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Expert Review Panel
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Submission to the Clean Energy Finance Corporation Expert Review

Dear Ms Broadbent

Thank you for the opportunity to respond to the request for submissions to the Clean Energy Finance Corporation (CEFC) Expert Review.

1. Introduction

RenewablesSA has been established by the South Australian Government to draw further investment in renewable energy to South Australia.

The initiative is lead by a Board and an independent Commissioner for Renewable Energy, Mr Tim O'Loughlin (the undersigned). The principal focus of RenewablesSA to date has been on designing Australia's most competitive regulatory and cost environment for investors in the State's renewable energy sector.

For instance, South Australia has Australia's most balanced and certain land use planning regime for wind investors. The administration of that framework is also the most expeditious in the country.

South Australia is the only State to offer payroll tax rebates for wind and solar investors in the development phase of their projects.

The State is also amending its Pastoral Act to open up the 40% of its land mass covered by pastoral leases for wind and solar farms. South Australia also remains the only State with customised regulation specifically designed for geothermal investors.

A key strategy has been to design regulation in anticipation of investment. This has helped draw 54% and 90% of national wind and geothermal investment respectively to South Australia.

The quality of State Government regulatory and cost frameworks is a relevant consideration for the CEFC.

This submission argues that some of the requirements for CEFC intervention spring from shortcomings in the design of the regulation of the national electricity system. The CEFC's ability to get full value from its investments will depend, in part, on the parallel development of the National Electricity Market to support the kind of opportunities the CEFC is charged with realising.

Similarly, the effectiveness of CEFC intervention is capable of being constrained by inefficient and uncertain State-based regulation which simply adds to investors' costs just as the CEFC can be working to lower costs of capital.

Against this background, RenewablesSA strongly supports the establishment of the CEFC to overcome capital market barriers to the development of renewable energy in Australia.

While Australia has abundant alternative energy sources, such as wind, solar, geothermal or wave energy, it continues to rely on fossil fuel sources to satisfy most of its energy needs. A lack of finance for alternative energy sources is undoubtedly one reason for the limited uptake of renewable energy sources. Another important reason is the regulatory and policy setting renewable energy technologies have to navigate.

While it is important to identify and address funding gaps for clean energy technology, the technology barriers inherent in the renewable energy target (RET) scheme and the National Electricity Market, as well as the state based regulation, will need to continue to be addressed for Australia to move Australia forward to a truly low emission economy.

The CEFC can "act as a catalyst to private investment which is currently not available" by focussing on opportunities created by the current policy and institutional settings for selective investment to spawn industry development, address market failure and create the environment for development of Federal and State regulatory frameworks that support provision of reliable and cost efficient renewable energy.

2. Identifying the Opportunities for the CEFC in the Australian Context

The opportunities for the CEFC stem broadly from market failure. In the Australian context, market failures are frequently the product of the inflexibilities of regulatory frameworks or, more often, a failure of policy and regulation to anticipate the changes required to seize new opportunities in both the renewable and clean technology sectors.

The main federal regulatory instrument to support renewable energy generation in Australia is the RET. Opportunities for renewable energy are further influenced by the regulatory and institutional framework of the National Electricity Market as well as planning laws and regulation at a State level. All of these affect the ability of Australia to move towards a low emissions future and are addressed in detail below.

2.1 The Renewable Energy Target and its emphasis on least cost investment

The design of the RET centres around delivering Australia's 20% target at least cost. It draws capital investment to renewable energy generation which is least cost at each point of time between now and 2020. Private capital is therefore skewed by the RET towards the most mature technologies, irrespective of the potential of emerging technologies.

The Federal Government's subsidy programs for other renewable technologies, such as the Solar Flagship program, acknowledge this implicitly by seeking to use subsidy to redress this imbalance.

The result is that the vast bulk of the RET will be met by wind power because wind power still enjoys a significant cost advantage over the competing technologies.

This competitive advantage is magnified by the market model which has emerged for meeting the RET. This model delivers the RET with the addition of relatively small increments of generating capacity which is reflective of the incremental increases in the annual obligation of retailers to surrender Renewable Energy Certificates. Wind is well-suited to play this role as it can be configured to add anything from 5 to 500 MW.

