Centre for Energy and Environmental Markets

CEEM Submission to the Issues Paper:

Driving Investment in Renewable Energy in Victoria: Options for a Victorian market-based measure

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Preamble

The UNSW Centre for Energy and Environmental Markets (CEEM) undertakes interdisciplinary research in the design, analysis and performance monitoring of energy and environmental markets and their associated policy frameworks. CEEM brings together UNSW researchers from the Faculty of Commerce and Economics, the Faculty of Engineering, the Australian Graduate School of Management, the Institute of Environmental Studies, and the Faculty of Arts and Social Sciences, working alongside a growing number of international partners. Its research areas include the design of spot, ancillary and forward electricity markets, market-based environmental regulation and the broader policy context in which all these markets operate.

The Victorian Government has recently released an Issues Paper seeking input from interested parties on the development of a market-based scheme to meet its policy to increase Victoria's electricity consumption from renewable sources to 10% by 2010.

This submission to the Issues Paper starts with some general comments on the Victorian government's proposed measure, and raises issues of particular relevance to its development process. It then discusses the specific design options identified in the Issues Paper.

This submission draws on a range of work by researchers now associated with the Centre, including submissions to the MRET development and review processes, and an analysis of options for State-based renewables obligations in Australia (Passey et al., 2005). More details of the Centre can be found at the CEEM website – www.ceem.unsw.edu.au.

This is an area of ongoing work for CEEM and we are actively seeking feedback and comments on this submission, and on related work.

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Executive Summary

The Victorian Government is to be congratulated on its intention to implement a market-based mechanism to drive renewable energy deployment in Victoria. The Federal Government's decision to not extend and expand MRET is regrettable, and leaves a major policy gap in driving the uptake of technically proven renewables including wind, biomass, solar and hydro. Elsewhere in the world, market 'pull' renewable energy policies are being widely deployed within multi-national, national, regional and state jurisdictions. Such policies can deliver short-term emissions reductions, build the renewable energy industry and expand the institutional capacity of the wider energy industry to manage our necessary transition to more sustainable energy systems.

The Victorian Government is "..seeking to maximise, to the extent possible, consistency with existing MRET scheme" and there are important lessons for policy makers in the experience to date with both MRET and other green certificate schemes worldwide. The Victorian Scheme is the first State-based proposal of its kind, and so will set the template for other states to follow. There are certainly opportunities to greatly improve upon the design of MRET, but a challenging policy development process lies ahead.

Some general comments on the proposed measure

- A renewable energy obligation is an important component of the integrated mix of policy measures required to effectively and efficiently respond to climate change. The interactions between all of these existing, and potential future measures, will need to be carefully managed through the policy development process. Tradeable certificate instruments have some useful characteristics for managing policy interactions as market prices adjust to changing circumstances. However, it is possible for other policies to cause unexpected and adverse impacts on poorly designed schemes. The interaction of State Building Rating schemes and solar hot water within MRET is an example of this.
- Scheme design: tradeable certificate schemes are 'designer' markets – they arise from policy, and design choices can markedly affect their effectiveness and efficiency. They are also complex which can lead to mistakes or, worse. The risks of incorporating old hydro into MRET was identified early in the design process, but still wasn't properly managed in the final implementation. The MRET policy process has also highlighted potential problems in trying to correct such design errors once the scheme is operating. Probably the most important design choice for the Victorian scheme is whether to include existing renewable plant or only new (post mid-2006) projects – we would strongly argue for the latter.
- Policy dynamics: A key issue for tradeable certificate measures is the risk of a 'boom and bust' investment cycle. They tend to drive participants to try and get their projects up as quickly as possible – both to maximise the time over which they earn RECs before the legislated end of the scheme and to capture the highest possible share of total market demand by locking in the liable parties and killing off competitors' projects. As the Victorian Issues Paper notes, MRET-driven project investment seems close to stalling even though the scheme has 14 years yet to run. This is, of course, a risk for a Victorian measure as well. We propose some possible approaches for managing this in our detailed comments including setting a target that increases beyond 2010 to 2020 or beyond, allowing only limited banking, and a 15 year sunset clause on projects being eligible to earn certificates.
- Risk management: Climate and energy policy is inescapably a risk management exercise. Some of these risks can be reduced or transferred between parties; others will always fall on society, and hence their governments. Tradeable certificate schemes can certainly

transfer some risks onto the market participants but they respond, naturally enough, with calls for greater investment certainty. Governments need to take care here – most private sector decision-making occurs in an environment of risk and Governments must retain the freedom to change a measure's design or introduce other policies should it be required.

- The policy development process itself is likely to be fraught - a transparent process that explains why particular design choices were made and assigns accountability for these decisions can certainly help. The process will need to be robust against unreasonable demands from powerful stakeholders, and retain the freedom to change as circumstances demand. It would be useful for the Victorian Government to provide more details on how this policy formation process will be conducted.

1. Start date for the scheme

- The 1st January 2007 is considered appropriate, although it is not obvious why 1st July 2006 could not also be used. Most critical is the date the Victorian Government commits to a particular scheme design.

2. Target level

- A percentage target is likely to be preferable to a fixed GWh target.
- A PPA effectively transfers the risk of a variable target from the project developer to the retailer – who can be protected by suitable banking arrangements and a shortfall allowance. A percentage target allows renewable energy to maintain its level of contribution, not only to 2010 but also to the scheme's end date.
- The year-to-year variation in a percentage target will be quite low in the Australian electricity industry. It is likely that banking arrangements, the size of the target, the timeframe of the scheme as well as the decisions of potential competitors have more significant impacts on investment certainty.

