

# The Political Economy of the Nuclear Industry

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It is eight years since the ALP came to power and placed the first obstruction in the way of renewed uranium mining. It marked the beginning of a tortuous obstacle course to be navigated by those companies wishing to mine and export the uranium recently discovered in the top end of Australia. Eight years later, at the beginning of the 1980s, with uranium mining beginning at Ranger, uranium milling at Narbalek, the October 1980 federal election over, and a Government elected which is strongly in favour of the mining and export of Australia's uranium, it is an appropriate time to examine the prospects for the future of the Australian nuclear debate. However, no such analysis could be complete which does not examine the effects of the changing international context in which the contest of political forces over plans for uranium mining and nuclear energy in Australia is being played out.

## 1. The International Context

### 1.1. The Decline in Expectations

In mid-1973, six months after the Australian Labor Party had come to power, the Australian Atomic Energy Commission (AAEC) was predicting that by the year 2000, global nuclear reactor capacity in the non-communist world would total 2,800-4,100 GWe, with a mid-range estimate of 3,450 GWe.<sup>1</sup> Other contemporary estimates went as high as 4,200 GWe.<sup>2</sup> The prospect was intoxicating. With uranium reserves then estimated at 312 thousand tonnes (at prices up to \$30/lb) representing 15.4 per cent of the non-communist world's resources, or a higher 27.1 per cent at prices below \$15/lb,<sup>3</sup> Australia seemed poised to enter a buoyant seller's market.

Ironically, it was this prospect and the inference that delay would bring higher prices, which allowed concern over Aboriginal land rights and a desire for an increased national stake in any uranium ventures to obstruct mining plans. It smoothed the way for the setting up of the Ranger Uranium Environmental Inquiry,<sup>4</sup> and this Inquiry played a crucial role in delaying the commencement of large-scale uranium mining for some seven years. Now when mining is finally able to begin, the international prospects for nuclear power look very different.

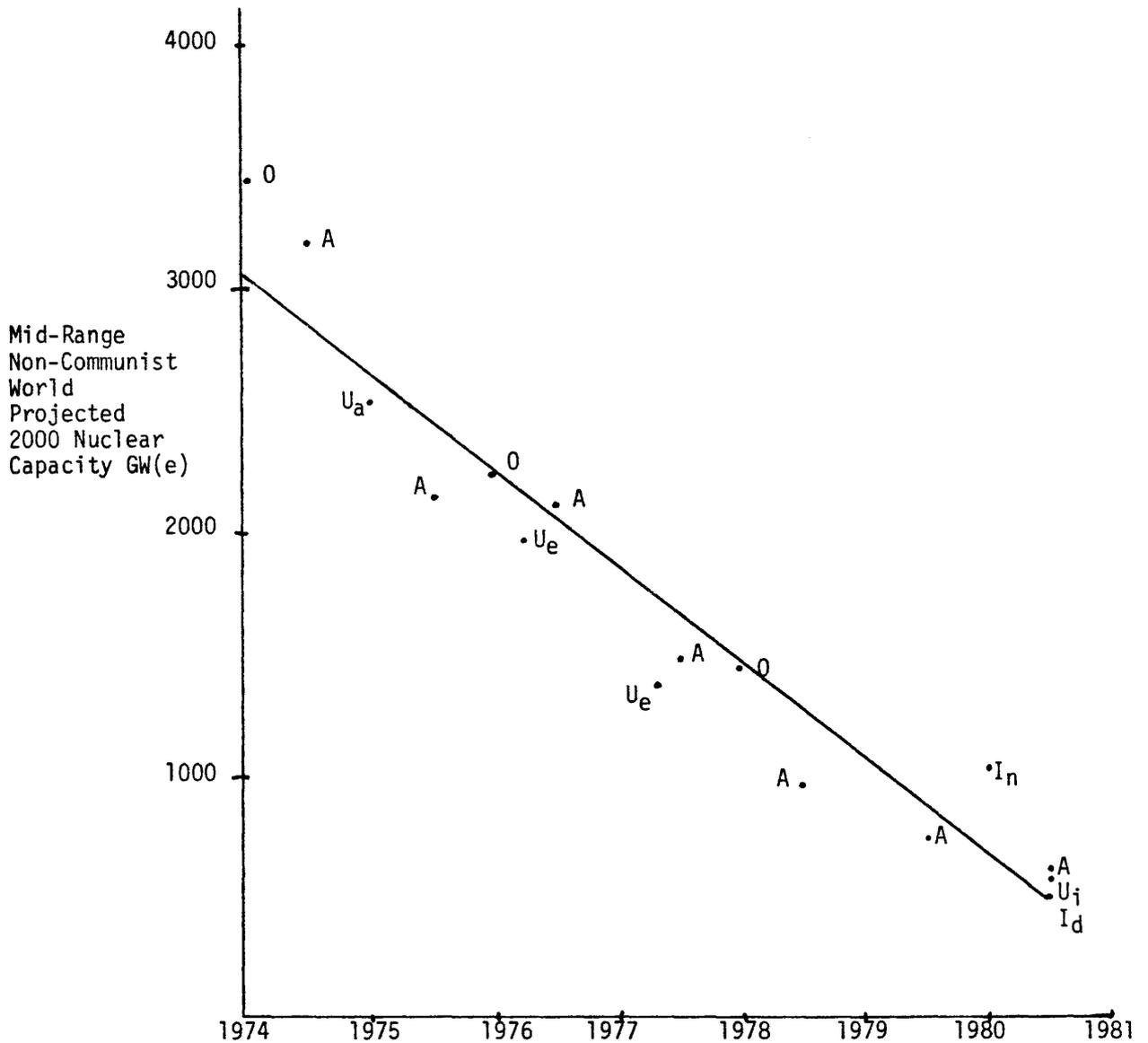
The decline in nuclear expectations has been spectacular. The AAEC's mid-range forecasts for non-communist world reactor capacity in the year 2000 has plummeted from 3,450 GWe in 1973-1974 to 585 GWe in its latest 1979-1980 report.<sup>5</sup> This 83 per cent decline over only six years has been consistent with the diminishing estimates by other agencies. In Figure 1, the consistent decline in the estimates by major agencies, of nuclear capacity in the year 2000, is shown by graphing the estimates against the year in which they were made.

