Dan Barrett
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Nuclear Power is Not the Answer to Climate Change

With the reality of climate change becoming more and more urgent some people have turned their attention to electricity production technology that does not rely on fossil fuels and does not emit carbon dioxide. It is natural that nuclear power plants be explored as an alternative to the dirty coal and oil power plants on which we currently rely for the bulk of our electricity generation in the United States. Faced with this opportunity to make a profound change in one of this country's most polluting industries it is imperative that we make the right decision. Nuclear electricity generation is inferior to renewable sources of generation in several ways.

Possibly the most obvious downside to nuclear power, is safety. Since 1952 there have been thirty-three accidents determined to be serious (Rogers), and countless others around the world that are deemed less serious but are often still extremely expensive to clean up or repair. The most famous, and most deadly, nuclear accident is the Chernobyl meltdown and explosion which occurred on April 26, 1986. Poor design and human error combined to cause a massive explosion and subsequent fire that spread radioactive material throughout the area for 10 days (*0. Introduction*). The direct death toll from that disaster is difficult to know, estimates range from 31 to 50 deaths, but the United Nations estimates that as many as 4,000 more might ultimately die from the radiation released in that accident, and, tellingly, the Ukrainian government is still paying benefits to 36,000 wives who lost their husbands thanks to the meltdown (Gray). Serious nuclear accidents do not merely kill, they also displace vast numbers of people. Radiation from the Chernobyl explosion forced 220,000 people to evacuate nearby areas (*A Brief History of Nuclear*

Accidents Worldwide | Union of Concerned Scientists) leaving the city of Pripyat completely uninhabitable to this day. The more recent Fukushima accident in Japan forced as many as 500,000 people to evacuate when hydrogen explosions caused by an uncontrolled nuclear reaction compromised reactor containment (*A Brief History of Nuclear Accidents Worldwide | Union of Concerned Scientists*).

Waste disposal is also a serious problem for nuclear power. Radioactive waste is produced not only from the plants themselves, but also from the uranium enrichment process (*Wayback Machine*). The United States has over 88,000 tons of radioactive waste for which it has no long-term storage or disposal plan ("How Nuclear Power Works"). Nuclear waste can remain radioactive for around 250,000 years, with a minimum of 10,000 years for it to reach radiation emission levels that are thought to be safe for humans (*Wayback Machine*). With these power plants estimated to generate an average of 30 tons of such material each year (*Wayback Machine*) a long-term disposal plan is absolutely essential to justifying nuclear power as the go-to electricity generation technology.

Another huge hurdle that nuclear power plants must get over is their cost. Nuclear reactor construction is routinely plagued by delays and enormous cost overruns and these uncertainties have led private investors to avoid nuclear power plant projects (*Nuclear Power Cost | Union of Concerned Scientists*). The nuclear industry has instead turned to government subsidies to stay afloat, meaning that taxpayers could have to pay up to $1.6 trillion for new plants (*Nuclear Power Cost | Union of Concerned Scientists*). And those hefty subsidies do not guarantee anything close to cheap electricity. Nuclear power is by far the most expensive means of producing electricity. In 2020, electricity from nuclear plants costs $117 per megawatt hour, versus a mere $52 for wind power and only $48 for solar power ("Cost of Building Power Plants in Your State"). This means that private consumers

must pay twice, once to subsidize the construction and operation of nuclear power plants and again for the electricity those plants provide.

In any discussion of how to mitigate climate change, it is necessary to look at the sustainability and environmental impact of a proposed solution. Mining the uranium used as fuel in nuclear reactors is no better for the environment than any other kind of mining and, since most of the world's uranium deposits are in politically unstable countries, relying on this fuel is as politically unsustainable as it is environmentally unsustainable (*Wayback Machine*). Even discounting geopolitics, investing in nuclear energy would mean only delaying addressing the problem since "…global reserves of uranium will only support a growth in nuclear power of 2% and only be available for 70 years" (*Wayback Machine*).

While it is true that carbon dioxide emissions from nuclear power plants is close to zero, that is not the whole environmental story. All nuclear reactors require massive amounts of water to cool the core. Plants in the United States, on average, take more than 57 million gallons of water daily (*Wayback Machine*). In times of drought that could mean scarcity for others or, perhaps worse, a shortage of cooling water within the reactor that leads to another massive accident.

If the goal of investing in nuclear power is to reduce greenhouse gas emissions from our national electricity production, then there are better and safer ways to accomplish that goal. Wind, solar, and geothermal technologies combined receive roughly three times less taxpayer money than the nuclear industry does (*U.S. Energy Information Administration (EIA)*). Investing more in nuclear power does nothing to solidify long-term energy production, in fact it undermines that goal by taking money that could be better spent on cleaner, safer, cheaper, and more sustainable technologies.

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