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SUBMISSION TEMPLATE

EMISSIONS REDUCTION FUND

Overview

This submission template should be used to provide comments on the design of the Emissions Reduction Fund.

Contact Details

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Date:	18th November 2013

Submission responses

General comments on the terms of reference

Carbon Targets

The Terms of Reference state that "The Government acknowledges the science of climate change and recognises that climate change is a global problem whereby all countries need to work together. Australia must act in a way that protects Australia's international competitiveness, while playing our part in any global effort to address this issue." The Terms of Reference then state: "The Government is committed to reducing Australia's emissions by 5 per cent from 2000 levels by the year 2020".

Given the climate science, these statements do not appear coherent, unless the Government accepts the need to adopt a significantly greater emission reduction target for 2020 should international progress warrant it. This is outlined clearly in the Targets and Progress Review Draft Report released recently by the Climate Change Authority (CCA)[1], which then also states: "The Authority's present thinking is that a target of 15 per cent by 2020 is the minimum option consistent with what, in the Authority's view, represents an equitable share for Australia of the estimated global emissions budget to 2050."

The CCA plays a vital role in providing independent expert advice to the Government on the most appropriate carbon targets and trajectories. The setting of Australia's carbon targets should place significant weight upon the extensive public consultation and independent research and analysis that has contributed to the recommendations of the CCA review, as well as the broad and deep expertise of the CCA members themselves. Therefore, if the Government is committed to protecting Australia's interests and playing a fair part in global efforts to address climate change, the evidence suggests the Government should move to adopting a minimum of a 15% by 2020 target, and consider adopting a 25% by 2020 target.

[1] Climate Change Authority, "Reducing Australia's Greenhouse Gas Emissions – Targets and Progress Review Draft Report", October 2013.

It is also important to consider the costs to Australia of failing to act on climate change. The so called "social cost of carbon" arises from the damage global warming is already causing to societal welfare, and seems likely to increasingly cause in the future. The existence of these potential costs are near universally acknowledged – as just one example the US government estimates a social cost of carbon as an input into the climate benefits and costs of government decision making. Their most recent estimate has a social carbon price of over A$75/tCO2e in 2020 given a 2.5% societal discount rate.[2] The question, therefore, is not whether to pay a carbon price or not but, instead, who pays how much to whom to do what, when. Will money go towards reducing emissions, or paying for the damages of unchecked climate change? What types of abatement actions might be supported and at what cost. What adaptation actions might also be pursued. And critically, who will pay these costs to whom?

Replacing the current carbon price mechanism with the ERF

The carbon price has been a centrepiece of the former Australian Government's climate policy framework. Whilst there were significant problems with its design and implementation, it did provide some measure of financial incentives to participants associated with the majority of Australian emissions. There are certainly options to reduce emissions that don't explicitly place a specific price on carbon emissions. The Renewable Energy Target is one example. There are many other opportunities to cost effectively reduce emissions that aren't currently being properly exploited – cost-effective energy efficiency is a key example. An appropriately structured, coherent and comprehensive series of direct interventions could certainly reduce emissions, and strengthen our capacity to reduce emissions further into the future. Having said that, the success of proposed direction action approaches to date in Australia including the Federal Government's former Greenhouse Gas Abatement Program (GGAP) and NSW Government's former Greenhouse Gas Abatement Program (GGAS) has been mixed.[3]

Nevertheless, it is difficult to see how Australia can effectively and efficiently achieve emissions reductions of the scale and speed required across the entire economy without placing some form of incentive and penalty on most of the key decision makers that will determine future emissions. This was of course intended to be the key role of the carbon price. There is a debate to be had about how effectively it was playing this role, however, it would be valuable to have the Federal Government better articulate how they plan to achieve comprehensive yet coherent action across the economy.

