



Climate Change and why Nuclear Power Can't Fix it

The pursuit of nuclear energy as a climate change solution inhibits the necessary rapid development of solutions that are effective, available, less expensive, safer and more environmentally acceptable.

Nuclear power does have a carbon footprint

Nuclear power is the third highest carbon emitter after scrubbed coal-fired plants and natural gas when considering life-cycle carbon emissions. The processing of low-grade uranium ore for reactor fuel once high-grade uranium deposits are depleted, will increase nuclear power's carbon emissions. **Every dollar spent on nuclear could have saved 5 or 6 times as much carbon with efficiency or wind farms.**

Nuclear power plants take too long to build

Most nuclear power plants under construction around the world are years behind schedule. Looking only at reactors that were completed and have come on line between 2006-2016, the global average construction time is **10 years**. This is too late for climate change.

Scale-up time is even longer, and far longer than renewables

The scale-up time for nuclear, which includes the time between the start of planning to actual operation, can take up to **20 years**. The scale-up time for wind and solar is typically **2-5 years**.

We cannot build enough nuclear plants in time to make a difference

A 2003 MIT study concluded that in order to displace even a relatively minor amount of carbon-emitting fossil-fuel generation, an unrealistic scenario of 1,000 to 1,500 new reactors (1,000 MW or larger) would need to come online worldwide by 2050, **more than two new reactors every month**. In 2015, MIT estimated that even if the 2015 Paris CO2 accords are implemented and 1,000 new nuclear reactors are constructed, global CO2 emissions will still increase.

Nuclear energy use impedes renewable energy development

As their financial condition worsens, nuclear power corporations are looking for government and ratepayer subsidies to keep plants running and to fund proposed new nuclear plants. This significantly draws down essential federal funding for a rapid deployment of a proven, reliable and marketable renewable energy sector.

Building new nuclear plants won't replace coal plants

According to Friends of the Earth Europe, at current nuclear plant lifespan and closure rates, we would need to build 80 new plants in the next 10 years to keep global nuclear production at present levels and another 200 in the 10 years after that. Even if that were achieved, we would only have replaced the present nuclear capacity and not a single coal-fired plant.

Nuclear power does not belong in state renewable portfolio standards

Renewable portfolio standards (RPS) require utilities to sell a specified percentage or amount of renewable electricity. An RPS helps drive the market for wind, solar and other renewable sources and enables states to diversify their energy mix and reduce carbon emissions.

Including nuclear power in an RPS slows renewable energy expansion.

The baseload myth

Nuclear power plants can't safely meet fluctuating power demand and are not efficient. They run at high capacity even at night when energy demand is much lower. In fact, nuclear energy has the lowest flexibility and the worst response speed compared to all other power technologies.

Grid reliability

With better predictive information, and the ability to analyze real-time conditions and to match generation with demand, grid operators have overcome the intermittency of renewables. With storage challenges now also being solved, storing renewable energy and adding it to the grid when demand is there, is a flexible, practical and economical option that nuclear cannot deliver.

Nuclear power plants consume too much water

In a warming world with increasing water shortages, it makes no sense to continue with large thermoelectric plants that consume huge quantities of water. A once-through cooling nuclear plant draws in as much as **a million gallons of water a minute**, which is later discharged as hotter water. Nuclear plants using cooling towers draw in water and then evaporate it as steam, thereby consuming and depleting area water supplies.

Nuclear power plants must power down or shut down during droughts and heatwaves

Under drought and heatwave conditions — which will increase due to climate change — nuclear power plant cooling efficiency requires it to power down and even shut down. In a heatwave, the water supply source may become too warm to use to safely or to efficiently cool the reactor. During a drought, the water source level may drop too low to be usable, or may be needed for more immediate needs such as drinking water and agriculture. This means that **nuclear power plants are not operating just when their electricity output is needed most.**

Coastal nuclear plants could end up under water

Under climate change, sea levels will rise. Many nuclear plants are located along coastlines. As seas rise, coastal nuclear power plants in at-risk regions will eventually become submerged, making them inoperable. Their radioactive waste inventories, if not moved in time, would then leak into the oceans.

Closing nuclear reactors does not mean an increase in fossil fuel use

When nuclear power plants close, they are not automatically replaced by fossil fuel plants. After the Ft. Calhoun nuclear plant closed in Nebraska, Omaha Public Power District opted to replace its output with wind energy rather than fossil fuels. The company predicted that wind power would generate 40% of its electricity by the end of 2019. Pacific Gas and Electric has stated that after it closes Diablo Canyon nuclear power plant — the last nuclear plant in California — it will replace that electricity with renewable energy and energy efficiency.

So-called advanced reactors are decades away and won't replace current designs

Gen. IV reactors remain theoretical and are decades away from a deployed reality, far too late for the climate crisis. Plus, they could never be produced in enough numbers to make an impact on carbon emissions. Small modular reactors — by definition much smaller in capacity at 10-300 MW — would be needed in even greater numbers to achieve any greenhouse gas reductions. **Wasting time and money on so-called “new” reactors diverts resources from where they are needed — to bring on large amounts of renewables quickly.**

Using nuclear plants to address climate change involves unacceptable risks

Nuclear power involves major risks, including: a higher probability of serious accidents; a mounting and unsolved radioactive waste problem; and increased nuclear proliferation. Renewable energy risks none of these.

Beyond Nuclear. January 2019

www.BeyondNuclear.org; info@beyondnuclear.org; 301.270.2209