Submission No 26

INQUIRY INTO URANIUM MINING AND NUCLEAR FACILITIES (PROHIBITIONS) REPEAL BILL 2019

Name: Mr Steven Noble

Date Received: 17 September 2019

Inquiry Into *Uranium Mining and Nuclear Facilities (Prohibitions) Repeal Bill 2019*

Submission by Steven Noble of Wollongong, NSW

I support nuclear power for many reasons, but by far the most important one is that there is no realistic decarbonisation scenario that does not involve it. However, despite the important role that nuclear is playing in helping many countries to reduce their greenhouse gas emissions quickly, the *Uranium Mining and Nuclear Facilities (Prohibitions) Act 1986* forbids the use of nuclear power in NSW, alongside similar restrictions at the federal level.

How can we explain these strange restrictions? It's because nuclear science is viewed by many people to be unusual. Not a technology that is so commonplace it's even the reason our smoke detectors work. Not a key component of every single scenario the IPCC has ever published. Not the reason that Australian nuclear medicine saves countless lives across the state and around the world.

The reality is that nuclear technology is already a normal and indispensable part of our modern lives. But the common view has a grain of truth — this technology is also unique in a way that needs to be fully appreciated.

Why? The answer lies in Albert Einstein's famous equation: $E= MC^2$.

In this equation:

- M is matter — such as the fuel consumed by a nuclear power plant
- C is the speed of light in a vacuum — roughly 300,000 kilometers per second
- C^2 is that speed squared — roughly 90 billion kilometers per 'square second'
- E is energy

In other words, the amount of electricity created by a nuclear power plant is roughly 90 billion kilometers per 'square second' multiplied by the amount of fuel that it consumes.

$E=MC^2$ is why nuclear power requires so little fuel. A lump of uranium the size of a can of soft drink can produce enough energy to support a first-world lifestyle for a person for an entire lifetime. Australia's first nuclear power plants could feasibly be operated on the uranium that is already extracted as a by-product of mining for other elements such as copper.

$E=MC^2$ is why nuclear power plants produce such a tiny

> It's important to consider all the raw materials required by every power generation technology. That includes fuel, construction materials and decommissioning. It also includes the new power lines and storage required by some technologies, as well as gas plants and diesel generators that are deployed to compensate for their reliability issues. These materials should be measured against the total CO2 displaced across the entire life of the plant. Right now, nuclear is the only technology that is routinely held to this standard.

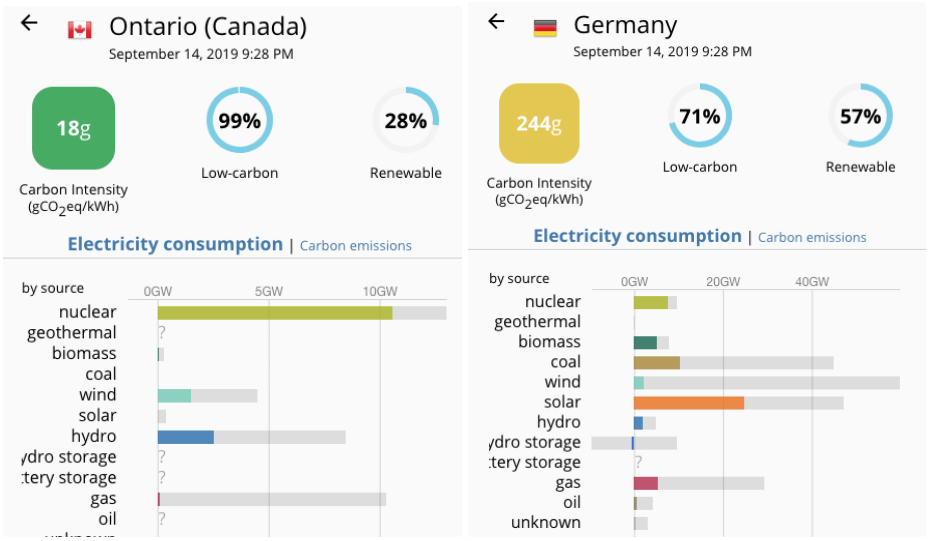
amount of waste. For example, all the waste ever produced by Switzerland's nuclear power program currently sits in dry casks that fill a space about the size of a basketball court.

$E=MC^2$ is one of the reasons that a study published *in the Lancet (vol 370, p979–990) f*ound that nuclear was one of the safest ways to produce electricity. It's not just that individual nuclear power plants tend to be very safe. It's that nuclear power plants produce such an immense amount of power that their risk per gigawatt hour is miniscule.

> The nuclear power sector has had just one fatal disaster in its history, at Chernobyl. Even the tragic loss of life that occurred there — up to 100 people killed in the short term and up to 4000 shortened lives in total, according to the WHO — pales in comparison to the 171,000 to 230,000 people killed by the collapse of the Banqiao hydroelectric dam in 1972. Most people attribute the tragedy at Banqiao to the dangers of heavy engineering under a dictatorship rather than the danger of building dams, despite the fact that dam failure regularly kills people to this day. The same principle should be applied to Chernobyl.

$E=MC^2$ is one of the reasons why countries from Sweden to South Korea that have invested in nuclear power benefit from immense amounts of cheap, reliable power, even if nuclear is not always the cheapest way to roll out the next sliver of generation capacity.

Finally, and most important of all, $E=MC^2$ is one of the reasons why nuclear power has a far stronger track record than any other technology when it comes to decarbonising electricity grids. It's not just that nuclear power plants operate 24/7 — though that is incredibly important. It's also the fact that nuclear power plants produce such an immense amount of reliable energy. This is why they make it practical to retire other sources of generation. Without reliable low-CO2 power generation — whether that be from nuclear, hydro or geothermal — economies have always found it impossible to wean themselves off reliable high-CO2 sources of power like coal and gas, as Germany's €150 billion renewable energy push has made tragically clear. The country sources 57% of its electricity from renewables, and its electricity grid still outputs more than 13 times the CO2 of Ontario.



Despite its overwhelming strengths, nuclear faces a number of obstacles in Australia today. These challenges could be addressed in many different ways at the federal from carbon pricing to a cap-and-trade system to nationalising the electricity grid, and I would support any of these options. At the state level, it is vital that NSW supports this transition by:

- Removing all legal bans on nuclear power in NSW, so it can be accepted or rejected on its merits
- Including nuclear power as an equal partner in all NSW energy policies, including consideration of any future NSW-owned or NSW-subsidised generation capacity
- Work with NSW local governments to normalise the treatment of all nuclear technology in all its forms, from radiotherapy to smoke detectors to nuclear power
- Build on NSW's national leadership in nuclear science through deepened co-operation with and support for the world nuclear science experts at ANSTO