

**INDEPENDENT SUBMISSION
TO THE
HOUSE STANDING COMMITTEE
ON INDUSTRY & RESOURCES
COMMONWEALTH GOVERNMENT OF AUSTRALIA**

**"INQUIRY INTO DEVELOPING
AUSTRALIA'S NON-FOSSIL FUEL
ENERGY INDUSTRY"**

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DEVELOPING AUSTRALIA'S NON-FOSSIL FUEL ENERGY INDUSTRY

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Terms of reference - Call for submissions

The House of Representatives Standing Committee on Industry and Resources shall inquire into and report on the development of the non-fossil fuel energy industry in Australia.

The Committee shall commence its inquiry with a case study into the strategic importance of Australia's uranium resources. The case study shall have particular regard to the:

1. Global demand for Australia's uranium resources and associated supply issues;
2. Strategic importance of Australia's uranium resources and any relevant industry developments;
3. Potential implications for global greenhouse gas emission reductions from the further development and export of Australia's uranium resources; and
4. Current structure and regulatory environment of the uranium mining sector (noting the work that has been undertaken by other inquiries and reviews on these issues).

Background of the author

The author, Andrew Crooks, is a 37 year-old mining analyst with 17 years experience in the mining industry. I have a Bachelor of Science with majors in geology & geophysics, and minor credits in finance, economics and accounting. Post-graduate studies included a Graduate Diploma in Mining Engineering & Mineral Processing.

Early practical mining experience was gained with exploration and mining companies in NSW and Queensland, including Lachlan Resources, New England Antimony Mines, CRA Exploration (now Rio Tinto) and Cyprus Minerals. This experience exposed me to a number of metals mines and the mining workforce at a grassroots level.

Mid-career experience was gained with Barlow Jonker, a reputable international coal mine engineering & market consultant with a large international client base, as a coal market analyst. More recent career experience included 1 year with W.H.I. Securities Pty Ltd, a boutique finance company focusing on the provision of finance to small mining & exploration companies in Australia or overseas.

Currently I am embracing the benefits of self-employment as a trader in small, unloved exploration and mining companies for they are the soul of Australia's prosperity. Small resource companies have been a personal passion since I commenced trading at the age of 11 year.

The future of the author

The author is dismayed by the lack of integrity and wisdom displayed by politicians under the current political paradigm, so invites similarly frustrated citizens to contact him if they embrace the thrust of this submission. I am interested in establishing a think tank, so any expressions of moral or financial support are welcomed.

Development of the Non-Fossil Fuel Energy Industry in Australia

Introduction

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Global Demand for Australian Uranium Resources

Australia has a great deal of uranium resources because of its large areas of Proterozoic and Archean rocks which have proved particularly attractive for the concentration of uranium-bearing minerals. The significance of these resources are even more impressive considering that the 'three mines policy' adopted by successive Labor governments has discouraged uranium exploration.

Every boom heralds the dawn of a new age, yet seldom are these booms sustained, and never to their hyped significance. Nevertheless a lot of people become rich by seeing the promise and selling on the hype. Uranium offers such promise. The reality is there is plenty of proven and probable uranium resources to last the world for several thousand years. Because uranium fuels constitute a very low portion of the value-added chain to electricity generation, the price of uranium only has a lot of upside – if the demand is unmet – as the current market will demonstrate. The problem is once the industry matures in about 7-10 years uranium prices will plummet into the doldrums and will stay there for years, rallying only briefly every decade or so, after it has once again become a forgotten story. It's a familiar pattern to resource analysts and market punters.

Strategic Importance of Australian Uranium Resources

Australian uranium resources are no longer of strategic value. Back in the 1980s there was an opportunity for Australia to develop several advanced uranium resources but the Labor government obstructed these developments with its 'Three Mines Policy' as well as an appeal to aboriginal mythology in the case of the Coronation Hill deposit. I don't say this to suggest that aboriginal interests should be ignored, but its noteworthy that aboriginal mythology doesn't seem to obstruct projects like it did in the 1980s. It seems to suggest that aborigines are just as capable of rationalising as Europeans. But then recognition of aboriginal interests have come along way since then, so its not surprising they are more conducive to 'reasonable outcomes'. Its noteworthy that the submission by the Northern Lands Council strikes is one of the better researched submissions.

The global resource environment has changed considerably since then. Global stockpiles of enriched uranium have depleted and the demand for primary uranium (ores) is set to take off. But the reality is that it takes very little uranium, or relatively few projects to satisfy the needs of global power markets. And whilst perceptions to nuclear power are changing there is still far too much supply looming. The current asset bubble is providing more than enough stimulus to this sector. Given that the number of ASX-listed uranium explorers has swelled from 4 to 70 in the last

4-5 years, one might conclude that its time to sell!! So its rather amusing that the government is considering uranium policy. Rest assured it was written by the Federal Reserve back in the 1980s.

Science and common sense were more scarce than gold in the 1980s and those same conditioned appear to prevail in the current market. Consider that there is a lack of evidence to suggest that greenhouse gases are causing global warming, yet this inquiry seems to be premised on the notion that greenhouse gas-induced warming is an irrefutable fact. It has yet to be substantiated, and I have argued as much on many forums because the media and populist scientists have propagated this 'myth'. There is still the prospect that natural processes are causing global warming. Its notably that after 30 years of warming some 'populist scientists' are blaming industrialisation. Prior to this 30-year period there was 30 years of cooling, during which a section of the scientific community asserted that an Ice Age was imminent. I also highlight that temperatures in the Carribbean (causing Hurricane Katrina) in the 1800s and global atmospheric temperatures in the 1400s rose to current levels, with post periods pre-dating modern industrialisation.