Incremental addition to wind generating capacity is also the model which fits best with the retailers' own business models as it means they can meet their RET obligations in the same way they participate in the market more broadly - acting alone and in competition rather than acting in concert.

Within this environment, it comes as no surprise that there is little investment in other technologies capable of competing with wind in circumstances where scale can be achieved and where the value of an externality such as community acceptance can be captured.

2.2 Beyond the RET: Why we should support technologies other than wind

There is undoubtedly a business case for investing in renewable energy other than the obvious case for investing in the most mature technologies.

Examples from Europe show that differential levels of subsidy can be used to support deployment of technologies which are less mature in their development, but still sufficiently advanced and capable of contributing to aggregate electricity supply.

Importantly, this form of intervention can be driven as much by considerations of industry development potential as it has by considerations of having cleaner and more secure electricity supplies.

For example, Denmark moved early to achieve high rates of market penetration for its wind power, creating an industry focussing on turbine design and manufacture as well as establishing itself as the world's leader in wind forecasting capability.

Solar feed-in tariffs, which provide a premium for solar power beyond that applied to wind power, have been used in Germany to spawn an industry in design and manufacturing of panels and increasingly on componentry for assembly and installation. A 2011 report by the German Federal Ministry for the Environment, Nature Conversation and Nuclear Safety estimates that, apart from lowering Germany's greenhouse gas emissions, renewable energy support, especially through the Renewable Energy Sources Act, has let to the creation of 367,000 jobs and generated an additional economic impetus of $11.1 Billion Euro in 2010.[1]

The United Kingdom has applied a premium to offshore wind power, allowing it to develop industries based on using its shipyards and existing engineering skills. [2]

The difference between the European schemes and Australia's is that the European schemes generally have an industry development objective embedded in their scheme design, usually in the form of differential levels of support for different technologies. Australia's scheme includes no such objective and, up until the formation of the CEFC, support for less mature technologies has been provided in the form of public subsidy.

The CEFC offers an opportunity to develop a different form of support which imposes commercial disciplines through its criteria for support. This applies not just to support for emerging technologies but to other areas of investment into renewable and clean technology projects where high costs of capital are preventing otherwise sound projects from proceeding. Frequently, these costs of capital are being driven by Australia's limited experience with the technologies along with the fact that much of the drive for these projects is coming from relatively small companies with limited capital.

Another barrier to investment in commercially sound projects arises with projects with capital investment requirements so large as to require investment from several companies and/or where the initial cash flow is some way off. The two outstanding examples are the geothermal industry and investment in greenfields transmission facilities needed to connect new renewable energy provinces to markets.

One reason that these opportunities may not be realised is that the current policy settings and the market that has emerged from them favour competition on small-scale projects that deliver cash flow in the near term rather than collaboration on large-scale projects which typically take longer to generate net income.

The CEFC can use its funds to spawn the collective approach that will be required from generators, transmitters and retailers that will be needed to form capital at a scale that

[1] German Federal Ministry for the Environment, Nature Conversation and Nuclear Safety, Renewable Energy Sources in Figures (June 2011), http://www.erneuerbare-energien.de/files/english/pdf/application/pdf/broschuere_ee_zahlen_en_bf.pdf

[2] "The Birth of a Power Source", Roland Kupers, ABC Environment- November 2011

realises the potential for large-scale renewable projects, particularly in regard to large scale wind projects in areas without transmission as well as large scale solar thermal and geothermal energy projects.

Other instances of market failure endemic in the present system that could be addressed through the CEFC are:

- Lack of private capital investment into commercial scale solar, wave and tidal opportunities; and
- Failure of various biofuel projects to come to fruition, notwithstanding that commercial cases exist for many of them.

2.3 The National Electricity Market and Barriers for Renewable Energy Generation

There are other policy and institutional settings which give rise to market failure in this area, particularly the exclusion of environmental considerations from the National Electricity Objective and the performance of regulatory authorities in administering the framework for that objective.