3. Interim targets

- Given the size and timing of the Scheme's targets relative to the existing manufacturing capacity of the renewable energy industry, and to minimise administrative complexity, a simple linear increase is recommended.

4. Technology neutral vs. portfolio approach

- A technology neutral approach is recommended as it is likely to be lower cost and simpler to administer. Other technologies such as PV are likely to be better supported through separate measures.

5. End date

- The Scheme should extend at least 15 years beyond the year of its highest GWh target. This will extend the Scheme beyond 2020, so if it uses the MRET administrative framework, the Victorian Government will have to, from the start of the Scheme, be clear on how it will operate beyond this point.
- Even if a percentage target is used to maintain the relative amount of renewable energy beyond 2010, to provide long-term least-cost abatement, the target will need to increase through to 2020. This will also provide additional investment certainty, both because of the increasing demand for renewable generation and because of the clear policy signal it sends to investors and the resultant reduction in sovereign risk.

6. Liable parties

- To reduce administrative and compliance costs, liability should be placed on all electricity retailers to the extent that they sell electricity in Victoria, and on wholesale purchasers of electricity in Victoria. The use of annual renewable power percentages to achieve the interim targets published by 31st March each year is also recommended.
- Exemptions for particular industry sectors are not recommended as they are unfair on other sectors, will create distortions in the market place and are difficult to quarantine.

7. Eligible generation and certificate creation

- Eligibility under the Victorian Scheme should be limited to renewable generators that commence operations after a certain date – such as mid 2006.
- Old hydro should be excluded from the scheme entirely, including upgrades and refurbishments. Emphasis should be on dynamic efficiency and on developing an industry based on technologies that have the potential to significantly increase output over the long term, such as wind, bioenergy and solar. The additional incentive available to new renewable plant as a consequence of exclusion of old hydro will result in a stronger renewable energy industry over time.
- Baselines should not be allowed for any plant, as it is almost impossible to ensure 'additionality' from existing plant. Output from such plant can be increased by BAU upgrades made in response to energy market revenue, or even just climatic variability leading to year to year fluctuations. In the latter case, the new renewable generation claimed by the scheme will be inaccurate, as it does not recognise that generation below a plant's baseline also reduces the Scheme's overall generation.
- Plant should be eligible to participate in the Scheme for only 15 years after their commissioning date. This would encourage new renewable generation, and could increase renewable energy contributions above the Scheme's target levels.
- Solar water heaters should be excluded from the Scheme as they are already supported by other measures. Fuels cells and cogeneration should only be eligible to the extent they use fuels derived from renewable sources.

8. Shortfall charge

- The shortfall charge could be set at $40/MWh. If the Scheme target increases beyond 2010, the charge should be indexed to the CPI.
- Simply indexing the penalty of the Victorian Scheme won't necessarily result in it being additional to MRET. Where the marginal cost of the renewable energy required to meet both targets is higher than the MRET penalty, the retailer may be able to buy renewable energy to avoid the Victorian Scheme penalty but pay the MRET penalty because it is cheaper to do so. This type of potential loophole needs to be addressed.
- Liable parties should be allowed a leeway in meeting annual targets as long as there are make-good provisions and unmet liabilities are not permitted to become excessive over time.

9. Banking and borrowing

- To increase certainty regarding the number of certificates likely to be brought on to the market, they should be declared within a limited time of generation.

- To avoid a boom-bust surge of investment in the early stages of the scheme, it may be advisable to limit banking so that certificates can only be used for a limited time after creation.
- Borrowing of certificates from future years should not be allowed.

10. Administration

- The likely roles for the State Administrator, and the two options for accreditation and validation of certificates canvassed in the Issues Paper are reasonable.
- If ORER is not used and instead the State Administrator takes on equivalent functions, it may not be necessary to create a new Victorian certificate. Depending on the outcome of Recommendation 29 of the MRET Review Panel, the State Administrator may be able to collect RECs then submit them to ORER for extinguishment.
- If the State Administrator is to assume control of the administration requirements after 2020, this will need to be clear from the start of the Scheme.
- Transaction and administration costs: The most important design principle to minimise both transaction and administration costs is simplicity. Creation of additional rules or design features for particular industries provides points of uncertainty and leverage for other stakeholders – which can significantly increase administration costs as 'special cases' are dealt with.
- Efficiency: short-term, dynamic and long-term: Short-term economic efficiency can be maximised by both minimising transaction and administration costs, and by promoting the use of least-cost renewable generation. Dynamic efficiency can be maximised by excluding old hydro from the Scheme, as they would otherwise increase the time taken for new technologies to develop. Long-term economic efficiency is best served by having a significant, ongoing and increasing renewable energy target, and by including all electricity consumers in the scheme - especially large energy users.
- Transparency: The current MRET arrangements are sufficiently transparent in terms of registration of certificates and requirements placed on liable parties. However, unlike MRET, certificates should be declared to the market within a limited time of generation, and any baselines should be publicly available.

11. Transition to a multi-State scheme

- None of the design options discussed are inconsistent with an expanded MRET, and in fact, depending on the extent and nature of expansion, may still be necessary. Likewise, none of the design options discussed above preclude expansion of the Victorian Scheme to other states.
- A key point is to ensure the Victorian scheme is effective, efficient and tightly defined from the start. Poor early design choices can result in too many compromises that are incompatible with more rigorous measures as policy frameworks evolve – the NSW GGAS is a good example of this.
- Having the Victorian certificates fully fungible with the MRET RECs would aid any integration with an expanded MRET. However, care should be taken since fungibility with MRET could compromise the effectiveness and efficiency of the Victorian Scheme.