We have all heard of economic rationalisation....but lets consider the role of 'scientific rationalism' in undermining public policy, and more importantly the credibility of the scientific method. Scientists are constantly leading us astray... and the cause is a lack of critical thinking, a lack of respect for facts and the impact of collectivist values on society.

Below is the share price for Paladin Resources – an emerging uranium producer, whose share price has risen from 1.3c to \$2.50. This success has arisen because Paladin Resources was prevented from exploring & developing resources in Australia, so it was forced to go overseas to countries like Namibia with lower 'sovereign risk'. Australia is the loser.



Source: Boursedata

Rest assured that the current implied market capitalisation for Paladin Res of \$940mil does not represent 'real value'. It will be a long time before it earns that \$100-200mil per year to justify a market value of that magnitude (for a stock in a cyclical bubble). So it seems rather late for the

Federal government to consider strategy for the uranium sector. This report will be forgotten in a few years, uranium demand will plummet.....at least until the current global over-capacity is absorbed by markets in this decade.

Might the government be better advised to address other areas – I suggest:

1. The ongoing subsidy of road infrastructure at the expense of rail. A lesson could be learned from Japan
2. The Federal governments attitude to gold given that it sold Reserve Bank gold reserves several years ago. If I remember correctly the RBA sold about 80tonnes of reserves at \$US320, and gold is now pushing through \$US500/oz. Does it not understand the perilous state of affairs that the US Federal Reserve is driving the money base. A lot of indebted Australian households are exposed. The problem is the trust in the supply-side model, that you can expand credit and demand will respond. This bird flu makes me nervous.
3. The government should be embracing coal seam methane if any industry because Australia has large resources of gas along the east coast (where industry & people are concentrated), its rural-based so good for rural development, it competes with conventional gas, ensuring a competitive market, its clean, it prevents methane loss from coal mining (thus worthy of greenhouse carbon credits). In contrast, nuclear power generation is relatively expensive power generating capacity. Better to wait for lower capital costs before advocating development of nuclear fuels, but why prevent uranium exports?

Irrespective the Australian government can be thanked for its tacit support of George Bush's monetary policy. The gold industry, which constitutes a large portion of the spec mining industry, is set for a boom.

The other opportunity is storing nuclear waste in central Australia, though its dangerous to assume that a safe way of disposing or an economical method for recycling uranium spent-fuels will not be developed.

Greenhouse Gas Implications

Notwithstanding the lack of evidence to support 'industry-based warming' there is good reason for the government to support energy-saving schemes. Energy costs money and money should be saved. The nuclear industry is not attractive by this measure, though over-investment in nuclear power stations is likely to result in a decline in the cost of constructing a nuclear power station. The problem for nuclear power plants is the high upfront cost of power station development compared to coal, oil and particularly gas.

If the government is concerned about greenhouse gases, why has it not addressed the lack of support for rail whilst subsidised road. There is no GST on petrol but there is on rail tickets. I'd have thought a rail line extension from Bondi Junction to Avalon Beach via Bondi Beach and Manly an easy choice if only to reduce congestion, boost tourism access. And a Very Fast Train service from Newcastle (Williamstown Airforce base being Sydney's next airport) to Sydney-Canberra to reduce air pollution whilst improving been commuting to Central Coast.

Political Paralysis

There should be some analysis of why the political process failed to reach a rational outcome in the 1980s when the 'nuclear debate' was passed over for emotive arguments. Its should be apparent that political parties have no integrity, that they place perceptions above the facts and will appeal to the lowest common denominator to assert their own 'narrow' interests. This reflects on them, but it also perhaps reflects on the political process which facilitates such populism.

I would like to see Australia become a meritocracy where vested interest have a seat in parliament and reason is the standard of value rather than 'numbers'. The question is whether Australians are worthy of such a paradigm change in thinking? I would argue that populism hardly mounts a

strong counter argument. The way terrorism is being used to create a 'climate of emergency' to achieve dubious political policy objectives is symptomatic of the same type of thinking.

Analysis of other Submissions

This chapter is concerned by the mis-information and misconceptions evident in other submissions, so attempts to deal with the errors inherent in other submissions. These errors are identified in no particular order. Maybe they should be in order.

These errors arise for a variety of reasons including:

1. Ignorance
2. Self-righteous rationalism (of many varieties)
3. Hatred of mankind (fearful religious conservatives)

Robert Elliot

Robert is right to support nuclear option, but the current balances of payments deficit has nothing to do with value-adding of uranium. The cause of the deficit is easy monetary policy by the US, keeping interest rates artificially low, combined with the detachment of money supply from a gold standard, effectively allowing banks to issue debt then repackage it as debt securities.

Janet Marsh

Janet makes the mistake of using history as a sole indicator of nuclear industry safety. The best advise I can give her is to sell her house (whilst they are high) and buy a cave with solar panels. The nuclear industry can be safe if people are accountable and management systems are robust. Coal mining is much more dangerous than any dangers from uranium. Uranium deposits are not in populated areas. Even if there were tailings leakages from mines, they would be low-level discharges in remote desert areas. These areas are also safe from earthquakes, cyclones.

Though I note her word of caution about uranium exposure. Be very careful!

Yes 'nuclear power is deadly', so is driving. We are constantly bombarded by radioactive isotopes all the time by just living on earth since all rocks contain some level of radioactivity. One does not find dead bodies around uranium mines...its a safety management issue.

I'm comforted by Janet's advise that CFCs cause 50% of greenhouse warming as it means we need only find a substitute to greatly reduce our impact. Thanks Janet for highlighting the opportunities for more technological advance...otherwise we might have got really scared.

