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Implications of the Sale of Australian Uranium to India

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Implications of the Sale of Australian Uranium to India

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Introduction

Important strategic, moral, safety and environmental outcomes hinge on Australia's decision whether to sell uranium to India. In its final days, the Howard Government decided to sell. Following Labor's win, Foreign Minister Stephen Smith reversed that decision and declared Australia would not sell.[1] But, somewhat confusingly, Canberra also decided not to oppose the Indo-US nuclear deal in the International Atomic Energy Agency (IAEA) or the Nuclear Suppliers' Group (NSG).

Until recently, the issue was academic. A successful conclusion of the Indo-US nuclear deal was necessary for the sale of Australian uranium to India. But India's Congress-led government, dependent on communist and other left-leaning votes in the Indian parliament, was floundering in its attempts to obtain political support for the deal. Then, in July 2008, the political logjam was broken when the Manmohan Singh Government split with the leftists, teamed up with another minority party, the Samajwadi Party, and won a confidence vote in the Indian lower house. Since then, India has managed to strike a safeguards deal with the IAEA. After protracted negotiations, it now appears that the 45-member NSG has also endorsed the deal. Final clearance is still needed in the US Congress and timing is tight, with impending US and Indian elections. But prospects for the deal look brighter than they have for some time, and the matter of the sale of uranium to India is now very much back in Canberra's in-tray.

This paper argues in favour of the sale of Australian uranium to India. But it also emphasises that Australia should participate only in the context of highly conditional outcomes in terms of the long negotiation process now underway involving the United States, India, the IAEA and the NSG. And Canberra should be especially aware of the important strategic issues around the edges of the deal, particularly in relation to a perception in some quarters in Washington that China should be contained and that the deal is part of that process.

In reaching this conclusion, the paper examines the issue of India's industrial growth and its contribution to climate change, whether the deal would protect Australian uranium from misuse, whether it would have any counter-proliferation effects in terms of India's nuclear weapons strategy and the future of the Nuclear Non-Proliferation Treaty (NPT) and, finally, the strategic implications of the deal in terms of India's rise as an Asian power.

India's energy needs and global warming

One of the most powerful issues brought to bear on the argument relates to India's future as a substantial emitter of greenhouse gasses. But before the protagonists of the debate over the sale of uranium even lock horns, they must consider difficult technical issues surrounding the utility of nuclear energy in alleviating greenhouse effects.

One side in this debate maintains that the greenhouse benefits of nuclear energy are doubtful. They contend that greenhouse costs associated with mining, construction, de-commissioning and waste disposal outweigh any greenhouse benefits. They maintain that the track record of the nuclear power industry shows that it has struggled to prove economic.[2] Others, however, maintain that there are substantial greenhouse net benefits to be derived from nuclear energy. They claim that, given new efficiencies in the design of nuclear power plants and potential pricing of carbon emissions, the industry will prove economic in the future.[3]

This paper assumes, for the sake of argument, that there are net benefits from nuclear power in terms of greenhouse reduction—especially in the case of Australia-sourced uranium, which is relatively easy to extract, and also given the increasing global reliance on coal for production of base load electricity. It also assumes that nuclear energy is competitive in relation to the provision of base load in respect of renewable sources of energy, or at least in terms of currently available technology. But, if either of these assumptions were proved wrong, or were to become inaccurate due to future developments, there would be no case for selling uranium to India, or anywhere else for that matter. Crucially, the assumptions in this paper actually depend on a decision by Australia to mine and sell uranium widely, in order to ensure that easily extractable resources are available.

* * *

The Indian population is expected to have outstripped that of China by 2030. It will eventually reach stasis at about 1.6 billion people. The economy is now growing at between 8–9 per cent. India is energy poor given this enormous population and rapid economic development.

India has 17 per cent of the global population, yet consumes only 4 per cent of its energy. But development from a low base implies energy intensive growth and India is likely to emerge as a major greenhouse gas contributor. In the decade to 2002, for example, India's greenhouse emissions rose by 57 per cent compared to China's 33 per cent. The Energy and Resources Institute estimates that to sustain a 'business as usual' scenario (an estimated growth rate of 8 per cent per annum and the current approach to the energy mix), India would need to quadruple coal consumption by 2031 to 1200 million tonnes of oil equivalent.[4] The Chairman of the Indian Atomic Energy Commission estimates that if India cannot import fuel or reactors under the Indo-US nuclear deal, it will have to burn 1.6 billion tonnes of imported coal per year by 2050.[5]

India is energy poor in terms of liquid fuels. India's energy mix is 30 per cent dependent on oil, but it supplies only 34 per cent of its own crude. It has discovered substantial gas fields off the east coast, but these are located in deep water and will take some years to develop.

India has substantial supplies of coal, but the quality is poor with high sulphur content. The location is also distant from major demand centres and troubled by a Maoist insurgency,

which limits investment potential. The industry—mainly controlled by government-owned Coal India—is outmoded. More importantly, even if India were able to extract sufficient coal to meet its energy needs, this would constitute a massive contribution to greenhouse gasses, with global ramifications.

