



NUCLEAR POWER MYTHS

MYTH 1 Nuclear Power Is Clean And Green - WILPF says "WRONG"

Large amounts of electricity, petrol/diesel, and water are consumed in the mining and processing of uranium to generate nuclear fuel.

Essentially a nuclear reactor is a very expensive way to boil water¹.

The actual nuclear reactor may not produce any green house gases like carbon dioxide (CO₂), but there are significant amounts of CO₂ produced in the mining and transport of the ore to the reactor.

Large quantities of water are also consumed in mining, and in some cases these can exceed the amounts used for coal mining, eg **Olympic Dam (Roxby Downs)** uses 729,000,000 litres of water a day from the Artesian Basin². This water becomes radioactive and toxic.

The problem of waste disposal from mining and processing as well as from the reactor is very large and so far unsolved. After the current expansion of BHP Billiton's Olympic Dam (Roxby Downs), it is expected that 1 tonne of radioactive tailings will be produced every second, and 10 million tonnes of tailing are produced annually³. It is stored at the mine but there are no long-term treatment and management plans for how to deal with this contaminated mining waste.

There are no solutions for dealing with spent fuel rods and other high-level radioactive waste generated from the nuclear cycle.

MYTH 2 Nuclear Power is necessary to solve Climate Change - WILPF says "WRONG"

Nuclear power plants take a long time to set up. Reports suggest 15 - 20 years before Australia would be ready to generate nuclear power⁴. **Renewable energy sources** like wind and solar power technologically are ready to be used now.

Investment in renewable technologies would create jobs and stimulate the economy. Instead the current government has chosen not to invest equivalent sums in renewable energy, and continues to preferentially fund coal research.

Nuclear and coal power generation appear cheap when the cost to the environment is not factored in and water use is ignored.

MYTH 3 Nuclear power is safe-there are safeguards in place - WILPF says "WRONG"

There is a broad belief that the International Atomic Energy Agency (IAEA) has a role in ensuring that nuclear material sold by Australia to other nations is not used for nuclear weapons. This is not true. There are **no adequate safeguards** in place to ensure this⁵.

MYTH 4 Nuclear Reactors are needed for Nuclear Medicine - WILPF says "WRONG"

The new nuclear reactor at Lucas Heights (Sydney) is not required for medical purposes. This debunks one of the central myths about the reactor: that a nuclear reactor, which itself poses risks to human health and safety, is required to supply Australia's medical sector with radioisotopes⁶.

1. Caldicott, H 2006 Nuclear Power is not the Answer, MUP
2. South Australian Parliamentary Report 19, Roxby Downs Water Leakage, Tabled 10 / 4 / 1996, session 3s48, revealed 5 billion litres of liquid tailings waste had leaked over several years
3. Uranium Mining, Processing and Nuclear Energy Review, 2006 <http://www.pmc.gov.au/umpner/reports.cfm>
4. Nuclear Power Joint Fact-Finding Report, Executive Summary, June 2007 http://www.keystone.org/spp/energy07_nuclear.html
5. Medical Association for Prevention of War Australia (MAPW) A New Clear Direction -Key Findings, August 2004, http://www.mapw.org.au/nuclear-reactors/NewClearDirection2004/key_findings.html
6. Medical Association for Prevention of War Australia (MAPW) A New Clear Direction -Key Findings, August 2004, http://www.mapw.org.au/nuclear-reactors/NewClearDirection2004/key_findings.html



NUCLEAR TERMINOLOGY

Radioactive:

When a material is radioactive it emits radiation (like X-rays, gamma rays). Radiation can affect the DNA structure causing cells to die or mutate resulting in cancer and other radiation caused diseases. By affecting the DNA of cells, these health effects can be passed down through generations. Radioactive particles and gases can also contaminate the food, water and land, increasing our exposure to radioactivity. No dose of radiation is safe and all radiation is cumulative in the body.

Uranium and plutonium:

Uranium is the material most often used in nuclear power generation. Uranium oxide is mined, and Australia has 40% of the world's reserves. When it is used to generate power, it produces plutonium as a waste product, another radioactive material. Both uranium and plutonium are used in nuclear weapons. Uranium 235 is enriched from 0.7% up to 3% for use in electricity generation. It can be enriched to over 50% for use in nuclear weapons. After enrichment, the waste produced is called Depleted Uranium.

Depleted Uranium:

Uranium 238 is called "depleted uranium" as it has had most of the Uranium 235 removed from it. It is radioactive. It is used in weapons, as it is heavier than lead and will easily cut through steel. When it explodes, it creates a radioactive gas that contaminates the surrounding area. It has a half-life of 4.5 billion years.

