2003 MRET review submission by ANZSES Queensland branch

Introduction

ANZSES Queensland Branch represents a diverse group of professionals involved in progressing the research, development and application of all forms of renewable energy, including solar energy and energy efficiency.

Overriding premise

MRET is but one strategy for reducing national greenhouse gas emissions. Its greater value lies in its industry development and could be seen as the cornerstone of Australia's response to global warming. The overall objective of MRET forms part of our international commitment to stabilise and/or reducing the carbon dioxide content in the atmosphere and to also create a long-term benefit to the Australian society, environment and economy. An estimated 60% (reference to 1990 base line) reduction of greenhouse gasses is needed to stabilise the atmospheric concentrations to limit global warming.

Australian solar resource

The PhD by Dr. David Mills (Renewable Energy Potential in Australia, University of Queensland, 2001) has investigated the potential of renewable energy for commercial applications. While the study investigated, Domestic Photovoltaics, Domestic Solar Hot Water and Commercial Wind Energy, reference to the Wind study is made here.

Several decision filters were applied to the raw wind data obtained from the Bureau of Meterology (LAPS) with corrections for surface roughness. These included:

- Minimum commercial average wind speed of 8m/s (6m/s and 7m/s also investigated)
- Maximum proximity to the high voltage electricity network of 50km
- Wind resource is located in an area more than 7 square kilometres per site
- Land use limiting wind turbine siting to 43% of suitable land
- Land owners were supportive of wind farms

Queensland was estimated to have available enough sites over 114 square kilometres to support 247 MW of wind power generation, delivering an estimated 965 GWh of electricity per year. South Australia was estimated to have available enough sites over 583 square kilometres, to allow 1260 MW of capacity delivering an estimated 4,808 GWh of electricity per year.

Compared to the 1995 electricity consumption of Queensland (26.5 TWh) and South Australia (9.3TWh), the wind resource potential could meet 3.6% of grid electric energy in Queensland and over half of South Australia's electric energy. If the

commercial wind speed was lowered to 7m/s, the wind potential resource in these two states could many times over supply the grid. This is provided there was sufficient spatial distribution to ensure reliable supply from wind turbines at periods of peak electricity demand. An interconnected National electricity grid will allow wind power surplus in one region to be transported elsewhere. Temporal and spatial analysis of wind resources would be a valuable addition to Mills' resource analysis.

The wind energy resource for other States is better than Queensland and South Australia, but data on location of electricity networks limited further detailed analysis. However, based on the ratio of useable wind resource to total wind resource (7.8%), Mills (2001) estimated the total useable wind resource potential for Australia at the 8m/s commercial limit, as 129.1 TWh per year. ABRAE estimated total Australian electricity generated in 1996/97 to be 154.7 TWh, so wind has the potential to generate as much as 80% of Australia's electric energy.

In short, the renewable energy potential for Australia, need look no further than the wind energy resource, though other renewable energy sources are also viable. Renewable energy can be the major source of electricity in Australia.

Benefits of the current MRET

The current MRET has been a significant development in Australian energy industry demonstrating the enormous potential for RE to be a major player. The MRET has achieved in a few short years many positive benefits:

- Spawned a large range of diverse energy "opportunity" projects
- Positive effect of the existing electricity network due to the "embedded" nature of the generation resulting in reduction in distribution losses and use of local RE resource
- Encouraged energy and cost competition amongst existing RE technologies
- Matured both product range and market for many RE technologies
- Increased production levels decreasing costs
- Market price of REC's is still well under the penalties
- Increased community awareness of RE products and services
- Created significant job opportunities across sectors and geographic locations
- Increased the need for industry RE training
- Improved Australian manufacturing base
- Increased research and development in industry and education institutes
- Has a positive effect of the energy supply security

Deficiencies of the current MRET

While the current MRET has been successful in many areas as expected from a new incentive a number of failings were built into the scheme:

- Fixed % target but tied to expected energy demand that has increased significantly; instead of achieving a real +2% RE generation has merely managed to maintain the status quote.
- Cost penalties are not indexed to inflation or by % under purchased by retailers
- MRET is seen by many state governments as not being adequate and they have implemented other schemes to try to address this
- REC's from existing large hydro systems are not averaged over time potentially causing a boom bust cycle while the RE % is still very small
- +2% fixed target is seen by many community groups as significantly below what could be easily and economically achieved
- Target is subject to high political influence and lobby groups only interested in company profits and no community benefit
- The full potential of both the technologies and solar resource is not realised
- The deemed REC's for some technologies in the domestic arena should be given REC's upfront for the expected life of the installation eg solar hot water, PV and wind should be treated the same

The COAG report identified many barriers and areas of increased expense to "embedded generation" which practically applies to all plant generating REC's.