### 1.2. The Stagnated Market

It is not necessary to look as far forward as the year 2000 however to observe this decline in nuclear expectations. As at June 1980, world installed nuclear capacity stood at a mere 126.6 GWe, compared with the 213 GWe estimated for 1980 by the AAEC in 1975,<sup>6</sup> and estimates from 293 GWe (by the USAEC) to 370 GWe in 1972.<sup>7</sup> In short, global installed nuclear capacity now stands at less than one third of that which was confidently predicted eight years ago.

The slump in the nuclear reactor market has been reflected by an overall drop in the net ordering rate from key nuclear-vendors. This has occurred at the very time that the rate was expected to rise rapidly.

Figure 1. Variation of Various Official Estimates of Non-Communist World Nuclear Capacity in Year AD 2000 Against Year of Forecast. 8



A= AAEC (Australian Atomic Energy Commission)  
 O= OECD (Organisation for Economic Cooperation and Development)  
 U<sub>a</sub>= USAEC (US Atomic Energy Commission)  
 U<sub>e</sub>= ERDA (US Energy Research and Development Administration)  
 U<sub>i</sub>= US Energy Information Administration  
 I<sub>d</sub>= Interdevelopment Inc.  
 I<sub>n</sub>= INFCE (International Nuclear Fuel-Cycle Evaluation)

TABLE 1

Average Per Annum Net Ordering Rates in 1970-74 and 1975-79 (GWe/y)

|            | <u>1970-1974</u> | <u>1975-1979</u> |
|------------|------------------|------------------|
| USA        | 27.4             | 3.8              |
| Canada     | 0.9              | 1.4              |
| France     | 3.8              | 4.1              |
| FR Germany | 2.3              | 1.7              |
| Japan      | 2.4              | 0.9              |
| Sweden     | 0.7              | 0.2              |
| UK         | 0.8              | 0.0              |
|            | <u>38.2</u>      | <u>12.1</u>      |

From Table 1 we can see that the ordering rate dropped sharply between the first and second halves of the 1970's in all of the countries shown, with the exception of France: in fact, the average net order rate plummeted to less than one third its earlier level. These figures tend to mask the severity of the fall since recent cancellations of reactors ordered earlier in the decade smooth the decline. Thus between 1977-79 the decline in the order rate was even more marked, with 34.4 GWe of nuclear power ordered but 50 GWe cancelled giving an overall decline of 16 GWe.<sup>10</sup> Especially since the accident at Three Mile Island, the result has been to strip back the number of reactors ordered from vendors. For the US the number on order has fallen from 104 in 1975 to 47 in 1979 and 26 in 1980. Globally the number on order has fallen from 156 in 1975 to 102 in 1979 and 65 in 1980.<sup>11</sup>

### 1.3 Causes

The depression of the nuclear reactor market has been due to a number of inter-related political and economic factors. Firstly economic growth in the non-communist world was substantially lower in the 1970's than in the 1960's; so, consequently was the growth in electricity consumption. In the early 1970's, electricity consumption grew rapidly at 8 per cent per year. But in the period 1973-1978, the average annual rate dropped to 4 per cent.<sup>12</sup> By 1978, US utilities' expectations of growth in electricity consumption during the decade ahead had fallen from 7.5 - 7.0 to 5.5 - 3.5 per cent per annum.<sup>13</sup>

The causes of the prevailing economic stagnation in the capitalist world are uncertain. One set of contributing factors is probably the declining economic power of the US, the growing importance of trans-national corporations whose interests transcend national boundaries, and the combined actions of some of these corporations and the OPEC countries in raising oil prices in the furtherance of their joint interests. Although these structural changes to the global economy seem likely to be further entrenched, it is probably fruitless to attempt long term predictions. Nevertheless, there seems little reason to expect any rapid return to the boom days of the 1960's.

