On August 25 last year the Federal Government, in one of the most detailed and well researched policies yet delivered, announced that Australia would develop its significant uranium resources subject to stringent environmental controls, promotion of Aboriginal welfare and international safeguards. This was the culmination of a turbulent and at some times neurotic political and social process that had been going on ever since the major uranium deposits were discovered in 1970. It was a policy constructed after one of the most exhaustive and far ranging public inquiries that had ever been held into a natural resource industry. It was also conceived under the pressure of a public debate that had been raging for the past three years in an atmosphere of highly charged politicisation of the uranium issue. Notwithstanding the constraints imposed by political caution, the Government produced a policy that while bureaucratically cumbersome, provided the framework for the development of Australia's uranium resources.

Unfortunately the administrative structure which the policy envisaged, now seems better geared to promote the development of a fulsome bureaucracy than uranium resources. The following administrative bodies were required to be created—National Parks and Wildlife Service, Supervising Scientist, Coordinating Committee for environmental control, Marketing Authority and Uranium Advisory Council. In addition the Government departments of Aboriginal Affairs, Northern Territory, Trade and Resources and Environment, together with the Aboriginal body, the Northern Land Council, must interface with one another and the administrative bodies in order to implement the policy. Legislation was required to create the Marketing Authority, to provide authority for the appointment of the Supervising Scientist and Coordinating Committee, to amend the National Parks and Wildlife Act and the Aboriginal Land Rights Act. All this appears to the uranium companies to be a guarantee of something about as coordinated and fast moving as a traffic jam in Rome.

It has been 6 months now since the policy was announced and the industry is still frustrated in its development. While there has been considerable activity within the public service concerning the uranium policy there has been very little discernible progress that has been made in an overall sense. No one can accuse the Government of leaping precipitously into the uncharted seas of uranium development. There perhaps have been several reasons for the lack of progress, not the least important of which would be the December 10 election and the Christmas holiday season. Hopefully now that these two factors are behind us there will be some more progress. I think however the point has come where Ministers themselves must expedite the process and if necessary cut the Gordian knot of bureaucratic red tape. Once the various administrative bodies have been established (most of them already have been) it should be possible to proceed with development at an expeditious pace provided there is strong ministerial leadership and a will to cooperate on the part of the bureaucracy. The mining companies too play a role in the development even though, as it would seem to some, a somewhat unimportant one.

Some, if limited action has taken place however. Specifically the Supervising Scientist has been appointed on an unofficial basis and has been putting together his team of experts and establishing environmental monitoring systems. The Director of National Parks and Wildlife has been appointed and is operating in his area. The Northern Land Council has been officially created by statute and has established a modus operandi interfacing with the Department of Aboriginal Affairs. The required legislation is being
drafted and is expected to be introduced early in the first session of Parliament, commencing at the end of this month. One of the most important features of the Government’s policy is the commitment to playing a responsible and influential role in improving the international safeguards system, i.e. the system which seeks to impose international controls and prohibitions on the diversion of nuclear materials from peaceful to non-peaceful purposes. It has been widely recognised and recently highlighted by President Carter that the existing regime is deficient in the means for achieving its objectives. To this end several nations including Australia have commenced multilateral discussions concerning the nuclear fuel cycle and the means by which the peaceful use of nuclear power can be controlled so as to prevent diversion of nuclear materials into weapons use. This discussion group is the International Nuclear Fuel Cycle Evaluation (INFCE). In addition, there has been a breakthrough in international safeguards brought about by the agreements recently reached between Canada and the European Economic Community and Japan. It would seem quite likely that the Australian Government’s position on safeguards would be very close to the Canadian position and that accordingly it should not be long before Australia enters into similar agreements with the EEC and Japan. This should have a positive impact upon Australian public opinion since it would constitute proof that it is in fact possible to tighten up the international safeguards system and for Australia to have an influence through the promise of uranium supply. It would also mean progress on the uranium marketing front.

One of the factors in uranium development that gives many people concern is the attitude of the Trade Unions. It is not appropriate for me to predict what the union attitude will be eventually or what resolution will be passed at the forthcoming ACTU Conference on February 10, but I think it is possible to make some observations. There seems to be two main factors which are being considered by the Trade Unions in the context of uranium and its development. The one is the concern which many members have about the ability of utilities and Governments to dispose of nuclear waste on a long term and safe basis. The other is, whether in view of the much publicised slippages in the nuclear reactor program, it would be possible to delay the development of Australia’s uranium resources without adverse consequences. The first factor is quite a reasonable one but is a concern that has a solution. However the second one is based on an incorrect appreciation of the uranium market and the real consequences of reactor slippages. Since the question of nuclear waste disposal is a matter for community concern there is merit in outlining the steps that are being taken by Governments and the technical communities in the world to deal with the problem.