Half-life:

The half-life is the number of years it takes for the radioactivity level of a material to be half of what it was at the start. So for depleted uranium it takes 4.5 billion years for the radioactivity level to halve. Radioactive iodine has a half-life of 8 days. In practice the half-life is multiplied by 10 or 20. Radioactive iodine 131 remains active for approximately 160 days; depleted uranium remains radioactive for 90 billion years.

Hiroshima and Nagasaki:

The cities in Japan, where on 6th and 9th August, 1945 the first two nuclear bombs were dropped on civilian populations killing over 100,000 people immediately. The long-term effects of these attacks are still being felt today, with cancer and other illnesses being experienced by the children and grandchildren of survivors. These events are remembered each year as Hiroshima Day.

Nuclear Cycle:

Refers to all of the steps that are involved in creating nuclear energy or weapons. The process of enrichment can be used to make material for power generation or weapons; it is just a question of how far enrichment is taken. It is not possible to guarantee that Australian uranium is not used in weapons as it is not possible to track where the uranium has come from after it has been transformed into uranium hexafluoride. Used fuel rods are reprocessed to recover plutonium to be used in weapons. Only a few kilograms of radioactive uranium or plutonium are needed to make a nuclear weapon.

And in addition CO₂:

Carbon dioxide is known as a greenhouse gas and is a main contributor to global warming. It is produced when materials containing carbon, such as coal, coke, gas, petrol, and wood are burnt in air. It is a main waste gas from the production of electricity using non-renewable methods.

1. Caldicott, H 2006 Nuclear Power is Not the Answer, MUP.



HARM FROM NUCLEAR POWER

Where are the radioactive waste dumps proposed in Australia?

In the Northern Territory (NT) less than 20 kilometres away from Aboriginal settlements. The proposed sites are at Muckaty Station, Mt Everard, Harts Range and Fisher's Ridge. Recent Federal Government initiatives against Aboriginal people in the NT may mean that they lose the right to bargain about how their land is used and who can have access to their land.

Where do we currently store radioactive waste?

At Lucas Heights in Sydney in a residential urban area, at the Beverly Uranium Mine, and also at Olympic Dam (Roxby Downs) in South Australia where 10 million tonnes are produced annually and are held underground causing risk of contamination to the groundwater¹.

Problems with waste.

There is still no permanent repository anywhere in the world for the long-term disposal of high-level nuclear waste. Nuclear waste has enormous financial, environmental, medical, social, and environmental costs to life on earth, and will be a burden for many future generations.

How is waste transported?

Waste is transported by land and sea through populated and environmentally sensitive areas using ordinary road transport, goods trains and ordinary ships. There is no guarantee of safe transport.

How and why is nuclear power generation harmful?

All radiation has negative effects on life. It can cause changes to cell structure and result in cancer. There is no safe mechanism for waste disposal and there is no safe protocol for dealing with nuclear accidents. The nuclear accident at Chernobyl (1986) immediately exposed **8.4 million people** to radiation, has resulted in the deaths of tens of thousands of people and will continue to claim victims for decades to come².

What can go wrong?

Leaks, spills, accidents, sabotage and terrorism can all occur at nuclear power plants. Traffic accidents and rail accidents or sabotage can cause leaks and spills. Terrorism can include theft of the waste for reprocessing into weapons of mass destruction. Only small amounts of several kilograms are needed for this. All safeguards are inadequate³.

What is a nuclear incident/accident?

It is an uncontrolled release of radioactive gases, liquids and radiation from mines, power plants, transport journeys or waste dumps.

What are the generational effects of the Nuclear Cycle?

The nuclear cycle consists of uranium mining, enrichment of the ore into fuel for a nuclear reactor and/or weapons production, and reprocessing. All parts of the nuclear cycle produce radioactive waste and contamination. The nuclear industry, including uranium mining, creates enormous risks, costs and contamination for future generations.

1. Vincent E(Ed) 2006 Yellowcake Country, Friends of the Earth
2. Caldicott H 2006 Nuclear Power is not the Answer, MUP
3. Empowering Change 2007 Friends of the Earth and the Australian Conservation Foundation



NUCLEAR POWER COSTS

The true costs involved in nuclear power generation come from all stages of the nuclear cycle and are not counted in the public accounts provided by the Federal government:

Land Acquisition /Compensation	Transport
Mining	Power Plant Decommissioning
Crushing and Milling	Waste storage, treatment and disposal
Extraction of Uranium from ore	Security at all stages
Enrichment	Concrete and steel manufacture involved in building plants and storage areas

Costs can be thought of in terms of **dollars, CO₂ emissions and water consumed**. Energy is needed for all of these stages and this energy is currently obtained from fossil fuels (coal and gas).

