No way to reach Rudd's target

THERE may be some cause for alarm for those who are looking for big cuts in carbon emissions by 2020.

The results of a recent Australian study lead to a worrying conclusion that spending a huge $65 billion on low-emission power-generation technologies will give an 8 per cent rise in emissions from electricity generation by 2020, not the 5 per cent reduction that the Government wants. No cuts in power emissions will make it very difficult to make big cuts in total emissions by 2020, as electricity generation contributes almost 40 per cent of emissions.

The Australian Academy of Technological Sciences and Engineering, a group of scientists and engineers that promotes the development of new and existing technology, has turned its collective mind to the future of electricity generation. In particular, it has considered how the government's projected reductions in carbon emissions might be achieved. This analysis of a range of electricity generation scenarios has been released in an important study, Energy Technology for Climate Change – Accelerating the Technology Response.

The key finding of the report is a need for government and industry to invest about $6 billion by 2020 on research, development and demonstration of new power generation technologies. Installing the technologies by 2050 would need capital investment of about $250 billion.

ATSE considered a scenario for electricity generation in 2020 that uses 20 per cent low-carbon technologies. This scenario is hypothetical (not a prediction) but takes into account an assessment of the state of the technologies. The low-carbon technologies include biomass, solar, wind, wave, geothermal and carbon capture and storage with a balanced split between them. The installation cost of these technologies, including some additional gas generation, is $65 billion over the next 12 years, an average of more than $5 billion a year.

The net effect of this investment is to increase carbon emissions by 8 per cent from 2000 levels. This is a considerable improvement on the 31 per cent increase that would happen with business-as-usual but the result is of great concern when our government wants to reduce total emissions by at least 5 per cent, and an even greater concern for those that want the reduction to be more like 25 per cent.

Maybe the academy was too conservative with its 20 per cent low-carbon technologies? Hardly. The scenario requires an increase in wind power of more than 1200 per cent in 12 years and an increase from practically zero solar to 6 per cent of total electricity supply over the same period. It also includes a big contribution from the yet to be commercially proven technologies such as wave and geothermal. Gas generated power would also need to

increase (by 40 per cent) and coal-CCS would need to be in production in three large power stations.

Maybe they didn't include savings from energy efficiency? The scenario expects a 20 per cent increase in energy demand by 2020. During the same period the Australian Bureau of Statistics also expects the population to increase by 20 per cent, so possibly the expected scenario includes no net efficiency savings or demand reduction.

Could a reduction in electricity demand fix the problem? Based on the scenario modelling, reducing the demand growth rate from 1.4 per cent per year to 0.8 per cent a year will reduce emissions growth to zero. On past history of trying to generate demand reduction this may be a tall order and zero growth in emissions isn't what we are looking for.

So where do we go from here?

We need to get a quick breakthrough in low-carbon technology (probably not likely to be quick enough), increase the 20 per cent low-carbon target (this target is already looking like a stretch, and is very expensive) or significantly reduce electricity demand further if we have any hope of getting even the "soft" reduction of 5 per cent by 2020. The challenge will be to do all that without greatly affecting the economy and society.

An alternative would be to recognise that even a 5 per cent reduction in electricity generation emissions is not going to happen by 2020. In the meantime, as the academy recommends, we should spend a significant amount more on low-carbon technology research. And maybe start to plan that first nuclear power station.

Written by Martin Nicholson and first published in The Australian 29 January 2009