Nuclear energy is one of a mix of solutions through which India and China may be able to generate the enormous amounts of energy their growth will entail without undue production of greenhouse gasses. Nuclear energy will not be a panacea, but it certainly should be considered.

India's civil and military nuclear programs and doctrine

The civil program

India has only 1 per cent of the world's discovered uranium, but 32 per cent of its thorium. It is consequently seeking to configure its civil nuclear program with thorium in mind. But this will take many years to realise even if it can eventually be achieved (which is highly questionable).

Meanwhile, India is seeking to expand its generating capacity from the current 3.8 per cent nuclear power to 25 per cent nuclear power by 2050—an ambitious program that will demand considerable supplies of imported uranium or successful completion of the thorium fuel cycle program. Australia, with 40 per cent of the world's easily recoverable uranium, is a natural source to which it will turn.

The three-stage thorium cycle begins with pressurised heavy water reactors (PHWRs) fuelled by natural uranium, which produce plutonium. Fast breeder reactors (FBRs) then use the plutonium in an oxide fuel to breed U-233. The 'advanced' PHWRs then burn the U-233 with thorium, thereby obtaining 75 per cent of their power from the thorium and also providing a safer proliferation regime.

India's FBR program is ostensibly civil, but potentially has a fuel cycle in common with the military program. Both require plutonium separated at reprocessing facilities, while the FBR also produces Pu-239, which is suitable for a bomb.

The military program

For many years, India has argued that the dual system operating under the NPT is unfair, flawed and hypocritical. At base, India is requesting from the United States under the proposed deal something very close to the status enjoyed under the NPT by the so-called Nuclear Five (N5)—the United States, Russia, France, the United Kingdom and China. New Delhi maintains that India has a deep need for the security offered by nuclear weapons, focusing on Pakistan and China. India further argues that, despite its refusal to sign the NPT, its performance on 'horizontal' proliferation has been better than that of China.

There is some truth in this claim. Although India has dissembled through a series of shell companies in order to obtain certain dual use technologies, including from the United States, there is no evidence that it has ever transferred nuclear weapons-related technology to a third country. Unlike India, there is strong evidence that China has done so.[6]

As shall be discussed, the fact that India is an embittered, revisionist power in respect of the NPT continues strongly to influence its strategic positioning and attitude to vertical proliferation.

In contrast to Pakistan's nuclear weapons program, which primarily depends on highly enriched uranium, India's program mainly uses plutonium from two 'research' reactors and possibly some commercial reactors.[7]

In 2005, David Albright estimated that, at the end of 2004, India had enough plutonium for 65–110 weapons, or a median of 85 weapons equivalent. Today, this would represent a median of 90 weapons.[8] Desmond Ball puts the figure at 120–125.[9] Writing in 2006, Ashley Tellis put the figure at 65–91 weapons equivalent of fissionable material.[10]

India is likely to have two units of *Prithvi* short-range ballistic missiles weaponised with perhaps a dozen weapons, capable of hitting parts of Pakistan. Other weapons would be ready for delivery by India's fighter-bombers. The *Agni*, India's intermediate-range ballistic missile, may also be weaponised. India is working on a 5000 kilometre range version of the *Agni*, known as *Agni III*. This will be independently targeted and, in three or four years, is likely to be weaponised and capable of reaching most of China, including Beijing.

India has publicly expressed its nuclear doctrine in two documents, the first issued in 1999 and the second in January 2003. The doctrine calls for 'no first use', combined with what is referred to as 'minimum credible nuclear deterrence' (the word 'minimum' has recently been omitted). This combination implies that, after receiving a nuclear strike that could knock out some of its nuclear weapons, India would have enough warheads for a punishing retaliation against combined Pakistani and Chinese nuclear forces. It also implies survivability. India sees this, in turn, as necessitating a so-called nuclear 'triad'—that is, nuclear weapons to be delivered by missile, aircraft and submarine, with redundancy in command and survivable C4I (command, control, communications, computers and intelligence) systems.

India has not defined the number of warheads that would constitute 'credible deterrence', but sees the doctrine as 'dynamic', depending on strategic circumstances at the time, especially in relation to China's development and modernisation of its arsenal and delivery systems and the political situation between India and China.

India's position on nuclear weapons is shared between the country's two major political groupings and is unlikely to be rolled back. Indeed, India is likely to proceed with some kind of submarine delivery capability—whether this will be a submarine-launched ballistic missile or a cruise missile remains unclear. India is also developing its own nuclear-powered submarine, known as the Advanced Technology Vessel.

The 2003 document announced a nuclear control structure that places control firmly in the hands of civilians. The Nuclear Command Authority consists of two committees—a political committee headed by the Prime Minister and a technical council involving the defence chiefs and military bureaucrats. Actual forces are under a Strategic Forces Command, currently headed by an Air Vice Marshal. Physical control of the arsenal has been given to the Indian Army.

