to Australia's security in a broader sense needs to be openly acknowledged, and factored clearly into the nation's foreign and defence policy thinking. Developing this clear conception of energy security in the broader sense, and integrating it into policy is of compelling importance, and will be explored in the next section.

Chapter 5

ENERGY IN AUSTRALIA'S FOREIGN AND DEFENCE POLICY

The Australian Government and policy community have a firm grasp of the role of open energy markets in maintaining Australia's energy security. They should now seek a better understanding of how energy insecurity might affect the priorities of other Asia–Pacific states, especially the larger ones, and contribute to tensions between them.

Australia's interests will be best served by maintaining and developing our position as a dependable energy supplier ...

Australia's interests will be best served by maintaining and developing our position as a dependable energy supplier, by supporting the further integration of naval security mechanisms to protect energy shipping, and by promoting multilateral forums that include major energy consumers as well as producers. Such forums could make the market more transparent and efficient, and lead to demand-side reforms and innovations that diversify the energy base, stabilise the market, and reduce tensions between players.

Australia's energy security policies

Australia's current policies to ensure energy security accord broadly with common practice within the OECD. There's a strong emphasis on promoting supply through free energy markets and improving and linking distribution infrastructure. As a member of the OECD's IEA, Australia participates in the Emergency Oil-Sharing System, which

Photo opposite: Oil production ship, Timor Sea, Australia. © Chris Sattlberger/The Image Bank/Getty Images

requires member countries to maintain emergency oil reserves of at least 90 days of net oil imports, develop programs of emergency demand restraint measures, and participate in a collective oil allocation scheme in the event of severe supply disruptions. Such a system also allows individual countries to mitigate the effects of moderate supply disruptions, such as when the US released some of its strategic reserves in the aftermath of hurricanes Katrina and Rita. Currently, Australia has total oil stocks equivalent to about 47 days of oil consumption, or over 200 days of net oil imports. We differ from most other OECD countries in that our stockpiles are privately held, but the government can order their use in an emergency under the *Liquid Fuel Emergency Act 1984*.[13]

More recently, the federal and state governments have established the Energy Security Working Group under the auspices of the Council of Australian Governments (COAG) Ministerial Council on Energy, with responsibility for managing the National Liquid Fuel Emergency Response Plan. Recent energy security measures also include the setting up of the Border Protection Command to coordinate patrols of Australia's offshore oil and gas fields to strengthen their security against terrorist attack. The COAG Energy Reform Implementation Group has responsibility for advancing work to achieve a fully national electricity transmission grid (Australian Government 2006). Australia is also committed to diversifying its energy types and sources and increasing the interconnection of energy systems, broadly in line with suggested practice within the IEA and APEC (Hogan et al 2007).

Canberra subscribes strongly to the belief that an extensive international energy market is the best mechanism for ensuring energy security.

Beyond such specific crisis response measures, Canberra subscribes strongly to the belief that an extensive international energy market is the best mechanism for ensuring energy security. The trend over several decades has been to move away from exclusive, long-term, statist arrangements for energy supply towards open global energy markets (even though state-owned companies dominate oil production, they trade through the free market) (May 1998:16–17). Prices are no longer determined by deals between producers and distributors, but rather by spot markets and futures contracts negotiated openly and competitively (Fesharaki 1999). The increasingly free market in energy, when backed up by measures such as strategic petroleum reserves and regional crisis sharing arrangements[14], provides security for importing economies in three ways.

First, the energy market diversifies risk and provides the capacity to absorb disruptions through the price effect. Fossil fuels are a fungible commodity and, in the conditions of an open market, all consumers absorb an equal part of a supply disruption through paying the same increased price:

> Insofar as oil is a globalised commodity, a disruption anywhere is a price spike everywhere. Thus, mere geopolitical access to the strategic resource will not yield the accessing party the best price. What matters, rather, is who gets what long-term contract. (Manning 2000)

The recent track record of the global energy economy in providing such security is impressive. Since 2002, the market has absorbed the effects of three major supply disruptions due to instability in Venezuela and Nigeria and the war in Iraq, with some help from demand weakness and restraint in major importers and a willingness by Saudi Arabia to boost production.