Policy Robustness

A key aspect of the climate policy challenge is that of robustness. Given ongoing uncertainties in the climate science, it is entirely possible that the necessary scale and speed of emission reductions to avoid dangerous warming may be revised – up or down. Similarly, there is little clarity on what international consensus on mitigation may emerge over the next few years. Finally, there are inevitable uncertainties associated with particular policy measures themselves. Even the best designed policies may fail to achieve their desired ends. This is a particular issue with incentive based approaches that seek to change private sector decision making through financial carrots or sticks. It is inherently uncertain how these participants may choose to respond. As such, Australia's climate and energy policy framework will need to be robust against surprises –

[2] US EPA (2013) http://www.epa.gov/climatechange/EPAactivities/economics/scc.html

[3] See, for example, the review of GGAP undertaken by the Federal Auditor General (2010) *Audit Report No.26 2009–10 Performance Audit - Administration of Climate Change Program*. CEEM has undertaken extensive reviews of the NSW GGAS scheme over its life – more details are available at www.ceem.unsw.edu.au.

good or bad – on both the scale of the challenge and the best means of addressing it. Key elements of robust policy include the use of a portfolio of policies such that if one fails, others can continue to drive progress. Removal of the carbon price and associated institutional frameworks reduces the options available to the Government to drive action should circumstances change, or preferred approaches prove more challenging than expected.

Policy comprehensiveness and cohesiveness

A wide range of policies will be required to comprehensively address climate change, and transform the diverse sectors of Australia's economy towards low carbon alternatives. With the removal of the carbon price, the Climate Change Authority, the Climate Commission and the Clean Energy Finance Corporation it is necessary to re-assess the remaining policy suite and ensure coherent and comprehensive coverage. The introduction of the Emissions Reduction Fund should take into account the remaining policies, and ensure that the mechanisms defined under this fund produce a response that is coherent and comprehensive.

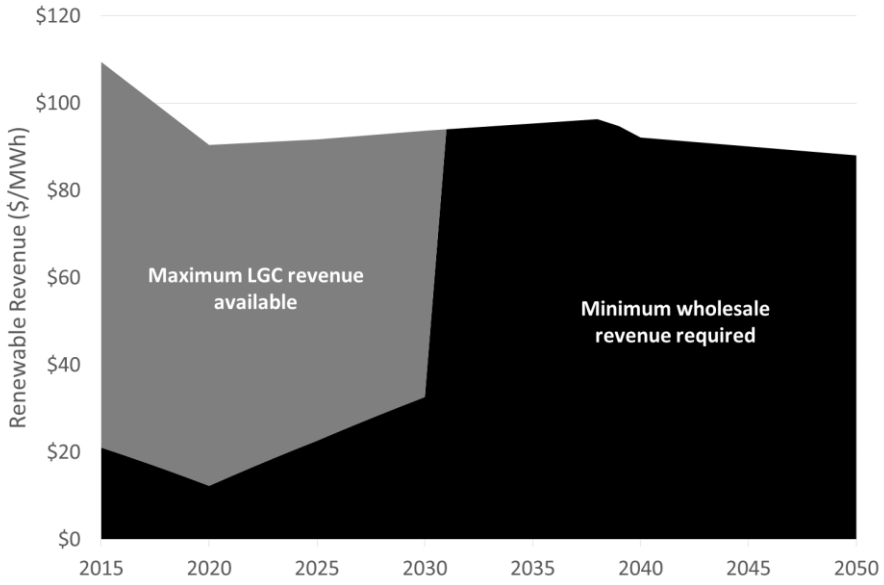
The Government should undertake a detailed and extensive review of the wide range of policies affecting the transition to a low carbon future to ensure comprehensive policy coverage, and policy coherence in the absence of the carbon price mechanism. Adjustments may be required in a range of these schemes to ensure continued effectiveness, and prevent unjustified cost burdens on consumers.

One particular example of adjustments that are likely to be required upon repeal of the carbon price is in the Renewable Energy Target (RET) scheme. The Terms of Reference state that the RET will be reviewed in a separate consultative process in 2014, but it is important that it is reviewed as a part of a comprehensive and coherent approach to climate mitigation. Analysis suggests that in the absence of the carbon price, the RET will need to be strengthened in order to still achieve its legislated objectives. The RET and the carbon price were designed to work in partnership, with the price of Large-scale Generation Certificates (LGCs) rising and falling as necessary to hedge against movements in the wholesale electricity price (affected by the carbon price). With the removal of the carbon price, the wholesale electricity price can be expected to fall. This means that the LGC price will likely need to rise significantly to support continued investment in renewable generation.