12. Interaction with Green Power

- The use of Green Power sales to meet the Victorian Scheme's liabilities would mean the additional payments made by consumers electing to pay for Green Power would not result

in increased renewable energy generation. An attempt to use Green Power to meet targets would not reflect well on the Victorian Scheme's intentions.

13. Impacts of a 10% renewable energy target

- Economic impacts: Renewable energy is not a short-term least-cost abatement option, but part of a long-term least-cost abatement portfolio. Since it is agreed Australia needs to reduce greenhouse emissions, the aim should be to achieve the lowest cost and lowest risk approach, not just compare the cost of one abatement technology against the cost of doing nothing. Thus the cost of a Victorian renewables obligation should not only focus on the short-term increase to electricity prices, but on the increased overall abatement cost if its renewable energy industry is not developed. Note that cost estimates are necessarily speculative, short-term and incomplete due to the modelling tools used. Such tools are poor at modelling technology progress, externality costs imposed by different fuel technologies, employment impacts of different technologies etc.
- Employment impacts: Generating electricity from renewable sources creates more employment than generating electricity from fossil fuels – this in part contributes to the higher generation cost. A greater proportion of the employment and capital expenditure also occur in Australia. Other state-based schemes, such as the NSW GGAS and the QLD 13% Gas Scheme, have set a precedent for restriction of eligible generation to within their borders. Restriction of eligible renewable generation to within Victoria will increase the local employment benefits, but likely at increased cost, and would also require greater integration of stochastic and partially predictable generation into the Victorian grid.
- Energy intensive industries: Because of the likelihood of a price being placed on carbon emissions within the life of the Scheme, protecting and nurturing energy-intensive industries may not be in Victoria's best interest. They would be better served through a gradual transition process, rather than being shielded until it is no longer possible to do so, increasing the likelihood of sudden collapse. Although in the short term, compensatory measures might be introduced, care should be taken to preserve the integrity of the Scheme and to ensure the measures are only temporary, not for the Scheme's duration.

Some general comments on the proposed measure

The Victorian Government is to be congratulated on its intention to implement a market-based mechanism to drive renewable energy deployment in Victoria. As the Issues Paper notes, the Commonwealth MRET has been a key driver of such deployment across Australia but is now stalling. The Federal Government's decision to not extend and expand MRET is regrettable, and leaves a major policy gap in driving the uptake of technically proven renewables including wind, biomass, solar and hydro power. The R&D and Demonstration support for renewables announced in the Federal Energy White Paper does not fill this gap. Elsewhere in the world, market 'pull' measures[1] to drive renewables uptake are now being widely deployed as a key element of climate and energy policy frameworks within multi-national, national, regional and state jurisdictions.[2]

These policies achieve short-term emissions reductions, build a renewable energy industry and expand the institutional capacity of the wider energy industry in managing the transition to more sustainable energy systems - all of this will be key in achieving the longer-term major emissions reductions that seem almost certain to be required to avoid dangerous climate change.

We also now have growing experience – some hard earned – in good practice when implementing such policies. Given that the Victorian Government is "..seeking to maximise, to the extent possible, consistency with existing MRET scheme" it is worth focusing on experiences to date with this tradeable renewable certificate approach. In particular, we will consider the challenging policy development process that lies ahead.

Good climate and energy policy is inherently complex – the scale of the challenges and likely transformation of our societies required to avoid dangerous climate change will require a coherent, dynamic policy framework of numerous measures. Each of these measures needs to be carefully designed, the interactions between all of these must be carefully managed, and the policy process must be able to adapt to the inevitable changes required in scheme operation over time – changes driven by our evolving understanding of both the emissions abatement challenge and our available options for action. Framing all of these issues is the reality that policy making is effectively a risk management exercise, and needs to be explicitly recognised as such.

Scheme design: Tradeable certificate instruments are challenging in all the above regards. Such market-based approaches are sometimes argued to be simpler than regulatory or direct fiscal approaches because governments just have to set the target, and then let the markets work out how best to achieve these objectives. The reality is very different. Markets for tradeable certificates are 'designer' markets – they arise from policy, and design choices can markedly affect their effectiveness , efficiency and equity impacts.

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[1] We use a somewhat different policy terminology to that employed in the Issues Paper. Measures that drive deployment of proven technologies can be seen in a broad sense as market 'pull' policies – these include market-based certificate schemes including MRET, but potentially also regulatory instruments such feed-in laws and fiscal incentives including capital grants and tax credits. These are different from measures to drive the development of promising but technically unproven renewable technologies – such mechanisms include publicly funded R&D and capital support for demonstration projects.

[2] Renewable energy deployment policies are being widely applied across the European Union, the United States (both Federally through Production Tax Credits and at State level through Renewable Portfolio Standards). Furthermore, a growing number of developing countries, including China and India, have already, or are in the process of introducing such policies.

Such markets can perform well – renewable energy projects in Australia being driven by MRET are proving to have some of the lowest delivered MWh costs in the world.[3] They can also be reasonably compatible with restructured, market-based electricity industries.

However, important issues can be lost in all the potential complexities of scheme design. For example, the MRET design process seems to have given too little attention to some questions of market information – participants such as large hydro have been able to conceal their amount of renewable generation eligible to earn RECs, thus providing a source of potential market power.[4]

Of even greater concern is the potential for influential stakeholders to manipulate design choices to their own advantage. Market participants are always seeking competitive advantage and this can drive innovation that reduces the costs of achieving policy objectives. However, they will also seek advantage during the scheme design process.