Second, the experience of the 'reverse oil shock' and the dependence of most oil exporters on socially determined target incomes from energy exports have led to a significant convergence of interests between producers and consumers in maintaining affordability and stability in global energy markets, and in the ongoing affordability of production and consumption. Energy exporters, while happy to enjoy the increased rents of temporary price spikes, worry about the effect of long-term price rises on the diversification of energy sources and demand restraint. This convergence of producer and consumer incentives complements the risk-spreading mechanism of the global energy market, making major producers such as Saudi Arabia more willing to return to the traditional role of 'swing producer' to flatten price fluctuations.

Third, the growing interdependence among national economies, and between the energy market and global trade in other commodities and services, also provides a security mechanism. The most energy-hungry economies are also the most dependent on the continued normal functioning of world markets, both for oil products and for the exports needed to pay for those products (May 1998:25). In other words, Asia's developing giants require energy to fuel their export-led development, which in the main is provided by growing trade intensities with European, North American and other Asian economies. An energy embargo against any of those major economies would cause it to stall, with inevitable knock-on effects for other major economies. Under current conditions of economic interdependence, it's impossible for any major economy to energy-embargo another without itself suffering major economic losses. This can be seen through the tendency for sanctions against producers under conditions of tightening energy markets to almost inevitably be circumvented by other consumers, with the attendant price effects probably offsetting the producer's losses from the original sanctions (Porter 2001).

What remains to be factored into Australian policy is an acknowledgment that the steady tightening of energy markets in the years ahead may begin to impinge on the security calculations of regional powers in ways that destabilise the regional order.

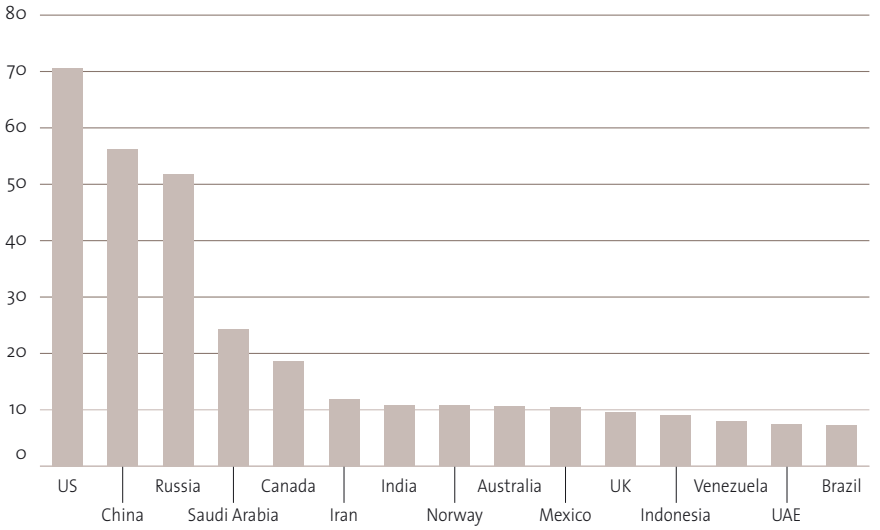
Canberra understands well these aspects of energy security through open energy markets, and is wary of outbreaks of 'gut economic nationalism' that occur from time to time in relation to energy markets. There's a strong belief within the Australian Government that risks to energy security can be overstated, and that general, blanket solutions to specific risks can threaten the natural efficiencies of energy markets. What remains to be factored into Australian policy is an acknowledgment that the steady tightening of energy markets in the years ahead may begin to impinge on the security calculations of regional powers in ways that destabilise the regional order. Australian foreign and security policy should consider

what measures might be taken to mitigate tensions and competitive behaviour arising from anxiety about the continued supply of energy.