All the significant power sources require raw fuels, whether oil, gas, coal or uranium. None of them has a material level of energy consumption intensity. I'd have though coal is much worse in terms of contained energy, scale and difficulty of mining, yet coal is among the cheapest energy sources. Hydro is probably the worst as concrete dams require a lot of energy. I agree with Janet - nuclear is expensive, so we shouldn't develop capacity, but we should rejoice that China is.

Nuclear weapons have saved life because politicians are more concerned with their own lives than their soldiers. Rest assured they will always make good decisions on this issue. Nuclear waste can be stored in canisters until a satisfactory disposal site is found.

Australian Academy of Technological Sciences & Engineering

Whilst there are no technical obstacles to adopting nuclear energy in Australia, it does not make commercial sense compared to the alternatives. Coal, coal seam gas, conventional gas are far more attractive. Nuclear power is too expensive to build at present. But why preclude it...things change over time, and research should be encouraged. Prohibiting nuclear power generation will only discourage research in this country.

Wind Prospect Pty Ltd

Wind might play a niche role in future power generation in the short term, but it has its disadvantages. Its not a cheap source of energy and its hard to imagine those dynamics changing

unless the cost of basic materials falls (unlikely), or more likely mass production reduces costs. But they are still a noisy form of generation and some people think they are aesthetically ugly. I care to differ....unless they have pocker dots on them.

The following points are very good.

While Australia holds a significant percentage of the world's known uranium reserves, Australian uranium has not always been competitive in the international market. This has been the case in recent memory. According to the Uranium Information Centre, during 1990-97 the market spot price for uranium was lower than the cost of production at Ranger. During that time, Ranger contracts were met through the purchasing of cheaper concentrate from countries such as the Republic of Kazakhstan. While Australian uranium companies can guarantee security of supply to their customers, they are not

~~able to compete on world markets~~
The nature of the uranium market and the economics of nuclear power generation mean that uranium prices will be very low, except for the infrequent demand-driven boom. It's a commodity like any other – and by no means a rare one. Australia has no great advantage in this area, though Australian companies can benefit as much from overseas project development as in Australia. Paladin highlights the potential for Australians to make money from uranium mining. Never will it be so good.

When quantifying the greenhouse gas intensity of an industry, it is necessary to consider the lifecycle, from mining to decommissioning. While the production of steam in a nuclear reactor is essentially greenhouse-free, the same is not the case for the mining, transport and enrichment of the uranium concentrate and the decommissioning of the plant. Uranium enrichment facilities in the United States (where Australian uranium is processed) are powered by fossil fuel energy at a rate of thousands of megawatts. The greenhouse gas cost of nuclear power has been estimated at around a third of that of conventional fossil fuel plants when the highest quality uranium ore is used. As the quality of the ore drops, more processing is required and the greenhouse gas emissions become comparable to (or above that of) fossil fuels. Only a small proportion of uranium ore available is of the highest quality.

These points are true but the same can be said about all the mainstream fuels, and its thus the preferred on the 'greenhouse' measure, but that's not an appropriate standard until science confirms that industrialisation is the cause of global warming.

Clearly the unattractive economics of wind power is highlighted by the lack of details on the viability of it.

John Reynolds (formerly of Uranium Info Centre)

As a former advocate of the Australian Uranium Information Centre John is playing up greenhouse warming. Why would we embrace nuclear power gives its commercial costs and unproven (in the sense that industrialisation has not been credited with causing global warming) greenhouse credentials. Nevertheless, the market should be allowed to determine the competitiveness of nuclear generation. Actually nuclear power promises to be very attractive for everyone but the original investors, so don't believe for a moment that some opportunist wont come around spruiking nuclear power. It's a great investment after the share price plummets because nuclear has among the lowest operating costs (as opposed to capital costs).

Approximately 16% of total world electricity output is from uranium fuel. France is about 77% reliant on nuclear with 59 operating reactors and also exports power to a number of other European countries. Japan has 54 operating reactors and USA, 103.

The fact that uranium is an important source of power overseas in no way supports its use in Australia. Japan, Korea for instance embrace nuclear generation for 'security of supply' concerns given that the coal, oil and gas producers around the world are highly concentrated both in terms of geographic location and ownership (after industry consolidation). Australia has enough coal & gas to last hundreds of years, and still plenty for an export industry. It makes more sense to use it domestically than export it, but we can do both and have our 'yellowcake' as well. John didn't think of that joke.

Economics

The economics of nuclear power production in Australia has not been adequately studied. However it has become competitive with alternatives in many regions of the world, and its increasing use confirms its competitiveness.

The economics of nuclear power generation have not been studied in Australia because it makes absolutely no sense. There are plenty of plants overseas to gauge commercial viability....its problem is that it makes no sense FOR AUSTRALIA for the foreseeable future, but why outlaw it. But let it be based on good science, not political or market hype.

John suggests that there are advantages to having a nuclear power industry...

- (1) It would enhance our credibility in the global uranium trade and help secure a long term and beneficial participation.**

This is nonsense – it would make no difference as uranium is a commodity in itself. If anything the opposite would be true because a domestic power plant would provide a local producer with a local customer, giving them pricing power. Small issue really.

- (2) It would provide a new dimension of technology in Australia, in which our education and technical institutions would participate with great benefit.**

Yes, but this expertise already exists elsewhere in the world, so why not save money by building upon our strengths. Perhaps John is looking for a job. Since when do you develop an industry to develop technical expertise. Unless it has national defence motives – none.

- (3) It would provide new and challenging opportunities to the manufacturing and service industries.**

Redeploying fixed capital investment, say in coal seam gas, would also produce jobs, and it would create even better types of jobs for the government, eg. Jobs in rural areas, eg. Drilling contractors, earthworks, pipeline infrastructure. Whilst Australia is not a leader in coal seam methane, it integrates well with farming (drilling supplies water to farmers) and coal mining (extraction of methane before mining), thus reducing wasteful methane emissions into the atmosphere. And we get points (greenhouse credits) for it!