For example, the decision to allow pre-1997 generators to earn RECs has had the consequence that such plants are projected to supply near 30% of REC demand over MRET's legislated life to 2020 (BCSE, 2005). Many of these plants will not have had to make any additional investment beyond Business-As-Usual to create their RECs. The outcome is reduced investment in genuinely new renewable energy and hence reduced industry development, as well as windfall profits to some participants.

The issue of baselines for old hydro was raised in the original MRET Issues Paper prepared by the Renewables Target Working Group (RTWG, 1998). They noted that the stated intent of the measure was to encourage new renewables additional to existing renewable generation but that it was important not to discriminate against increased output from existing renewables. In the final report of the working group, they were unable to form consensus on this issue. Instead, they offered three possible approaches that might be adopted – i) do not include any renewable energy projects in commercial operation prior to 1997, ii) provide a regulator with the discretion to decide the proportion of an existing renewable generator's output which would be eligible to earn RECs or iii) make existing generators eligible for RECs for part of their production above a *specific target equal to x per cent of their baseline energy output averaged over an appropriate time frame with 'x' determined through the political process*. The Commonwealth and Western Australia supported option i, Queensland option ii, and Tasmania option iii. Somehow, the policy process ended up choosing option iii, with the consequences for the scheme noted above.

Finally, participants will also seek competitive advantage by testing the final rules and related policy processes. For example, cost competition in MRET had the result of driving some project developers to pursue controversial yet high wind regime sites on some parts of the Victorian coast. Such controversy and public opposition risks the prospects for wider wind industry development in the State. The Victorian Government's State planning policy and wind project guidelines will be helpful in managing such issues that they will inevitably arise because of the nature of tradeable certificate measures. Still, more may have to be done.

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[3] For example, the price of the UK's Renewable Obligation Certificates have been more than twice the price of MRET RECs, while the feed-in tariffs available to wind projects in a number of European countries also involve far higher levels of renewable energy support.

[4] Participants have been free to delay registering generation eligible to create these RECs. This allows the participants to create market uncertainty as to how many RECs are actually available. The MRET review recommended that this loophole be closed, and the Federal Government has agreed with this recommendation.

Policy interactions: Tradeable certificate instruments have some useful characteristics for managing policy interactions as the market for certificates can automatically adjust as other policies are put in place. For example, the introduction of a carbon tax in Australia would increase the costs of coal-fired generation in Victoria and so increase electricity prices. New renewable projects receiving higher electricity prices would require lower prices for their Victorian RECs in order to achieve adequate returns on investment. This impact would likely ripple through the REC market over time.

Still, interactions can have unexpected impacts that adversely impact on scheme's meeting their stated policy objectives. As noted in the Issues Paper, the introduction of Victorian and NSW Building Standards is driving uptake of Solar Hot Water that also earn deemed RECs. The BCSE is projecting that deemed RECS may meet more than 15% of REC demand over the life of the scheme, and this adversely impacts the opportunities for renewable projects that aren't receiving the benefit of such regulatory drivers.

It would be helpful for the Victorian Government to advise stakeholders on how it plans to manage these interacting issues.

A dynamic policy process: The context of climate and energy policy is fast changing. The dynamics of policy measures, the processes by which they are changed, and their 'robustness'[5] to such changes are all of vital importance.

One key issue for tradeable certificate measures is the risk of a 'boom and bust' investment cycle. They tend to drive participants to try and get their projects up as quickly as possible – both to maximise the time over which they earn RECs before the legislated end of the scheme and to capture the highest possible share of total market demand by locking in the liable parties and killing off competitors' potential projects. As the Victorian Issues Paper notes, MRET-driven project investment seems close to stalling despite having a legislated life to 2020. This is, of course, a risk for a Victorian measure as well. We propose some possible approaches for managing this in our detailed comments later.

More generally, the MRET policy process has highlighted potential problems in trying to correct design errors. MRET's baseline problems with old hydro did not take long to emerge once MRET had commenced, yet the Tambling MRET review was unwilling or unable to act on the problem except by recommending a sunset clause that would make pre-2005 generation ineligible to earn RECs after 2020.

Risk management: Climate and energy policy is inescapably a risk management exercise. Some of these risks can be reduced or transferred between parties; others will always fall on society, and hence their governments.

Tradeable certificate schemes certainly transfer some risks onto the market participants – both those who are liable parties as well as those who voluntarily participate as project developers. For example, unlike feed-in tariffs, governments do not guarantee fixed publicly funded support for some number of years.

[5] Here meaning the measure's ability to remain effective and efficient.

Certificate schemes therefore increase the demands of market participants for some other measures of investment certainty. Governments need to take care here – most private sector decision-making occurs in an environment of risk, and government policies are only partly responsible for this. Furthermore, there is often some asymmetry in such demands for investment certainty - policy changes that create windfall profits for existing renewable projects are unlikely to see project developers offering to hand these profits back to government. Finally, markets need some risk and uncertainty in order to function properly – it drives innovation and careful decision making.

Commitments to creating investor certainty can limit a government's freedom to change a measure's design or introduce other policies at a later date. This is a freedom that government's will require in order to effectively respond to climate change on an ongoing basis. A key strategy for managing uncertainty in policy formation is to seek 'robustness'. It might be worth explicitly incorporating this in the formal criteria by which design options will be assessed.

The policy process: As seen above, the policy process for introducing tradeable certificate measures is a fraught one. A transparent process that explains why particular design choices were made and assigns accountability for these decisions can certainly help. The process will need to be robust against unreasonable demands from powerful stakeholders, and retain the freedom to change as circumstances demand. It would be useful for the Victorian Government to provide more details on how this policy formation process will be conducted, and how they plan to address the general issues raised above.