The shortfall charge for the RET was set at a level that is appropriate in the presence of a meaningful carbon price. However, in the absence of a carbon price, it seems likely that the shortfall charge is too low to ensure continued investment in renewable generation.

Figure 1 illustrates an estimate of the minimum wholesale electricity revenue required to promote continued renewable investment, based upon projected technology costs and the legislated shortfall charge. Based upon this analysis, with removal of the carbon price the RET shortfall charge will need to be increased significantly to ensure continued renewable investment. We would also recommend that the shortfall charge is indexed at CPI to prevent decline in real terms. If the shortfall charge is not increased, retailers may prefer to pay the penalty fee rather than invest in renewable generation, causing increased costs to consumers without the positive outcomes of decarbonising the electricity sector, promoting rural development, and supporting the growth of the renewable energy industry.

Figure 1 - Minimum wholesale electricity revenue required to promote continued renewable investment



Source: Total renewable revenue required determined from levelised cost of least cost renewable technology in each year (wind and PV), sourced from Bureau of Resources and Energy Economics (BREE) Australian Energy Technology Assessment (AETA) 2012.

Furthermore, the RET ceases in 2030, which is already within the technical lifetime of renewable projects installed today. Retailers may well be reluctant to sign long term PPAs beyond the end of the RET unless there is confidence of electricity prices exceeding $90/MWh. Given the intention of the present Government to repeal the carbon price this confidence is not likely to be forthcoming. In the absence of sufficiently long term PPAs (or confidence of sufficiently high LGC prices and electricity pool prices), renewable projects are likely to struggle to obtain financing. One way to address this issue would be to extend the RET beyond 2030, subject to a number of changes to the scheme including project sunsets, in addition to providing long term certainty on the scheme details, and an increase in the shortfall charge.

Design of a 'baseline and credit' mechanism.

The Terms of Reference suggests that the Government is considering a mechanism to apply to emissions above "business as usual" baselines. Experience with such approaches here in Australia and internationally has highlighted how challenging such approaches are. In particular, baselines are notoriously difficult to define and calibrate appropriately.

Ensuring genuine abatement

An essential characteristic of any successful abatement mechanism will be that it procures genuine abatement. Unfortunately, given the complexity of many carbon systems, it is often surprisingly non trivial to determine the true abatement that can be attributed to a particular activity.

For example, the abatement attributable to the closure or reduction of output from an emissions intensive coal-fired power station must be considered carefully. Given that electricity demand is relatively inelastic in the short term, demand will simply be met by the next generator in the dispatch merit order. In Australia, this will mean that the majority of the electricity no longer supplied by that retired generator is met by other coal-fired generators, which may not be significantly less emissions intensive. This means that, counter intuitively, closure of the most emissions intensive power stations is unlikely to lead to significant greenhouse abatement.

In a concrete example, if payments for closure were made to Hazelwood power station, the electricity that would have been supplied might be instead sourced from a combination of the other coal-fired power stations located in Victoria (given transmission constraints to other market regions, and energy constraints on wind and hydro generation). The capacity-weighted emissions intensity of these power stations is only 15% lower than that of Hazelwood[4]. Thus, the closure of Hazelwood could reasonably be expected to produce only on the order of a 15% reduction in the historical emissions from that power station. This is especially true in an oversupplied market, where excess capacity is available from other similar power stations, as is currently the case in the National Electricity Market (NEM).

Furthermore, paying a power plant to simply reduce production (in order to reduce greenhouse emissions) sets a problematic precedent. This is broadly similar to paying a steel manufacturer simply to produce less steel, or farmers to plant less crops. In an environment where demand and price for that product may be fluctuating over time (such that production may have decreased during that period anyway) this is a particularly problematic way to expend public funds.