- (5) It would stimulate possible adoption of down-stream industries such as uranium conversion (to UF₆), enrichment to fuel grade, and possibly fuel manufacture.**

This is a nonsense. Australia would have to develop a lot of nuclear power stations before we saw such benefits. If <5 reactors (5000MW) of capacity was developed in Australia, would just be importing the technology of foreigners. Mind you that is the case for most power plant, but its no benefit, and mature technology will be cheaper.

- (6) It could offer an opportunity for Australia to become a world nuclear fuel provider in the longer term with the further possibility of offering fuel reprocessing and storage services. These would be most valuable industries and**

I agree with John that Australia has an opportunity to develop a nuclear fuel repository site for storing foreign waste, but it's a difficult decision given that sentiment towards local storage could change (because its an emotive issue) and because without global standards we could always be undercut by some African repository that has lower standards.

Compass Resources

Strategically therefore Australia's uranium resources are potentially important if developed, but if they are not, marginally higher cost overseas resources will meet the demand.

I would make the point that uranium deposits in third world countries could be developed at lower cost unless producers are required to meet the same safety and environmental criteria. I would therefore urge the Federal government to seek global standards from those countries with

resources, so the competitiveness of Australian producers are not penalised by 'uneven' playing fields'. We don't want to compete on safety. Since Australia, Canada, US, South Africa and Britain are the major investors in uranium mining; the safety issue can be regulated from western markets.

Remember 'good regulation' is effective regulation (accountability), and do not permit a company to seek a consultant to reach the conclusion it wants to hear. The benefit of 'level regulation' is the costs can be passed onto power generators (meaning more value is retained in Australia and other producer markets).

Keith Adler (former Australian Atomic Energy Commission)

During the 1960's and early 1970's Australia enjoyed a permanent seat on the Board of Governors of the International Atomic Energy Agency (IAEA) in Vienna. Indeed, at one stage we provided the Chairman (Baxter), and the first Director-General of International Safeguards (McKnight).

The latter statement would suggest having technical authority is an end in its own sake. We don't have to have skills in all areas in a globalised market. We can always buy some cheap Chinese consultant after the Americans teach them, just as the Chinese are learning from the Japanese and Americans.

There is still scope and opportunity for Australia to become a major fuel supplier to the nuclear power plants now operating and being built in many countries, and particularly in our Eastern neighbours e.g. Japan, China, Korea, Taiwan, India, Pakistan, and soon in

Yes Australia can play a role as a supplier of uranium to foreign markets, so we have all the technical expertise we need in the form of Energy Resources of Australia, and 2 other producers.

We are already under criticism internationally for our 'coal only' policies for base load generation, and this can only get worse as time passes.

Yes, we are criticised by the same countries that import our coal. That's where the argument ends. If they want to tax it - fine, but the implication is they will only increase the delivered cost of fuel and give their government an excuse to raise taxes (implied impost).

"Why isn't nuclear power even considered for use in Australia?"

"Are all those other countries, particular all our Eastern neighbours, wrong?"

"Are we the only ones in the region who are right?"

I want to answer these questions. Australia has no commercial or strategic advantage in developing nuclear power. East Asian countries are deficient in fuel, uranium is easier to store than coal or oil (requiring large plant to store), so the nuclear option suits their 'paranoid' security of supply concerns. Its worth noting that the only supply shock to Asian energy generators was caused by OPEC in the 1970s. Hardly a compelling threat since US-Arab alliance to keep oil prices stable, which has paradoxically resulted in under-funded oil refining capacity. We are not right or wrong, just our context is different.

Medical Association for the Prevention of War (WA Branch)

2. The links between nuclear power and nuclear weapons is well-established. While

If I was part of the medical establishment I'd be ashamed to see this presented by my representatives. Where is the correlation? Development of nuclear weapons and power generating capacity require intelligence, so all intelligent people are evil. Really? Nuclear weapons are tools - like guns - they are not good or evil - they just are - as all inanimate objects are. It's the user who is morally responsible. Its preferable that they are controlled by semi-free countries like Australia and the USA, and preferable not with China or Russia. But its noteworthy that they have likely prevented war. If we are advocates of peace, lets advocate rational discourse because I get

scared when I hear a scientific body like the WA ?????? espousing emotional nonsense like this. What does it say about the values of lesser Australians – the common man or women. Perhaps that's their point....you common people cannot be trusted....but then who can.....the irrational. And who is served by mounting an irrational defence like this.

uranium mining and nuclear power diverts intellectual and financial resources away from real solutions – renewable energy technologies and improved energy efficiencies.

That is a good thing – it means we have choices, perspective and objectivity. Just as long as they keep studying as the commercial realities don't support nuclear power.

5. The health consequences of uranium mining and nuclear power are on their own enough reason to spurn any increase in uranium mining/nuclear power.

Uranium mining & nuclear power generation compare favourably with other sources of power – and particularly with coal and oil. Coal mining is very dangerous – particularly in the third world. And I would add that deaths are less frequent than they used to be. Far fewer people need to be underground these days, and most uranium mining is likely to be open-cut, except the larger polymetallic mines.

6. Enlarging Australian uranium exports would add more burdens to the indigenous people under whose land this ore occurs. They should be left in peace – and the uranium left undisturbed in the ground.

What burden? The burden of how to spend millions of royalties. I would argue that these royalties would be a empowering source of self-reliance for aborigines, such that they could fund their own health care facilities. It would also offer them jobs.