Comments on the key design issues identified in the Issues Paper

In this section we address the key design issues outlined in the Issues Paper. Note, however, that many of these design choices interact in complex and sometimes surprising ways. For example, scheme end-dates, targets, interim targets and banking arrangements have proven inextricably linked in the operation of the MRET scheme.

These complexities can lead to unpleasant surprises when the scheme is underway. Such surprises can be reduced, as noted earlier, by having an open and responsive design process. The Victorian Government might wish to consider the use of experimental economics techniques that allow policy makers to explore the impact of key design decisions in a laboratory setting using market simulations.

1 Start date for the scheme

The 1st January 2007 seems to be an appropriate start date for the Scheme. Note that this will allow a maximum of 14 years for plant to be credited for renewable energy generation if the scheme terminates in 2020. What is more critical in terms of investment certainty is not the start date of the scheme but when the Victorian government commits to a particular scheme design so that liable parties and project developers can develop their business plans accordingly. Certificate

schemes have a tendency to drive an early investment rush that, as the Issues Paper notes, can work against cost and industry development objectives – options for reducing this investment rush are discussed in Section 9.

2 GWh or Percentage Target

There are arguments for and against the target being set in absolute (GWh) or relative (percentage) terms. The position of the Victorian Issues Paper is that a fixed GWh target would provide greater long-term certainty, making it easier to attract financial backing for projects.

However, as seen with MRET, important risks are then transferred to the public. MRET was meant to deliver a 2% increase in renewable generation yet that now seems unlikely to eventuate. In addition, for a renewable energy project developer to access finance they are likely to require a PPA from a retailer (some projects may finance off their balance sheet and take a chance on getting a contract later, or selling into the spot market). The retailers effectively then take on the risk of any variance in the target due to incorrect demand projections. Both banking arrangements and a shortfall allowance provide sufficient flexibility for retailers to meet such a target.

A percentage target would also represent a more meaningful target in terms of climate change. Unanticipated increased growth in electricity demand has adverse climate impacts and a percentage target would drive additional effort in new renewables. Conversely, policies reducing energy consumption would make the target easier to reach. A fixed target also has a tendency to create a ceiling for renewables, which is then reflected in policy and industry planning.

Finally, a percentage target also has the attraction of allowing renewable energy to maintain its level of contribution, regardless of demand movements, not only to 2010 but also to the scheme's end date. Electricity demand is projected to increase from 155PJ in 2004/05 to 171PJ in 2009/10, then to 214PJ in 2019/20[6]. Assuming a 10% target means 17.1PJ in 2010, this absolute target maintained through to 2020 would result in only 8% of electricity being from renewable sources at that time. Note that we argue for a ramping target beyond 2010 in Section 9.

It is likely that banking arrangements, the size of the target, the timeframe of the scheme and, critically, the decisions of potential competitors will have more significant impacts on investment certainty for particular projects than relatively minor annual target fluctuations. Of course, if demand decreases significantly below projections, a percentage target could result in retailers being left with excess renewable energy certificates. If this does occur it will most likely be towards the end of the Scheme's life when there is a good chance that greenhouse intensive electricity generation is becoming more expensive due to other policy measures.

3 Interim targets

Given that under the current proposal, the Scheme targets will increase over a period of only four years, whether they are increased linearly or through an optimised investment profile is unlikely to have any material impact, especially if banking is allowed. Thus to minimise administrative complexity, a simple linear increase is probably preferable.

[6] From ABARE 2004 dataset "Total final energy consumption by industry and fuel, Victoria".

4 Technology neutral vs. portfolio approach

As highlighted in the Issues Paper, a technology neutral target is likely to have a lower cost outcome. Although a portfolio approach may result in a lower long-term cost by supporting technologies that can provide a greater contribution in the long term, it would be significantly more complex. Not only would the 'correct' level of support for the current technologies have to be determined, but this support would have to be continually optimised as technologies improved over time. The experience of biomass within MRET is relevant – early projections suggested that biomass would be the major technology driven by the scheme, but technology and planning challenges meant that wind, instead, has fared better than expected. A portfolio approach would have hampered this market-led response. Furthermore, it should not be an objective of scheme design that it solves all renewable energy deployment needs. It is likely that some technologies would be better supported by separate measures (for example capital grants or feed-in tariffs).

5 End date

5.1 2025 or an alternative end date

The Scheme should extend at least 15 years beyond the year of its highest GWh target. If a percentage target were used, there would actually be two separate end dates – the date to which the target is maintained (eg. 10% to 2020), and the other 15 years after that. This is because, assuming demand increases, the GWh required to meet the percentage target will also increase, and so new capacity will be required. This is particularly the case if only limited banking is allowed.

As stated in the Issues Paper, use of the MRET administrative framework poses a significant problem as under present Commonwealth Government policy the MRET scheme expires in 2020 and so the ORER and associated regulations that govern its operation as defined under the Act will then no longer exist. If the ORER is used by the Victorian Scheme until 2020, and the State Administrator is to assume control of the administration requirements after this time, this will need to be clear from the start of the Scheme.

5.2 Target beyond 2010

A fixed target for 2010 will result in a smaller percentage of electricity from renewable sources at later dates, assuming electricity demand continues to grow. Even if a relative target is used to maintain the percentage of renewable energy, this is unlikely to be sufficient to reduce Australia's greenhouse emissions from electricity generation to acceptable levels over the longer term. Estimating the least cost mix of abatement options - energy efficiency, renewables and lower-emission fossil fuels - for Victoria is a major challenge, with many unknowns. These unknowns include the climate science itself, international and other Australian policy developments, and technical progress. Still, it seems likely that renewables will have a major role to play in most regions of the world including Victoria.