From the point of view of this paper and the debate on sale of uranium to India, there are important lessons to be learned from this brief examination of the Indian program. First, there is a very close link between the civil and military programs—a link derived from the

autonomous nature of the development of nuclear sciences in India and the plutonium base of India's weapons. Second, India's nuclear weapons posture is deeply held, bipartisan, and based on a firm belief that the NPT regime has been most unfair in its strategic effect on India. India is the only emerging world power that is not a member of the N5 and this makes it something of a special case. As discussed below, this is a very important factor in the debate over how to deal with India's nuclear weapons program. Third, India has generally been somewhat restrained as a nuclear power and, as far as is known, has not shared its nuclear technology with any other power. Rather, its program has only entailed vertical proliferation and even that has been conducted at a moderate pace. These features differentiate the Indian program from those of other NPT and non-NPT players such as China and Pakistan.

The Indo-US nuclear deal and the potential role of Australian uranium

The Indo-US deal is crucial for the sale of Australian uranium to India. Not only must the deal proceed, along with subsequent deals with the NSG and IAEA, but these arrangements together must also be of a quality to protect Australian uranium from possible direct use in the weapons program. In short, no deal, no sale.

Ideally, the arrangements should also force at least some level of restraint on India and achieve better nuclear safety outcomes. Potential greenhouse emission reduction benefits have already been discussed.

And, finally, any benefits should not be outweighed by any damage the deal and concomitant sale of Australian uranium might do to the NPT regime. This last point will be dealt with in a later section of the paper on strategic issues.

The original nuclear deal between the United States and India, negotiated in 2005 and 2006, was little more than a loose political agreement. Unfortunately the devil proved to be in the detail.

The original deal involved India separating 14 reactors of its 22 facilities, reserving them for civil nuclear use and placing them under safeguards, to be agreed with the IAEA. The 14 reactors on the civil list do not include India's FBR, which requires plutonium from the reprocessing facilities and produces plutonium capable of use in a nuclear weapon. The Canadian-supplied CIRUS reactor, which had been a critical component of the weapons program because of its supply of plutonium, was to be decommissioned by 2010 and possibly replaced with an indigenous, non-safeguarded, research reactor. For its part, the United States agreed to 'facilitate' agreement within the NSG that members would agree to allow nuclear trade with India.

As discussions between India and the United States proceeded, two major sticking points emerged. First, the United States refused to amend or override section 123 of the 1954 Atomic Energy Act to remove the stipulation that any Indian test would result in the return of all US-supplied materials. According to India, the US position contradicted the clause in the original deal that guaranteed lifetime supplies of fuel for foreign-supplied reactors.

Secondly, the United States demanded an end to Indian re-processing. Since India's weapons program is predominantly plutonium based, this was tantamount to a severe limit on production of fissionable material, if not an actual cut-off. New Delhi also saw it as a limitation on the nature of the civil nuclear program, which required plutonium for the FBRs. Given India's concerns about a proliferating China and its argument that reprocessing was intrinsic to the Indian nuclear model, New Delhi was not prepared to concede on this point.

Eventually a compromise was reached allowing India to erect a separate re-processing facility to handle 'foreign' nuclear material in a cut-off loop that effectively separated such material from the military program. The issue of testing was also addressed by allowing India, with US support and assistance from other nuclear supplier nations, to build up strategic stockpiles of material sufficient to allow the continuing operation of civil nuclear plants even should the United States demand repatriation of its material following a test. Moreover, the new text stipulates simply that the two sides would consult following any alleged breach, rather than that India would suffer a mandatory repatriation of US material.[11]

These new provisions amounted to significant concessions on the part of the United States. Nevertheless, in India, the Singh Government was caught between the rock of the hawkish Bharatiya Janata Party (BJP) and the hard place of its then communist and leftist allies, who did not want any nuclear deal with the United States. Although a parliamentary vote was not a mandatory requirement, the minority Singh Government was subject to the leftists bringing it down on other issues. However, Singh eventually solved this problem by breaking with the leftists, forming an alliance with the Samajwadi Party, and subsequently winning a confidence vote in the Indian lower house, the Lok Sabha.

The situation is further complicated by the fact that the Hyde Act—the Act of the US Congress allowing the deal to proceed at all—apparently contradicts the finalised version of the 123 Agreement by asserting a tougher US position on a number of matters, including the return of materials following any Indian test. The position stated in the Hyde Act is unacceptable to India, so the issue arises: which document has precedence, the Hyde Act or the 123 Agreement? Under the Geneva Conventions, the 123 Agreement (as an international treaty) apparently has precedence, but the situation is not at all clear and may need testing in the US courts.

Moreover, the Singh Government faces a national election in May 2009. Given current high inflation in India, there is a reasonable prospect that the government will not be returned. Should a BJP-led government emerge, it would be unlikely to renege on any deal finalised in the interim period. That is not the case, however, should a left-leaning alliance be victorious. Thus, notwithstanding recent progress with the deal, the long-term outcome is still uncertain.