Similar to the RET, the electricity market regulatory framework, too, has been created with an emphasis on least cost, ie efficient, achievement of reliable and safe supply of electricity.[3]

This objective leads all decision making by the market participants and the regulator and particularly informs the revenue decisions made by the regulator. Benefits other than efficiency, such as, for example, the long-term and global environmental benefits resulting from a move to low emission electricity provision, cannot be recognised under the current electricity objective.

This has led to underinvestment especially in the areas of renewable friendly transmission investment and embedded generation.

2.3.1 Incentivising Transmission Investment for Renewable Energy

Transmission investment will be crucial for a high penetration of renewable energy in stationary electricity generation.

In Australia, as in most other countries, the transmission grid reflects historical, fossil fuel-based generation patterns. In Australia, the existing network infrastructure has for the most part been custom built by the then vertically integrated state owned electricity utilities to connect the major load centres with the big coal based generators. Since then major reforms have seen the electricity industry split into its separate functions of generation, transmission, distribution and retail and transformed to profit oriented, corporatized or privatised businesses.

[3] See National Electricity Law, s 7: "The objective of this Law is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity"

Renewable energy sources are often dispersed and remote to the grid. New renewable generators in remote locations do not have the luxury of getting a customised grid build to connect them to the load centres.

Infrastructure investment in transmission can be prohibitively expensive for developers and is a major obstacle for accessing new renewable energy resources in Australia. Because network infrastructure is a long term investment, decision-making on how to invest flexibly, taking account of potential future generation profiles, remains a problem.

The question of who plans and who pays for transmission infrastructure is not only an Australian problem. Successful transmission investment in renewable friendly infrastructure is a problem that continues to stymie developments all over the world.

Targeted intervention into the regulatory framework for transmission investment may be necessary to address this issue. This includes a regulatory framework that can recognise the public benefits of renewable generation, as well as socialising the costs for the necessary transmission, and potentially a planning function for the public hand that can compel renewable friendly network investment.

Successful models include the Texan Competitive Renewable Energy Zones (CREZ) where, through legislation the market regulator was enabled to designate CREZ, to access the best wind resources and to select transmission service providers to build the identified transmission infrastructure.

Likewise, the UK has legislated to enable the tendering of their offshore wind transmission infrastructure to new offshore transmission owners.

Germany has wide ranging transmission investment arrangements for renewable generation in its Renewable Energy Sources Act, as well as the Energy Industry Act, which compel Transmission Network Providers to augment networks to allow for more renewable energy or, in the case of offshore wind, built a new offshore transmission grid. In all cases costs for infrastructure investment are socialised, that is, can be recouped from the customers, in recognition of the public benefit renewable energy provides. [4]

In Australia the problem, while identified for example by the Garnaut Climate Change Review (2008/2011), and the Victorian Parliamentary Inquiry into the Approvals Process of Renewable Energy Projects (2011), remains unsolved.

The Garnaut Climate Change Review has identified the “two barriers to successful network augmentation that could significantly slow or even halt the progressive deployment of lower-emissions generation technologies”:

- Free-rider problems and first-mover disadvantage:

[4] For an overview of grid regulation and its impact on renewable energy see also, Anne Kallies, ‘The Impact of Electricity Market Design on Access to the Grid and Transmission Planning for Renewable Energy in Australia: Can Overseas Examples provide Guidance?’ (2011) 2 Journal of Renewable Energy Law and Policy 147.

"For a simple remotely located generator the additional cost of connection is likely to be insurmountable. If the costs can be shared between multiple generators, the likelihood of a successful network extension increases. But the extension may not eventuate due to strong incentive to free ride on the efforts early movers."

- Barriers to achieving optimal scale in network extensions:

  "Current processes for extending the electricity network may result in extensions without adequate capacity to carry future generation load. At present regulatory arrangements stipulate that additional network capacity can only be funded by the broader customer base if it is judged to be the best alternative to meet reliability requirements or providers not market benefits."[5]

- In his update, Garnaut added:

  "Some long extensions attempt to capture multiple benefits, typically through the use of a line that can, in the future, pick up customers or generators en route or through small extensions of the line. Whilst it is appropriate for the main proponent at the end to sponsor the line according to the size it needs, there may be long-term economic advantages if a more expensive design is pursued at the outset, which contains the flexibility for future connecting generators. It is unreasonable to require the original sponsor to fund this additional cost. Instead, the additional cost should initially be recovered from customers more generally, and then recouped from the connecting generators when they ultimately use the capacity. Bringing together a right-sized multi-purpose extension will be challenging.