Expansion of the market for reactors has been reduced below earlier expectations through the combined economic and political consequences of the opposition to

nuclear power. In Austria, Denmark, New Zealand, Luxembourg and Norway the nuclear debate has led directly to parliamentary decisions to avoid the use of any nuclear reactors in these countries, at least in the near future.<sup>14</sup> In other countries, such as Sweden, political limits have been placed on the maximum size of the countries' programs. Elsewhere, such as in West Germany and Holland, combinations of political and legal action have severely curtailed the use of nuclear reactors. On top of these factors, the capital costs of nuclear reactors have grown rapidly, decreasing and in many places removing any competitive advantage that nuclear reactors may have appeared to possess over coal burning stations.

In the USA, the growth in the capital costs of nuclear reactors has been particularly marked. The costs rose more than ten times the consumer price index over the eleven years from 1964 to 1975.<sup>15</sup> The rise has since continued, and according to a detailed study by Komanoff, by 1978 electricity produced by new nuclear plants on average cost more than that from new coal plants in all regions of the USA (with the possible exception of the Northeast, where nuclear power was found to be marginally competitive).<sup>16</sup> Combined with growing opposition to nuclear power this has led to a number of proposals for nuclear power stations being deferred or cancelled in favour of coal burning stations (for example in Wisconsin,<sup>17</sup> New York,<sup>18</sup> New England,<sup>19</sup> and Michigan<sup>20</sup>).

#### 1.4 Implications for the Industry

Given the market slump it is tempting to pronounce the nuclear reactor industry dead or dying. One of the first to succumb to this temptation has been Amory Lovins, a deservedly well respected critic of the nuclear industry. Appearing before the US Committee on Government Operations in 1977 he testified:

It is my considered judgement that nuclear power is dead, in the sense of a Brontosaurus that has had its spinal cord cut but because it's so big and has all those ganglia near the tail some place, can keep thrashing about for years not knowing it is dead yet. I shall therefore suggest why the death of this particular Brontosaurus was inevitable....<sup>21</sup>

Lovins summarised the basis for this view, that the decline of nuclear power is inevitable and was inevitable all along, as:

The more than tenfold decline is due to straight forward market forces: as Adam Smith might have said, the Invisible Fist strikes again.<sup>22</sup>

Others in the US, and even Australia, have since come to similar conclusions.<sup>23</sup> However, the analysis that leads to such a conclusion is oversimplified and the obituary is premature.

The conclusion that nuclear power is not now economic must be tempered by the understanding that nuclear power has never been economic. In fact it has always been subsidised to the hilt. Much of the cost of research and development, the cost of ultimate treatment and disposal of the wastes and decommissioning of nuclear reactors (assuming such costs can be arrived at), and the costs of international and national supervision of the nuclear fuel cycle, are all omitted from the price of delivered nuclear electricity.<sup>24</sup> As well, a spectrum of allowances (such as accelerated depreciation allowances and credits for construction work in progress) and low interest loans together with insurance premium savings through government legislation (such as the Price-Anderson Act in the US which limits the industry's liability in the event of serious accident<sup>25</sup>)

all help reduce the pressure that the market might otherwise exert. One recent estimate is that if some of these subsidies were accounted for, then nuclear generated electricity would cost between three and seven times as much as it does at present.<sup>26</sup> Given the array of subsidies, whether the nuclear generation of power seems economic is the outcome of political decisions.

Equally significantly, the rapid capital cost rises experienced by nuclear reactors are also intimately related to the level of opposition to nuclear power within the community. Bupp et al showed,<sup>27</sup> in 1975, that high reactor capital costs strongly correlate with prolonged reactor licensing periods. They note that:

These periods (the time between a firm decision to build a reactor and the day it first puts electricity into the grid) are often extended by the activities of opponents of nuclear power (for example, by taking legal action to force nuclear utilities to put in capital equipment to make them safer than they otherwise would have been). In other words some of the risks that would have previously been transferred to the consumer, are being internalized back into the cost structure of nuclear power.

Bupp et al. conclude:

The issue here is not merely technical or economical, it is inherently political. Present trends in nuclear reactor costs can be interpreted as the economic result of a fundamental debate on nuclear power in the United States community.<sup>28</sup>

Finally, as has been mentioned earlier, in many countries the debate over nuclear power has directly produced major political consequences which have substantially limited the penetration of the nuclear industry into the available electricity market.

Since the fate of the industry depends on the outcome of this political contest, rather than simply the operation of "bare" market forces, the conclusion that the nuclear industry is already doomed is premature. Nevertheless, it can fairly be said that the industry has already been severely constrained and may be more so, in the future.

