

Diatribes 167

If Uranium power is no answer to global warming, what is?

Last time I was on air, I pointed out that the two supposed solutions our government is offering to global warming – the existence of which they are now reluctantly admitting – are figments of the imagination of the coal and uranium mining industries. Even if they could contribute meaningfully, nuclear power and CO₂ sequestration are mere notions which would take far too long to implement.

By a happy coincidence, the end of May saw the appearance of the precise book which gives the answers to alternative power as far as they are known. I am talking about Mark Diesendorf's *Greenhouse Solutions with Sustainable Energy*. Mark currently lectures at the University of NSW at the Institute of Environmental Studies ;and has spent much of his life teaching various courses to do with sustainability He has written nearly 100 papers and book chapters as well as the recent book I mentioned. Better still, he has been an environmental activist all his working life and as such he has dealt with the politics of the subject as well as its technology. If you get a chance, borrow Mark's book from the local library or, better still, if you can spare the cash, buy it. It will cost you \$50 from the bookshops, or \$45 from the UNSW bookshop.

Having done my advertising spiel, let's get on with the nitty gritty. As I mentioned, the Howard Government and its stooges repeat endlessly that the only ways CO₂-free base-load power can be generated – apart from burning coal or gas – is through nuclear power stations or by so-called clean coal technology.

By a not-so-strange coincidence, these two apparently unrelated technologies have a lot in common; mainly that they are both designed to put oodles of money into the pockets of mining magnates. That's what you would expect, given where they come from. The other, more important common factors are they won't work and that they take a long time to implement before people find out that they won't work, as I mentioned earlier.

There is, however, no need to rely on the non-solutions proposed by our politicians to deal with the greenhouse crisis. In Australia and in Victoria in particular, this means finding ways of producing electricity because we currently generate electric power by burning brown coal which has only a very small energy content. In Victoria this means that whereas only about a fifth of our energy requirements are in the form of electricity, almost half our greenhouse gas pollution originates with electricity generation. This doesn't mean that we have to have fume-belching smoke-stacks for ever, however. Mark Diesendorf's book shows that there are numerous solutions available right now, and probably an infinite number in the future. I shall try to list them in what is, at present, their order of economic importance:

Firstly, there is wind-power. This goes back at least three millennia in the form of sailing ships and grain mills which latter came into use almost as early as grain production itself. Electricity production from wind was common on Australian farms since the 1930s with lead-acid batteries smoothing out the peaks and troughs of the natural variations in wind-strength. Let me here give an explanation of a common fallacy. The two types of wind-mills seen on farms are both practical; the multi-bladed forms are for driving pumps which often stop in mid-stroke and need considerable torque to start up from there. Their inefficiency doesn't matter – there is plenty of time to fill the drinking troughs for animals or domestic tanks for humans.

The other type is the high-speed two or three bladed turbine which drives a generator for electricity generation. It is this type, scaled up by factors of hundreds, which currently is one major source of renewable energy.

Another already well established renewable is solar heat and electricity. Solar hot water services are economically viable (in the sense that they pay for themselves over a few years in all states with the possible exception of Tasmania. Great strides have also been made in the development of photovoltaic cells which generate electricity directly from sunlight. There are lots of proposals, some of which have already been implemented, for concentrating the sun's rays onto pipes which containing fluids which will ultimately generate steam to turn turbines. There is biomass which utilises the

decay of plants to generate heat. The earth's internal heating, a form of nuclear power, is also almost inexhaustible compared to the energy we require to maintain our current levels of well-being. This could be tapped by bores which could carry cold water down and hot water or steam on the way back. The tapping of wave energy and tidal flows is being explored world-wide. There was even a proposition for a solar chimney somewhere near Mildura which used a covered area close to the ground to heat air which then rose in a chimney-like structure twice the height of the Eiffel Tower, driving an air turbine on the way up. This project appears currently on the back burner

These are not pie-in-the-sky propositions, but unlike nuclear power or CO₂ sequestration, are practical solutions which stand and fall on hard-nosed economic calculations. So, with this bewildering choice of practical possibilities for sustainable energy production, and given the pressure to implement workable solutions, what do the coal barons put forward as reasons for rejecting the real possibilities? Of course, it has to be something which their non-solutions avoid.

Their answer is that whatever solution is proposed, has to provide base load power, that is, power available 24 hours a day for 7 days a week. This is ridiculous. No existing energy source is available 24/7 all the year round. There is downtime for maintenance, the odd breakdown and waiting for repairs. In fact, you are lucky to get more than 80% reliability. Besides, you are better off when the generating units are small, as was clear after the commissioning of Hazelwood which had very little flexibility, consisting of a small number (4 or 6, from memory) huge turbine – generator aggregates.

One of the common misconceptions about adding relatively small generating units like wind turbines to the electricity grid is the outdated belief that alternating current technology makes this difficult in practice. Modern technology makes the addition of extra generating plant a breeze. And as for the variability of wind power supplies, they are no more variable than power consumption, and even within a moderately-sized wind-farm the spread of individual turbines makes up for local gusting. Mark Diesendorf estimates that by the middle of this century half our electricity could be supplied from sustainable sources at a cost equal or lower than that delivered by fossil fuel fired power plants.

But cost comparisons don't, in this case, compare apples with apples. Government support for the coal and uranium industries is not limited to attempts to disadvantage and disparage sustainable energy production. It is backed by vast direct subsidies, currently amounting – wait for it – to some 6 1/2 billion dollars per annum. These come in everything from tax remissions to research grants. For instance, the money for fossil fuel research is vastly greater than that provided for renewable energy, and gas-guzzling four-wheel drives are attracting half-a-billion dollars annually in tax benefits. Keep some of these figures in mind next time someone in Government waffles on about their interest in reducing global warming.

So far we have only taken a look at electricity production, our greatest single polluter. The next two on the list are transport and housing. For instance, a German research paper from a few years ago showed that each able-bodied citizen could be given a new bicycle every year plus free public transport and an annual bonus of a few thousand dollars if they gave up their car. The extra exercise may well bring about in public health what endless exhortations and hospital beds have not achieved.

As far as habitation goes, new Australian houses are once again showing enormous window spaces facing west and compensated for by massive air-conditioning systems which make our summer energy loadings the highest of the entire year. Think of the possible savings achievable through insulation, drapes and a smidgin of human input!

These projections of possible savings used to be mere speculation. With global warming now a reality, with the seas rising and oil running out, nature may be forcing on us what common sense failed to do in years past. At a time when the term "lifestyle" has come to mean spending patterns, could we hope to once again establish human relations and personal achievements as the yardstick of our well-being?