For example, recent scenario work by the IEA exploring possible future roles for carbon capture and storage (CCS) suggest that renewables will be the major contributor to achieving major global emissions reductions in 2050 at least cost. The IEA GLO50 scenario projection in Figure 1, where the penalty for emissions stabilises at $US50, has renewables' contribution at 45% by 2020 and maintained through to 2050 – even where carbon capture and storage contributes significantly to abatement from 2015 through to 2050.

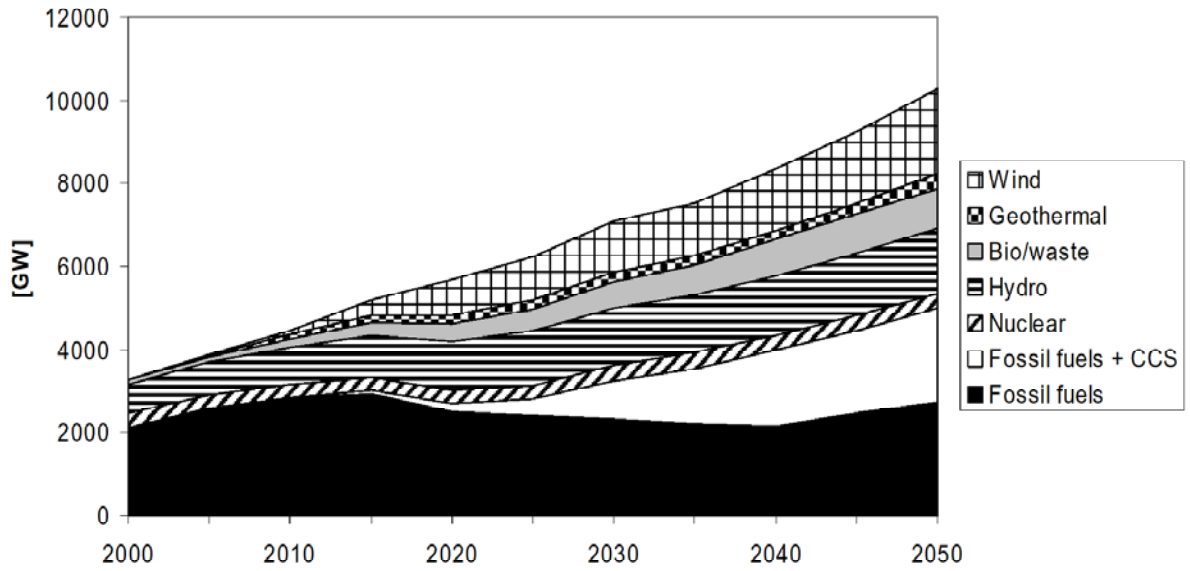

Figure 1 Global Electricity Production Under the IEA GLO50 Scenario

From (Gielen and Podkanski, 2004)

Thus, regardless of whether a percentage target is used, it seems sensible that the target should increase well beyond 2010. For example, the European Parliament adopted a mandatory target of 20% additional renewable energy by 2020, bringing the total to around 33% by that time (REA, 2005).

Longer-term targets will also provide additional investment certainty, both because of the increasing demand for renewable generation and because of the clear policy signal it sends to investors. As noted above (and in the MRET Review), the Scheme should extend at least 15 years beyond the year of its highest target.

6 Liable parties

Placing liability for the Victorian Scheme on all electricity retailers that sell electricity in Victoria and on wholesale purchasers of electricity in Victoria would reduce administrative and compliance costs, and so is recommended. The use of annual renewable power percentages to achieve the interim targets published by 31 March each year is also recommended.

More generally, there is the question of how such liabilities are passed on to customers. As noted in MRET's Working Group Final Report, exemptions for particular industry sectors are not recommended (RTWG, 1999). Such exemptions are unfair on the other sectors, will create distortions in the market place and are difficult to quarantine.

7 Eligible generation and the creation of certificates

The Issues Paper states, “In order to maximise consistency with MRET, it would be preferable for the Victorian Scheme to adopt, to the extent possible, the same list of eligible renewable energy sources” (Vic, 2005, p15). Of course, where particular MRET design choices have now been shown to have caused serious problems, the Victorian scheme should try to avoid making the same mistakes.

As noted earlier, there was an early recognition in the MRET design process that including existing generators would be problematic. So it has proved - the BCSE estimates over 25% of the MRET target out to 2020 will be met by RECs from old hydro (BCSE, 2005).

The problem is that it is almost impossible to ensure ‘additionality’ for renewable generation from existing plant. Output from such plant can be increased by Business-As-Usual upgrades made in response to energy market revenue, or even just climatic variability. For example, hydro plant under MRET can create certificates when above their baseline in a particular year (perhaps a year of unusually high rainfall), but don’t have to ‘pay them back’ when below their baseline in another year.[7]

Thus, as suggested in the Issues Paper, eligibility under the Victorian Scheme should be limited to renewable generators that commence operations after a certain date – the suggested mid 2006 cutoff seems appropriate. If actually required, other measures could be used to support the refurbishment of ageing assets.

Like MRET, the Victorian Scheme has the dual role of greenhouse gas abatement in the short-term and industry development to the point where it can be self-sustaining for GHG abatement in the long term. Thus, to increase dynamic efficiency, support should be directed towards technologies that have the potential to significantly increase output over the long term, such as wind, bioenergy and solar. It is likely the additional incentive consequently available to new renewable plant will result in a stronger renewable energy industry over time.

If the Victorian Scheme runs for longer than 15 years, plant should be eligible to participate in the Scheme for only 15 years after their commissioning date. This would encourage new renewable generation and, assuming generators remain on stream after the 15 year time period, would increase renewable energy contributions above the Scheme’s target levels.