Australia's energy influence

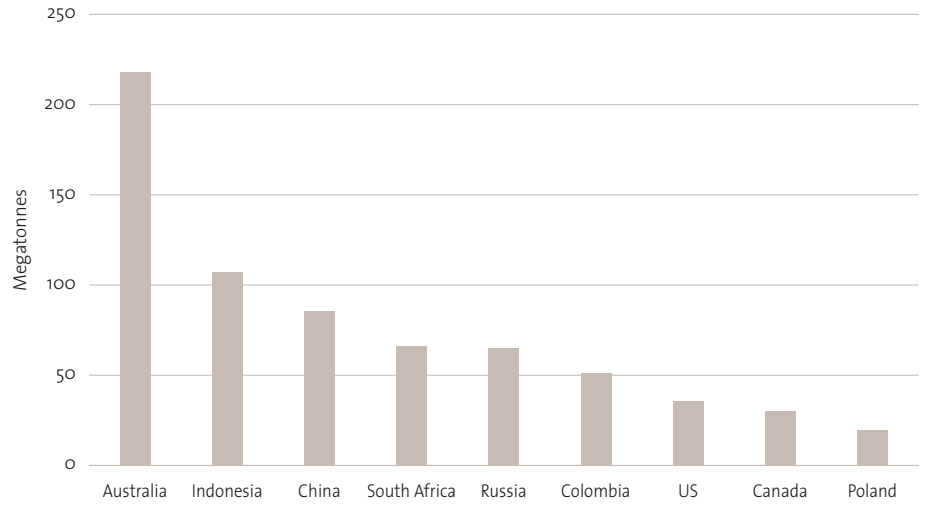
In a July 2006 speech, the Prime Minister said, 'As an efficient, reliable supplier of energy, Australia has a massive opportunity to increase its share of the global energy trade. And with the right policies, we have the makings of an energy superpower.'[15] Australia is the ninth largest energy producer in the world (see Figure 8). We're the largest exporter of coal, the second largest exporter of uranium and the fifth largest exporter of liquefied natural gas. Given this prominence, how much influence can we wield in world energy markets? Or would it be more realistic for a country of Australia's size to ensure the integrity and resilience of its own supplies, and leave bigger management issues to others?

Figure 8: World primary energy production, 1980 to 2004 (quadrillion BTU)



Source: IEA Statistics

Figure 9: Major coal exporters



Source: IEA Statistics

Even given Australia's predominance in global coal exports (see Figure 9), it's unrealistic to argue that we can enjoy influence of the kind that Saudi Arabia or Russia has been able to wield through their status as major energy producers. Coal doesn't play the same pivotal role as oil in enough of the world's economies—as a fuel for generating electricity, it has more readily available alternatives, and coal deposits aren't as geographically concentrated as oil and gas deposits.

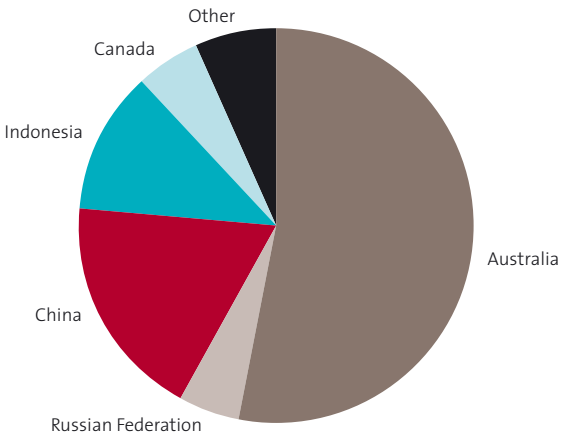
For example, while Australia is the major supplier of coal for Japan's electricity generation (see Figure 10), a sudden halt to those supplies would result in fairly minor disruption. Japan relies on coal for 47.5% of its electricity generation, and could possibly compensate for temporary coal shortages using demand management, peak load shaving and surge capacity from other fuel sources. It's also likely that the other suppliers of coal to Japan would between them be able to replace a significant proportion of lost Australian imports.