Thus, it is important that the abatement occurring as a result of power station closure is *not* calculated based upon an historical baseline of operation, assuming that all of the historical emissions from the power station are "abatement". Other power stations will supply that electricity, may well have an only slightly lower emissions factor.

[4] AEMO, "National Transmission Network Development Plan - 2012 NTNDP Assumptions and Inputs," Australian Energy Market Operator, [Online]. Available: http://www.aemo.com.au/Electricity/Planning/National-Transmission-Network-Development-Plan/Assumptions-and-Inputs

To properly determine the amount of emissions abatement as a result of a power station closure, it would be necessary to conduct simulations of the electricity market to determine which generators might increase production in response to that closure, and determine the corresponding reduction in aggregate system emissions. This would need to be calculated by comparison with an equivalent scenario where that power station remains in service (rather than by comparison to historical baselines). This will be a complex and uncertain process given the inadequacies of electricity market models. For example, many electricity market models struggle to appropriately capture the energy constraints on hydro generation, and may therefore suggest that hydro units increase production to fill the gap, when this is unlikely in practice. This complex modelling process likely to be both controversial and open to rent seeking behaviour.

It therefore appears that paying for the closure or reduction of generation at emissions intensive power stations is a poor policy choice for the Emissions Reduction Fund. Furthermore, in general, it will be essential to accurately quantify the actual emissions abatement associated with an activity, given market adjustments and so on.

Ensuring additionality

As with all processes of this nature, projects supported via the Emissions Reduction Fund should also be additional (ensuring that the project is additional to what would have been undertaken in the absence of support). Additionality is a highly non-trivial issue that has rightly received extensive attention in the design of other carbon abatement schemes, such as the Clean Development Mechanism, and the learnings from these schemes will be relevant for the development of the Emissions Reduction Fund.

For example, in the electricity sector in Australia it will be highly challenging to determine whether a reduction in output from an emissions intensive power station was additional to what may have occurred due to normal market pressures, particularly in the present situation of capacity oversupply in the NEM. With declining demand, many power stations are likely to see a reduction in output, and therefore a reduction in greenhouse emissions. If baseline levels are set at historical levels, and power stations receive a credit or payment for a reduction in emissions below that level, this risks paying public funds to private companies that would have reduced emissions to that level even in the absence of support. Avoiding outcomes of this nature will be critical to ensure a sound and effective mechanism.

Windfall profits

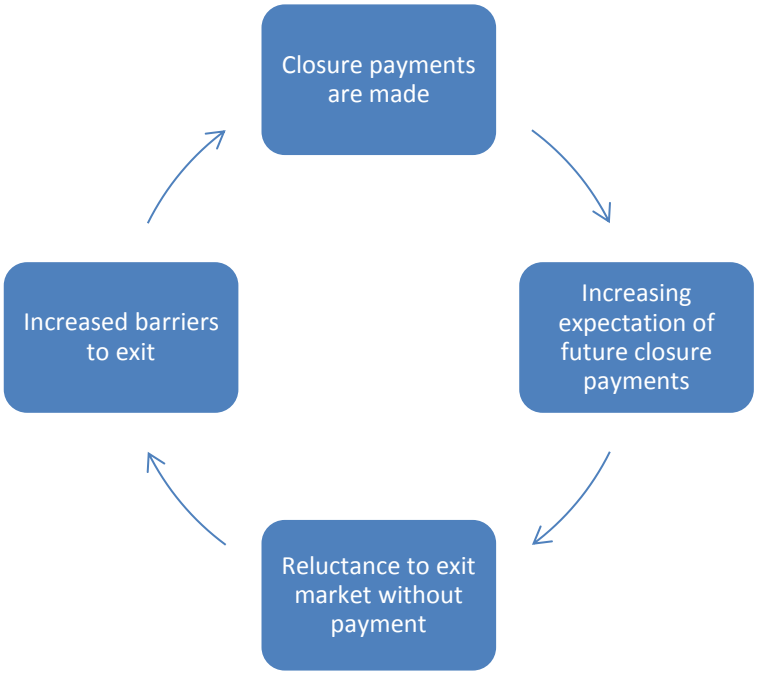
One concern that has been raised is that of potential windfall profits to liable entities who received free permit allocations under the so-called compensation arrangements of the Clean Energy Future package. It would be valuable for the Government to make public any analysis that it has undertaken on this vexed issue.