* * *

In terms of the criteria for an Australian sale mentioned above (protection of Australian material and some restraint on India), how does the latest iteration of the Indo-US agreement stand up?

In the matter of protection, on the surface it would appear that any Australian material would be protected from direct use in the nuclear weapons program. Such material would only be used in the protected reactors and reprocessed in the protected reprocessing plant. An audit and inspection regime would be in place, as recently agreed between India and the IAEA. Thus, in a direct sense, Australian uranium would not be used in the weapons program.

Numerous commentators (including this author) have argued, however, that any uranium supplied to India would be 'fungible' between the two programs.[12] They argue this on the grounds that any foreign supplied uranium, even if confined to protected reactors, would effectively free up India's limited indigenous uranium supplies for use in the military program.

It should also be noted that uranium could be fungible in the international as well as the Indian national context. Should Australia provide world markets with large quantities of uranium, which it will, then that would free up other recipients of this uranium, such as the United States, France, Russia and even China, to provide their uranium to India—which they could do quite legitimately under the decision of the NSG, which in turn hinges on the 123 and IAEA Agreements. In this sense, Australia's decision *not* to sell to India will have little material effect on India's access to uranium, so long as India is accorded access to world markets and Australia continues to sell into those markets.

These arguments about fungibility have been countered in two ways. First, one commentator asserts that the argument effectively applies to any energy supplied to India, whether coal, gas, oil or uranium, in that all such supplies effectively take pressure off India's indigenous uranium.[13] This argument fails to account for the fact that India, and the world, require a 'clean' energy regime to fuel India's industrial rise. Nuclear energy fuelled by uranium is one means of meeting this criterion.

A second argument against the 'fungibility' thesis has been made by Ashley Tellis. According to Tellis, India can afford to pursue both its civil nuclear program and military program without unduly taxing its domestic uranium supplies, at least for several decades. Tellis maintains that this is because India has pursued its weapons program with overall restraint. He backs up this argument with a detailed assessment of consumption scenarios against availability.[14] If one accepts Tellis' position on fungibility, then there is little evidence that Australia's uranium would assist the military program, at least in the short-term. Tellis' view is, however, challenged, including by the Chairman of the Atomic Energy Commission, who asserts that the PHWR program will stall if uranium and reactors cannot be imported to support an accelerated three-stage program and India will consequently suffer a severe 'energy gap'.[15]

But, in addition, one of the criteria for the sale of Australian uranium should be a requirement that the 123 Agreement limit India's nuclear weapons production capability or modify its nuclear posture for the better. As well, the Agreement should improve the nuclear safety regime in India.

Those opposed to the deal outside India argue that it does not limit India's weapons capacity, and actually enhances it.[16] Ironically, this is the exact opposite of the arguments used by the broadly described 'right' within India. Some of India's leading nuclear scientists and strategic commentators, as well as the BJP, are opposed to the deal precisely on the grounds that it would *limit* India's future nuclear weapons development capacity. Their arguments touch upon India's right to test under the deal, the need of India to establish a separate reprocessing facility for civil nuclear material and the potential limitation this places on India's production of fissionable material.[17] While these views have been contested,[18] they go to the heart of a debate in India that nearly unseated the current government.

Probably the issue is at the margin: that is, the deal would not make all that much difference to India's weapons capacity. According to Tellis, it is 'universally' agreed that the two research reactors, CIRUS and Dhruva, were the principal means of production of India's fissionable material up to the time of the 1998 tests.[19] Tellis asserts that, after the tests, some

of the other reactors may have been used in a speeded-up program at 'low burnup' modes.[20] If this were true, and if some of the 14 reactors designated for the civil nuclear program under the Indo-US deal were involved, then this would imply that the deal places at least some limitation on India's capacity. But if Tellis is correct, this limitation is minimal and would be offset by the construction of a new, larger research reactor to replace CIRUS.

However, in certain circumstances, the deal could have major implications for any future production of fissionable material. This would occur should relations between India and China sharply deteriorate to the extent that India felt constrained greatly to expand its nuclear weapons program to counter a resurgent and, in India's view, threatening China. Were it not for the deal, in such circumstances those reactors designated 'civil' would likely be coopted for production of plutonium for the weapons program. Those opposed to the deal may argue, however, that, in such dire circumstances, India would be tempted to 'tear up' the deal in any case.

Also, the deal does place some limitation on India's capacity to test. An India more fully integrated into the world civil nuclear program would have at least some incentive not to test, because at least some of its nuclear trading partners would likely refuse trade following a test. The inability to test, however, would only be a serious setback to India if its thermonuclear tests of 1998 were unsuccessful, as many believe to have been the case. But again, the incentive on India to test would very much depend on the circumstances at the time, and especially the level of perceived threat from China.[21]

Be that as it may, the deal at least has the effect of limiting and constraining the Indian program in the formal sense. In that regard, it can be argued that it helps to reinforce normative values that support nuclear restraint. As argued below, it could also act as a circuit breaker in helping to stabilise vertical nuclear proliferation in Asia, especially in relation to testing and fissionable material cut-off.

