

To the committee,

Australia does need to consider large nuclear installations for power generation and advanced manufacturing. Until very recently anti-nuclear power campaigns have been meaningless in Australia simply due to the lack of industrial base and energy grid of sufficient scale to be compatible with a nuclear power plant.

Nuclear power has become feasible recently simply due to international recommendations that any nuclear power plant should only be considered for participation in an energy grid where the scale is such any particular plant is at most 10% of the generating capacity of the total generating capacity due to the frequency disruption and instability caused by a generating plant tripping. Total network demand now consistently exceeds 20GW across the national grid. A standard reactor is generally designed for a capacity of 2x1000MW.

A nuclear reactor provides very cheap power that attracts industrial investment and development. Maintenance and decommissioning costs are often cited as arguments against often cited cheap power but even factoring these costs, it still provides very cheap energy. The lifecycle is often considered to be about 100 years over which time it operates for 30-50 years. Decommissioning costs are unknown, can not be factored into the cost of the plant and so it must be assumed that they will form a permanent scar upon any city or landscape in which they are constructed. No large land based nuclear power plant has ever been decommissioned resulting in only fictitious estimates being cited. The same is true for fossil fuel plants that now house solar fields for air quality monitoring. Unlike other types of former industrial sites, it's not possible to simply pave over the entire site and construct residential blocks.

Nuclear power is generally sought due to its potential for nuclear weapons manufacturing. This provides some relief in the form of reassuring other nations that any nuclear weapons manufacturing country's lifespan is limited and likely to collapse under the weight of its stockpiles of irradiated weapons grade fissile material. I would like some reassurance in the form of legislation that Australia will not develop a nuclear weapons manufacturing program and that there is no intention to construct breeder reactors. Or depending on strategic needs that there is a hard cap on the the number and or collective destructive power of such munitions. That such matters remain open to parliamentary debate and not relegated to executive discretion. Additionally that enriched materials will not be exported to any conflict region or a lesser developed state.

Nuclear power would permit Australia to competitively produce green aluminium and stabilize global production. Norway, Sweden and Germany for example emptied their dams to meet export market demand and their extensive hydroelectric infrastructure has collapsing capacity due to receding glacial water sources that feed the reservoirs. Or maybe it was the war in Ukraine and Russian gas etc. as reported but no. I am unconvinced due to the huge jump in aluminium exports.

Solar panels are made in nuclear reactors. Nuclear reactors are essential to the global semiconductor supply chain via their ability to perform Neutron Transmutation Doping. Consider your last cup of tea or coffee. The dregs and left over solutes and emulsions at the bottom of the mug or the ring of coffee stain around the mug. This is the problem that NTD solves when trying to produce a highly uniform materials. Mixing molten silicon or GaN with impurities in a cauldron will produce a non-uniform material. NTD solves this material uniformity problem by transmuting in situ atoms held within the solid high purity crystal lattice uniformly such that trillions of transistors can be fabricated with uniform electrical characteristics from a single wafer. manufacturing high tech materials such as those required for aerospace and extreme environments demands access to nuclear reactors. Material science is also a lucrative Intellectual Property generating industry restricted to only the wealthiest of nations. I would suggest requesting information from Dr. Vitali Polonski, operations manager for the Silicon Irradiation Facility at ANTSO on this critical industry and considerations for future nuclear installation planning that could improve Australia's advanced manufacturing capabilities. What is

the ideal design for modern and emerging materials processing? This is often neglected in the literature and an after thought to reactor design.

There are many reasons to consider the expansion of nuclear technology.

Robert Heron

[REDACTED]

Cairns City
4870, QLD