- Connection agreements are complex and biased towards large fossil generation plants
- The current NEMCO generation requires generators to supply electricity to nodes in the distribution network and totally excludes any benefit to the local geographic area in power quality support, this are is where the embedded generation is of greatest value
- True value of the energy source is not recognised in the $ value
- True system support value is not realised

Industry requirements for cost effective MRET implementation

For industry to improve the cost effectiveness of RE and increase exports a road map has been drawn up (Renewable Energy Action agenda). In the Renewable Energy Action agenda industry has a vision of an annual growth of around 25%, for this to be achieved it needs to be actively supported by a significant indexed MRET. The dot points below give opportunities for MRET improvement:

- Implement a consistent long-term strategy
- Have long, medium and short term objectives i.e. very long-term (50 years), medium (10 - 20 years), short 0-10 years
- The installed capacity should be progressively increased ultimately to 100%
- Should be decoupled from short term political agendas
- Should have a clear focus on building a competitive world-class RE industry
- Create investor confidence i.e. long-term stable investment
- MRET should be responsive to increased energy demand i.e. any demand above a level will trigger extra RE capacity increase
- Avoid at all cost a stop start industry due to uncertain government review processes

- Continuous incremental increase in installed and generated RE capacity
- Plus - responsive strategy to meet a high % of any increase of load
- Significant Jobs creation in many sectors and wide geographic locations
- Significant export potential of goods and services derived from RE industry
- MRET should be included as an integrated part of any carbon trading system underpinning the move away from fossil fuels to renewable energy
- $ Compensation should be added cost of embedded generators until the electricity industry review values the real benefit of the generation this could be in the form of guaranteed long term purchase $ or % of the MRET to meet
- Supportive regulatory support

As with any industry a number of factors need to work together to make it viable, just having a world-class solar resource is no guarantee of success. What is needed is a supportive MRET framework to give the industry a leg up; this is not unlike the government subsidies and support given to the current electricity generation and supply companies when they were established.

Potential of a continuing MRET

Solar hot water

With 30% of the 47,800 GWh electricity market (based on Electricity Australia 2002, ABARE's Australian energy projections 2001 and the BCSE survey of cogeneration plants) required for domestic use and of the 30% something in the order of 20-40% on average is used for hot water heating. The current national penetration of solar hot water systems is in the low percentage single figures. The potential of the domestic solar hot water market effectively displacing a large part of the electrical generation is both cost effect and achievable in the short term. If this was achieved in a realistic 10 years it would currently represent about 10% of the 47,800 GWh or 4,780 GWh's.

Wind

Many of the technologies have demonstrated very large capacity for annual growth with figures around the 30% common and have sustained this over at least a 10 year period be it from a small base. For example the world wind industry grew 28% in 2002 with an installed capacity in Germany of 12 GW (equivalent to about 25% of the total Australian generation capacity) in a geographic area similar to Victoria and with much less wind resource. While in theory the wind resource could supply the total energy needs some practical limitations exist, but the potential for a real significant % greater that 10% is possible in the short term.

The analysis of Mills (2001) indicates that the wind energy resource is sufficient to meet up to 80% of electricity generated in Australia.

Photovoltaic (PV)

PV technologies are seen as very green and have a high level of community acceptance. The technology has been installed in an extensive range of niche markets and by early adaptors in the grid support area. The cost competitiveness of PV's is

gradually improving, with the current production levels in Australian at around 30 MW annually and growing. The solar resource used by the PV systems is readily available throughout the country making it the ideal choice (and most cost effective) for many applications. The scale of applications is growing annually but continued support any MRET can give will aid in increasing Australian manufacturing capability and cost reductions.

What should be our target for MRET implementation?

While a simple percentage target is easy to understand and communicate to the general public many deficiencies exist with this method. Many groups would try to simplify the MRET target to a percentage of generating /energy capacity. Also lobby groups from the existing energy infrastructure have a vested interest in maintaining the current energy mix or limiting the MRET. **The significance and long-term community benefit of getting the MRET appropriated cannot be under stated.** The MRET should fit into or expand on the existing RE industry vision while giving the existing energy industry encouragement to find solutions for the inevitable technical problems with more complex generation and distribution. The extra system complexity should not be seen as an unsolvable that many quarters of the existing industry would portray.

Cost Impact of scraping MRET

In short any scraping of a MRET would not only send the wrong political message to Australians but also to the international community further alienating Australia and having a significant negative impact on our general export market and world standing.

Ideas for an improved MRET

First a "real" +2% RE should be reinstated back to the original target and time line. Followed by a progressive increase to an achievable +10% but we should not be locked into this percentage. If energy efficiency is implemented vigorously even in a climate of economic growth, RE percentage will increase naturally as the overall generation is decreased, this is where the incremental increase in RE generation base is required to leverage on this advantage.