Costs of nuclear energy usually exclude the costs of reactor decommissioning, waste storage and disposal, and understate the costs of accidents (which are generally the problem of governments, not the company providing the power). It has been the case in both the UK and US for large government subsidies to be made to make nuclear power profitable for power companies and shareholders.

Reports do not compare nuclear power and renewable power on a level playing field. Similarly there is little real comparison in terms of greenhouse gas emission. The nuclear reactor is talked of as a separate unit and the other activities that are associated (eg mining) are not factored into the discussion on costs and CO₂ output.

Health care costs of nuclear power are not factored into the cost for nuclear power generation. These are paid for by the public health system, despite the fact that there are greater risks for workers in the nuclear industry, the local community, and in particular the indigenous communities where waste dumps have been located (as in the US). Many health care costs do not become apparent for generations.

Nuclear power emits **three times more greenhouse gases than wind power** according to the 2006 Switkowski report. Nuclear power is also far more greenhouse intensive than energy efficiency measures¹.

Nuclear power is not renewable energy. Currently 3.5 million tonnes of high-grade uranium ore exist worldwide. With current consumption rates this high-grade ore will be used within 50 years. Then lower grade uranium ores will be mined, mining costs will increase, as will the amount of CO₂ emitted and water used in its production².

Costs associated with the treatment and disposal of mining waste are high when they are treated to make them safe. In the US, millions of tonnes of radioactive waste are dumped on the ground, often on native American tribal land, emitting radioactive elements into the air and water. Burying and treating this waste is not done as it makes the cost of nuclear energy unprofitable³. A similar situation would exist in Australia.

1. Green, J 2007 10 Reasons to say NO to Nuclear Power in Australia, FOE
2. Diesendorf, M and Christoff, P 2007 "Economics of Nuclear Power" FS01, www.energyscience.org.au
3. Caldicott, H 2006 Nuclear Power is Not the Answer, MUP, Chapter 1.



8 ACTIONS TO MAKE A DIFFERENCE

1. Join WILPF:

Join the Women's International League for Peace and Freedom and promote peace in the world that is safer without nuclear power or weapons.

2. Sign the ICAN (International Campaign to Abolish Nuclear Weapons) petition:

The ICAN petition demonstrates to government leaders that there is strong popular support for total nuclear disarmament. <http://www.icanw.org/petition> and join the mailing list: ICAN bulletins include the latest on nuclear disarmament news from around the world.

3. Get the word out:

Let your friends and family know about WILPF and ICAN – get them involved. Come up with innovative ways to spread the word. Have a conversation each week with someone you know about the topic. Use the fact sheets for more information. Talk to everyone you know. If you are nervous about speaking up, go to a local TAFE or community college course on confident speaking.

4. Get informed:

To be a good campaigner, you must be informed! Visit www.icanw.org Get the 6 minute video from ICAN www.icanw.org/launch-video, Visit the ICAN Blog at www.myspace.com/icanw Join the No Nukes News list. Get more information from www.nuclearfree.com.au and WILPF's www.reachingcriticalwill.org

5. Call for disarmament:

Urge your government to support a Nuclear Weapons Convention! Write to your local member, and all of the opposition candidates asking what action they will take to achieve this.

6. Create a nuclear-free zone:

Make your school, workplace or local council an unofficial nuclear weapon free zone!

7. Contact your local candidate and ask them these questions:

- Have you considered what the damage is from nuclear energy generation and nuclear weapon use?
- Have you considered the long-term costs of mining uranium, as well as the greater costs to the community in terms of health and safety?
- How can you ensure that Australian uranium is not used in nuclear weapons, when the IAEA can't ensure this?
- Have you considered what legacy uranium mining, electricity generation and weapon use will have for future generations?
- What real actions will this government take to support the Nuclear Non Proliferation Treaty, and ask why it is acceptable for the Coalition now to sell uranium to India who refuses to be a signatory to this global treaty?
- Ask for support of a total ban on nuclear power generation in this country, support for the cessation of mining uranium and real support for investment in renewable energy supply.

8. Sign up for green power from your electricity company today:

Some companies will charge you the same for green or coal power. Make the switch today.