Avoiding perverse incentives

The complexity of carbon cycles, and the overlapping and highly interactive nature of various markets, policies and mechanisms already in existence means that there is high potential for perverse incentives to be created when new policies are introduced. This should be avoided by carefully considering the coherence and comprehensiveness of the entire landscape when any new policy is introduced (or when any policy is removed).

One example of perverse incentives created by the introduction of a new policy is a mechanism that makes payments to compensate generators for early closure. Payments of this nature create an expectation that government payment is available upon exit from the market, creating incentives to remain in operation until payment is offered. This creates a vicious cycle; the more closure payments are made, the greater the expectation that they will be paid in future, and the greater the reluctance of generators to leave the market without compensation. Thus, a mechanism that makes payments to generators to prematurely leave the market can actually exacerbate barriers to exit, as illustrated in Figure 2.

Figure 2 - A vicious cycle – Closure payments exacerbate barriers to exit



With around 75% of Australia's electricity currently being generated by emissions intensive coal-fired generation, it is clear that a rapid transformation of Australia's electricity system is required over the coming decades. This makes it essential to minimise barriers to exit and entry as far as possible. Payments for closure of emissions intensive assets are likely to have the opposite effect.

If agreement had been reached in the original Contracts for Closure scheme proposed by the Labor Government, the first 2000 MW of particularly old and high emissions generation would have been paid to exit. The next round of potential exits would then have a higher expectation of Government payment to close. This vicious cycle then can only be broken by a clear signal from Government that they will not be making any more payments to exit. The later this occurs, the stronger the signal will need to be from Government to ensure sufficient market certainty that further payments will not be forthcoming.

Given that Contracts for Closure have already been pursued as a Government policy, there is already an expectation of potential future payments for exit, which is probably already exacerbating barriers to exit at present. Indeed, this may be playing a role in extending the present market oversupply.

The Government could aim to rectify any such barriers to exit already created by the Contracts for Closure scheme by clearly specifying with bipartisan support that no government will make payments to incumbents to close. This could be strengthened by articulating bipartisan support for a credible long term plan to transition the electricity sector to low emissions technologies, with a trajectory consistent with a fair contribution to global mitigation of the aggregate scale agreed by the United Nations Framework Convention on Climate Change (UNFCCC). It could include expansion and extension of the RET to beyond 2030, and increase the LGC shortfall charge, as an unequivocal signal to market that the ongoing entry of renewable technologies will be supported, and incumbents should respond to market signals appropriately. We direct the reader to the recent CEEM working paper which explores these issues more thoroughly[5].

Potential sources of low cost, large scale abatement

This will of course depend on the eventual Fund arrangements which will, inherently, require some list of approved activities for consideration.

An important opportunity lies in the electricity Sector

It appears likely that Australia's electricity sector offers significant opportunities for abatement. The electricity sector is the single largest source of greenhouse emissions, and the fastest growing source of emissions. Furthermore, there are plentiful, cost effective and readily available options for abatement in the electricity sector, via the introduction of renewable energy technologies. These factors mean that any comprehensive and coherent approach to mitigation in Australia will need to create meaningful change in the electricity sector.

Although the economic literature generally agrees that comprehensive carbon pricing approaches are the "first best" policy tool for abatement, they also acknowledge that renewable energy policies can be a good "second best" approach that can be more politically palatable[6]. This suggests that structuring the Emissions Reduction Fund to directly support investment in renewable generation as could be effective.

[5] Riesz, Noone, MacGill (2013) Payments for Closure: Should Direct Action include payments for closure of high emission coal-fired power plants? CEEM working paper available at: http://ceem.unsw.edu.au/sites/default/files/documents/Working%20paper%20-%20Payments%20for%20Closure%20-%202013-10-07a.pdf

[6] For example, Frederick van der Ploeg, (2011) "Macroeconomics of sustainability transitions: second-best climate policy, Green Paradox, and renewable subsidies", Environmental Innovation and Societal Transitions, 1(1) 130-134.