One definite advantage of the deal is that it would greatly improve the safety regime within the civil nuclear program by linking India's hitherto autarchic program to world safety best practice. Given that India will persist with and expand its program with or without the deal, this is a very important consideration. Because of India's high population density, many reactors are located near populated areas. Even those not so located are sited in agricultural areas—areas that could be extensively contaminated during an accident. Although no Indian reactor has experienced a catastrophic accident, there have been numerous incidents, some involving injury to workers.

Another important outcome of the deal is that, over time, it could result in India being weaned away from its difficult, costly and dangerous three-phase nuclear program involving FBRs and advanced PHWRs. This would occur should India become confident that it would have assured supplies of relatively cheap natural uranium, including from Australia. Of course, nobody in the Indian nuclear establishment would yet admit to that possibility.

The above focus on the Indo-US deal suggests that it would likely protect Australian uranium from misuse and have at least some benefit in terms of vertical proliferation and safety. But how would the arrangements likely affect strategic relationships in the region? And how would they impact on vertical and horizontal proliferation and the future of the NPT?

Strategic considerations and the NPT

The Indo-US deal is being negotiated during a time of flux in Asian security. China and India are steadily accruing power. Russia is attempting to re-assert some of the influence enjoyed by the former Soviet Union. After a long post-war interregnum, Japan is again adopting a more assertive position. Meanwhile, the US role in Asia has been overshadowed by its involvement in wars in the Middle East and Southwest Asia.

As a big, potentially powerful player, India is relatively new on this scene. The Central Intelligence Agency therefore refers to it as a 'swing' state in Asia:[22] that is, how India chooses to slot into the unstable environment could have an effect on the security architecture that eventually develops in the region.

Against this background, the United States has offered India what US Secretary of State Condoleezza Rice has called a 'broad strategic' relationship.[23] The Indo-US nuclear deal evolved directly out of this offer and is integral to it.

What is Washington's motive for this major strategic move? Is it, as the conservative think tank the Heritage Foundation suggests, that the deal is part of a necessary move to balance the rise of a 'less predictable' power, namely China?[24] Is it simply an attempt by a discredited administration to pull some chestnuts out of the ashes of a failed foreign policy? Does it result from commercial pressures to get back into a re-vitalised nuclear market? Does it relate to concerns about climate change? Or is it a positive attempt to stabilise a potentially difficult nuclear equation in Asia by bringing India in from the nuclear cold and giving it an incentive to work with other Asian powers on nuclear security?

Probably each of these motives is to an extent in play. Certainly some in the US Administration, such as Vice President Dick Cheney, seem keen to balance and contain a rising China. Recently, he reportedly supported involving India in the 'trilateral' strategic dialogue process between the United States, Australia and Japan so as to create a so-called 'quadrilateral'.[25]

From Canberra's viewpoint, the Cheney approach is likely to be unwelcome.[26] A policy of containment of China may force Australia at some stage to choose between China and the United States, or China and India. It could cut directly across Australia's commercial interests in supplying commodities to a booming Asia, especially China. Australia would obviously prefer an Asia of open markets, rising mutual confidence and a peaceful rise for China than a premature policy of containment.

A 'quadrilateral' arrangement apparently aimed at containing China would also trump any prospect of Asia developing a 'concert of powers' amongst the large players in Asia, to use Coral Bell's term.[27]

The Indo-US deal could arguably therefore be a negative step in Asia's security. In combination with the 'quadrilateral' proposal, it could be interpreted as an attempt to induct India into the US security sphere. Certainly, China seems initially to have opposed it on that basis.

Canberra therefore has a strong incentive to develop Australia's bilateral relationship with India in a way that balances Australia's strategic need to ensure that India 'inserts itself into the Asian power equation' in a constructive way. This could prove difficult, given the

preferences of some within the Bush Administration and Australia's limited traction as a middle power—one moreover that sometimes appears in New Delhi as a 'pale shadow' of the United States and its policies. However, a new administration in Washington—whether Democrat or Republican—is likely to be more accommodating to China.

One way of helping to achieve a more dynamic bilateral relationship with India—a relationship not overly focused on the military and 'quadrilateral' type arrangements—would be to encourage a deepening trading relationship. Such an approach would be similar to the one adopted first with Japan, then China, as those two countries emerged as the industrial power-houses of Asia. The export of commodities, and especially energy-related commodities, would be an important aspect of such a relationship.

In this regard, India is hungry for the export of Australian uranium. Should the respective deals with the United States, the IAEA and NSG proceed, New Delhi would expect export to take place, especially given Australia's decision to export to China—a decision which India regards as having a far worse track record on horizontal proliferation. If Canberra were to refuse, it would damage the bilateral relationship for a limited period.