Australia currently produces 22% of global production of uranium, after Canada (29%) and before Kazakhstan (9%). Given that we have over 40% of the world's commercially recoverable reserves (i.e. costing less than $40 per kilogram of uranium oxide to produce), there's clearly a potential to increase our market share at a time of surging interest in nuclear power in North America, Asia and Europe.

In 2006, the IEA advocated the widespread adoption of nuclear power generation as the answer to concerns about global warming and the adequacy of fossil fuel stocks into the future. Nuclear power supplies 16% of the world's electricity. The International Atomic Energy Agency estimates that this proportion will increase to at least 27% by 2030. Even the most conservative estimates suggest that global production of uranium has to increase by 40% by 2020 to meet the coming demand for nuclear energy.

For any energy exporter, the ability to make dependable profits from those exports entails locking in demand security. The civil nuclear industry enjoys the advantage of being the cheapest and most reliable alternative to fossil fuels as a generator of baseload power, but still struggles with a legacy of safety and environmental concerns. The uranium industry and the Australian Government believe that Australia has a limited window of opportunity to promote uranium-based civil nuclear energy's current advantage over other non-fossil

Figure 10: Suppliers of coal to Japan



Source: ABARE

fuel sources, before other options (such as the use of thorium as a nuclear fuel, which India is trying to develop) become commercially viable. This dictates that uranium exporters in the short term will need to make dependable supplies of uranium available to countries contemplating expanded civil nuclear programs, in order to lock in demand security for uranium in the longer term. Australia's production of uranium has been increasing steadily for over a decade and, with uranium prices having trebled since 2003, our expanded production puts us in a good position to underpin the dramatic expansion of nuclear power in the coming years. China, alone, intends to quadruple its nuclear power generation by 2020.

The growing demand for nuclear fuel for energy has also prompted concerns about the spread of sensitive uranium enrichment technology and about the safe transport and storage of highly radioactive waste material.

The growing demand for nuclear fuel for energy has also prompted concerns about the spread of sensitive uranium enrichment technology and about the safe transport and storage of highly radioactive waste material. This, along with concern over Iran's nuclear program led the Bush Administration to propose the Global Nuclear Energy Partnership (GNEP) in February 2006. The GNEP aims to increase access to nuclear power by those countries that need it, while addressing the risk that increased production of radioactive material could lead to proliferation.

At the heart of the GNEP is the concept of a closed cycle, whereby a small number of countries would help approved counterparts to construct advanced generator reactors and provide them with nuclear fuel on a leasing basis, thus allowing the provider countries to strictly control the proliferation and accident risks. Many of the details of the GNEP have yet to be agreed, but it's possible that it would freeze the number of states able to enrich uranium. This potentially poses a direct challenge to Canberra by threatening to lock Australia in as a non-value-adding exporter of yellowcake, and was a major stimulus for the commissioning of the Switkowski review. The July 2007 suggestion by the US Department of Energy that Australia and the US update their 1982 nuclear cooperation agreement suggests that Washington sees a significant role for Canberra in the GNEP, and that intense negotiations could ensue over Australia's status within the scheme.

In this context of surging demand for fossil fuels, concern about the finiteness of reserves, and awareness of imminent measures against global warming, Canberra has developed a broader concept of Australia's influence on energy markets. A developing theme is that, as a stable supplier of low-cost, low-emission energy, Australia can redress some of the current inequity in access to energy among countries, and stabilise some of the intensifying international competition over fossil fuels.[16]

This is an evolution of a long-held belief that it's only by being a major supplier in the international nuclear fuel cycle that Australia can influence the international nonproliferation regime in the right direction. Australian policy has been to develop world's best practice for the export of Australian uranium and, partly through example and partly because of the

Australia's new uranium customers

Australia possesses 40% of the world's low-cost recoverable uranium reserves. Between the mid-1980s and the early-2000s, however, the global market in uranium was weak, due to low demand and an oversupply of nuclear material derived from decommissioned Cold War arsenals. In the past few years, however, a resurgence of interest in nuclear power and the drying up of stocks of Cold War nuclear material have seen a rapid and sustained rise in the demand for uranium.