However, and for reasons that we outline above, the design of the Emissions Reduction Fund is more likely to be successful if it avoids the following activities:

- Paying for emissions intensive generation to close or retire;
- Paying for emissions intensive generation to reduce generation levels; or
- Crediting emissions intensive generation with payments based upon a reduction of emissions below historical baseline levels.

It would certainly not be appropriate to pay for the closure of a fossil fuel generator and consider the full historical emissions profile to be abatement. More effective ways for the Emissions Reduction Fund to support emissions reductions in the electricity sector might include:

- Reducing electricity demand through end-use efficiency projects (although this has its own challenges as seen with various state government schemes incentivising energy efficiency improvements[7]).
- Efficiency improvement at power stations (producing the same MWh at a lower greenhouse intensity) although, again, this has its own challenges in measuring additional actions beyond business-as-usual plant improvements[8].
- Renewable generation projects that are additional to those already incentivised by the RET
- Hybrid renewable projects at fossil fuel power stations (producing the same MWh at a lower greenhouse intensity)
- Non-hybrid co-location of renewable energy projects at fossil fuel power station sites
- Projects that reduce network losses.

The Emissions Reduction Fund could also consider supporting enabling projects for renewable energy, such as the development of transmission assets that allow access to lower cost remote renewable resources. Calculating the abatement attributable to this activity is likely to be challenging, and would need to be based upon long term modelling projections. However, the co-benefits associated with developing network assets of this nature could be significant, including rural development, growth in the renewable industry and retention and development of important skills and expertise in Australia.

A wide range of possible mechanisms are available to target the activities listed above, and many have been implemented internationally, providing ample opportunities for learning from international experiences. For example, in the promotion of renewable generation, a key finding is that minimising uncertainty for renewable project developers is highly important, since it lowers the cost of capital. All renewable technologies are very capital intensive, meaning that even a small increase in the cost of capital (caused by a higher perceived risk due to policy uncertainty, market uncertainty or other factors) can significantly increase the cost of the rollout of renewables. Therefore, mechanisms that minimise risk for renewable developers can lower costs to consumers.

[7] R. Betz, Jones, I. MacGill and R. Passey, "Trading in energy efficiency in Australia: What are the lessons learnt so far?," *in Proc. ECEEE Summer Study, Nice,* June 2013.

[8] I. MacGill, H. R. Outhred and K. Nolles, "Some design lessons from market-based greenhouse regulation in the restructured Australian electricity industry," *Energy Policy,* vol. 34, no. 1, pp. 11-25, 2009.

A model that appears successful at present is the solar auction mechanism employed by the ACT Government. This scheme has elicited great interest from the market, with 49 proposals received in the first stage, and 25 in the second stage, for the development of up to 40 MW of large-scale solar capacity[9]. It also appears to have procured a highly competitive price for the renewable energy delivered to customers, with a feed-in-tariff rate of only $186/MWh[10].

Under this model, the Government specifies the desired aggregate capacity of a desired technology, and requests tenders from developers. Project developers then submit proposed projects, with an associated feed-in-tariff level that would be required for the project to go ahead. The Government can then select the preferred projects (based upon achieving the target capacity at lowest cost, combined with an assessment of ability to deliver in a timely manner, and possibly any co-benefits associated with the project). The Government agrees to pay the set feed-in-tariff to the generator for each MWh produced. A mechanism of this nature has the benefit that project developers receive certainty of a set revenue level throughout the lifetime of the project, providing high certainty and therefore a low cost of capital (reducing costs to the Government, and therefore to consumers). However, as with all mechanisms there are disadvantages; in this case, governments must choose the desired capacity and technologies to be installed, which limits the influence of market signals and may prevent the mechanism from seeking the least cost renewable generation available.