  It is likely to require a changed approach to planning and network regulation such as the use of "Real Options" valuation.

  The proposed National Electricity Market Scale Efficient Network Extensions arrangements seem capable of efficiently facilitating incorporation of the option value of uncertain future developments."[6]

While this market failure has been recognised and is part of the ongoing transmission networks framework review currently being undertaken by the Australian Energy Market Commission, the recent introduction of a new rule in regard to Scale Efficient Network Extensions has shown that the little changes for renewable generators may be forthcoming under the review.

In the event, the concept of partial consumer underwrite of Scale Efficient Network Extension was rejected by the Australian Electricity Market Commission. This is not the place to debate the logic for that decision. It is sufficient to note that the potential for the kind of market future identified by Government in the foregoing remains unaddressed by the regulators.

[5] The Garnaut Climate Change Review pgs 448-449. As a post script, the regulatory mechanism was updated by the Australian Energy Regulator in June 2010 which amalgamates reliability and market benefits considerations.
[6] The Garnaut Climate Change Review Update 2011 pg 31

Case Study 1: Green Grid

This form of market failure may be becoming real, not just theoretical.

For instance, the South Australian Government has commissioned the Green Grid report which has established that a commercial case exists for building wind generation and transmission facilities to add 2,000 MW of generating capacity.

Wind already makes up 20% of South Australia's electricity production and the addition of this 2,000 MW could not be supported by the local load.

Therefore, the Green Grid concept has been developed on the basis that most of the power is transported to Victoria.

The Government also commissioned a separate study from SKM to identify whether the addition of the Green Grid would increase or decrease the costs of meeting the RET.

A key assumption for this study is that the recent land use planning rules imposed in Victoria for wind farms are applied through the network.

The study is yet to be published but its conclusions are that Green Grid would reduce REC prices by $5 per MWh and see the RET realised at a net present cost of $325 million less than without it.

So, if a commercial case exists and if it delivers the RET to the nation at a cheaper price, why is it not happening?

There are the obvious barriers such as the need for several companies and the transmission provider to agree on the parameters and difficulty of securing offtake agreements.

The CEFC is in an ideal position to overcome this market failure and the limitations of Australia's electricity market design by providing debt or equity financing for the transmission part of the project. Obviously the application of some of its own capital to this aspect will lower the cost of capital for other investors.

Importantly, CEFC's involvement would also provide a catalyst for action, requiring potential investors to determine their own positions within a timetable specified by the CEFC. The absence of this sort of mechanism is probably the most important factor holding back progress at present.

For its part, RenewablesSA is looking at supporting running the RIT-T on the transmission requirements for the Green Grid project. Success in this exercise would make a substantive contribution to de-risking the project thereby inviting an involvement from the CEFC. Both outcomes could be expected to have the effect of lowering the cost of capital for the project and therefore lowering the cost to the nation of meeting the RET.

There are, and will be, other opportunities. However addressing market failure in transmission investment generally is likely to prove the most significant and potentially the most rewarding area for facilitating investment.

2.3.2 Demand Side Management and Embedded Generation

The regulatory framework for distribution networks as embodied in the NER makes it difficult for demand side solutions to compete with network development options. Instead, regulatory bias gives rise to incentives for network rather than non-network solutions. The benefits that demand side management and embedded generation can deliver are not fully captured in the regulatory framework. Under-investment in embedded generation energy is also due, in part, to the absence of codes for establishing conditions for connection to the distribution network.

2.4 Planning Law as a barrier to clean energy projects

In regard to the question of other non-financial barriers for renewable energy projects, planning law has the potential to seriously affect opportunities for renewable generators.

In Victoria's case, the State Government has implemented new wind planning guidelines which expressly exclude wind farms in the name of protecting landscape value. Additionally all owners of dwellings within 2 km of a planned wind farm have now a right to veto developments, as their written consent is required under the new planning guidelines.