Solar water heaters are predicted to contribute 16% of RECs over MRET’s life (BCSE, 2005), and, as stated in the Issues Paper, receive considerable government support from other programs. Thus, as has recently occurred in the Green Power Accreditation Guidelines, solar water heaters should be ineligible for the Victorian Scheme.

Fuel cells and cogeneration should only be eligible where the fuel is derived from renewable sources, and only electricity generation should be included, not electricity avoided through heat production.

[7] If baselines are allowed for any plant they should ‘pay back’ their certificates when they go below their baseline. Otherwise, the new renewable generation claimed by the scheme will be inaccurate, as it does not recognise that generation below a plant’s baseline also reduces the Scheme’s overall generation.

8 Shortfall charge

The effective MRET shortfall charge is $57 given taxation implications, and this would seem to have been sufficient to ensure compliance, with REC prices generally remaining below $40 over the scheme's life to date. As noted in the Issues Paper, general principles of good policy design suggest that the shortfall charge should maintain its value over time - presumably by indexing to the Consumer Price Index beyond 2010.

However, because the MRET penalty won't be indexed, simply indexing the penalty of the Victorian Scheme won't necessarily result in the Victorian Scheme being additional to MRET. In a situation where MRET and Victorian RECs are fungible, and the marginal cost of the renewable energy required to meet both targets is higher than the MRET penalty, the retailer could use RECs to avoid the Victorian Scheme penalty but pay the MRET penalty because it is cheaper to do so.[8] Potential loopholes such as this need to be addressed in the Victorian Scheme design.

Liable parties should be allowed some leeway each year in meeting annual targets as long as there are make-good provisions and unmet liabilities are not permitted to become excessive over time.

9 Banking and borrowing

Certificates should be declared to the market within a limited time of generation eg. six months. This avoids the uncertainty currently afflicting the MRET scheme where RECs can be registered at any time after their corresponding electricity generation has taken place, and so an unknown number of RECs might be brought on to the market at any time by large participants.

It may be appropriate to limit banking so that certificates can only be used for a limited time after creation; for example, two years. This might help avoid a boom-bust surge of investment in the early stages of the scheme, instead promoting a steady increase in generating capacity – an approach which is likely to be more conducive to sustainable industry development.

As noted in the MRET review, the scheme's banking arrangements, 2010 maximum target and 2020 end-life combined to create an early surge in project development. This surge means that investment is now likely to fall away almost entirely some 14 years before the scheme's legislated end.

The same might also apply to the Victorian Scheme. Some mix of limited banking arrangements, a target that continues to increase to 2020 and sunset clauses that only let projects earn RECs for 15 years is likely to be required in order to restrain an investment boom and bust cycle.

10 Administration

The likely roles for the State Administrator, and the two options for accreditation and validation of certificates canvassed in the Issues Paper are reasonable. Note that if ORER is not used and instead the State Administrator takes on equivalent functions, it may not be necessary to create a new Victorian certificate. Recommendation 29 of the MRET Review Panel, which the Commonwealth government agreed to but has not yet passed, was that "The Act to be amended

[8] Note that after 2020, this would no longer be a problem if the Victorian Scheme sets the entire target.

to allow any registered owner of a REC to surrender the REC to ORER, either voluntarily or against a registered liability“ (AGO, 2003). In this case, the State Administrator could collect RECs then submit them to ORER for extinguishment.

As stated above, if the State Administrator is to assume control of the administration requirements after 2020, this will need to be clear from the start of the Scheme.

Transaction and administration costs

The most important design principle to minimise both transaction and administration costs is that of rigorous simplicity. Both the EU emissions trading scheme and the NSW Greenhouse Gas Abatement Scheme (GGAS) suffer from a high level of complexity (at least in part, as a direct result of industry pressure), and therefore significant transaction and administration costs. The creation of ‘special case’ rules or design features for particular industries provides points of uncertainty and leverage for other stakeholders – which can significantly increase administration costs as ‘special cases’ are dealt with. This highlights the importance of excluding existing renewable plant from the scheme.

Efficiency: productive, allocative, dynamic and long-term

Short-term economic efficiency in terms of new renewable generation per dollar of public support can be maximised by both minimising transaction and administration costs as above, and by promoting the development of least-cost renewable generation projects. Both productive (reduced costs for particular projects) and allocative (the least cost types of projects) efficiency can be supported.

However, the longer-term sustainable energy transformation that seems required to avoid dangerous climate change will depend on dynamic efficiency improvements (the development and commercialisation of new technologies and processes). Longer-term, major and ramping renewable energy targets will be key in driving dynamic efficiency..

Transparency

The current MRET REC registry arrangements have reasonable transparency as each REC carries information on the project from whence it came, and who eventually surrendered it to meet their liabilities. As noted earlier, however, Victorian RECS should have to be registered within a limited time after the associated renewable generation . If baselines cannot be avoided entirely, they should at least be publicly available for each plant.

Most importantly, the policy development process should also be transparent.

11 Potential to transition the Victorian Scheme to a multi-State scheme or expanded MRET scheme

None of the preferred design choices discussed are necessarily inconsistent with an expanded MRET and, depending on the extent and nature of any proposals to expand MRET, may greatly increase the value of any such expansion. It is certainly possible for a new State-based scheme to greatly improve on the current MRET design. This would set a valuable example for policy makers contemplating significant expansion of MRET.