Thus, a scheme of this nature may be most appropriate for emerging technologies (such as photovoltaics), with support for renewable generation transitioning to the RET as technologies achieve market competitiveness. Over the longer term, allowing full market signals to influence investment choices is likely to be more optimal, and could be achieved by appropriately factoring in the cost of the externalities of emissions intensive generation.

[9] ACT Government, Environment and Sustainable Development Directorate, Solar Auction http://www.environment.act.gov.au/energy/solar_auction

[10] ACT Government (5th September 2012), ACT Labor Government delivers big solar for Canberra http://www.cmd.act.gov.au/open_government/inform/act_government_media_releases/corbell/2012/act_labor_government_delivers_big_solar_for_canberra2

Facilitating the development of abatement projects

This is a critical issue. While the ERF may provide a financial incentive to undertake projects that deliver abatement, actual project delivery often depends on a wide range of factors, and potential impediments. Along with the ERF, the Government should undertake work to identify barriers that currently impede such activities and, in the context of broader societal objectives and potential trade-offs, implement arrangements to support stakeholder engagement and action.

More generally, is clear that Australia faces a great challenge in achieving emissions reductions of the scale and speed required to fairly contribute to an effective global response to climate change. It is clear that this will require establishing and retaining substantial technical knowhow and institutional capability in low carbon technologies and techniques. Long term policy frameworks that provide a high degree of certainty of ongoing support for low carbon technologies are likely to be essential to avoid damaging boom-bust cycles, and ensure steady growth in the expertise required.

The renewable energy industry is a key example. Australia has come a long way since the establishment of the Mandatory Renewable Energy Target (MRET) by the Howard Government in 2001. This scheme has supported the development of substantial expertise in the wind sector in Australia, including the establishment of a number of highly active companies dedicated solely to developing renewable generation, such as Wind Prospect, Epuron and Pacific Hydro. However, this expertise is under threat at present. The sector faces the combined challenges of the oversupply of Renewable Energy Certificates (RECs) created by small-scale renewables (many of these being "phantom" RECs created under the Solar Multiplier mechanism), combined with perpetual policy uncertainty. These pressures have very likely dampened the growth of the renewable industry in Australia over the past several years. It is unclear how much longer this industry can continue to survive in the atmosphere of policy uncertainty. In the absence of strong signals from Government that they intend to support the ongoing growth of this industry in Australia, leakage of skills and expertise to international markets is likely to be imminent.

Details of Auction Arrangements to deliver cost effective outcomes

Procurement arrangements for incentive based schemes such as proposed here are invariably challenging. Reverse auctions have had only limited application in Australian jurisdictions although there is considerable overlap with more standard government procurement processes. Nevertheless, auction design is challenging to get right and expensive to get wrong. CEEM has had some expertise in this area with regard to proposed auctioning of carbon permits under the previous carbon pricing scheme (Betz), and with abatement mechanisms attempting to reduce costs through competitive pressure.

Non-additionality a source of competitive advantage

Ideally, the auctioning process should identify the lowest abatement cost opportunities available (amongst eligible parties) and those parties best placed and most willing to take action. Unfortunately the measurement challenges for direct action approach generally work against such outcomes. In particular, the lowest abatement cost opportunities are, by definition, those that were going to happen anyway. Although there are exceptions (notably with energy efficiency which has many non-cost barriers), a useful general rule

is that the higher the additional cost of undertaking an action, the more likely that it is actually additional. Simple auctioning processes therefore risk only rewarding the least additional activities. There are, also, no easy fixes to this as it is inherent in the process, and additionality is so difficult to prove.

Co-benefits should count too

Even if potential projects can be assured to be genuine additional activities and then suitably ranked in a reverse auction according to the relative costs of abatement, it is still important to also take into consideration any co-benefits to the community, the environment or the economy. The co-benefits of investing in renewable energy, for example, could be substantial, and may include rural development, increased jobs and employment opportunities (particularly in rural communities), and beginning the transition to an economy that is resilient and sustainable over the long term. The displacement of coal-fired power with renewable energy also reduces other emissions that are harmful to human health, including particulate emissions. Although co-benefits can be challenging to quantify, they should be taken into account when prioritising abatement activities to be funded with public money for societal benefit.

