

In the dark on the power struggle: inconvenient truth proves renewables can't cut it

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Australia's low-emissions energy journey is locked in a struggle between engineering and hope.

The nation has lost its way on energy because it has failed to think long term, excluded emerging technologies from the discussion, and refused to learn the lessons of failure from elsewhere.

Debate this week about how a capacity market should work to keep the lights on and industry in business underscores the point.

Too many people with too little understanding have turned a problem of physics and engineering into one of politics and economics. The breakdown in electricity supply is as serious as it has been predictable. Engineers know that grinding the coal sector into the ground won't make renewables produce electricity when the wind isn't blowing or the sun isn't shining. Leaving gas in the ground, as NSW and Victoria have done, won't power a back-up supply. Stealing back supplies of gas from companies that have contracted to sell it elsewhere will compound the problems.

Governments generally don't last long enough to reap the product of the chaos they sow. But new governments should learn the mistakes of others.

Contrary to popular opinion, Germany's transition away from nuclear power has not been fuelled by wind and solar. It has been powered by greater use of brown coal and a dependence on Russian Gas. Power shortages in South Australia, California, Texas, UK and Europe all share a common feature, a naive hope that renewable energy will do the job it is not equipped to do.

Politicians have been cowered into supporting solutions they don't understand. No serious thinker believes it's economically sensible to firm up a national grid with batteries but a whole industry is willing to take government money to give it a try.

It might well be an expensive fix for individual households, but not industry. Spending billions to extend the national grid is based on the premise that the wind will always be blowing somewhere. The reality is this is not necessarily the case.

Hydrogen is a promising technology but experts who have worked in the field maintain it is a dangerous substance, difficult to contain and invisible when it burns. From an environmental perspective, the vast amount of materials and area of land needed to attempt what is being proposed using wind, solar, batteries, pumped hydro, hydrogen and transmission lines does not meet the cost/benefit test. A bigger concern is electricity is only a small part of the challenge ahead. Bigger and more important for industry is process heat, something that wind and solar can never deliver.

Alinta Energy chief executive Jeff Dimery belled the cat this week that the energy crisis was caused by chaotic market planning that had swamped the country with renewables that in turn made coal uncompetitive.

"We're committing economic suicide if we rush and try to do it too quickly when we haven't got the alternative supplies in place," he told a Melbourne conference.

To illustrate the point, he said renewable energy plants in South Australia last Wednesday at 6.15pm were producing one megawatt of electricity, a tiny fraction of capacity. There was no wind in Victoria either.

"So it wouldn't have mattered if you doubled the capacity of the transmission, and it wouldn't have mattered if you quadrupled the capacity of intermittent generation. Without coal and gas, the lights would have gone out in South Australia, that is a fact," he said.

Watching on, as the nation's energy thinkers look for Band-Aid solutions to potentially fatal conditions in the energy market is the former head of Australia's Nuclear Science and Technology Organisation, Adi Paterson, who has also commercialised pioneering research on lithium ion batteries and participated hydrogen policy work in South Africa.

Paterson says the nation is locked in a false struggle. "This debate has become about economics and the universal law of economics is that it does not trump physics," he says.

"We have the burden of explaining more clearly to people what the real energy choices look like. Carbon-free process heat is a much bigger problem than electricity. And the fundamental problem is, if we are going to electrify everything, we are going to need reliable, predictable, 'always-on' electricity for a rational society to function.

"With the energy cost issues, people are starting to see that when you take the baseload out the costs go up."

He said it was important to have an intergenerational view of the problem: "We do not have to do it all in 10 years. In the next century, I believe, if we just take off the false time problem, we will be looking for the highest density of energy we can get, and at the top of that pile is nuclear fusion."

There are critics who can point to decades of promises but the world is looking to new-generation nuclear reactors and fusion to solve the problem of low-emissions electrification to run a developed industrial economy.

In the domain of nuclear fission, the first small-scale modular nuclear reactor by a US firm NuScale is under construction and will be completed this decade.

The US National Academies road map has set a time line to build nuclear fusion reactors from 2035. Australian company HBII Energy, of which Paterson is a director, is leading the world in exploring nuclear fusion using a new generation of high-energy lasers. The technology won a Nobel prize for the inventors and can bring decades of theory into reality.

HBII Energy is looking at the 2040s to have a plant operating based on the principles of inertial fusion using lasers.

Despite this, nuclear fission and fusion technology are not part of Australia's official energy discussion. Jim Chalmers, says he has ruled out nuclear energy because "the economics don't stack up".

The Treasurer said he had never been a supporter of nuclear power and would maintain his opposition to it, which was "economic not ideological".

Paterson says this view misunderstands the problem.

"There is a tendency to oversimplify," he says. "I think the fundamental problem of wind and solar is it is highly accessible to the domestic consumer but most of what is useful in our society we don't really understand. You can win an argument by saying solar, wind and batteries because people understand it.

"I think we need to have this discussion about fission and fusion as a low-cost source of electrons because it gives us predictability and optionality.

"It will give us a stab at solving the energy problem not just the electricity problem. The question for wind, solar and batteries is 'Where is the process heat?'

"If we solve the issue of nuclear fusion plants – because they will also provide process heat for industry – they will be the anchor tenant of most modern economies from about 2060."

This line might not suit the catastrophisation narrative of a climate emergency. But at least it might just work.

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