

Source: "Nuclear Power is the Problem, Not A Solution", an article by H. Caldicott in The Australian Newspaper, Higher Education Section, 13/4/05

"...even if we decided today to replace all fossil-fuel-generated electricity with nuclear power, there would only be enough economically viable uranium to fuel the reactors for three to four years."

Of course no one is suggesting that this be done. The uranium resources up to \$US130/kgU are enough to supply the present reactors for about 50 years. Beyond this are as yet undiscovered reserves (most of Australia has been off limits for prospecting for decades), the uranium in the ocean and the use of fast breeder reactors. The latter could extend the 50 year lifetime of the current reserves to 3000 years. See Standard Anti-Nuke Assertion No. 3.

"...the enrichment facility at Paducah, Kentucky, requires the electrical output of two 1000-megawatt coal-fired plants, which emit large quantities of carbon dioxide."

Of course this assertion pertains primarily to the US. However the Paducah plant is supplied from the TVA electricity grid connecting fossil (69%), nuclear (29%) and hydro (9%) generating plants. Thus the Paducah plant is partially supplied by nuclear.

Ref: "USEC Response on Caldicott's CFC Distortions," NEI Nuclear Notes, 15/7/05

" this enrichment facility [at Paducah] and another at Portsmouth, Ohio, release from leaky pipes 93 per cent of the chlorofluorocarbon gas emitted yearly in the US."

Of course this assertion pertains primarily to the US. Another point is that it is out of date because the Portsmouth plant closed in 2001 (It is now a National Historic Landmark). The only diffusion enrichment plant still in operation is that at Paducah. This plant uses reclaimed CFC-114 as a coolant - there is some leakage, but this is within EPA guidelines. This plant will be superseded by a centrifuge enrichment plant by the end of the decade.

Ref: "Caldicott off the mark on nuclear fuel cycle," NEI Nuclear Notes, 1/4/05

"Nuclear reactors consistently release millions of curies of radioactive isotopes into the air and water each year."

See Standard Anti-Nuke Assertion No. 8.

"Yucca Mountain has subsequently been found to be unsuitable for the long-term storage of high-level waste ..."

Of course this assertion pertains primarily to the US. However, on 16/3/05 (after irregularities were discovered in US Geological survey data) the new Energy Secretary Bodman said, "The fact remains that this country needs a permanent geological nuclear waste repository, and the Administration will continue to aggressively pursue that goal. We are committed to the safety

and protection of the citizens of Nevada as we pursue the development of the Yucca Mountain project."

An update on the situation was provided by the USDOE in a recent media release. [1] It said that the application for an operating license will go to the USNRC no later than 30/6/08 and that the facility should begin accepting spent fuel and high-level waste by early 2017.

Ref: "DOE Announces Yucca Mountain License Application Schedule," USDOE media release 19/7/06.

"Plutonium lasts for 500,000 years ..."

This presumably refers to Pu239 an isotope that has a half life of about 24,000 years, coupled with the oversimplification that it takes 20 half-lives to make it disappear. Plutonium can serve as a nuclear fuel and will be recycled in future reactors. See Standard Anti-Nuke Assertion No. 14.

"...any country with a nuclear power plant can theoretically manufacture 40 bombs a year."

Many things are theoretically possible but are not done in practice. See Standard Anti-Nuke Assertion No. 11.

Source: "Once a sunset industry, the uranium lobby paints a green dawn," an article by H. Caldicott in the Sydney Morning Herald, 12/8/05

"Nuclear power produces substantial amounts of carbon dioxide - a third of the amount produced by a gas fired plant..."

The lifetime average CO2 emissions from a nuclear plant is less than 5% that of a CCGT plant. See Standard Nuclear Assertion No. 5.

"...as the quality of high grade ores [uranium] declines more fossil fuel will be needed to extract uranium from low-grade ores, meaning the whole nuclear fuel cycle will eventually use more calories of energy than it will produce.

It is true that more energy will be required to produce uranium from lower grade ores but the current energy pay-back time is less than 6 months. Moreover if uranium becomes too expensive to mine fast breeder reactors can be used to extend the lifetime of the mined uranium by about 60 times. See Anti-Nuke Assertion Nos. 3 and 5.

"The true cost of the industry's liability in the case of an accident in the US is estimated to be \$US560bn"

This figure is probably comes from a study done in 1982 for a complete reactor meltdown and radioactive release to the environment. The probability of such an accident is miniscule. Apparently the study was done by Sandia Labs and the report to Congress was leaked to the press. The study predicted costs of up to \$US313 bn (1982 dollars).[1]

By comparison the actual cost of the TMI accident cleanup was US\$1 bn. "The cleanup of the damaged nuclear reactor system at TMI-2 took

nearly 12 years and cost approximately \$973 million. The cleanup was uniquely challenging technically and radiologically. Plant surfaces had to be decontaminated. Water used and stored during the cleanup had to be processed. And about 100 tonnes of damaged uranium fuel had to be removed from the reactor vessel -- all without hazard to cleanup workers or the public." [2]

Refs:

1. US House of Representatives Committee on Interior and Insular Affairs Sub-Committee on Oversight and Investigations "Calculation of Reactor Accident Consequences (CRAC2)" (1 Nov. 1982).
2. "Three Mile Island 1979," UIC Briefing Paper No. 48 (3/01)

Source: "Fuel plan beset by fossilised thinking," an article by H. Caldicott in The Australian, Opinion, 25/7/06

"...the nuclear fuel cycle - encompassing uranium mining, milling, enrichment, reactor construction and decommissioning, and radioactive waste storage for 500,000 years - creates large quantities of global warming gases, including CO2 and CFC."

As regard CO2 emissions - see first quote from previous article. The CFC assertion pertains to the Paducah diffusion enrichment plant in the US - see the third quote from the first article above. The assertion that radioactive waste must be stored for 500,000 years is an extension of the sixth quote from the first article above.

Source: "Risky plans fuel Australia's nuclear future," an article by H. Caldicott in The Courier-Mail, 8/8/07

"Generation IV reactors are hailed as part of a closed loop process because the plutonium can be "transmuted" into shorter-lived fission products such as strontium 90 and cesium 137 that only last 600 years instead of 500,000 years while at the same time generating electricity. But this is a vacuous plan because only 10 percent of the plutonium is converted to fission products while 90 percent remains."

This is the third claim for plutonium lasting 500,000 years in this compilation - see the sixth quote from the first article above. The contention of only 10% conversion of Pu is also a misunderstanding in that the intention is to keep recycling the Pu until it is all fissioned. See standard anti-nuke assertion number 12.