Assured project delivery can be problematic

Another key question with this approach is assured delivery of the projects that are awarded. Of course, the proponents may only get paid upon delivery. However, there are a range of reasons – reasonable and not – why projects might not proceed. Without appropriate arrangements in place, a particular problem can be the 'option value' – that is opportunity yet not necessarily obligation – of having a winning project. If allowed to do so, project proponents may have the option to defer or perhaps even cancel the project at their own convenience. Not only does the government not achieve the targeted abatement, but alternative abatement projects can be left in limbo without opportunities for funding whilst the successful project sits upon their decision. This has been a major problem with some previous tendering based processes in Australia and internationally, and there is growing experience on arrangements to minimise such issues.

Governance arrangements

Given all of the challenges noted here and elsewhere, appropriate government arrangements will be essential to the success of the scheme. In general, the principle of separation of powers between those setting the policy, making the specific rules, implementing the rules and judging whether the rules are being obeyed would suggest the need for a range of agencies and independent review processes. The governance arrangements of the Australian National Electricity Market highlight the necessary complexity of governance arrangements for designer markets such as that proposed with the emission reduction fund.

A particular challenge is the likely lack of countervailing interests with the arrangements. As noted earlier, non-additionality is the most important implementation risk for the fund. Unfortunately, non-additional projects offer perceived potential benefits for the lowest public cost, those project proponents who manage to get non-additional projects funded and those paying for the Fund who would of course like to minimise the costs. By contrast, there may be no key stakeholder in the process whose primary criterion is genuine abatement.

Transitional issues relating to the existing Carbon Farming Initiative

Given the significant role of land-use activities in greenhouse emissions there have been considerable efforts internationally and in Australia to incentivise land-use and land-use change activities that reduce emissions. Experience to date, however, has highlighted the vexed challenges involved. A key issue remains measurement. The net flux of carbon and other greenhouse gases between different ecological systems in the biosphere and the atmosphere has proven extremely difficult to measure with accuracy. They are also subject to natural variations, such as seen with the recent Australian bushfires, as well as possible interventions.

Whilst there appear to be some excellent opportunities to improve farming practices in order to both reduce greenhouse emissions whilst also offering broader benefits such as soil conditioning, measurement challenges suggest that these should be kept separate from incentive mechanisms that seek to drive action in sectors of the economy where emissions measurement is more straightforward. For example, land-use activities proved very problematic in the 'baseline and credit' Clean Development Mechanism of the Kyoto Protocol for these reasons.

About CEEM

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 Australian School of Business, the Faculty of Engineering, the Institute of Environmental Studies, and the Faculty of Arts and Social Sciences and the Faculty of Law, 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, the integration of stochastic renewable energy technologies into the electricity network, and the broader policy context in which all these markets operate.

Dr Regina Betz has a long history of contributing to the design and development of carbon abatement policies and mechanisms. Her research focuses on climate change policies and their associated instruments, such as Joint Implementation, the Clean Development Mechanism and particularly emissions trading. Her publications largely relate to the design and implementation of these instruments, including factors such as auction design based upon experimental economics. From 1998 -2004 she was a consultant to the German Federal Ministry of Environmental with respect to the Kyoto Mechanisms and Emissions trading (e.g. National Allocation Plan), and has been closely involved with European Union and United Nations negotiations on climate change (UNFCCC).

Associate Professor Iain MacGill was a key contributor to work assessing the design and development of the NSW Greenhouse Gas Abatement Scheme (GGAS), a scheme which has some significant similarities to the proposed ERF. He is also the Responsible Australian Expert on the International Energy Agency's PV Power Systems Task 14 on high PV penetrations in the electricity grid and an invited expert for the technical reference groups of the Federal Government's Australian Energy Technology Assessment, the Australian Energy Market Operator's future energy scenarios planning process and, previously, the Australian Energy Market Commission's Demand-Side Participation Review.

CEEM would welcome the opportunity to contribute to the Government's work on designing and implementing the Emissions Reduction Fund.

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