



NUCLEAR POWER

EXTRA:

**IAN LOWE'S ON-LINE FURTHER REBUTTAL
to BARRY BROOK'S REBUTTAL (in the book)**

WHY WE SHOULD SAY NO TO NUCLEAR POWER

THIS CONTINUES THE AUTHORS' DEBATE ON THIS HOT TOPIC, & IS PART OF **WHY vs WHY™ NUCLEAR POWER**

IAN LOWE:

Professor Barry Brook and I agree we need clean, sustainable energy supplies, that carbon dioxide from burning fossil fuels is a critical threat to civilisation and that oil reserves are limited. We disagree on the feasibility of reducing energy demand and on the capacity of renewable energy technologies to meet our needs.

In my section of the book I noted technical studies showing we could reduce energy demand considerably and meet all our needs from renewables. That is the clean energy path for the future.

Professor Brook's arguments about resources, waste management and weapons proliferation all rely on his belief that fast breeder reactors can be made to work. The fundamental technical problem is that they require enormous amounts of energy to be extracted from a small fuel assembly which, in turn, involves a cooling system that is both technically difficult and dangerous. Indeed, it is so risky that a veteran American nuclear scientist, the late Dr Alvin Weinberg—who was for 20 years Director of the Oak Ridge National Laboratory—admitted that he was not “a great believer in the liquid metal fast breeder reactor”.¹ The UK Atomic Energy Authority experimented with a prototype of such a reactor at Dounreay for decades before it gave up. The US abandoned its project in 1994. Leading American nuclear scientist Frank von Hippel concluded that it was not just safety issues that caused the US to give up on breeder reactors, but also proliferation concerns.² Noting that the Obama Administration terminated efforts by the Department of Energy to move toward near-term commercial fast reactors, he said that the new designs were “mostly paper studies” and concluded:

As this report went to press, it was debating whether to even continue R&D on fast-neutron reactors. The economic and non-proliferation arguments against such reactors remain strong.

A report from America's Institute for Energy and Environmental Research³ refutes the claim that reprocessing could manage spent fuel or produce plutonium for new reactors. About US\$100 billion has already been spent on attempts to produce commercial fast reactors, without even a proven design.

Weapons proliferation remains a huge risk. India used “peaceful” Canadian nuclear technology to produce weapons, provoking Pakistan to get the bomb. It may be that nations developing weapons will be detected, but what are the consequences? None for India or Pakistan. Nobody dares attack North Korea, precisely *because* it may have nuclear weapons, while it is an open secret that Israel has nuclear weapons, but there is no talk of sanctions.

Professor Brook's technical optimism goes as far as suggesting we could accelerate a nuclear program by building several reactors at once. This approach proved disastrous in the British Advanced Gas-cooled Reactor program; building several units at the same time precluded learning from mistakes, so there were huge blow-outs in budgets and construction time. As Australia's recent *Switkowski Report* on nuclear power showed, even an aggressive pro-nuclear approach would not meet our need to be carbon-neutral by 2050 or sooner.

Finally, Professor Brook accepts that it is impossible to prove in advance that waste can be successfully isolated for geological time. That is precisely my point. More than 50 years into the nuclear power experiment, we still don't have credible strategies to ensure waste is not a threat to future generations. Producing more is irresponsible.

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¹ Interview: Dr Alvin Weinberg, see: http://www.ornl.gov/ornlhome/news_items/news_061018.shtml

² Frank von Hippel et al. *Fast Breeder Reactor Programs: History and Status*, Research Report #8, Princeton: International Panel on Fissile Materials (IPFM), Program on Science and Global Security, Princeton University, February 2010. See: <http://www.fissilematerials.org/blog/rr08.pdf>

³ Arjun Makhijani, *The Mythology and Messy Reality of Nuclear Fuel Reprocessing*, Institute for Energy and Environmental Research (IEER), April 2010. see: <http://www.ieer.org/reports/reprocessing2010.pdf>