The way to dispose of the high level wastes that has been decided upon is to bury them in geologically stable rock formations approximately 600 m underground. It should be noted that all rocks in the earth’s crust contain traces of radioactive substances such as uranium, thorium, potassium and rubidium. The total amount of this natural radioactivity in the ground under the United States for instance, down to the proposed burial depth of 600 m is enormously greater than the radioactivity in the wastes that would be produced even if the United States were to generate all its electric power through nuclear fission. The fact that the radioactivity of the nuclear wastes is more concentrated does not make any difference because the biological effects of radiation are generally assumed to have a linear relation to dosage so that distributing a given total dosage among more people would not change the number of adverse health effects. If this assumption were not true, current estimates of the potential health hazards from nuclear wastes and all other aspects of nuclear power would have to be drastically reduced.

As regards the detailed procedures for handling nuclear wastes, the technology is presently in place for incorporating nuclear wastes into a boro-silicate glass. This is the so-called vitrification process. The glass is fabricated into cylinders about 300 cm long and 30 cm in diameter. Each glass cylinder is sealed inside a thick stainless steel casing. These canisters will be shipped to an environmentally operated repository for burial. The French are the most advanced in this technology and have had a pilot vitrification plant operating at Marcoule.
in Southern France since 1969. An industrial scale plant capable of handling all the nuclear waste that will be produced from the nuclear reactors at the Marcoule Nuclear Park, together with some others, is currently being put into operation. It is expected to start up this month. I visited both plants in October last year. As yet no wastes are actually being buried but plans are well advanced in the United States and Germany, in particular, for selection of suitable sites. It is well known that throughout the world there are ample areas with suitable geological formations.

It should be noted that the volume of nuclear waste is very small. One year's waste from a single 1000 MW nuclear power plant will go into 10 glass canisters and the canisters will be buried about 10 m apart. It has been estimated that by the turn of the century the United States will have approximately 300,000 MW nuclear generating capacity in place. The total high level waste generated annually by such a system would occupy an area of less than half a square kilometre. With respect to the public health hazard of radiation Prof. Bernard Cohen in his leading article in June 1977 edition of the Scientific American makes an interesting point. He says — "If one is to consider the public-health effects of radioactivity over such long periods, one should also take into account the fact that nuclear power burns up uranium, the principal source of radiation exposure for human beings today. For example, the uranium in the ground under the U.S. is the source of the radium that causes 12 fatal cancers in the U.S. per year. If it is assumed that the original uranium was buried as securely as the waste would presumably be, its eventual health effects would be greater than those of the buried wastes. In other words, after a million years or so more lives would be saved by uranium consumption per year than would be lost to radioactive waste per year."

The other factor being considered by the Trade Unions is the slippage of reactor ordering that has occurred over the past few years and its effect on the uranium market. It is wrongly alleged by some anti uranium groups that the uranium market is soft and that because of reactor delays a go-slow policy for Australian uranium development would not be harmful. This view is utterly incorrect and very harmful because it could lead Australia into creating one of the worst blunders in economic history. There is no ground whatsoever for a complacent and relaxed attitude toward the entry of Australia into the world uranium market.

Over the past few years there has indeed been a number of slippages in the nuclear power growth expectations and in the ordering of new nuclear power plants. However, it is absolutely vital to interpret correctly the effects of these slippages.

There are two basic periods in the development of nuclear electricity generating capacity relevant to Australia and the bringing to production of its uranium resources. They are, the short term, from 1981 to 1985 (being the period in which Australia can expect to enter the market) and the longer term, from 1986 onwards. Despite downward revisions that have occurred, electricity generating capacity for nuclear stations in the World Outside Communist Areas will probably double between 1980 and 1985 from about 150,000 MW to about 300,000 MW. With respect to the two major markets, Western European capacity should grow from about 62,000 to 120,000 MW and that in the U.S. from 70,000 to 140,000 MW.

Even though this growth rate is appreciably less than the rate predicted a few years ago it represents a combined annual growth rate of 12%. This should be physically easier to achieve than the figure of over 20% which was being predicted in 1975. In the United States, which for the balance of the century will represent a share of the total nuclear generating capacity in the world outside the communist areas ranging from approximately 50% in 1985 to approximately 40% by the year 2000, the growth rate is predicated upon a heavy reliance on energy conservation and coal. It is assumed by the Carter administration that the growth rate of electrical consumption can and will be held to 5% per year over the next decade and to 3.5% over the balance of the century, notwithstanding the fact that in recent decades it has averaged 7% per annum. This assumption, which is based more on hope than on realistic assessment, is considered unachievable by the U.S. electric utility industry. The utilities point to recent studies sponsored by the industry which indicate an average growth rate of approxi-
mately 5.5% over the next two decades. With respect to coal, the Administration’s target of doubling coal production to 1 billion tons per annum by 1985 is considered unrealistic by the coal industry. The investment requirements, the environmentalist opposition to the opening up of the Western strip mines, the availability of underground coal miners and the necessity for large scale additions to the nation’s railroad capacity make it very difficult to see how the U.S. can expect to rely on coal to the extent that President Carter wishes.

