Nuclear power has at least three potential forms of waste, all of which are dangerous to the environment. The question is if these streams of waste are better or worse for the environment when compared to conventional coal power generation waste streams. To compare the different power generation methods we will look at the physical environmental impact, the atmospheric impact and the impact to people living in the production location of these forms of power.

The physical environmental impact of a form of power generation is the effect the generation plant has on the local flora and fauna and the effect the plants discharge has on local natural resources such as water and minerals. First we will look at Coal's effect on the physical environment. The by-products of coal power production include coal sludge, heavy metals, and fly ash. Coal sludge is a liquid coal waste produced in the mining stage of coal. Coal sludge is comprised of heavy metals such as mercury, arsenic, beryllium, and other metals. An estimated 13 tonnes of mercury and over 3000 tonnes of arsenic are dumped into reserves each year. These metals have a profound effect on the flora and fauna of the ecosystems around the coal generation plants.

All of these metals can have devastating effects on the local wildlife in the locations they're dumped in. Arsenic compounds can cause chronic and acute effects in animals and humans. These effects can be lethal or lead to reproductive issues due to their effect on organ development. Environments with a high concentration of arsenic tend to have limited species diversity and a lack of a large population of these species. At a certain point of concentration, only species resistant to arsenic can survive. Severe neurological effects have been observed in animals and humans when exposed to high concentrations of mercury. Significant neurological effects have been observed in birds when exposed to concentrations as low as 0.05 to 2.0 mg/kg of mercury. At this levels, birds develop difficulties flying and other abnormal behaviour.

Compared to coal, nuclear power is a much safer alternative power method. This can mostly be attributed to the higher standard of regulation on nuclear waste by the government and environmental agencies. A higher standardization of disposing nuclear waste means that less of it ends up in the environment. UN Nuclear Regulatory Commission splits nuclear waste into 4 categories depending on the levels of background radiation and how long it will last in the environment. The waste produced by nuclear generation plants is packed into casks that have neuron absorbers built into their cases and are insulated with inert gas. These are then stored in a ventilated storage module made of concrete and steel for redundant protection. All of this compared to the radioactive waste produced in a coal factory, known as fly ash, that is simply buried and dumped into the environment.

Compared to coal, Nuclear power is a much safer and cleaner alternative power supply. The effects of fly ash on the environment are devastating to the wildlife and plant life surrounding the plants. Comparing coal to nuclear based on the containment and effects on the local wildlife, it is sufficient to say that Nuclear power is safer than coal power.

http://www.inchem.org/documents/ehc/ehc/ehc224.htm

https://wedocs.unep.org/bitstream/handle/20.500.11822/11718/final-assessment-report-25nov02.pdf

http://www.precaution.org/lib/08/prn_is_coal_green.081106.htm