In a careful study published last year by the Rockefeller Foundation, Mans Lönnroth and William Walker note that the nuclear industry is presently capable of sustaining an ordering rate of 50-60 GWe per year. Present projections for nuclear power assume an ordering rate in the 1980's outside the communist countries, of 35-50 GWe per year. This is three to four times the rate observed between 1975 and 1979. Lönnroth and Walker conclude that if the present level of opposition to nuclear power does not increase greatly then it is possible that orders could be sustained over the 1980's to give an annual average rate (in GWe per year) of 2-7 in USA, 0.5-1.0 in Canada, 3-4 in France, 1-2 in West Germany, 3-4 in Japan, 0-0.5 in Sweden and 0.5-1.5 in the UK.<sup>29</sup> This would yield a total average order rate of 14-25 GWe per year for the non-communist world during the next decade.

If only this latter range of rates were realised then some of the twelve reactor manufacturing companies in individual countries (such as General Electric and Babcock and Wilcox in the USA, and Kraftwerk Union in Germany) might be forced

to retreat from the reactor market. This would strengthen the positions of the remaining companies by improving their market shares, and they could probably then continue producing reactors into the 1990's. However Lönnroth and Walker warn that if the order rate were cut back further (with for example the withdrawal of Westinghouse also), then "the risk of irreparable damage would be considerably greater."<sup>30</sup> Thus the possibility is quite real that the nuclear industry in the non-communist countries may be destroyed as a functional entity, but only if the opposition to nuclear power further intensifies and consolidates.

## 2. The Role of Australia

The Australian struggle over uranium mining has formed one of the many strands in the tapestry of political and economic contestation which has led to the present vulnerable position of the nuclear industry.

In Australia, much of the opposition to uranium mining was consciously built around the international implications of withholding uranium from the world market. From the very beginning it was stressed that the reason for withholding the uranium was not so much that the uranium would thus be rendered unobtainable, but that it would "strengthen the position of the nuclear opposition movement overseas, quite possibly decisively."<sup>31</sup>

Undoubtedly the successes of the Australian movement between 1972 and 1979 did provide inspiration overseas. In particular they were frequently referred to in Canada and must be considered to have been one ingredient in the process that, in February 1980, resulted in British Columbia declaring a seven year moratorium on uranium mining.<sup>32</sup> Subsequently Labrador and Newfoundland also declared a six year moratorium on mining uranium.<sup>33</sup>

The actions of the Australian labour movement, and especially the trade unions, have become known overseas collectively as "the Australian experience". They have helped inspire other unions (such as the Irish General Transport Workers Union) to take a stand against various stages of the nuclear fuel cycle.<sup>34</sup> However, several years later with uranium mining already under way at Ranger and Nabalek, what can now be said of the role and prospects of the opposition to uranium mining in Australia in the 1980s?

### 2.1. The Legacy of the 1970s

Australia enters the 1980s with a substantial legacy of opposition to uranium mining, nuclear power and nuclear weapons bequeathed from the uranium debate of the previous decade. Over those ten years the national political context has been profoundly transformed by several important achievements by the anti-nuclear forces within the Australian community.

The first such achievement was the defeat of AAEC moves, between 1969 and 1971, to have a commercial nuclear reactor built at Jervis Bay. Amongst the reasons cited for this success was the aversion of Liberal Prime Minister, William McMahon, to enter a nuclear project that had the potential to supply plutonium for military purposes.<sup>35</sup>

The defeat of the AAEC Chairman, Sir Philip Baxter, over this project marked the beginning of the consistent subsequent decline of AAEC authority. Without a concrete major nuclear program, it found itself restricted to a low-profile watching brief. In addition, the Jervis Bay debacle set some trade unionists thinking

about the hazards of nuclear power. In September 1974, a conference of six major unions involved in the Electricity Commission of NSW, covering electrical, metal, engine-drivers and building workers passed the following motion:

That the power workers represented at this conference inform the Electricity Commission that under no circumstances will they man any nuclear power station until the problem of nuclear pollution is completely eradicated by new technical breakthrough, and we call on the ACTU to ban construction of nuclear power stations.<sup>36</sup>

By September of the following year the ACTU Congress had passed a motion that all uranium mining should be halted pending the completion of a "thorough-going public inquiry"<sup>37</sup> and on 24 May 1976 the policy resulted in a national railway strike over the transport of sulphur to the operating mine at Mary Kathleen. This action forced the Fraser Government to withhold its "decision" on whether it would permit uranium mining until after the release of the Ranger Reports (in October 1976<sup>38</sup> and May 1977<sup>39</sup>).