Seen in this light, the sale of uranium to India by Australia fits with a basic Asian strategy of deepening mutual trading relationships. But, on the other hand, it can also be argued that it opens out the possibility of a more antagonistic relationship between India and China because it strategically enhances the Indo-US relationship and also, according to some, encourages and supports India's nuclear weapons aspirations.

Right now, India is ambivalent about China. On one level, it benefits from increasingly vibrant trade and people-to-people relationships with China. On another level, it is deeply suspicious of China's growing footprint in the Indian Ocean. New Delhi considers this region to be India's 'backyard'. China has embarked on a series of economic and quasi-strategic relationships with South Asian and Indian Ocean countries. It is energetically competing with India in the hunt for energy around the periphery of the Indian Ocean region. But the claims of some Indian observers of a 'string of pearls' of Chinese 'bases' stretching from the South China Sea to the Persian Gulf, which it believes are designed to 'surround' India, are exaggerated.[28]

Also on the negative side of the ledger, India sees China as its most significant nuclear competitor and reserves the right to define 'minimum deterrence' in the context of China's strategic arsenal and posture at any particular time.

China, however, sees its principal nuclear competitor as the United States, with its much more powerful capability. Similarly, should India seek significant new nuclear capabilities, so too might the far less stable Pakistan. Overall, this is potentially a highly unstable nuclear equation. And the issue remains as to how the Indo-US deal will feed into it—positively or negatively.

While the deal is being negotiated between India and the United States, it would also open out the possibility of commercial nuclear relationships with a wide range of countries, including Russia and China. This type of relationship would offer the long-term prospect of developing mutual trust in the nuclear sphere rather than secrecy and distrust. The deal would also go some way to removing India's anxiety about energy supplies, including in relation to its energy competition with China.

In other ways too the deal should be seen as a first step in inducting India into a much wider regime intended to prevent vertical and horizontal proliferation in the Asia-Pacific region. By bringing India into the nuclear 'club', the deal would give New Delhi a far stronger incentive to support a more stable counter-proliferation regime in Asia. India would be less likely to play the destabilising, spoiler role of an embittered revisionist in respect of the NPT. Thereby, many other possibilities would start to fall into place. A much more hopeful scenario in terms of India eventually acceding to the Comprehensive Test Ban Treaty and agreeing to fissionable material cut-off could then be developed.

The introduction of a viable fissionable cut-off regime would be one of the single most important steps in ensuring a more stable proliferation regime in the Asia-Pacific region, since it would limit any potential nuclear weapons race between China and the United States, China and India and India and Pakistan. Minimisation of vertical proliferation would be an important element in limiting horizontal proliferation, since horizontal proliferation feeds from and is stimulated by vertical proliferation.

Ironically, it is the United States rather than India which is currently preventing a formal cut-off regime. Washington has refused to open US facilities to the type of inspections that would be needed to monitor a cut-off regime.

A new administration in Washington in 2009 may be more inclined to support a cut-off regime than the present Bush Administration. If the United States does come on board with cut-off, there is some prospect that both India and China could be induced to participate. If India remains outside the NPT regime, there is significantly less prospect of cut-off being achieved. Even if the United States does not formally adhere to cut-off, the deal would open the prospect that India might join the N5 in declaratory, but un-verified, cut-off policies.

While the deal would not, in itself, prevent India conducting further nuclear tests, it would provide a significant incentive in that direction. Should India again test, US collaboration would be withdrawn under the US Atomic Energy Act. Australia would also doubtless cease uranium supplies, should it have decided to sell to India by that time. Other Western suppliers would also likely re-consider their positions.

Although recent negotiations seek to mitigate this effect, from India's point of view, by allowing the formation of fuel and other stockpiles, an India inducted into a global regime and benefiting from that regime would certainly have pause for consideration of a further test.

Stabilisation of the regional nuclear competition is also a vital pre-condition for the creation of the kind of stable regional security architecture discussed above. Containment and a Cold War-like atmosphere would be hard to avoid in circumstances of nuclear instability in the region.

Both India and China are crucial here. If China seeks rapidly to develop and modernise its arsenal, India's view of minimum deterrence will not be a stable one. If China feels the United States is establishing a system of containment against it in Asia, it will be far more inclined to continue with its vertical proliferation.

This is where it becomes absolutely vital to ensure that, while supporting the US-India nuclear deal, Australia also seeks to limit prospects that the United States and its friends inadvertently and prematurely drift into a policy of containment of China. In this regard, Canberra's caution to date about the development of a 'quadrilateral' is commendable.

But what are the wider implications of the deal in terms of the future of the NPT? Many opponents of the deal argue that a policy of exception cannot be the basis for a successful NPT.[29] If it can be shown that the NPT would be seriously undermined by the deal, with a resultant 'nuclear breakout' in the region, any gains from the deal would surely be negated.

