

Energy in a Changing Climate

Hanging onto the Energy Dreams

Christopher Booker recently said in the [UK Telegraph](#): “When we embark on a course of action which is unconsciously driven by wishful thinking, all may seem to go well for a time, in what may be called the ‘dream stage’. But because this make-believe can never be reconciled with reality, it leads to a ‘frustration stage’ as things start to go wrong, prompting a more determined effort to keep the fantasy in being. As reality presses in, it leads to a ‘nightmare stage’ as everything goes wrong, culminating in an ‘explosion into reality’, when the fantasy finally falls apart.”

Over the last 20 years, the UK has installed more than 3,000 wind turbines at a cost of several billion dollars, in an effort to reduce greenhouse gas emissions. Last year, on average, if very irregularly, these turbines generated less than 3 percent of UK’s electricity (about 10 terawatt hours), less than the output from a single one of our brown coal power stations in the Latrobe Valley. Yet the UK still plans to spend billions more on offshore wind despite the significant additional cost to the UK electricity consumer.

Australians are in the process of making a similar mistake, hoping to abandon fossil fuels and replace them with energy from wind and sun in our effort to reduce greenhouse gas emission.

Recently, in this [journal](#), we were presented with an opportunity to see Booker’s dream theory acted out. Dr Mark Diesendorf has long been a strong advocate for renewable energy and its ability to power all our needs for electricity. It seems clear from his article that he is experiencing the ‘frustration stage’ as the progress of his dream seems not to match his expectations.

His retort to those who question the ability of renewable energy to meet our needs suffers from some of the same kind of simplistic myths he claims are made by the questioners. The misleading impression that baseload demand is low needs to be considered carefully. Baseload power demand, the minimum continuous level of power to meet all needs in Australia, is roughly 60% of peak power demand and represents 75% of total energy. Hardly low. The notion that this can be further reduced by solar hot water systems in the face of future need for night-time charging of electric vehicles seems rather fanciful. The latter is likely to double household demand, not reduce it.

Certainly there are renewable energy solutions that seem to have the potential for replacing baseload coal, like bio-electricity and hot-rock geothermal. But we need a reality check here. To replace a coal plant with biomass needs a land area for trees that is over 80 times that of an open-cut coal mine. Hot-rock geothermal has been in development for 40 years and we are yet to see a commercial scale plant anywhere in the world.

I share Diesendorf’s enthusiasm for reducing greenhouse gas emissions in Australia. But with wind limited to a probable maximum of 20-30% and still needing fossil fuel back-up,

the limited practicality of large scale bio-electricity and the doubtful prospects for hot-rock technology, I cannot share his dream.

In just nine years time, our government's Renewable Energy Target will require 20 percent of our energy to come from renewables energy sources - most of which will be wind power. This is over 50 terawatt hours of electricity, or five times the total output from all UK's wind turbines. This is wishful thinking indeed; we are still in Booker's 'dream stage'.

As 2020 approaches, the reality will dawn that increasing wind capacity, perhaps at least four-fold, is a fruitless task. Very few, if any, coal power plants will have been closed as a consequence and frustration will set in. Probably the government will be blamed for not mandating plant closures.

But the fantasy will persist. As we see from Diesendorf, there will be more calls for even more renewable energy research and development, and demands for more energy efficiency. The nightmare is around the corner. The extra renewable energy investments will still fail to close sufficient fossil-fuel plant. The improved energy efficiency will fail to reduce energy demand and the fantasy will fall apart.

Perhaps then we will be ready to 'explode into reality'.

Either fossil fuels are here to stay or we have to seriously consider more realistic alternatives than renewable energy. Switching from coal to gas for electricity generation could reduce our greenhouse gas emissions from all sources by 25 percent and help climate change. By itself, this will not be sufficient to reach our 2050 emissions reduction target of 60 percent but it certainly isn't just an energy dream.

Carbon capture and storage may also be wishful thinking. The technology is yet to be used at commercial scale anywhere in the world. It may well go through the same 'dream' routine that renewable energy has enjoyed over the last 20 years. More government incentives, more government funded research and development. More make-believe, more frustration and more nightmares with no certainty of success.

Winston Churchill once said that Americans always try to do the right thing after they've tried everything else. It seems like we Australians are as bad as the Americans.

Once we have lived out the dreams of renewable energy and carbon capture and storage, what then? We can keep dreaming, go into denial about climate change or seriously consider the one solution left that is not a dream. Fission energy. The solution accepted and used by almost all other OECD countries, plus many in the developing world because it's the only commercially available technology on a scale to replace all fossil fuels for electricity generation.

Right now, Australia is a 'nuclear-free' zone. That means no nuclear power plants. So we have no commercially viable solution to substantially reduce emissions from electricity generation. So we keep dreaming or go into denial.

Obviously, Fukushima has raised the nuclear danger genie. As a society we are faced with risks in much of what we do - and we often make irrational decisions by not understanding those risks. After 9/11 many Americans chose to drive rather than fly even though the risks of dying in a car crash per passenger mile were over 20 times higher than in a plane.

We face the risk of climate change by continuing to burn fossil fuels. We can take the risk that renewable energy will deliver us from burning fossil fuels in time or we can take the risk of more nuclear accidents.

Some might think this would be an easy safety choice. Like driving rather than flying. However no energy source is risk free. In terms of deaths per unit of energy generated, nuclear is by far the [safest option](#). Safer than wind, roof-top solar, hydro or bio-electricity. So we need to consider the relative risks carefully.

Modern nuclear reactors using either uranium or thorium are much safer than the units built 40 years ago (like the reactors used at Fukushima). But nothing is perfectly safe. Statistically, using nuclear power is less risky than using wind turbines, bio-electricity or roof-top solar panels to deliver the equivalent energy. It may not be intuitive but nor was flying in planes in late September 2001.

Those around the world calling for a ban on nuclear power, post Fukushima, should review their energy dreams, lest they turn into nightmares.

Written by Martin Nicholson and first published in On-line Opinion 9 May 2011