7. The threat of nuclear terrorism would diminish if there was less fissile material available for theft. Therefore, let Australia not contribute more to the global stock of fissile material – or to more reactors which could be subjected to terrorist attack.

The nature of the fissile material doesn't really lend itself to terrorism. I think they would be more inclined to steal the explosives from a mine site than the uranium – they would get so much more impact that way.

India. With the 1979 accident to the US reactor at Three Mile Island receding in the national memory, the US has plans to resume building new reactors. In Indonesia, there is
The Three Mile accident was 25 years ago. Since then a lot has been learned, so why live in the past.

There is a huge global push by nuclear power proponents who argue that the global Greenhouse problem would be alleviated if more nuclear power, and less fossil fuels, were used – but is this the case?

This is correct – the greenhouse issue is being used by rationalists and opportunists alike to support nuclear power. But then it was OK to start with, its just not a solution for Australia for commercial reasons. But we should embrace uranium mining.

The Greens NT

Uranium, the mineral basis of nuclear fuel, is a finite resource : some estimates suggest we have only 50 years worth of economically retrievable uranium. The use
We have decades worth of uranium and we haven't even started looking. It reminds me of the 1950s when iron ore was a strategic (scarce) commodity, now we have enough for centuries.

Potentials for catastrophic technical failure or human error, as have been demonstrated at the Ranger Uranium mine, represent a further unacceptable risk both to human health and the environment.

Where was the catastrophe? It was a minor leak and no one died. The coal industry has 'real deaths' – so perspective is needed. Certainly safety regulations are required (and in place), just as

with explosives and other 'dangerous materials'.

Yes, non-renewables pose a limited solution, but we need a mainstream energy source.

Australian Nuclear Forum

- the ANF believes that Australia might be an ideal location for at least a fuel enrichment plant under multinational safeguards control.

This is a credible suggestion – it makes sense for Australia to engage in intermediate processing of uranium, but more production capacity will be required. It seems likely that we might have an opportunity with respect to Asian demand.

- It is entirely ambiguous as to whether all Australian uranium is properly protected and prevented from entering nuclear weapons programmes (illicit or otherwise). At

This issue is entirely irrelevant as long as there are no special restrictions on sales of nuclear fuels, as otherwise other countries would supply the fuel. Its ludicrous to suggest an Australian producer would evade Australian national security interests if they change over time.

- **Beverley & Honeymoon – still no scientific evidence made public of claims of 'attenuation' of severe groundwater pollution caused by acid in situ leach mining. Despite my research being published at two international mining conferences and a well-respected international journal, the companies are yet to release peer-reviewed, independent research refuting my detailed analysis of the impacts of acid in situ mining.**

This quote from the Australian Nuclear Forum cast dispersions upon the governments regulation of uranium mining. If uranium mining is to be approved, miners need to held to the highest standards. We do however need to hold these leakages in context though. Is there any significant impact?

- **Olympic Dam – already Australia's largest single radioactive waste dump, currently about 73 million tonnes and growing by some 9 million tonnes per year. This radioactive waste dump, the tailings left from milling and smelting, has leaked profusely in the past. If the full ore resource is ever mined at Olympic Dam, IF, the tailings dump could reach some 4,000 million tonnes (or 4 billion tonnes).**

This strikes me as a risk with any mine (with uranium by-product) that involves dumps of low grade ore stockpiles on the surface. These facts need to be considered in the context of the land value for other uses. The Olympic Dam mine is in the middle of the desert. Leaching is unlikely to pose a significant risk, but I would expect the government to regulate such issues.

The uranium grade at Olympic Dam is very low, averaging about 0.04% U₃O₈ for the full resource (as at March 2005). Given that it generally takes a minimum grade of about 0.01% U₃O₈ to ensure an overall positive energy return on uranium mining, Olympic Dam uranium is only returning a marginal energy payback (although there is the partial benefit of copper, gold and silver production also). This severely limits the alleged energy benefits of most of Australia's uranium resources.

Olympic Dam is a polymetallic mine – actually uranium is the by-product – not the inverse.

The United Church of Australia

There is little doubt that there are financial benefits derived from uranium mining. However, our natural resources come from God and must not be misused.

Does God have a statute on uranium use. Not another 'apple argument'.

It does not appear that nuclear energy is a long-term solution to energy consumption needs as energy production using uranium is reducing over time.

By this standard nuclear fuels are 2nd only to renewable sources of energy since the globe has enough uranium to last thousands of years.

▪ **Contrary to popular belief, there is not an inexhaustible supply of nuclear material.**

Actually its very substantial – and many areas that have not been explored. Civilisation would have colonised the universe by the time we run out.

The **Uniting Church** supports greater research, development and implementation of environmentally benign, renewable energy alternatives (eg. geothermal, solar, biomass and wind technologies) rather than an increase to uranium mining or the establishment of nuclear power plants in Australia. The expense associated with such technology is becoming less prohibitive.