The argument that the deal would cause further horizontal proliferation in the region does not appear to accord with the facts. What occurs in India has very little bearing on policies in, say, Iran. Tehran's apparent nuclear weapons ambitions are driven far more by perceived security concerns about the nuclear United States and Israel than about India. Ironically, Iran itself is still a NPT signatory power.

Even North Korea commenced its proliferation initiative as a signatory, as did Libya. Neither of these countries gave up their nuclear ambitions because of the NPT, but rather as a result of other pressures and factors.

Both India and Pakistan 'went nuclear' because of security concerns and were not prevented from doing so by the NPT. Indeed, it can be argued in respect of India that the NPT was a 'red rag to a bull' in that China, later to become a member of the N5, had attacked India and exported nuclear technology to Pakistan.

It could also be argued that an India 'inside the tent' would be more useful for the future of the NPT than an embittered India attacking the regime from outside. And it could even be argued that the Indian precedent could, over the long term, work to strengthen the NPT by providing a model through which other dissident nations, such as Pakistan, might eventually be brought into a more protected environment—one that would minimise the possibility of the extremely damaging proliferation caused by the Abdul Qadeer Khan network. Obviously, Pakistan would need to cross some significant nuclear governance and general governance hurdles before any such move could be contemplated. But the possibility that it might one day become worthy of induction should be held out by way of encouragement.

So we are left with a nuclear deal that could pan out either way, depending on what occurs around the edges. On the one hand, it could be a profoundly positive development in opening India up to participation in moves to stabilise the nuclear equation in Asia, if not an actual 'circuit breaker'. But on the other hand, if rhetoric and actions around the edge of the deal are such that they are misinterpreted in Beijing, we could be left with a less stable situation in an Asia in which newly powerful states are jockeying for position and power, and in which nuclear competition emerges as an important element in this power play.

Conclusion

The argument in this paper in favour of Australia exporting uranium to India is highly conditional. It depends firstly on workable arrangements between India and the United States, India and the IAEA, India and the NSG, and India and Australia. It hinges on the prospect that India can be gradually drawn into a more comprehensive regime that involves the eventual stabilisation of an otherwise intrinsically unstable nuclear equation in Asia. In this, it views the deal and related arrangements as a potentially positive force in terms of developing a more viable regime in Asia. Above all, it depends on concurrent work to stabilise and neutralise the inherently dangerous regional tendency to contain and isolate China. In this, Australia and India would need to work together to retain a sceptical position

against any more forthright demands of Japan and the United States to militarise the sets of relationships in the region.

A further point, often overlooked by critics of the proposed sale, is that the Indo-US deal and the arrangements surrounding it are likely to prove very important in establishing a better Indian safety regime. If properly managed, the arrangements could provide the means to wean India away from its difficult, potentially dangerous and certainly costly three-phased nuclear program towards a more practical program that would depend on secure and relatively cheap supplies of natural uranium to be burned in third and fourth generation reactors.

And finally, although nuclear power will not, in itself, be a panacea for greenhouse gas emissions and global warming, it can probably be an important part of the solution.

Notes

1 'Govt reverses uranium sale to India', ABC News, 15 January 2008.
2 Stephen Thomas, Peter Bradford, Antony Froggatt and David Milborrow, *The Economics of Nuclear Power,* Greenpeace Research Report, Greenpeace International, Amsterdam, November 2007, available at <http://www.greenpeace.org/raw/content/international/press/reports/the-economics-of-nuclear-power.pdf>, accessed 20 August 2008.
3 According to the Ziggy Switkowski report, 'Nuclear power is a low-emission technology. Life cycle greenhouse gas emissions from nuclear power are more than ten times lower than emissions from fossil fuels and are similar to emissions from many renewables'. See Australian Government, Department of Prime Minister and Cabinet, *Uranium Mining, Processing and Nuclear energy: Opportunities for Australia*, Commonwealth of Australia, Canberra, 2006, available at <http://pandora.nla.gov.au/pan/66043/20070301-0000/www.pmc.gov.au/umpner/docs/nuclear_report.pdf>, accessed 20 August 2008.
4 The Energy and Resources Institute, *National Energy Map for India: Technology Vision 2030, Summary for policy-makers*, TERI Press, New Delhi, undated, available at <http://bookstore.teriin.org/docs/books/PSA%20Report-Summary.pdf>, accessed 20 August 2008.
5 Anil Kakodkar, 'Evolving Indian Nuclear Programme—Rationale and Perspective', p. 12, available at <http://www.dae.gov.in/lecture/peperiasc/pdf>, accessed 2 September 2008.
6 Federation of American Scientists, 'Pakistan Nuclear Weapons', available at <http://www.fas.org/nuke/guide/pakistan/nuke/index.html>, accessed 20 August 2008. This report also cites documents of the US Department of Defense alleging Chinese involvement, including in weapons design. China also gave Pakistan an unsafeguarded reactor, which was the basis for Pakistan's plutonium device. The most telling example of Chinese complicity comes from Libya. When Libya relinquished its program, it made materials available to the United States that included old, but highly functional, weapons designs identical to a Chinese design and containing Chinese assembly instructions. It was assumed this was passed to Libya through the AQ Khan network. See Joby Warrick and Peter Slevin, 'Libyan Arms Designs Traced Back to China', *Washington Post*, 15 February 2004, p. A01, available at <http://www.washingtonpost.com/ac2/wp-dyn/A42692-2004Feb14?language=printer>, accessed 20 August 2008.
7 India also has a small uranium enrichment plant near Mysore, producing highly-enriched uranium for the thermonuclear component of the weapons program and enriched uranium suitable for the reactor of its proposed nuclear-powered submarine. This plant has had a troubled history and is not thought to be producing highly-enriched uranium in any quantity.
8 David Albright, 'India's military plutonium inventory, end 2004', Institute for Science and International Security, 7 May 2005, p. 5, available at <http://www.isis-online.org/global_stocks/end2003/india_military_plutonium.pdf>, accessed 20 August 2008.
9 Desmond Ball, *The probabilities of On the Beach: assessing 'Armageddon scenarios' in the 21st century,* SDSC Working Paper no. 401, Strategic and Defence Studies Centre, The Australian National University, Canberra, May 2006, p. 8, available at <http://rspas.anu.edu.au/papers/sdsc/wp/wp_sdsc_401.pdf>, accessed 20 August 2008.
10 Ashley J. Tellis, *Atoms for War?: U.S.-Indian Civilian Nuclear Cooperation and India's Nuclear Arsenal*, Carnegie Endowment for International Peace, Washington, DC, 2006, available at