By the time the government had announced that it would permit uranium mining to go ahead<sup>40</sup>, the ALP biennial conference had passed a motion which bound the party to an indefinite moratorium on uranium mining.<sup>41</sup> The ACTU Congress passed a less definite policy in which union action over new uranium mines was contingent on the Government's attitude to a referendum on the question.<sup>42</sup> However, the following Congress, in 1979, adopted a more principled position of opposition to any new uranium mining. In the same year, nuclear opponents within the ALP headed off moves to weaken its policy for an indefinite moratorium on uranium mining, and the policy was reaffirmed without opposition at the mid-July biennial Conference.

These stands taken by the labour movement were accompanied by positions in opposition to nuclear power and uranium mining taken by numerous other community groups. These included the Australian Democrats (and the Australia Party), numerous peace, environmental, and Aboriginal community and Land Rights organisations, and the broad community coalitions set up to oppose uranium mining.

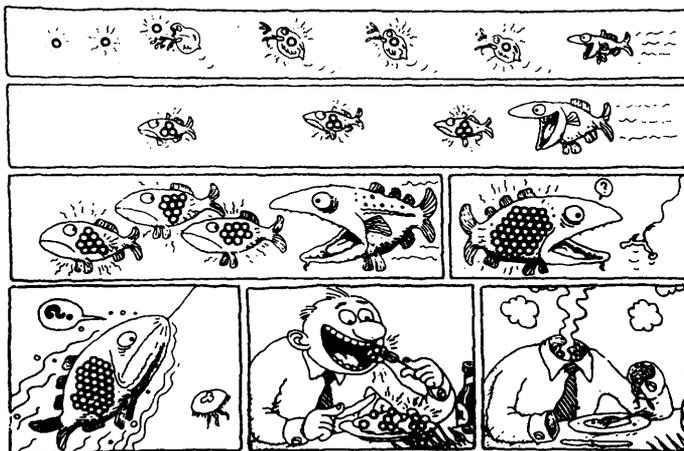
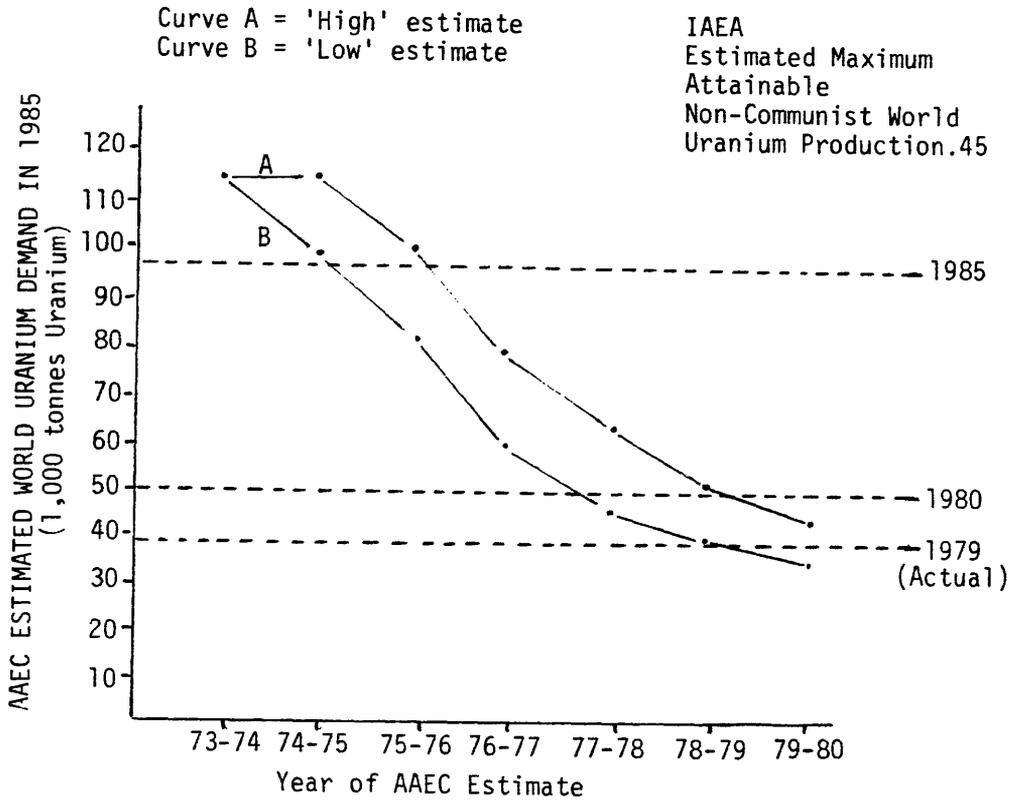
## 2.2. Uranium Mining in the 1980s

This assembly of forces was successful in delaying the opening of any new uranium mines until early 1979. But although the policies were strong, they did not constitute a plan of action which could continue to prevent the opening of the uranium mines at Ranger and Nabalek. Since mid-1980, the small Nabalek mine has been completely dug out, and uranium milling has been underway. However, both the political situation, and the market in which the uranium is to be sold, are now very different from those of ten years ago.