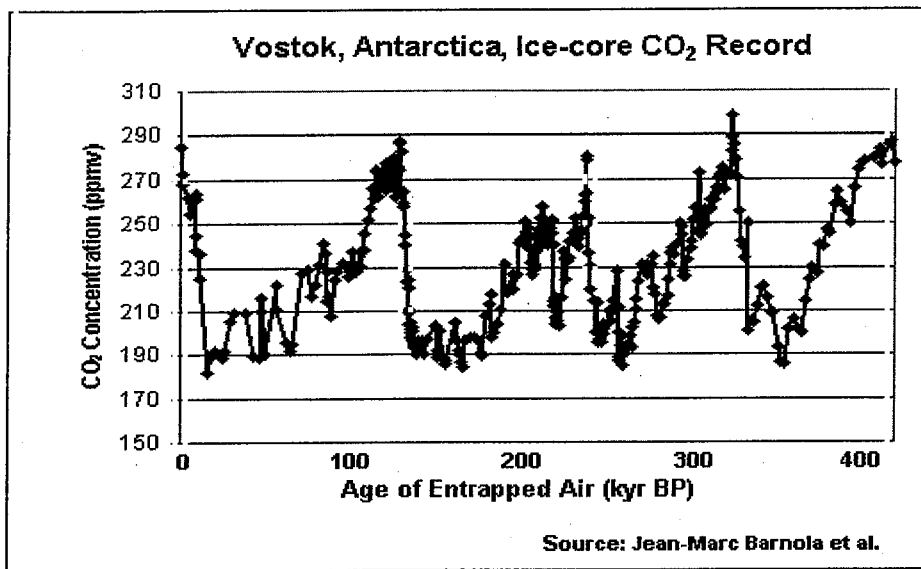
The Church partially has a point here. Its worth considering the pace at which alternative technologies are becoming competitive, as the conventional sources of power have plant lives of 20-30 years. Regardless, once they are built their operating costs are low.

Northern Lands Council

A fundamental contemporary issue is global warming, which in the scientific community is broadly accepted as deriving or substantially deriving from the release of carbon dioxide and other greenhouse gases to the atmosphere from human activity. The submission by officers of the Australian Nuclear Science and Technology Organisation (ANSTO) to this inquiry on 13 October 2005 was that 50,000 years ago the level of carbon dioxide in the atmosphere was 200 parts per million, that 100 years ago the level was 260 to 270 parts per million, that the level is presently 380 parts per million, and on current estimates is heading for at least 450 and perhaps 550 parts per million.

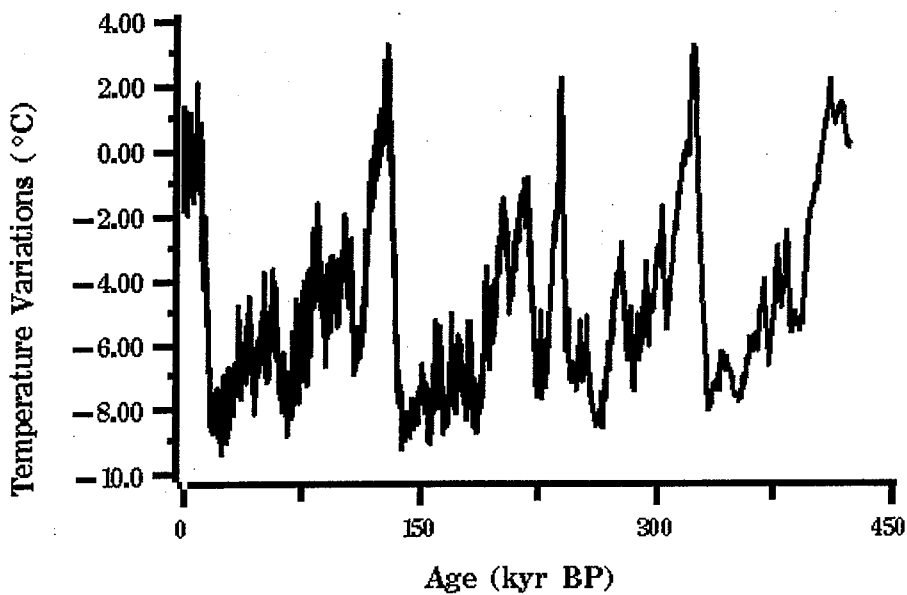
Evidence from ice cores shows that global warming may be triggered at about 180 to 260 parts per million - well below the current level of 380 parts per million.

I could not source the Northern Land Council claim of CO₂ and global temperature correlation in the ANSTO submission, but I did find references on the internet at <http://cdiac.esd.ornl.gov/trends/co2/vostok.htm> (this is the best data because it dates back 450,000 years) and www.elmhurst.edu/~chm/vchembook/globalwarmA2.html (just 160,000 years). This research suggests there is a strong correlation between CO₂ levels in the atmosphere and average global temperatures, but that current concentrations of atmospheric CO₂ and global temperatures are consistent with the 'natural' historical record. The implication is that if man is having an impact on the global temperatures, its not significant YET. Its possible natural processes provide their own counter-measures and we need to take no action. For this reason we are best to take sound commercial measures to limit CO₂ emissions whilst undertaking more research.



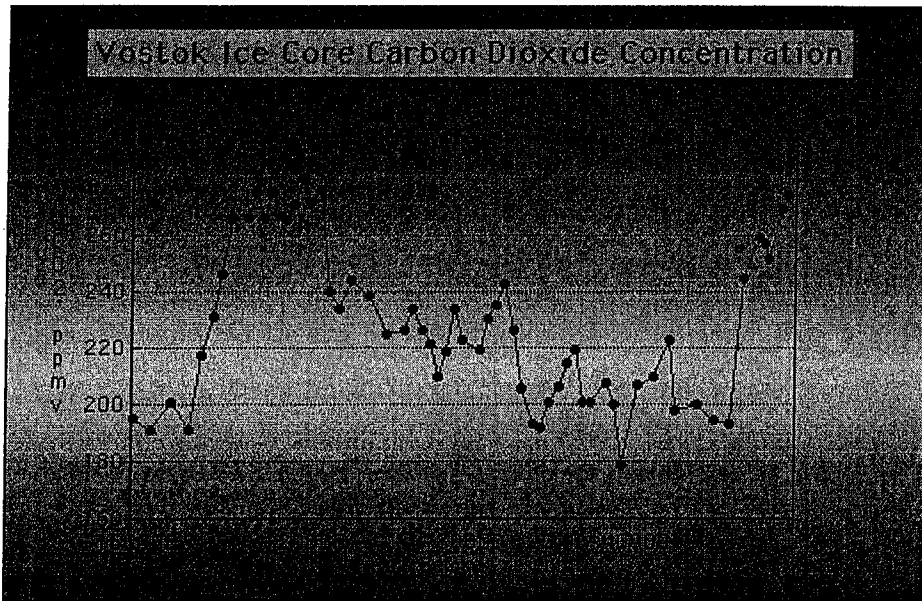
It would be worthwhile watching to see if temperature changes fall or rise from these current levels. Its noteworthy that historically they have peaked very sharply. But note that temperatures have stabilized around 0degC.