<http://www.carnegieendowment.org/files/atomsforwarfinal4.pdf>, accessed 20 August 2008. Tellis' estimate was partly dependent on Albright's work.

11 The full text of the agreement of 1 August 2007 can be found on the website of *The Hindu* newspaper, available at <http://www.hindu,com/nic/123agreement.pdf>, accessed 31 August 2007.

12 See, for example, Sandy Gordon, *Widening horizons: Australia's new relationship with India*, Australian Strategic Policy Institute, Canberra, May 2007, pp. 55–56, available at <http://www.aspi.org.au/publications/publication_details.aspx?ContentID=127&pubtype=5>, accessed 20 August 2008.

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15 Kakodkar, 'Evolving Indian Nuclear Programme—Rationale and Perspective', pp. 13–14, available at <http://www.dae.gov.in/lecture/peperiasc/pdf>, accessed 2 September 2008; see also Surendra Gadekar, 'India's nuclear fuel shortage', *Bulletin of the Atomic Scientists*, 6 August 2006, available at <http://www.thebulletin.org/web-edition/features/indias-nuclear-fuel-shortage>, accessed 2 September 2008.

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17 See Brahma Chellaney's 'blog' at<http://chellaney.spaces.live.com>, accessed 15 September 2008. See also '123 agreement compromised India's case: Former BARC chief, *The Hindu*, 6 August 2007, available at <http://www.hindu.com/thehindu/holnus/000200708060301.htm>, accessed 20 August 2008.

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19 Tellis, *Atoms for War?: US-Indian Civilian Nuclear Cooperation and India's Nuclear Arsenal*, p. 12.

20 Tellis, *Atoms for War?: US-Indian Civilian Nuclear Cooperation and India's Nuclear Arsenal*, pp. 12–13.

21 See Pallava Bagla and Andrew Lawler, 'Experts Search for Details After Indian Nuclear Tests', *Science* Magazine, 22 May 1998, vol. 280, no. 5367, p. 1189.

22 See Ashley J. Tellis, *India as a New Global Power: An Action Agenda for the United States*, Carnegie Endowment for International Peace, Washington, DC, 2005, p. 30, available at <http://www.carnegieendowment.org/files/CEIP_India_strategy_2006.FINAL.pdf>, accessed 20 August 2008.

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26 During the 2007 APEC meeting, the Australian Government denied the trilateral meeting in the wings was seen as threatening by China. However, Canberra simultaneously offered to have similar bilateral exchanges with China, seemingly undermining its claim that China did not feel slighted by the trilateral meeting.

27 Coral Bell, *Evolution (or Transformation?) in the Society of States*, Strategic and Defence Studies Centre, The Australian National University, August 2006, available at <http://rspas.anu.edu.au/papers/sdsc/Anniversary_paper_Bell.pdf>, accessed 20 August 2008.

28 This issue is explored in depth in Andrew Selth, 'Chinese Military Bases in Burma: The Explosion of a Myth', Regional Outlook paper no. 10, Griffith Asia Institute, 2007, available at <http://www.griffith.edu.au/__data/assets/pdf_file/0018/18225/regional-outlook-andrew-selth.pdf>, accessed 20 August 2008.

29 See for example, Ron Walker, 'Uranium for India: avoiding the pitfalls', Policy Brief, Lowy Institute for International Policy, May 2007, available at <http://www.lowyinstitute.com/Publication.asp?pid=588>, accessed 20 August 2008.