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An Alternative Pathway to Clean Energy

The coal industry's 'solution' to bury CO_2 emissions is costly and not fully tested, says Mark Diesendorf

At present, coal fired power stations provide 84% of Australia's electricity. They are our principal source of greenhouse gas emissions and, in several regions, a source of harmful air pollution and substantial land degradation.

Yesterday, with much fanfare, the coal industry launched its 'solution' to this massive problem: burning even more coal, capturing about 80% of the waste carbon dioxide (CO_2) and burying it deep underground. No doubt the government is being lobbied to throw hundreds of millions of dollars of subsidies at this 'geosequestration' approach.

But geosequestration still requires considerable technological innovation; is risky to the environment, health and economy; and is neither the cleanest nor the cheapest pathway to a sustainable energy system for Australia.

Fortunately there is an alternative pathway to a sustainable energy system for Australia, based on small improvements to existing, cleaner, cheaper technologies, while economic growth continues. These are the principal results of the Clean Energy Future study sponsored by a consortium of peak organizations from the renewable energy, energy efficiency and natural gas industries, in cooperation with the environmental organisation, WWF Australia. The team of consultants chosen to perform the project comprise Dr Hugh Saddler from Energy Strategies Pty Ltd, Richard Denniss from the Australia Institute, and the author of this article.

We chose the goal of achieving a 50% reduction in CO2 emissions from stationary energy sources by 2040. This target is similar to official targets in the UK and Denmark and is necessary for stabilising CO_2 concentrations in the atmosphere at a level that is likely to be safe for future generations.

In achieving our 2040 target, we assumed that the economy grows 2.4 times in real terms between our starting date, 2001, and 2040. Even the coal industry grows, but for export, not domestic consumption. The choice of 2040 allows sufficient time for most existing power stations and all energy using equipment apart from buildings to be phased out at the ends of their operating lives and replaced with cleaner and more efficient technologies.

Our restriction to small improvements to existing technologies means that our scenarios have no cheap solar electricity technologies, no cheap storage and transportation of renewable energy in the form of hydrogen, and no cheap capture and geosequestration of CO_2 emissions from coal-fired power stations. .

The least-cost contributors to our clean energy scenarios are a myriad of cost-effective technologies for using energy more efficiently in the home, office and industry. On the supply side, we draw primarily upon natural gas (the least polluting of the fossil fuels), crop residues (excluding those from native forests), wind power and solar hot water. All these technologies are cheaper than the International Energy Agency's projected costs of coal-fired electricity with geosequestration.

While continuing economic growth was built into our scenarios, it is difficult for any existing economic models to predict the impact of our scenarios on the economy as a whole. Such a large time step into the future and such large changes in the energy system go beyond the basic assumptions of standard macro-economic models.

Nevertheless, there is already growing evidence from other studies that the clean energy technologies produce more *local* jobs than conventional technologies. In particular, producing electricity from crop residues creates many new jobs in rural areas, where they are needed most. With wise government policies on regional development, it should be possible to provide plenty of jobs for the few who are disadvantaged by a transition to a clean energy system.

The study estimated the costs of both dirty and clean energy scenarios, but did not come to a simple conclusion about which set was cheaper. It all depends upon how much low-cost efficient energy use can be implemented and upon the future costs of fossil fuels. The cost savings from implementing energy efficiency can pay for all or part of the additional costs of renewable energy.

Our clean energy scenario assumed that a medium level of energy efficiency will be implemented, while growth in per capita GDP and population still drive up stationary energy demand by 25%. However, it is my personal view that, if population growth could be reduced significantly, e.g. by cutting the business/professional component of immigration, there would be a lower demand for energy in 2040 and so the clean energy scenarios would be more likely to be cost-effective compared with business-as-usual.

Clean energy futures will not be achieved without policies and strategies by all spheres of government. For 2004 a key recommendation is to expand the Mandatory Renewable Energy Target substantially, in order to build the capacity and capability of especially the bio-energy and wind power industries. Personally, I would like to see the existing target of 9,500 GWh extended to 20,000 GWh by 2010 and to at least 30,000 GWh by 2020.

The huge potential for cost-effective improvements in the efficiency of energy use will only be achieved if there is an immediate ban on new conventional coal-fired power stations. This should be addressed both by State and Federal Governments.

It is essential that the prices of fossil fuels are increased to allow for the environmental and health damage that they cause. This could be done by means of either a carbon tax or levy, or by emission permits with cap and trade. The revenue raised could be returned to the community in the form of funding to assist the creation of the new cleaner energy industries. With enhanced energy efficiency, there is no need for energy bills to rise.

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