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news and information about the UK nuclear industry

# Why Nuclear Power isn't the answer to Climate Change

**Nuclear power plants take too long to build**

We have just 10 years to make massive and unprecedented changes to global energy infrastructure to limit global warming to moderate levels, according to the UN's Intergovernmental Panel on Climate Change (IPCC). This is why many local authorities have passed 'climate emergency' resolutions calling for a reduction in carbon dioxide emissions to zero by 2030. It takes around 10 years to build a nuclear reactor, compared to 2-5 years for wind and solar. Hinkley Point C – the only new nuclear power station being built in the UK is not expected to start generating electricity until 2025 – 27, assuming it is built on time. Similar reactors being built in France and Finland are 10 or 11 years late.

**Nuclear power has a big carbon footprint**

All energy sources produce some carbon emissions during their life cycle. There will be $CO_2$ emissions generated to make the steel to build wind turbines for example. It can be quite complicated to work out the life cycle emissions for nuclear power. Professor Benjamin Sovacool, now at Sussex University, has looked at 103 different studies and concluded that the mean value is about 66 grams of carbon dioxide for every kWh produced by nuclear power. This compares to about 9g for wind, 32g for solar and 443g for gas. This puts nuclear as the third highest carbon emitter after coal-fired plants and natural gas. If a large programme of reactors were built around the globe, life-cycle emissions would increase as the quality of uranium used decreased, making it necessary to use more energy to get the uranium out of the ground.

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

In order to contribute to a significant reduction in global greenhouse gas emissions the Massachusetts Institute of Technology (MIT) estimates we would need to build around 1,000 Gigawatts (GW) of nuclear capacity by 2050. (Hunterston B's capacity is less than 1GW). That would mean a new reactor coming online every 10 days on average every year until 2050. This would triple global nuclear capacity, but it would still only be supplying 19% of the world's electricity.

**Energy Efficiency Programmes would be much quicker and efficient**

Total UK primary energy demand in 2018 was 2,324TWh. Electricity generated was around 333TWh (1 TWh = a billion units of electricity). Nuclear generated around 65TWh. So nuclear power only generated under 3% of our energy. Electricity generation in 2018 was some 63TWh (16%) lower than in 2005, a reduction equivalent to 2.5 times the expected output of Hinkley Point C. This is despite the UK population increasing by 10% from 60 million to 66 million people.

Total installed UK nuclear capacity is around 8.9GW. Yet an accelerated programme of LED lighting installation could, on its own, reduce peak electricity demand by almost 8GW. Cost-effective investments in domestic energy efficiency alone between now and 2035 could save around 140TWh of energy – roughly equivalent to the output of six power stations the size of Hinkley Point C, according to a report by the UK Energy Research Council. Such a programme could save an average

of £270 per household per year and deliver net benefits worth £7.5bn to the UK, and could reach £47bn, if benefits such as health improvements and additional economic activity are counted.

**Nuclear energy use impedes renewable energy development**

Renewable energy is now relatively cheap and becoming cheaper, and needs little or no public subsidy - a big contrast with new nuclear, which despite all the promised support, high consumer subsidies, and public guarantees of loan funding, has failed so far to generate a single kWh. And it will not until at least 2026 even if EDF's schedules for Hinkley C construction prove (miraculously in the light of recent nuclear construction history) to be achievable.

Even if only some of the new nuclear power stations proposed come online, new renewable energy would be crowded out. This is because electricity contracts given to nuclear power give them 'dispatch priority' over renewable energy, causing windfarms and solar farms to be turned off to give priority to nuclear power. Indeed, this is already happening with our current levels of nuclear and renewables. Renewable energy generated 33% of UK electricity in 2018, a figure that, with the recently announced 'sector deal' for offshore wind, will increase to around 65% by 2030 even without any more onshore wind and solar pv. If we had 35% coming from nuclear power, there simply wouldn't be any market space for any more renewable energy.

**Every pound we spend on reducing carbon emissions has to maximise carbon reductions**

Many advocates of new nuclear construction call for a "balanced energy policy" and promote the idea that 'we need every energy technology' in order to successfully tackle the climate change problem. This idea suggests that we have infinite amounts of money to spend on energy projects, which is obviously nonsense. Resources are scarce, so we need to make choices. Because climate change is a serious and urgent problem then we must spend our limited resources as effectively and quickly as possible - best buys first, not the more the merrier. For each pound we spend we need to buy the maximum amount of "solution" possible. (The "least cost" solution) Investment in more expensive nuclear power will, in effect, worsen climate change because each pound we spend is buying less solution than it would do if we were to spend it on energy efficiency and renewables.

**The baseload myth**

New nuclear plants would get in the way of expanding renewables, because they are inflexible and can't balance the output from variable renewables like wind and solar. We need to invest in flexible supply and demand side balancing systems, smart grids, and storage, including electrolytic 'Power to Gas' hydrogen production, using surplus renewables power, stored ready for conversion back to electricity when renewables inputs are low. Baseload plants are inefficient and cannot meet demand as needed. In fact, nuclear energy has the lowest flexibility and the worst response speed compared to all other power technologies.

**Nuclear power stations are not resilient to climate change**

Nuclear power plants function inefficiently or are forced to close during droughts and heatwaves. And many nuclear plants are located along coastlines. As seas rise, coastal nuclear power plants could be at-risk from being flooded making them inoperable. Their radioactive waste inventories, if not moved in time, could be in danger of leaking into the oceans.

**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. Why replace one risk – climate change – with another – nuclear accidents and radioactive waste – if we don't need to.

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