The decline in the nuclear reactor ordering rate has been matched by a fall in the official estimates of the non-communist world's requirements for uranium. The sharp decline in AAEC estimates of these requirements is shown graphically in Figure 2. As we can see, IAEA estimates for maximum attainable uranium production in the non-communist world for 1985 is 98,000 tonnes, twice the AAEC's high estimate of uranium demand for that year. The AAEC's low estimate for uranium demand in 1985 is below the level of uranium produced in 1979.

Large amounts of uranium have been discovered elsewhere over the last five years, most notably in Saskatchewan in Canada. As a result Australia's

Figure 2. Variation of AAEC Estimates of Non-Communist World Demand for Uranium in AD 1985, Against Year in which Estimates were made. 44.



uranium (at prices of less than \$30/lb of uranium oxide - U<sub>3</sub>O<sub>8</sub>) has fallen from 21 per cent of the western world's reasonably assured reserves in 1976 to 17.6 per cent in 1979.<sup>46</sup> Further, because of the looming uranium surplus, some countries may consider protecting their own domestic uranium supply industries. In the USA, the country with the largest share of uranium consumption, a legislative amendment that would cut allowed imports of uranium from 30 to 10 per cent of domestic uranium consumption has already been placed before Congress.<sup>47</sup>

In July 1978, the general manager of Ranger Export Development Co. was predicting that Australia would be exporting 16,000 tonnes of uranium oxide per year in 1985.<sup>48</sup> That would represent 38 per cent of the AEC's prediction for the Western world's uranium demand in that year - more than twice the proportion of the world's reserves held by Australia.

Since the AEC's predictions may well be optimistic, the Australian uranium industry is likely to find great difficulty selling its uranium if all mines go ahead. Although Ranger appears to have covered its initial output of 3,000 tonnes per year (with contracts with the US, Japan and S. Korea)<sup>49</sup> and Nabalek has been covered to about 60 per cent of its planned output of 1,100 tonnes per year,<sup>50</sup> other mines, such as Pancontinental, are likely to find their market prospects bleak. On 28 October 1980 Mr. Justice Fox, Australia's Ambassador at Large for Nuclear Non Proliferation and Safeguards was reported as saying that Australia is unlikely to be able to sell more than 3-4,000 tonnes per year of uranium oxide for delivery in the next five years or so.<sup>51</sup> In this glut market, the Australian miner's chances are not enhanced by the ALP's repeatedly stated policy that it will repudiate all new uranium contracts.<sup>52</sup>

In Australia, the arguments for preventing uranium mining have in the main been based on the effect this would have on the nuclear debate in the rest of the world. However the successes of the opposition in Australia have not been restricted to reinforcing nuclear-opposition elsewhere. Additionally they have delayed uranium mining for some six years, sufficient time for opposition overseas to have combined with other factors to produce a slump in the nuclear industry. The constraints that this has placed on the expansion of uranium mining has presented the nuclear opposition in Australia with an important breathing space needed to reorganise and consolidate if they are to successfully confront the nuclear plans now looming for Australia in the 1980s.

### 2.3 Nuclear Activities in Australia

Paradoxically the decline of the nuclear reactor market is capable of increasing pressure for the development of nuclear projects within Australia. First the vendors of nuclear reactors are seeking markets for their products everywhere with increased vigour. Thus there is serious pressure to lock Australian electrical production into the nuclear fuel-cycle. Second, the nuclear industry is looking for geo-politically favourable environments in which to site other parts of the nuclear fuel cycle. The move away from nuclear power leaves coal as the crucial remaining fuel for electricity generation in the immediate short term. Australia has abundant reserves of coal, and the eastern states are presently competing with each other to sell large quantities of their reserves. This has produced an electricity buyer's market. If any additional uranium enrichment capacity is warranted, Australia with both cheap electricity and uranium, is targetted as a desirable location. Third, greatly increased use and export of Australian coal greatly shortens the life-time of those reserves of coal which are both economically recoverable and able to be converted to electricity without acceptable environmental consequences.<sup>53</sup>

The possibility of enrichment facilities in South Australia was investigated as early as 1973. These were shelved by Premier Dunstan in 1977 but were subsequently re-opened by the new Tonkin government. In the meantime, the federal government has enthusiastically commissioned its own studies.