Seeking to lock in ongoing demand security for its uranium exports, Australia has begun to move towards exporting its uranium to states previously regarded as outside the strict guidelines for the sale of Australian uranium. In April 2006, Canberra signed a Nuclear Safeguards Agreement with China, paving the way for the export of up to 20,000 tonnes of Australian uranium to China per year. In 2001, Australia reached an agreement with the United States for Australian uranium to be enriched in the United States before being shipped to Taiwan under full safeguards.

On 16 August 2007 Australia and India signed the Australia–India Uranium Trade Agreement. Given India's non-membership of the Nuclear Non-Proliferation Treaty (NPT), the Australia–India agreement is dependent on the successful ratification of the 2006 agreement on civil nuclear cooperation between India and the United States. This conditionality derives from the fact that the US–India deal contains provisions for the alteration of the Indian nuclear sector that would potentially harmonise it with Australia's standards on export safeguards. The US–India deal involves India separating fourteen of its twenty-two nuclear facilities, reserving them for civil nuclear use and placing them under IAEA-agreed safeguards. India has agreed under the terms of the deal to establish a foreign material reprocessing facility to supply plutonium to its fast breeder reactor that will be kept separate from its military plutonium production. The deal includes provisions requiring all technology and material supplied by the US to be returned if India tests a nuclear weapon. However, the US–India deal faces strong opposition, particularly in India, where a coalition of left-wing parties has mobilised to block ratification in the Lok Sabha.

On 7 September 2007, Australia and Russia signed a Nuclear Safeguards agreement, allowing Australian uranium to be used in the Russian civil nuclear industry. Australian uranium has been enriched for re-export in Russia since 1990.

The issue of Australia's uranium exports has become entangled in a broader domestic debate over the development of nuclear power generation in Australia. The Labor Opposition has rejected the nuclear option for Australia, and would likely revisit the Australia–India Uranium Trade Agreement. What is clear is that the resurgence of interest in nuclear power globally is driving a partial reformulation of the nuclear supply and proliferation regimes, as new provisions, from the US–India nuclear deal to the Global Nuclear Energy Partnership (GNEP) are proposed. Given its stocks of uranium, Australia will be vitally affected by these shifts, and needs to develop a comprehensive framework marrying economic, strategic and environmental considerations to guide its future nuclear choices.

sheer volume of Australian exports, to multilateralise that practice through the Nuclear Suppliers Group standards for the trade in nuclear components and material.

The significance of Australia's lead-by-example could be tested by the case of India.

The significance of Australia's lead-by-example could be tested by the case of India. As a non-party to the Nuclear Non-Proliferation Treaty, India lies outside Australia's rigid export control standards. But the scale of India's potential demand and the fact that Washington has signed an agreement to supply India with civil nuclear technology have Canberra edging towards concluding a uranium export agreement with New Delhi. Such an agreement is potentially highly damaging to the nuclear material supply regime, given Australia's and the US's profiles on nonproliferation. It also heralds a major step in India's nuclear normalisation—a process being studied closely by Tehran as a model for its own path towards accepted nuclear status. However, in July 2007 Canberra stated strongly that it wouldn't contemplate uranium supplies to Pakistan, even if it were to decide to export to India. Given Australia's stand on the sanctions regime against Tehran, it's highly unlikely that Iran would be a recipient of Australian uranium exports in the future.