The effect of the Victorian Government's recent land use planning changes for wind farms can be seen as internalising the costs of community concerns as the new restrictions will undoubtedly increases developers' costs.

The South Australian Government has also introduced changes. These are different from the Victorian framework and are generally more supportive of wind investment. For instance, the prescribed separation distance between a turbine and a dwelling in South Australia is 1 km compared with 2 km in Victoria. The South Australian Government's policies in this area aim to achieve a balance between community amenity and achieving its goals for renewable energy and de-carbonising the State's economy.

The study referred to previously in the Green Grid case study establishes the relevance of these policies for the costs to the nation of meeting the RET. The CEFC can play an important role here, particularly by way of its participation in the investment climate for new transmission as described in 2.3.1.

Are there principles beyond financial viability that could be used to prioritise investments?

2.5 Flow-on benefits

Reference was made in the preceding section to industry development outcomes some countries have managed to realise as a consequence of being early movers in renewable energy technology.

The CEFC could include consideration of such benefits in its prioritisation of projects assessed as financially viable. This could include regional economic development benefits as well. One principle that could be used to prioritise investments is consideration of the availability and extent of flow-on benefits generally.

Case Study 2: Kangaroo Island

For example, Kangaroo Island in South Australia offers an advantageous environment for renewable energy solutions which could unlock other economic development opportunities.

At present, the power needs of the island are met by a 33 kV connection to the distribution grid augmented with *in situ* diesel generation.

A case for expanding the connection to 66 kV was rejected by the AER in the last regulatory reset, presumably on the grounds that it was not justified by the island's load profile.

Yet there is a widely-held belief that limited distribution of electricity to, and within, the island is a major limiting factor in growing the island's economy and hence the electricity load.

Renewable energy offers an opportunity to break the impasse. For instance, distributed photo-voltaics can be used to overcome the constraints of the island's distribution network. Wood chip residue can be used to provide base load power sufficient to meet all or most of the island's needs.

Adding *in situ* renewables incrementally into the island's electricity supply mix makes it possible to test the proposition about present supply limitations containing economic growth.

The case for an upgrade at the next reset becomes stronger if that proves to be the case. More importantly, a greater reliance on its own generation reduces the exposure of the island's economic development to unfavourable decisions of the AER.

Finally, the use of renewable energy has the capacity to add value to the island's products by adding a clean, green image to their market positioning. The same applies to its tourism industry.

Therefore, renewables can underpin Kangaroo Island's economic development by supporting incremental growth; reducing its exposure to AER decision-making; and helping add value to its primary production and tourism products.

The only problem is who will fund and own the facilities?

The investment requirement may be well beyond the capacity of the island residents - mostly a small farming community and tourism operators - even if the local Council acted as investor and operator.

It is difficult to see how this opportunity could be realised without some form of intervention to stimulate market interest. An investment from the CEFC could be expected to crystallise equity co-investment from potential suppliers as well as from some of their customers. More specifically, priority could be given to projects that support cleaner energy while helping meet the Government's regional development objectives.

2.6 Public Goods Test

Other principles to use in prioritising support could include a public good test. The CEFC should be interested in types of innovation which are a public good and which are typically underprovided as no one can be excluded from the benefits of it once it has been provided.

The CEFC could be interested in reducing, but not eliminating, the risk of investing in technical innovation as the benefits innovation confers on others justifies a public subsidy. The overall risk is that, without public support, there is less innovation than the community desires as a whole as the ability of the innovator to recover the full value of their investment is constrained by first mover disadvantage.

For this reason, considerations of involvement from a public authority should include assisting investors to defray spillover costs, that is the costs faced by early movers who make the initial investment to demonstrate or apply new technologies that benefit the industry more widely.

Spillover costs can include the costs associated with training in new skills; working through new regulatory frameworks; development of supporting industries and a reliable supply chain; demonstrating and communicating the safety and effectiveness of new technologies to the community; and educating providers of debt and equity about the technical and commercial dimensions of a new technology.

In this area, as in others identified in this submission, the CEFC will be in a position to make a substantial and unique contribution to delivering a clean economy. This opportunity to have an input now into how it might go about this task is appreciated.

Yours sincerely

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South Australia

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