Most attention has been focussed on slippages in the planning for nuclear power stations. Too often however the fact has been ignored that there have also been slippages in expectations for the production of uranium. While the largest delay of all in expected production increase has been in Australia, there have been important delays in South West Africa, Canada and the United States that have resulted in additional uranium production not being available to the market as early as had been forecast. In addition there is an awareness on the part of the U.S. producing industry that earlier predictions of the U.S. uranium production capacity made by ERDA were too optimistic. Whereas ERDA forecast U.S. uranium producers were likely to reach a production level of 31,000 MTU by 1985 a more realistic assessment indicates that the industry could be expected to achieve only about 21,000 MTU by that date. It should be noted that these over-optimistic ERDA projections were used by the Fox Commission. Because substantial growth in the nuclear power industry is undisputed over the longer term (at least by those who are informed about the industry) the critical time for Australia is in the market entry period, which will occur in the shorter term — from 1981 to 1985. In assessing the market over the short term it is essential to focus on what the industry refers to as firm demand, i.e. demand for uranium to be used as fuel in reactors which are presently in place or under construction. In this area nuclear slippages have been minimal. The slippages in almost all cases apply to the plans for new nuclear power stations and therefore fall outside the market entry period. This observation, together with well placed confidence in the longer term, should allow Australia’s uranium industry to view nuclear power slippages with equanimity, albeit without enthusiasm.

According to a utility assessment published in June of this year the total cumulative uranium demand in the World Outside Communist Areas to 1985 is approximately 500,000 MTU. Deducting the amount of uranium under firm contracts of 350,000 MTU leaves an uncommitted demand of 150,000 MTU to 1985. Allowing for slippages and demand in countries to which Australia may not sell due to safeguards policy restrictions, the uncommitted market for Australian uranium should be approximately 100,000 MTU. This figure is based on the assumption that utilities will maintain their expected 1980 inventory levels.

If utilities maintain the ratio between inventory and consumption expected in 1980 or, alternatively increase that ratio, additional uranium would be required. This conclusion of course is based on the expectation of actual consumption increasing year by year during this period. Another factor which would increase the amount of the uncommitted market is the shortfall created by Westinghouse which does not have the uranium supply to fulfill all of its commitments.

It is difficult to predict precisely when Australian uranium will come onto the market and in what quantities, but a reasonable estimate is that an output of 5000 MTU in 1981 should be considered as a maximum starting level, reaching approximately 13,000 MTU per annum in 1985. These outputs could therefore quite comfortably be fitted into the above scenario of uncommitted demand for the period to 1985.

As an indication of the uranium market’s desire for Australian uranium, Pancontinental has received letters from 12 European and 15 U.S. utilities expressing an interest in the purchase of Jabiluka uranium. The quantities they are seeking from us are in excess of 52,000 metric tons U over the 10 year period from 1981 to 1990. This amount exceeds the initial design capacity of the proposed plant. Most of the letters indicate that the interest in Australian uranium is not limited to the tonnage sought from Jabiluka. In other words the utilities anticipate additional requirements which they will seek to fill from other Australian producers. These expressions of interest provide clear evidence that there is a real market demand for Australian uranium and that allegations to the contrary are just
plain erroneous.

Further delays in bringing Australia’s uranium resources on stream will result in more wasted costs and real risks that sales opportunities will be lost to competitors. The current delays are costing the industry approximately $10 million per month in increased capital costs. Uranium deposits are being uncovered in other countries around the world and are in the process of being developed.

Confidence on the part of European, Japanese and American utilities in Australia as a reliable provider of uranium has been decreasing over the past few years and is presently at an extremely low ebb. Even though confidence in Australia is lagging there is still hope that the paralysis will be replaced by progress. That is why utilities are still willing to express interest in Australian uranium. But if this hope is frustrated much longer, it will disappear and alternative arrangements for uranium supply will be made. In that event, Australia will suffer irreparable harm because, in matters of this magnitude, patterns of international policy and behaviour are extremely difficult and time consuming to change.

Recent discoveries in the Key Lake area of Saskatchewan of rich uranium ore bodies soon will provide strong competition to Australian uranium in the marketplace. Central, South and South-west Africa are expeditiously developing their uranium deposits. The longer we delay, the greater the share of the market will be taken by these competitors. While it would be expected that the politically sensitive countries of Africa would not normally be preferred suppliers, they will certainly get the business ahead of Australia if Australia continues to be seized by its paralysis.

In conclusion, given the state of frustration in the development of Australia’s uranium, instead of asking the question whether Australia’s uranium is on the move, we should resolutely focus upon the undeniable reality that unless it does get on the move, and on the move fast, Australia will commit one of the most costly blunders in its economic history.