But Australia needs to play one more role in bolstering international energy security. Canberra's experience with energy markets, Australia's status as the world's ninth largest energy producer and our history of multilateral activism suggest a role in strengthening multilateral mechanisms that can bolster the resilience and smooth functioning of global energy markets.

Pouring oil on troubled waters

The past quarter century demonstrates that the combination of the energy market and multilateral cooperation has the best track record in mitigating energy supply risks and building trust among potentially rival energy consumers, producers and investors.

On the producers' side, OPEC has helped the major oil-producing countries to realise the extent and limits of their market power and their convergent interests with consuming countries to ensure a measure of demand security and the longevity of their reserves. After losing clout and market share to non-OPEC producers in the two decades after 1985, OPEC has begun to re-establish its authority over oil production, with even Russia coming to an unspoken agreement on prices and production (Horsnell 1997).

On the consumers' side, the IEA has enabled OECD states to coordinate the management of their energy security exposures. Beyond administering the Emergency Oil-Sharing System, the IEA plays a vital role in increasing the transparency of energy supply and demand trends through its substantial research and statistical services.

But there are important gaps in the multilateral structures underpinning energy security. There's no mechanism for regular consultation between the leading energy-producing and energy-consuming states. In conditions of tightening energy supplies, we've seen how certain, largely market-based, policies tend to be assumed to have political and strategic

undertones, and to lead to mercantilist reactions by powerful states. In the absence of a regular consultation mechanism among major producing and consuming states, signals are sent and leverage is applied through the market, in ways that can be highly distorting to international energy markets. Establishing a forum that allows major producers and consumers to discuss issues and problems freely would remove some of the pressures of strategic behaviour and signalling from the global energy market.

Both OPEC and the IEA have important gaps in their membership. While important oil producers, such as Angola, have joined OPEC recently, Russia remains aloof. This is an important anomaly, given the size of Russia's oil and gas reserves, its penchant for using its energy exports as leverage, and the enduring rivalries between Russia and Saudi Arabia. And while the IEA has begun factoring non-OECD countries into its statistical reports and analyses, it's increasingly anomalous that an international energy agency doesn't include major consumers of energy, such as China and India. Both countries are aware that they were relatively powerless when the global energy market was established, and are consequently joining an international energy market constructed without them. The alarmed reactions to their energy equity purchases, such as to China National Offshore Oil Corporation's bid for Unocal, send strong signals to Beijing and New Delhi that the international energy market mightn't be as free as it appears.

Australia has a strong security interest in bolstering the operation of a free global energy market. In times of rising oil prices, vanishing surplus capacity and growing concerns over energy security, the global energy market could start to be eroded by strategic rivalries and increasingly statist responses to energy supply problems.

... it's in Canberra's interest to begin to lobby for a new round of institutional innovation on global energy security ...

To avert such a development, it's in Canberra's interest to begin to lobby for a new round of institutional innovation on global energy security—a response that until now has been almost completely lacking during the third oil shock. An initial move would be to decouple the IEA from its OECD-only membership, to bring in as full members the major energy-consuming countries of the future, particularly in Asia. Such a body could promote transparency, facilitate dialogue among energy importers and with producers, and play an advocacy and research role to promote a range of demand-side reforms and fuel innovations.

The existing body that brings together producers and consumers is the Riyadh-based International Energy Forum (IEF). Established in 1991, the IEF has evolved as a series of meetings among the energy ministers of some of the leading energy exporters and importers. In 2005, a Secretariat was established in Riyadh, and provided with the capacity to compile, analyse and publish energy market data. Yet in its current form, the IEF lacks the capacity to play a decisive role in world energy markets. Many major energy producing and consuming countries are wary that it could be used to manipulate markets.

Through an enhanced IEF or a new institution, but also generally through diplomatic mechanisms, Australia should emphasise that certain attributes of international energy

markets need to be bolstered so that those markets can play their necessary part in ensuring energy security.

