

Review of: "[Commentary] Fallacy of Abundant Cheap Nuclear Energy"

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Potential competing interests: No potential competing interests to declare.

The author needs better exposure of the fundamentals of nuclear power as several statements are not based on facts. The increased urgency of dealing with mitigation of the looming climate change has sparked renewed interest in the nuclear energy option in spite of safety-related issues highlighted by Three Mile Island, Chernobyl, and Fukushima. While fossil fuelled power causes most emissions on the power plant site, the majority of greenhouse gas emissions in the nuclear fuel cycle are caused in processing stages upstream and downstream from the plant. The most popular reactor types, LWR and HWR, need, on average, about 0.2 kWhth for every kWh of electricity generated. Energy payback times are around 7 years. It is important to bear in mind that the burnup of fuels and thereby the lifetime of a reactor is extendable beyond the original estimate of around 35 years. In addition, uranium-bearing ores are often mined for other metals as well. The author has unnecessarily brought in the energy input issue for the production of plutonium as it is a byproduct in spent fuel. Thus, energy input needs to be apportioned for the recovery of other valuables. Depending on a number of factors such as the greenhouse gas intensity of the background economy and the grade of uranium ore mined, these energy intensities translate into greenhouse gas intensities for the LWR and HWR, with an average of 65 g CO₂-e/kWhel. These greenhouse gas emissions are expectedly lower than those of fossil technologies (typically 600–1200 g CO₂-e/kWhel).