In general, tradeable certificate schemes have flexibility for such types of integration. The key point is to ensure the Victorian scheme is effective, efficient and tightly defined from the start. As now evident with MRET and NSW GGAS, it is hard to tighten up a scheme where there are some

poor early design choices. Poorly designed schemes may well have compromises that effectively make them incompatible with more rigorous measures – the apparent incompatibility of NSW GGAS with 'cap and trade' emission trading scheme designs now being investigated by the states is a good example of this.

Having the Victorian certificates fully fungible with the MRET RECs would aid any integration with an expanded MRET. However, care should be taken since fungibility with MRET could compromise the effectiveness and efficiency of the Victorian Scheme.

12 Interaction with Green Power

Notably absent from the Issues Paper is whether the Victorian Government would use Green Power sales to meet the Scheme's target. The use of Green Power sales to meet MRET liabilities was canvassed by the National Green Power Accreditation Steering Group in 2000. This option was rejected after an extensive consultation process because it would mean the additional payments made by consumers electing to pay for Green Power would not result in increased renewable energy generation. This would also apply to the Victorian Scheme, and so an attempt to use Green Power to meet targets would not reflect well on the Victorian Scheme's intentions.

Impacts of a 10% renewable energy target

Economic Impacts

It is important, first, to note the limitations of available modelling tools for exploring the economic impacts of a 10% renewable energy target in Victoria. These tools generally do a poor job of modelling emerging energy technologies that have different technical and economic characteristics to existing, conventional, plant. They have particular weaknesses in modelling technology development such as that driven by market-pull technologies such as MRET style schemes.

On the supply side, it is likely Australia's least-cost abatement portfolio will include significant contributions from renewables, gas-fired generation and possibly CCS. Diversification of abatement options is clearly a valuable risk management strategy, not only in terms of abatement over the longer term but also because, for reasons of energy supply security and system diversity, a mix of technologies will likely provide the least-cost solution (Awerbuch, 2000).

In Australia, the cost of introducing an abatement technology into the electricity generation sector has traditionally been modelled with respect to a business-as-usual scenario. For example, up to and during the 2003 MRET Review, the price impacts of increased targets were modelled with respect to the projected cost of the existing generation mix, with or without the current MRET. However, since it is agreed Australia needs to reduce greenhouse emissions, the aim should be to achieve the lowest cost and lowest risk approach, not just compare the cost of one abatement technology against the cost of doing nothing. Renewable energy, and possibly CCS, are not short-term least-cost abatement options, but part of a long-term least-cost abatement portfolio. What is economic in the future depends at least in part on previous patterns of investment (Neuhoff, 2004).

Thus an appropriate basis for evaluation is the cost of abatement without these technologies – the opportunity cost. For example, according to the IEA GLO50 modelling, exclusion of CCS from the global abatement portfolio increased the marginal abatement cost in 2050 from US$50/tonne CO_2 to almost US$80 tonne/$CO_2$ (Podkanski and Gielen, 2005). Given the contribution that renewables are projected to make to the generation portfolio internationally (Figure 1), limiting their use in Australia would likely increase the marginal abatement cost significantly. Therefore, economic modelling[9] of the Victorian Scheme should not only focus on the short-term increase to electricity prices, but on the increased overall abatement cost if its renewable energy industry is not developed.

Employment

Generating electricity from renewable sources creates more employment than generating electricity from fossil fuels. This includes employment from extraction of the fuel, such as coal, through to generation of electricity – this in part contributes to the higher cost. In addition, case studies by the authors found that a greater proportion of the employment and capital expenditure occur in Australia for wind power and bioenergy than for either gas- or coal-fired generation (MacGill et al., 2002). Restriction of eligible renewable generation to within Victoria will increase the local employment benefits, but likely at increased cost, since a smaller resource will be available. This would also require greater integration of stochastic and partially predictable generation into the Victorian grid.

Restricting eligible renewable generation to within Victoria may raise questions regarding Constitutional prohibition of barriers to free trade. Note, however, that existing State-based schemes, such as the NSW GGAS and the Queensland 13% Gas scheme effectively specify that some eligible electricity generation related-activities are restricted to within those States. The GGAS requires eligible demand side abatement and sequestration activities (unless otherwise approved by the Minister) to occur in NSW. The QLD 13% Scheme specifies that interstate generators can participate in the scheme but only to a fraction of their output determined by the Queensland Usage Factor.

Energy Intensive Industries

The impacts of such a scheme on energy intensive industries need to be considered in a longer-term, broader societal perspective that considers the value they add to society. In this context, protecting and nurturing energy-intensive industries may not be in Victoria's best interest – especially considering the relatively small amount of employment they provide relative to their energy use and emissions. For example, Australia's aluminium smelting industry consumes almost 15 per cent of Australia's electricity generation yet contributes only 0.15 per cent of Australian GDP or around $1 billion (AGO, 2002), while receiving electricity price subsidies estimated at $210 million to more that $250 million a year (Australia Institute, 2002). These industries invest and operate in a complex international context that includes many factors other than electricity prices. It is highly likely that well within the timeframe of the proposed Scheme, Victoria's industries will have to begin operating in an environment where an international price has been placed on carbon emissions. Thus, government policy should enable structural change to a lower carbon intensive economy in the long run. Energy/emissions-intensive industries would

[9] Note also that such estimates are necessarily speculative, short-term and incomplete due to the modelling tools used. Such tools are poor at modelling technology progress, externality costs imposed by different fuel technologies, employment impacts of different technologies etc.

be better served through a gradual transition process, rather than being shielded until it is no longer possible to do so. Sudden collapse of these industries would not be in anybody's interest.

Although in the short term, compensatory measures might be introduced, care should be taken to preserve the integrity of the Scheme and to ensure the measures are only temporary, not for the Scheme's duration, as well as transparent.

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