The Australian role should include:

- promoting a general understanding that supply problems are best responded to cooperatively, rather than competitively
- promoting an understanding that the best long-term response is to allow the market to re-establish itself
- promoting market transparency through information
- promoting the covering of supplies in futures markets, rather than the physical market
- promoting, to the extent it can be accommodated within the market, scope for offsetting disruptions in supply with a greater diversity of fuel types and sources.

Australia has enough at stake, and enough standing in global energy markets, to play such a role.

Australia is also well placed to play a more vigorous role in promoting further development of the cooperative maritime security mechanisms that operate in the Pacific and Indian Oceans. As the most significant Indian and Pacific Ocean power south of China and east of India, Australia is a central participant in several cooperative maritime frameworks: the Western Pacific Naval Symposium,[17] the Five Power Defence Arrangements (FPDA), the Radford-Collins Agreement,[18] the Pacific and Indian Oceans Shipping Working Group, and the Proliferation Security Initiative.

Figure 11: Shipping routes in Southeast Asia

Australia is also well placed to play a more vigorous role in promoting further development of the cooperative maritime security mechanisms that operate in the Pacific and Indian Oceans.

Despite such frameworks, there are important gaps in regional maritime security. American and Japanese concerns about shipping in the Malacca Straits have led both countries to offer to contribute to regional security patrols, only to be rejected by Indonesia and Malaysia. Yet the Malaysian-Singaporean-Indonesian counter-suggestion of coordinated rather than joint patrols raises questions about effectiveness. Particularly through the FPDA, Canberra could promote a more effective collaborative response. There are also opportunities to expand on the maritime security aspects of the Trilateral Security Dialogue with Japan and the United States, and to bring in China and India on an issue of shared regional concern.

Canberra should also reconsider developing a more conventional oil stockpile, administered by the state, as an emergency response to supply disruptions or significant short-term tightening of the market. Currently, Australia is an anomaly within the IEA, choosing to allow market players to constitute the 90-day mandated oil stockpile. During the price spikes caused by Hurricanes Rita and Katrina in 2005, when the United States and others used their strategic reserves to smooth price fluctuations, Canberra took a hard-line market-based approach and chose to rely on the pass-through of higher prices to restrain demand. But given Australia's distances and reliance on road transport, major price fluctuations or supply shocks stand to hit it extremely hard. Against these potential effects, the cost of developing a conventional stockpile, in addition to Australia's surge capacity, may be worth considering.

Endnotes

1 Asia's developing economies will see a rise in the use of all forms of commercial energy, as a consequence of the steady decline in biomass (wood, dung) fuels.

2 For a good summary of debates on peak oil, see Australian Senate (2007).

3 Some of the minor energy shocks included the 'tanker war' during the Iran–Iraq war and the 1991 Gulf War, both of which saw temporary disruptions in oil supplies to industrialised countries.

4 Japan has bowed to US pressure, placing restrictions on investment and financial operations in Iran pending resolution of the nuclear issue, but key Japanese spokesmen deny Tokyo has pulled out of its oil investment projects; see http://www.irna.com/en/news/view/line-203/0611297310173126.htm

5 For a good account of this competition, see Morse and Richard (2002).

6 For a detailed survey of the Russo–Ukrainian stand-off, see Stern (2006).

7 This important distinction was first made in Keohane and Nye (1977).

8 International Energy Agency, Country Statistics, at http://www.iea.org/Textbase/stats/balancetable.asp?COUNTRY_CODE=AU&Submit=Submit (accessed 14 July 2007).

9 The current drought means that significant amounts of coal-fired electricity are needed to pump water into the Snowy Mountains Hydro scheme to keep its hydroelectric turbines working.

10 Part of the cause of the OECD's dramatic improvements in energy efficiency are the result of the decline in energy-extensive industry in the OECD—largely due to the export of such industry to energy-intensive economies, such as China and Vietnam.

