

Submission to: **Inquiry: The Generation IV Nuclear Energy - Accession.**
by Noel Wauchope, 24 April 2017

First of all, I find it very strange that this agreement has been signed up to in advance, not by any elected representative of the Australian Parliament, but by Dr Adi Patterson COE of the Australia Nuclear Science and Technology Organisation, apparently pre-empting the results of this Inquiry!

I find it disturbing that this Inquiry is being held without any public information or discussion. Are we to assume that the decision to join this "Charter" is being taken without prior public knowledge?

It is a pretty momentous decision. According to the World Nuclear Association the 2005 Framework agreement *"formally commits them (signatories) to participate in the development of one or more Generation IV systems selected by GIF for further R&D."*

The Environment Protection and Biodiversity Conservation Act 1999 currently prohibits the development of nuclear power in Australia. Nuclear power cannot be approved under either the EPBC Act or the Australian Radiation Protection and Nuclear Safety Act 1998. These prohibitions are, as I understand it, supported by all major parties in Australia?

This would be an extraordinary step for Australia to take, especially in the light of the recent South Australian Nuclear Fuel Cycle Royal Commission (NFCRC) pro-nuclear Royal Commission, which, while recommending South Australia for an international nuclear waste dump, nevertheless stated that

"The recent conclusion of the Generation IV International Forum (GIF), which issued updated projections for fast reactor and innovative systems in January 2014, suggests the most advanced system will start a demonstration phase (which involves completing the detailed design of a prototype system and undertaking its licensing, construction and operation) in about 2021. The demonstration phase is expected to last at least 10 years and each system demonstrated will require funding of several billion US dollars. As a result, the earliest possible date for the commercial operation of fast reactor and other innovative reactor designs is 2031. This timeframe is subject to significant project, technical and funding risk. It extends by six years a similar assessment undertaken by GIF in 2002. This means that such designs could not realistically be ready for commercial deployment in South Australia or elsewhere before the late 2030s, and possibly later."

This was hardly a ringing endorsement of Generation IV nuclear reactors.

The South Australian Citizens Jury, Community Consultations, numerous economists, and the S.A. Liberal Party all rejected that nuclear waste plan, as not economically viable. A huge amount of preparation was done by the NFCRC in investigating the phases of the nuclear Fuel Cycle (more accurately Chain) to arrive at their rather negative view of Generation IV nuclear reactors.

That makes it all the more extraordinary that the Australian government would be willing to sign up so quickly to ANSTO's request that Australia put resources into these untested, and so far, non-existent nuclear technologies.

I hope that the Committee is aware of the present financial troubles of the giant nuclear corporations, such as AREVA, Toshiba, and Westinghouse Electric. Nuclear power is turning out to be a financial liability wherever it is not funded by the taxpayer, (as in China and Russia). (1)

The World Nuclear Association describes the Generation IV International Forum (GIF) as countries for whom nuclear energy is significant now or seen as vital in the future. Australia's situation in no way fits these criteria.

Nuclear energy is not significant now in Australia, and even the NRCRC nuclear proponents do not see it as vital for Australia's future. It is almost laughable, that right now, renewable energy systems are taking off in Australia - both as large solar and wind farms, and as a huge increase in small decentralised systems such as home and business solar panel installations.

That's where Australia should be putting its resources of human energy, talent, and funding.

The claims made by the nuclear lobby, ANSTO and some politicians, notably Christopher Pyne and Julie Bishop, about Generation IV nuclear reactors, do not stand up to scrutiny:

Non proliferation " *Furthering Australia's non-proliferation and nuclear safety objectives.*" The well-known claim that a "conventional" nuclear bomb cannot be made from these new types of reactor, might be true, to a certain extent. However, IFRs and other plutonium-based nuclear power concepts fail the WMD proliferation test, i.e. they can too easily be used to produce fissile material for nuclear weapons. The use of thorium as a nuclear fuel doesn't solve the WMD proliferation problem. Irradiation of thorium (indirectly) produces uranium-233, a fissile material which can be used in nuclear weapons. These materials can be used to make a "dirty bomb" - irradiating a city or other target. They would require the same expensive security measures that apply with conventional nuclear reactors.

If the purpose in joining the GIF is to strengthen non-proliferation and safety – why is ANSTO the implementing agent not the Australia Safeguards and Non-Proliferation Office?

Solving nuclear waste problem? Claims that these new nuclear reactors will solve the problem of nuclear wastes are turning out to be spurious. For example, Nuclear energy startup Transatomic Power has backed away from bold claims for its advanced reactor technology after an informal review by MIT professors highlighted serious errors in the company's calculations. (2) Even at the best of times, the "new nuclear" lobby admits that their Gen IV reactors will produce highly toxic radioactive wastes, requiring security for up

to 300 years.

The Integral Fast Reactor is called “integral” because it would process used reactor fuel on-site, separating plutonium (a weapons explosive) and other long-lived radioactive isotopes from the used fuel, to be fed back into the reactor. It essentially converts long-lived waste into shorter lived waste. This waste would still remain dangerous for a minimum of 200 years (provided it is not contaminated with high level waste products), so we are still left with a waste problem that spans generations. (3)

Climate change. The claim that new nuclear power will solve climate change is spurious. This ignores life-cycle CO2 emissions
Nuclear energy is not zero carbon.

Emissions from nuclear will increase significantly over the next few decades as high grade ore is depleted, and increasing amounts of fossil fuels are required to access, mine and mill low-grade ore.

To stay below the 2 degrees of global warming that climate scientists widely agree is necessary to avert catastrophic consequences for humans and physical systems, we need to significantly reduce our emissions by 2050, and to do this we need to start this decade. Nuclear is a slow technology:

The “Generation IV” demonstration plants projected for 2030-2040 will be too late, and there is no guarantee the pilots will be successful.

Nuclear Economics. For *"a time when significant expansion in nuclear power production is underway"* - this is a laughable falsehood. In reality, nuclear power economics are in a state of crisis, most notably in America, but it is a world-wide slowdown. (4)

The vagueness of the Generation IV International Forum (GIF) agreement is a worry. Australia is to formally commit to participate in the development of one or more Generation IV systems selected by GIF for further R&D. Surely Australia is not going to sign up to this, without any detail on what kind of research, what kind of reactor, what amount of funding we would be committing to the GIF.

And all this without any public discussion!

1. <https://www.theguardian.com/business/2017/apr/11/toshiba-losses-uk-moorside-nuclear-plant-westinghouse>
2. <https://www.technologyreview.com/s/603731/nuclear-energy- startup-transatomic-backtracks-on-key-promises/>
3. <https://skeptoid.com/episodes/4555>
4. <http://reneweconomy.com.au/nuclear-industry-crisis-29735/>