

Renewable energy is a foolish fantasy. Nuclear power is safe, and the only way to go green

Take it from me. I'm an experienced power engineer, not a politician or an activist



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Works in the dark and when there's no wind CREDIT: Arvin Temkar/Atlanta Journal-Constitution

As things stand the 'net zero' policies adopted by many governments, including those of the US and UK, are doomed. Professor Kelly, a Cambridge University engineer, has shown that the cost for the UK could exceed £3 trillion. A lack of key resources makes net zero by 2050 impossible at any cost.

This is because a net zero, low cost electricity supply largely based on wind and solar power is unachievable. Wind power is becoming more and more expensive and offshore wind farm projects are being abandoned as uneconomic. Operation and maintenance costs are much higher than expected. Many manufacturers are losing money and some have very serious ongoing maintenance problems. Solar power is also in serious trouble with steadily increasing costs of raw materials driving the price up.

If electricity is expensive, net zero is much harder and more economically damaging to achieve as it requires many energy-intensive activities – transport, heating etc – to be electrified. But that is not the worst problem with renewables.

To be a practicable method of supplying electricity, wind and solar power need a low cost, large scale storage technology that will store surplus energy when available and deliver it when needed. The problem is that no such technology exists. But without mass-scale storage, more wind and solar power will lead to major blackouts and intolerable price spikes alternating with price crashes. As wind turbines and solar panels do not help to stabilise system frequency and voltage in the way that thermal powerplants do, even a minor disturbance could collapse a renewables-driven power grid completely.

The only viable and scalable low-carbon power technology is nuclear. Today, more than 400 reactors generate about 10 per cent of world electricity. They are emissions free and reliable. Their only problem is that they are perceived to be dangerous and are violently opposed by some groups.

Dangerous, nuclear is not. Per unit of energy generated, nuclear power has proved to be much safer than any other major power generating technology. Coal, gas and hydropower are respectively 4000, 100 and 35 times more dangerous.

In the event of an accident where all power supply is lost, all modern reactors will shut down safely. Over the last 60 years the only nuclear powerplant accident with directly measurable health consequences has been at Chernobyl. The reactor there was operated in defiance of all safety principles and used obsolete technology without shielding: its failure has no relevance to a discussion of normal nuclear reactor safety.

Even Chernobyl's consequences were not large in the context of normal industrial accidents or normal, non-nuclear pollution. It's possible to say, as the UN does, that 50 people died as a direct result of the Chernobyl accident and that as many as 4000 people worldwide may have had their lives shortened over the decades because of it. Industrial accidents have commonly killed hundreds or even thousands of people: ordinary air pollution results in tens of thousands of deaths every single year in the UK alone.

The disposal of nuclear waste is not a major problem. I have stood in the hall at Sellafield where 75 per cent of the UK's high level waste is stored. Although the waste was only about 2 m below my feet I was not exposed to dangerous levels of radiation. After about 1000 years, the radiation will have reduced to safe levels. By contrast, large dams can stand for more than 2000 years and remain a terrible, looming menace. If they are abandoned, they will eventually fail and drown thousands of people: there have already been some terrible dam disasters involving massive loss of life. Nuclear waste can be safely isolated and forgotten: dams can't. There is also the prospect of today's nuclear 'waste' becoming an economic source of new fuel should demand and prices rise in future. It should be noted that this would not mean expensive electricity: fuel accounts for only a small fraction of the cost of nuclear energy.

In the Western world the construction of large modern reactors has suffered from poor project management, financing problems and regulatory delays that have

resulted in major overruns in cost and time. This need not have happened: the Russian and Chinese are successfully building similar reactors. More than 50 reactors are under construction right now and even more are planned. The Western world needs to get its act together!

Many different designs of small modular reactors which are built on a production line basis are proposed and several are now under construction. None of them can melt down and release radiation.

A major cause of delays and excessive costs is a regulatory regime that was designed to cope with the situation many years ago when the technology was evolving rapidly and radiation risks were not well understood. It is unsuitable for licensing identical modern mass produced reactors. US requirements are even more onerous than those of the UK and Canada. All three regimes require that radiation exposure of workers has to be “As Low As Reasonably Achievable”. This vague requirement needs to be replaced with a level of radiation that is known to be safe. People living in Ramsar in Iran are exposed to natural radiation 10 times greater than the regulated level: research has shown that they suffer no ill effects as a result. There are other areas around the world where natural background radiation is at levels which would be unacceptable in today’s nuclear industry, yet local residents suffer no ill consequences. Should we adopt the Ramsar level?

A rapid switch from expensive, impractical wind and solar power to reliable nuclear is the only way of meeting the net zero goal while keeping the lights on and society in general functioning. So how do we get from here to there?

As a first step, politicians and the public will need to be educated on the benefits of nuclear power. They should be reminded that wind and solar farms last for less than 25 years while nuclear power stations have a life of 80 years or more. Governments and the industry need to mount a major publicity campaign extolling the virtues of nuclear power and emphasising its safety and its ability to provide a reliable and economic emissions-free supply. The media must learn to stop exaggerating the risks of nuclear power: and this doesn’t only apply to Chernobyl. The reporting of the Fukushima reactor incident was hysterically inaccurate, leaving many people with the impression that major hazards occurred. In fact, according to the United Nations Scientific Committee on the Effects of Atomic Radiation, health effects from Fukushima radiation are unlikely ever to be discernible – and yes, this includes the plant workers and everyone else in the world. Yet such was the media coverage at the time and thereafter that to this day very few people are aware of this reality. Germany even decided to shut down its reactors as a result, and is now building new coal power stations which will do far more damage to the people of Europe than the Fukushima reactors ever did to anyone.

At the same time nuclear manufacturers, users and regulators must agree on what is really needed in the way of regulation and levels of radiation. They must agree on internationally acceptable standards for reactor design and safety with the aim of providing a blanket approval for reactors of identical design rather than the current practice of repeating the process for each reactor in each country.

Nuclear power needs to be recognised as a low emissions source of electricity that is superior to wind and solar power. Subsidies, mandates and other enormously

expensive policies intended to promote wind and solar power must be abandoned and the money switched to expediting nuclear power.

Governments need to face the fact that wind and solar power can never deliver their net zero dreams of low cost, reliable, emissions free electricity. They have only two realistic options: switch to nuclear power, or abandon net zero.

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