Historical Isotopic Temperature Record from the Vostok Ice Core

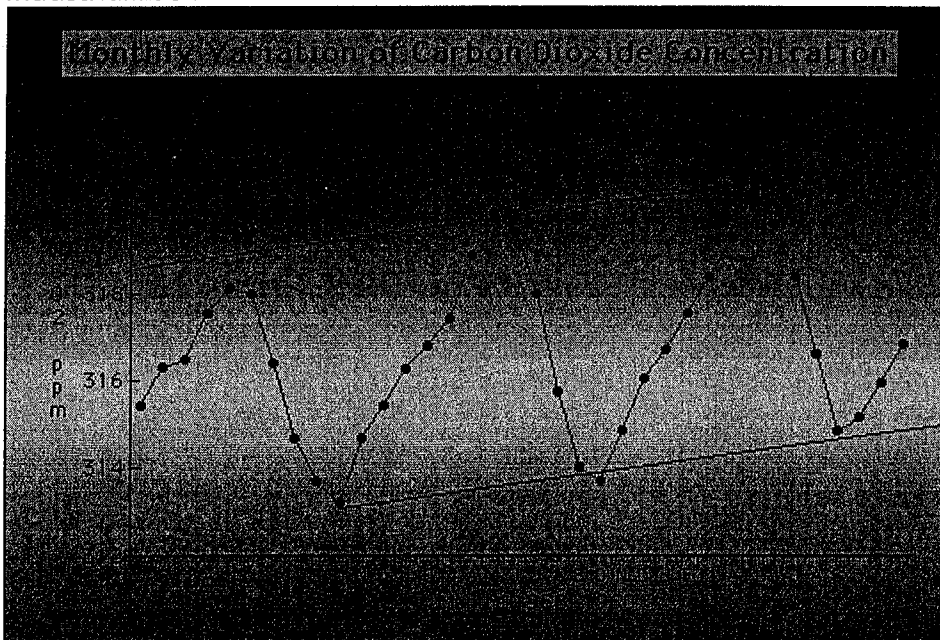


*Variation with time of the Vostok isotope temperature record
as a difference from the modern surface temperature value of -55.5 °C.*

Source: Petit et al.

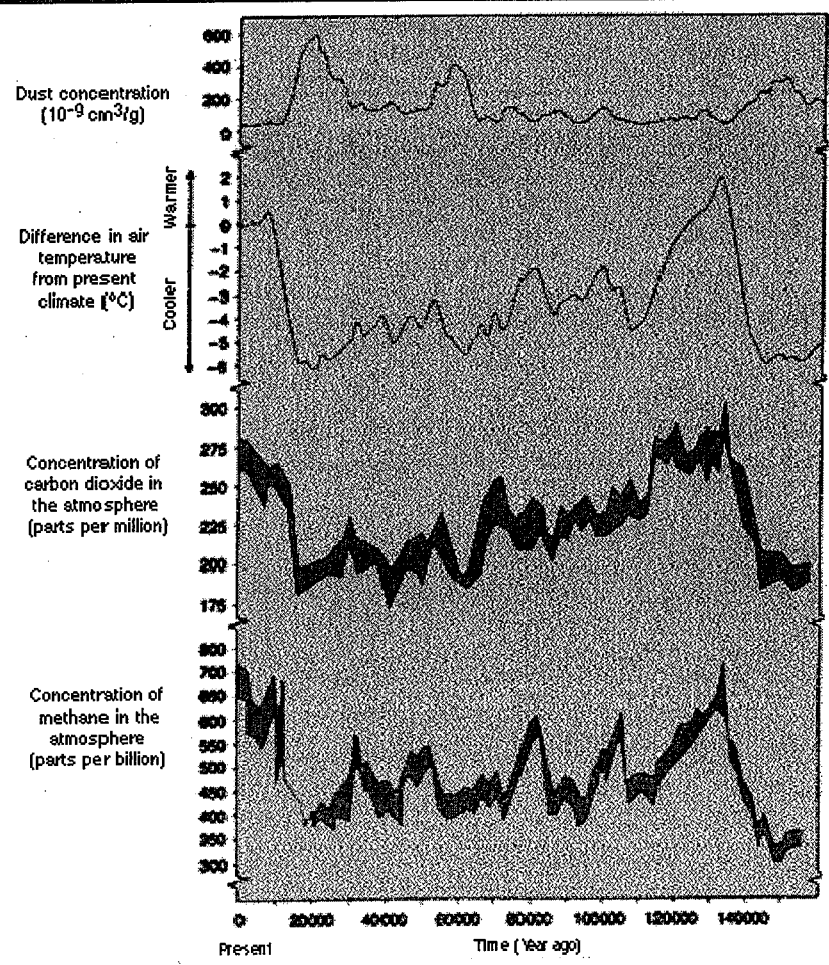
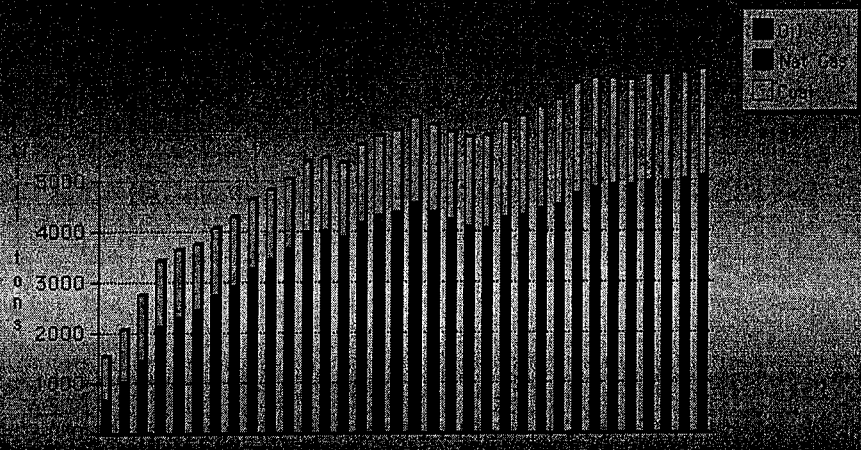