11 E Anthony Wayne, Assistant Secretary of State for Economic and Business Affairs, testimony to the US Senate Committee on Foreign Relations, 26 July 2005.

12 In 1996, Turkey signed a $3 billion, 25-year deal to access Iranian natural gas.

13 However, an APEC Energy Working Group Workshop held at the East–West Centre in Honolulu on 27–28 July 2005 commented that the situation in Australia was 'ambiguous', given that the Liquid Fuel Emergency Act has never been invoked.

14 Such as the ASEAN Petroleum Security Agreement (APSA).

15 John Howard, address to the Committee for the Economic Development of Australia, Sydney Convention and Exhibition Centre, 18 July 2006.

16 See John Howard, speech at the launch of the *Securing Australia's Energy Future* White Paper, September 2004.

17 A biennial forum for Chiefs of Navy among Australia, Brunei, Cambodia, China, Fiji, France, Indonesia, Japan, Korea, Malaysia, New Zealand, the Philippines, Papua New Guinea, Russia, Singapore, Thailand, Tonga, the United States and Vietnam. Observer countries are Bangladesh, Canada, Chile and India.

18 A 1951 agreement among the United States, Australia and New Zealand designed to coordinate shipping at times of regional tensions or war.

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Acronyms and abbreviations

APEC	Asia-Pacific Economic Cooperation
APERC	Asia Pacific Energy Research Centre
COAG	Council of Australian Governments
ESI	Energy Security Initiative
EWG	Energy Working Group
FPDA	Five Power Defence Arrangements
GNEP	Global Nuclear Energy Partnership
IEA	International Energy Agency
IEF	International Energy Forum
NPT	Nuclear Non-Proliferation Treaty
OECD	Organisation for Economic Co-operation and Development
OPEC	Organization of the Petroleum Exporting Countries

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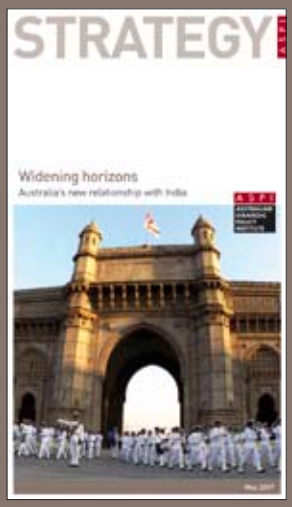

Power plays
Energy and Australia's security

The world is entering an era of steadily tightening energy markets. The growth in demand of the United States, China and India for imported oil and gas, and the increasing dependence of the world on supplies from unstable regions means that the adequate supply of affordable energy will become increasingly a part of most states' security calculations in the coming decades.

Australia is no less dependent on a small range of fossil fuels than most other developed countries. It is in the enviable position of being dependent on imports for less than a quarter of the energy it consumes. However, there is little reason to be complacent about energy and Australia's security. Australia's self-sufficiency in oil products is declining markedly and will become increasingly dependent on imports from the Middle East in the next decades. Furthermore, energy security issues are likely to substantially reshape the great power relationships in the Asia Pacific.

Most of the fragile states in the Asia Pacific are completely dependant on energy imports, and would have little economic resilience in the face of such a major shock. And a general energy crisis, even if it didn't have a profound effect on Australia directly, could do major damage to the Australian economy by virtue of its effects on other economies more dependent on energy imports.

Australia needs to factor these broader aspects of energy security into its foreign and defence policies. The Australian Government believes that a freely operating global energy market is the best guarantor of global energy security. But history shows that global energy markets can be distorted by distrust, rivalry and power manoeuvring.

As a major energy exporter, Australia has the diplomatic weight to advance a multilateral mechanism that brings together the world's major energy producers and consumers to promote cooperative approaches to managing supply problems; a reliance on the free operation of a transparent global energy market; and the development of a greater diversity of fuel types and sources. Australia's status as a maritime power also allows it to play a more vigorous role in promoting cooperative regional frameworks
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