



## Australia's Renewable Energy Future Report Released

Posted by [Big Gav](#) on March 9, 2010 - 9:25pm in [The Oil Drum: Australia/New Zealand](#)

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The Australian Academy of Science have released their report into [Australia's Renewable Energy Future - Australia's Renewable Energy Future](#) (pdf).



The impact upon the climate caused by our current energy use cannot be sustained. The economic costs of current energy arrangements have been analysed in the Garnaut Climate Change Review Final Report.

There exists a large difference between the price paid by consumers in Australia for electrical energy, over 80% of which is produced from black and brown coal, and the true cost of this energy, when we factor in the environmental impacts. Such market distortions hinder the development and deployment of cleaner alternatives.

Likewise, in the area of transport, current practices in terms of supply and environmental impact are unsustainable in the longer term. At present, our transport needs are driven by the use of liquid hydrocarbons. This was at least domestically serviceable when Australia was self-sufficient in oil production, but this is no longer the case. A recent report has highlighted Australia's growing dependence on foreign oil, which doubled our petroleum trade deficit to \$10.85 billion in 2007-08.

This deficit can only grow over time, as Australia's oil reserves continue to be depleted and production continues to fall. ... With an assumed price of oil at US\$100 per barrel, by 2020 our petroleum trade deficit will have risen to over \$40 billion per annum, comparable to the size of the recent economic stimulus package.

The adaptation of the electricity and power distribution grid to facilitate the low-carbon economy appears to be pivotal. The current model of a 'dumb' grid, centralised power generation, and high-loss transmission is unsustainable. To quote our sister academy, the Australian Academy for Technological Sciences and Engineering:

Australia's energy security requires a major increase in base-load electric power generation capacity to meet the expected growth in demand. The electricity grid must be planned to meet the long-term demands imposed by a diversity of technologies supplying power, including base-load and intermittent

renewables, remote locations for some power generation and the need for stability of the system under variable supply and demand situations. There is a need to introduce consideration of the 'national interest' when planning future expansion of the grid.

Replacing the current energy generation regime with a model based upon renewable technologies will not be easy. Minister Martin Ferguson argues, 'the factors limiting the uptake of renewables remain technical, not political. We must have a rational science-based pathway to overcome those hurdles. Faith alone will not get us there'.

This report aims to inform such a rational science-based pathway offering contributions to overcoming these technological problems. However, as the lecture series clearly demonstrated, there are many areas where the key science and technical problems have already been solved. Impeding the deployment of these technologies is a lack of both routes and financial support for innovation. To hasten the transition to the low-carbon economy, advantages of scale need to be achieved.

Several speakers in the lecture series acknowledged that further research by scientists, engineers, social scientists, economists and public policy researchers is required to expedite deployment of technologies and the cost-effective transition to the low-carbon economy. However, the series as a whole demonstrated beyond doubt that there is no complete science-based pathway to renewable energy that can be found within a single technology. Rather, we find that a holistic approach embracing complementary aspects of different technologies is to be preferred. Only such an approach can successfully address issues such as base-load power supply by renewables. ...

Likewise, our approach to infrastructure development needs to be holistic and many-faceted. A report commissioned by WWF Australia states:

... modelling finds that there are sufficient low emission energy resources, energy efficiency opportunities and emissions reduction opportunities in non-energy sectors to achieve reductions of 60 to 80%, and even emissions reductions of 90% or more if livestock emissions are reduced; and that there is sufficient time for the low emission technologies and services to grow at sustainable rates if development starts promptly. The model finds that a sequential approach to low emission industry development (lowest cost technology first, then the next lowest cost technology and so on) requires much higher growth rates for each industry than one that grows a number of technologies/industries concurrently.

As Australia makes the transition to the low-carbon economy, some jobs in emission intensive industries will inevitably be phased out as alternative technologies and jobs appear to meet ongoing needs for energy, materials and services. The history of civilisation has many examples of occupations that have been revolutionised by new technologies which have served to raise living standards. Efforts should be taken to quantify the nature of the renewables revolution, especially in terms of workforce transitions and the need and perspective for retraining. However, to quote a CSIRO document:

... achieving the transition to a low carbon sustainable economy will require a

massive mobilisation of skills and training – both to equip new workers and to enable appropriate changes in practices by the three million workers already employed in these key sectors influencing our environmental footprint. Current approaches do not appear sufficient for meeting these challenges.

We can become more energy efficient and at the same time grow our economy, as demonstrated by the example of Sweden. Since 1990, the economy of this country has grown by 50% while reducing its greenhouse emissions by 10%. To achieve a similar outcome, Australia must build infrastructure to reduce our greenhouse gas footprint, cut our dependence on liquid fuels, and enable the transition to a low-carbon economy. The full gamut of low-carbon renewable energy generation techniques has been ably reviewed in the report *A Clean Energy Future for Australia*.

This document builds upon the lecture series. It outlines the state of the technological alternatives, and provides a set of development options for consideration by policy-makers. The report is based upon, but is not strictly representative of, the inspiration and data provided by speakers at the Academy's series of monthly public lectures, *Australia's Renewable Energy Future*, held between 2 September 2008 and 4 August 2009.

*Cross-posted from [Peak Energy](#).*



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