In July 1978, detailed proposals were released from the URENCO consortium for a \$250 million pilot plant which could be operating within six years.<sup>54</sup> That proposal was followed five months later by the leaked details of an Australian-Japan enrichment feasibility study, initiated in 1974.<sup>55</sup> Since then the Victorian Minister for Energy, Mr. Balfour<sup>56</sup>, and the South Australian Mines and Energy Minister, Mr. Goldsworthy<sup>57</sup> have both advocated placing a plant in their states. On 6 August 1980 the South Australian Premier, Mr. Tonkin, released a report from his State's uranium enrichment committee which concluded that a gas centrifuge enrichment plant would be economically viable in his state. He said that URENCO SENTECH was anxious to build the proposed plant.<sup>58</sup> The final decision, however, resides with the Federal Government. As Federal Minister for Trade and Resources, Mr. Anthony, has commented 'virtually all State governments are interested.'<sup>59</sup>

Whether or not investment is ultimately directed into uranium enrichment in Australia, the possibility that excessive development of mining facilities may occur in relation to market requirements may increase pressure on Australia to accept conditions on sales that have previously proved unacceptable. One such condition might be to accept the return of the uranium once it has passed through the nuclear fuel cycle and emerged as waste. It has been pointed out numerous times that the dry Australian interior is a potentially superior location to most others in the world for waste storage.<sup>60</sup> It has been pointed out elsewhere<sup>61</sup> that the decrease in the spot price of uranium oxide, from US\$43 per lb in January 1980 to US\$38 per lb in December 1980 has placed increased pressure on the Federal Government to lower its already eroded safeguard requirements.<sup>62</sup> A recent progression of this trend occurred on January 8th 1981 when the Government signed a treaty with France allowing France to purchase Australian uranium and to re-process the resultant spent fuel to produce plutonium.<sup>63</sup> Additionally, the present enthusiastic and unrestrained sale of coal reserves for enrichment, aluminium projects, coal to oil conversion and other such ventures further increases the pressure for the introduction of nuclear power in Australia. Such plans are now clearly visible on a number of drawing boards.

In October, 1978 Dr. Miles of the AAEC testified to the Senate that he expected one or more Australian states to have nuclear reactors by 1995.<sup>64</sup> One year later the director of the Commission predicted that a reactor would be established in either Victoria or South Australia within seventeen years.<sup>65</sup>

In West Australia Premier Court has announced that the State will build a reactor.<sup>66</sup> The WA State Energy Commission intends to install it by 1995.<sup>67</sup> There are no firm plans yet for nuclear power in the Northern Territory. Energy Minister Paul Everingham says that 'Nuclear power is the obvious answer. But the political complications are a bit daunting.'<sup>68</sup> In Victoria, as early as 1978, Portland was proposed as a site for a nuclear reactor which would supply electricity to the Western half of the state.<sup>69</sup> Despite pre-election protestations to the contrary,<sup>70</sup> there is considerable evidence that a nuclear reactor is intended for Victoria for the 1990s.<sup>71</sup> In particular the recent SEC report 'Latrobe Valley Power Station Siting' projects a 663 per cent growth in Victoria's electricity production<sup>72</sup> over the next 50 years, generated by 21 additional 1 GWe coal burning power stations in the Latrobe Valley.<sup>73</sup> If these additions were to be installed, the consequent environmental burden for the Latrobe Valley would be devastating. Such a prospect would lead to pressure for some of the load to be borne by nuclear reactors. Additionally, the program would require seventy per cent of the SEC's 'economically winnable reserves' of coal over the next 50 years. Since other uses for the coal such as coal-to-oil conversion are being contemplated on a large scale, the contemplated load growth would almost certainly be partially based on nuclear power.

At the Federal level, Mr. Anthony announced on 22 August 1980 that the government intended to carry out a wide ranging review of the Atomic Energy Act and related matters. The stated purpose was to assess whether the act was an appropriate basis for the 'promotion, regulation and control of nuclear activities and the development of an Australian nuclear industry.'<sup>74</sup>

But the above-mentioned proposals to develop further nuclear projects may well be very difficult to implement whatever the legislative framework. Although in 1978 and 1979 the more dramatic anti-uranium mining actions went into decline, this was probably because many people lost faith in their ability to take effective action to obstruct mining plans in the remote North. However, there is already evidence that opposition is beginning to re-activate.

Union action over uranium mining is beginning to become visible. In February 1980 members of the Amalgamated Metal Workers' and Shipwrights Union (AMWSU) at two Queensland steel companies refused to handle 4,000 tonnes of fabricated steel bound for the Ranger mine.<sup>75</sup> Subsequently, the Australian Council of Trades Unions (ACTU) called on its members to withdraw from uranium mining, although so far its call has been without success.<sup>76</sup> Officials of the Australian Railways Union (ARU) have said that they intend to move towards initiating bans on uranium transport in early 1981. On the other hand the membership of the much smaller Queensland Railways Station Officers Union has voted by a narrow margin (58% against) not to ban the movement of uranium from the Mary Kathleen mine.<sup>77</sup> The Electrical Trades Union has already adopted rules prohibiting the mining of uranium,<sup>78</sup> and in Darwin the waterside workers have voted to ban the export of uranium through the port,<sup>79</sup> although this decision was later, at least temporarily, reversed. More recently, on February 6th 1981, the prospects for union action were enhanced when a special meeting of unions voted to support the decision by the ARU to ban the transport of uranium. The meeting was also told that the Seamen's Union of Australia had banned all shipments of uranium out of the country.<sup>80</sup> All these demonstrate that possible routes still exist for obstructing the uranium mining projects in Queensland and the Northern Territory. Any attempt to introduce nuclear projects in the south is likely to substantially reinforce these and similar developments.

