

# Energy in a Changing Climate

## **Nuclear power can save billions**

DO we really want to spend \$700 billion on foreign carbon permits? According to Treasury, this is the likeliest way for Australia to meet its emissions reduction target by 2050.

[Treasury modelling](#) concludes that we would have to invest more than \$700bn in overseas abatement permits to reduce carbon emissions to 80 per cent below 2000 levels by 2050. This is money invested in foreign projects to reduce greenhouse gas emissions.

Electricity generation presently contributes about one-third of Australia's total greenhouse gas emissions and the electrification of transport and industry is likely to increase in the coming decades. Stationary energy is the sector targeted by Treasury for the biggest cuts and its core policy model has these emissions down to less than half by 2050.

The Treasury model envisages more renewable energy and gas plants. It retains some coal plants, with and without carbon capture and storage. By 2050 it has about 40 per cent of our electricity coming from renewable energy and the balance from fossil fuels.

Notably, neither CCS nor some of the renewable energy technologies proposed in the modelling report (for example, deep geothermal drilling) has been proven on a commercial scale in Australia, so significant technical risk remains.

Renewable energy plants produce no greenhouse gas emissions in operation. But, presently, only about 10 per cent of Australian electricity comes from renewables (mainly hydro and biofuels); the rest comes from fossil fuels.

Gas and coal plants produce greenhouse gas emissions even with carbon capture. As modelled, fossil fuel generation retained to 2050 means that decarbonisation of the sector cannot reach its target. That's why the Treasury model calls for the purchase of overseas abatement permits.

Greens leader Bob Brown wants us to believe that these gas and coal plants are not required and we could shift to 100 per cent renewable energy, even well before 2050.

The consulting experts used by Treasury for its modelling seem to disagree.

Presumably they give more weight to the need for a reliable, continuous and cost-effective electricity supply in a growing economy such as Australia.

If the model included fewer fossil fuel and more zero-emissions plants, while maintaining a reliable network, we could save some of that \$700bn spent on overseas permits. Nuclear power can do just that.

Resources and Energy Minister Martin Ferguson clearly recognised this when he stated that Australia would have to consider a nuclear-powered future by the end of the decade if advances in renewable energy failed to provide options for cost-effective base load power.

Of course, we are not privy to the consultant briefings from Treasury but it seems likely that they were asked to exclude nuclear power even though it produces no greenhouse gas emissions in operation and can readily replace coal plants. One wonders how the generator mix would have changed had those briefings been different.

To stop wondering, I decided to tweak the Treasury modelling by replacing all its coal and much of its gas by 25 gigawatts of nuclear power by 2050. That number was picked because it represents [a reasonable construction rate](#) for the nuclear industry.

The energy mix would then be about 40 per cent renewables, 40 per cent nuclear and 20 per cent gas, which happens to line up with energy planning for the world's two fastest growing economies, China and India.

These are economies that appreciate the need for both nuclear power and renewable energy in achieving their growth forecasts. According to PricewaterhouseCoopers, China and India will rank No 1 and No 2 in world economies by 2050.

The [result](#) of my analysis was startling. Progressively building 25GW of nuclear plants in Australia between 2020 and 2035 to displace fossil fuels reduced the cost of overseas permits by \$180bn. It also provided an ongoing abatement saving of about \$10bn a year beyond 2050 (depending on the carbon price).

Could we really build 25GW of nuclear plants for \$180bn? My answer is definitely yes, but it does depend on who you ask.

Figures given to the Department of Resources, Energy and Tourism by consultants [EPRI](#) give a cost of \$120bn to \$150bn. If we went to the South Koreans, who [are building new-generation nuclear plants](#) for the United Arab Emirates, the cost would be \$60bn to \$90bn -- roughly half.

Of course, these nuclear plants also would save the cost of building some of the new coal and gas plants modelled by Treasury. Using the costs they modelled, the saving could be \$60bn to \$90bn. That would cover more than half the cost of the new nuclear plants at EPRI prices or all the costs if we called in the South Koreans.

In the worst case (highest capital cost to build the nuclear plants and lowest possible savings from not building the fossil fuel plants) the net savings would be \$90bn by 2050 plus \$10bn or more a year beyond that. The best case saves the full \$180bn.

It's ironic, but the government's own Treasury modelling has revealed that Australia's distaste for nuclear power could be an extremely expensive indulgence. My analysis also puts into question Greens senator Christine Milne's [claim](#) that "nuclear is too expensive".

Apart from cost, there is the matter of verifying our national emission reductions. With nuclear power this is direct and easy. Verification may not be possible with overseas permits or investment in domestic carbon farming projects.

Instead of power companies buying overseas permits as substitutes for direct emission reduction or investing in carbon farming projects, they should be allowed to put their money into building new nuclear plants.

This would leave Australia with valuable, income-generating, productive assets that might last 60 years. And we would know we were getting value for money -- and [cheaper electricity](#).

To quote from [a recent report](#) from the Committee for Economic Development of Australia (Australia's Nuclear Options), "To not consider the nuclear option when trying to decarbonise the economy is tantamount to committing economic and environmental vandalism".

Written by Martin Nicholson and first published in The Australian 14 December 2011