

Apparently, substantially safer designs for nuclear reactors are now available. But the safe storage and disposal of nuclear waste is a significant challenge and a yet unresolved problem. Presently, waste is stored at over a hundred facilities across the country, within seventy-five miles of the homes of 161 million people.

The major problem is the longevity of the waste – plutonium will be dangerous for 250,000 years. Although we may be able to model the geologic and physical processes at some geographic sites over such time periods, no one seems to have a clue about how to model possible changes in human behavior and society. Thus, by producing nuclear waste, we are leaving our descendants with a dangerous problem, while having no real idea how competent they will be to handle it. Assuming we care about their welfare, we seem to be taking a serious gamble at their expense.

In the short run, it is not feasible to eliminate existing nuclear facilities. The tougher problem is the basic question of whether to continue producing substantial quantities of waste in the medium to long-run.

In the medium run, we have to think seriously about the upside benefits of nuclear power and whether they are enough to the risk to later generations. Upside benefits seem likely mostly in terms of avoidance of carbon emissions, so as to limit what we have already seen to be the severe downside risks of climate change. Whether nuclear should be part of the medium-term strategy depends in part on how optimistic we are about alternate technologies.

In the long-run, however, it is hard to see how we could justify continued production of nuclear wastes, given the tremendous uncertainties about containment – at least if we care about the welfare of distant generations. There may be alternative ways of using nuclear reactions to produce power that do not result in the production of such long-lived, dangerous waste. But as other non-carbon energy sources such as solar become more widespread and cost-effective, the upside benefits from nuclear will fade, leaving us in a situation where the imposition on our descendants becomes increasingly hard to justify.