Although the level of visible action against uranium mining declined in 1978 and 1979, there is no evidence that the community's opinion has changed on the issues. A Morgan Gallup Poll in November 1979 found that the level of opposition had marginally increased since June 1978, whilst a previous poll using the same question showed no change between June 1977 and June 1978.<sup>81</sup> Nevertheless, judging from responses to this question, it was still a minority who opposed uranium mining.

Another national poll taken in June 1979 asked the Australian community its attitude to the construction of nuclear reactors in Australia. 56 per cent were opposed and only 34 per cent were in support.<sup>82</sup>

In studies carried out in several countries, people have been found to have developed more widespread and intense opposition to nuclear reactors in their own locality, than to those remote from where they live. At the same time local projects have proved far more vulnerable to community opposition. Success at the local level has then led to growth of effectiveness at a greater distance, including effectiveness in opposing nuclear power at the national level.

This factor is likely to operate also in Australia when attempts are made to introduce nuclear projects. With growing evidence that such attempts are likely to be made and with the legacy of Union opposition to uranium mining and nuclear power, political parties committed to a nuclear-free Australia, and a community

already educated about the hazards of the nuclear fuel cycle, there is no reason to presume that the conflict over uranium mining and nuclear energy in Australia, is anything like over.

#### FOOTNOTES

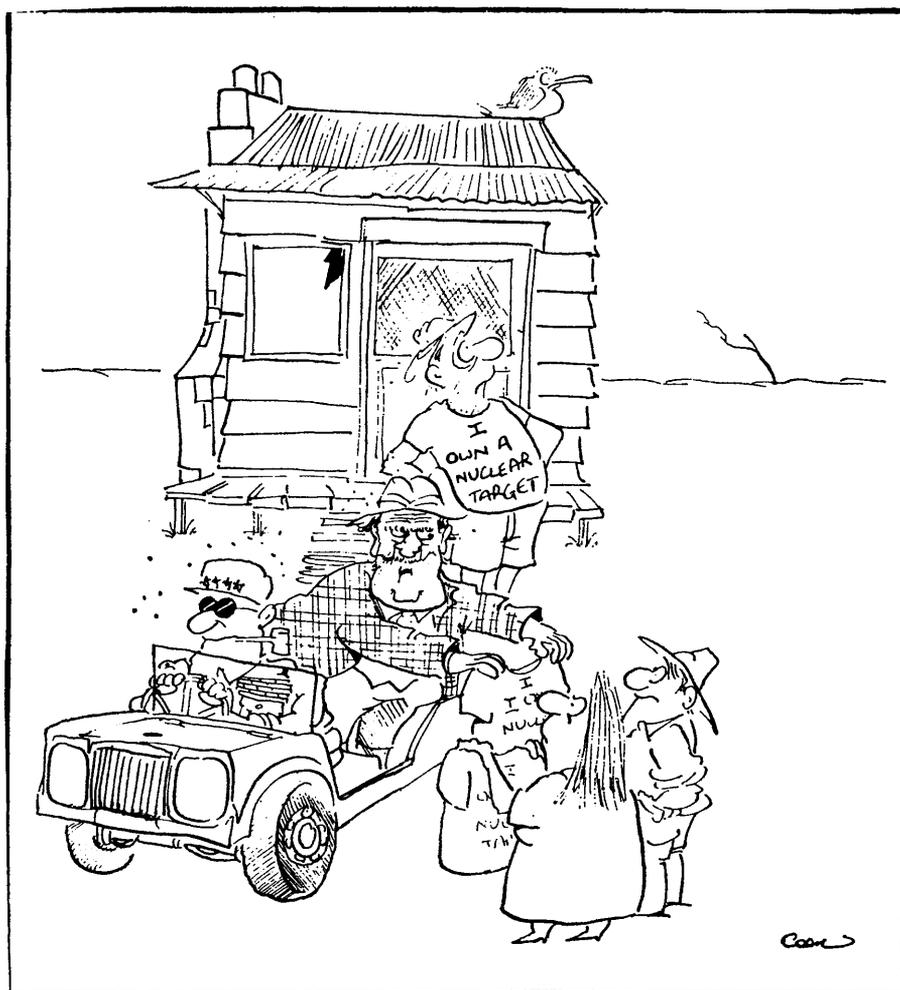
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5. Australian Atomic Energy Commission, Annual Report, AGPS, Canberra, June 1980, p.12.
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13. R. Stobaugh and D. Yergin (eds.), Energy Future, Random House, New York, 1979, p.111.
14. More detail of the political constraints on contemporary nuclear programs will be available in a forthcoming book by the author, presently titled: Global Fission: The Battle over Nuclear Power to be published by Oxford University Press (Australia) in 1981.

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