Why nuclear power slows action on climate change

AN ANALYSIS BY AMORY B. LOVINS

Expensive, slow energy options save less carbon than cheaper, faster ones. Nuclear power is far slower and more expensive than renewables. This makes the renewable choice the clear winner over nuclear power.

- To protect the climate, we must save the most carbon at the least cost and in the least time, counting all three variables – carbon *and* cost *and* time.
- Costly options save less carbon per dollar than cheaper options. Slow options save less carbon per year than faster options. Thus even a low- or no-carbon option that is too costly or too slow will *reduce* and *retard* achievable climate protection. Being carbon-free does not establish climate-effectiveness.
- To compare nuclear power with other potential climate solutions we should start with two criteria – *cost* and *speed* – because if nuclear power has no business case or takes too long, we need not address its other merits or drawbacks.

- Building new reactors, or operating most existing ones, makes climate change worse *compared with spending the same money on more-climate-effective ways to deliver the same energy services*.
- New nuclear electricity keeps getting costlier while renewables keep getting cheaper.
- Most US nuclear reactors now cost more just to run – including big repairs that trend upward with age – than their output can earn. They also cost more just to run than providing the same services by building and operating new renewables, or by using electricity more efficiently.

- Battery storage, though often cost-effective today, is rarely needed to "firm" the varying output of solar photovoltaics and wind power, because there are eight ample cheaper methods.
- Average nuclear operations – just to run existing nuclear plants, not to pay for building and financing them – *now cost more than building and running new modern renewables*, with or without their temporary subsidies.
- During two recent three-year periods, average nuclear operating costs fell as the worst reactors were closed, but renewable prices fell even faster. Nuclear operating costs will be hard to cut much further in reactors averaging four decades old, but renewable prices promise strong further declines for decades to come.
- Closing one of the two dozen costliest-to-run US nuclear plants and *buying efficiency instead*, as utilities could volunteer or regulators require, *would save considerably more carbon than continuing to run that nuclear plant*. Some modern renewables too can now rival efficiency's cost and could compete for that opportunity.
- In the United States, the climate-effectiveness of continued nuclear operations is not discussed; the conversation focuses solely on carbon, not on cost or time.

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- The 170-year-old financial house Lazard examined prices for different ways to generate a megawatt-hour of electricity and found nuclear power to be the most expensive, at $118–192/MWh (of which $29 is typical operating cost). Utility-scale solar power cost just $32–42/MWh, and onshore wind power cost $28–54/MWh. Previous editions also listed efficient use of electricity at $0–50/MWh, typically around $25/MWh.
- While we close coal plants to save carbon directly, we should *also* close distressed *nuclear* plants and reinvest their large saved operating cost in cheaper options to save carbon *in*directly. These two climate-protecting steps are not alternatives; they are complements. Doing both will save more carbon than doing either step alone.
- Replacing a closed nuclear plant with efficiency or renewables empirically takes only 1–3 years. If owners don't give such advance notice—a common tactic to extort subsidies by making closure more disruptive—more natural gas might temporarily be burned, but then more than offset over the following years by the carbon-free substitutes.

- Rapid nuclear growth occurred over three decades ago under conditions that no longer exist, while comparable or faster renewable growth is here, now, and accelerating. Modern renewables, which omit big hydro, grew faster worldwide in the past decade than nuclear power's fastest growth, more than three decades ago.
- Nuclear plants take many years to build, typically around a decade, while renewable projects can take a year or less—even months or weeks. National nuclear power programs also need three times as much lead time for institutional preparations as modern renewables need. For both reasons, renewables can start saving carbon many years sooner.
- Both project-level and program-level nuclear slowness incur a big carbon penalty. Being both slower *and* costlier than its modern competitors makes nuclear power doubly unhelpful for protecting the climate.

- Sustaining uneconomic reactors would not only divert public funding from more climate-effective competitors but also constrain their sales and degrade the competitive markets where they thrive. Slowing and blocking the fastest and cheapest climate solutions harms climate protection.
- The nuclear industry seeks its own sales arrangements protected from competition, its own prices determined by political processes rather than markets, and diminished opportunities for its carbon-free competitors to express their value, reach their customers, and discover their own prices. This is hardly in the national interest or helpful for climate protection.
- Citizens who care about climate should vigorously defend markets' ability to choose climate solutions that can save the most carbon per dollar and per year.

These talking points are drawn from Amory B. Lovins' article in Forbes magazine – "Does Nuclear Power Slow Or Speed Climate Change?" An edited version of the article was also published on the Beyond Nuclear International website.

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MARCH 2021