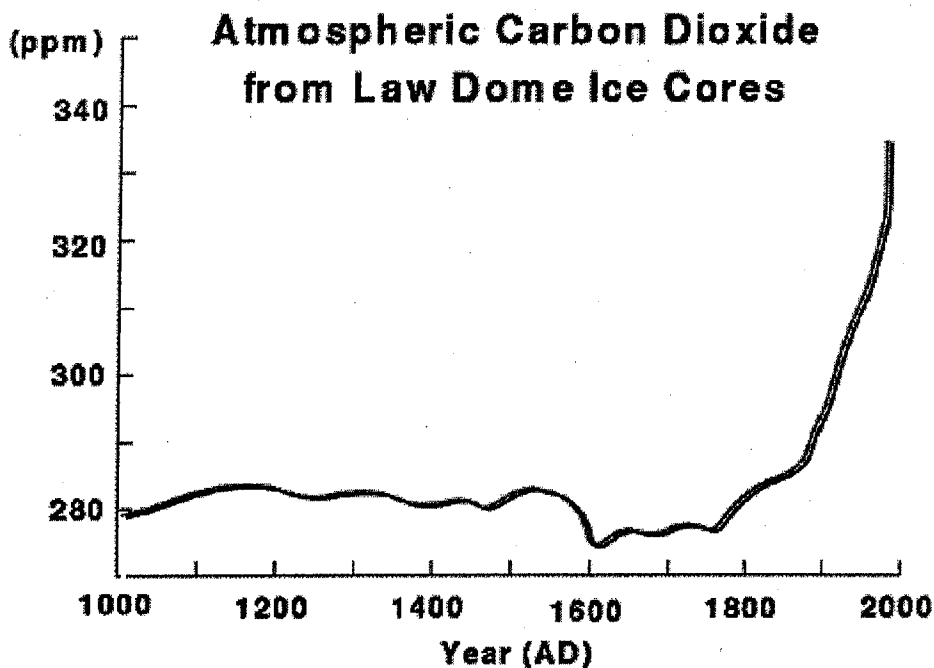
The chart below suggests that there is a positive non-seasonal trend in CO2 concentrations which might be the result of industrialization, or entirely natural processes. Its noteworthy that CO2 concentrations have been at current levels and fallen, and that these occurred well before industrialization.



The following chart suggests a declining influence by industrialization, but does not provide enough evidence either way.

World Fossil Fuel Use in Millions Tons Oil Equivalent





Alligator Rivers Region. Between 1982 and 1985 a total of 29 Aboriginal people worked directly for the Ranger mine, only 10 of whom were local Aboriginal people. By mid 1988 the mine employed only 15 Aboriginal people, two of whom were local. By 1990 employment had fallen to 13 and by 1992 to 10. In 2005 the Ranger mine has a total workforce of over 300 staff of whom 33 are Aboriginal. However, few are local. In general, the very small number of local Aboriginal

One gets the impression that uranium producers are not employing jobs. Perhaps aborigines are lacking the skills for mining, but aborigines can negotiate terms which includes some schemes to get aborigines in jobs. Preferably these schemes should have performance targets rather than a commitment of money. Likely self esteem and lack of purpose are issues likely to plague some aborigines, which might reflect their declining employment in the local industry. Industry feedback should be sought to determine why these workers have left the industry. Alternatively it might be producers pragmatically employed them for an annual report photo.

Ms B Daly King

For years I've heard from family in South Australia that animals and birds were dead around water at Roxby Downs although there was only **one** short segment of ABC reporting about this years after this was known by locals. The Aboriginals call this Roxby Downs region, including British testing sites at Emu Downs and Maralinga as *'the sick country'*.

This would be great research if anybody bothered to tell the pertinent authorities so they could perform some more objective studies.

Obituary

It seems rather timely that at the time of writing (28th Nov 2005) that 220 Chinese coal miners were just buried in a coal mining disaster. China needs our coal and our uranium. Actually over 5000 Chinese coal miners die in China every year. An enormous waste of life, but it also demonstrates that coal is killing more people than the nuclear option. I'm not suggesting

Australian coal miner death rates are anywhere near comparable. Our coal industry is among the safest in the world....but its more dangerous than uranium mining. Fatalities are of greater concern than the risk of exposure though a management mishap.

References

1. **Submission hearings:** the submissions are listed at the parliamentary website. See <http://www.aph.gov.au/house/committee/isr/uranium/hearings.htm>
2. **Greenhouse data:** See <http://cdiac.esd.ornl.gov/trends/co2/vostok.htm> (this is the best data because it dates back 450,000 years) and www.elmhurst.edu/~chm/vchembook/globalwarmA2.html (160,000 years).