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Potential Impacts of the Clean Energy Finance Corporation

Introduction

The Australian Government announced their intention to establish the Clean Energy Finance Corporation (CEFC) as a part of the Clean Energy Future package, intending to commence operations on1 July 2013.

The objective of the CEFC is to:

> "apply capital through a commercial filter to facilitate increased flows of finance into the clean energy sector thus preparing and positioning the Australian economy and industry for a cleaner energy future."

The CEFC has been designed as a financial institution which, for a given return, may take on higher risk and, for a given level of risk, due to positive externalities, may accept a lower financial return than their private sector equivalents.

It will provide concessional finance to clean energy projects on a case-by-case basis, with the terms being the "least generous" possible whilst allowing the project to proceed[1].

Co-financing with private investors is considered a prerequisite, to ensure that the CEFC will not supplant private finance. At least half of the fund ($5 billion) is reserved for "renewable energy technologies", or technologies that enable the deployment of renewable energy projects.

In order to be eligible for CEFC financing, projects must[1]:

1. Be principally located in Australia
2. Have a track record of technical performance
3. Have financial barriers that inhibit the transaction
4. Demonstrate a positive return and capacity to repay capital

Works Cited

1.
Clean Energy Finance Corporation Expert Review Panel, "Clean Energy Finance Corporation Expert Review, Report to Government," March 2012.

2.
IT Power, "Realising the Potential of Concentrating Solar Power in Australia," Commissioned by the Australian Solar Institute (ASI, May 2012.

Eligible technologies

AECOM conducted analysis to determine which technologies are likely to meet the eligibility criteria defined by the expert review panel. The following key assumptions were made:

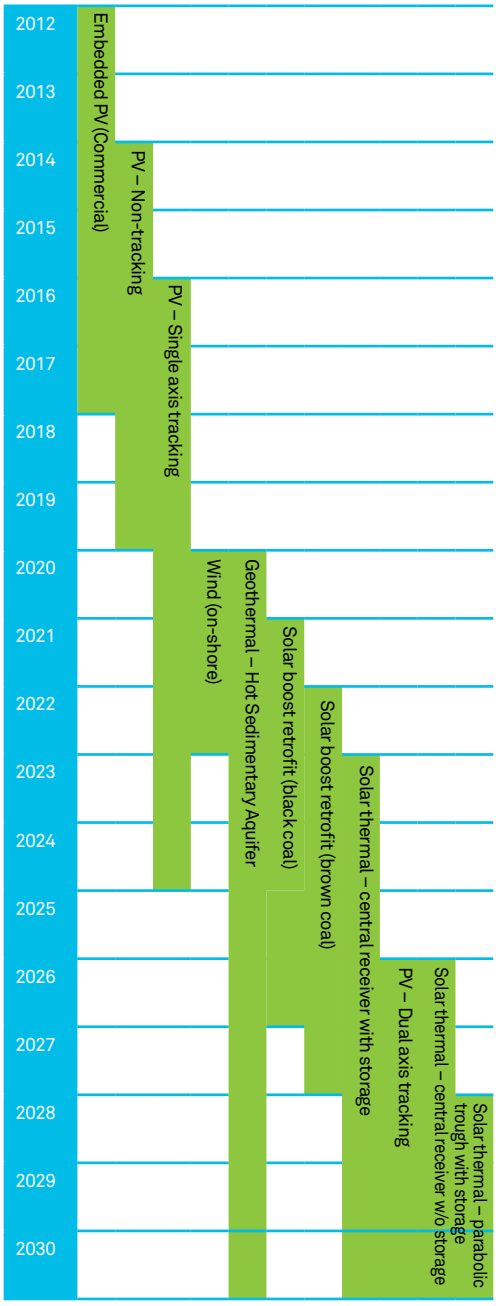
- Technology costs
  Sourced from Australian Energy Technology Assessment (AETA), released by the Bureau of Resources and Energy Economics (BREE), July 2012. Solar boost technology was based upon published costs for the Kogan Creek 44MW project and reduced over time at the same rate as the other solar thermal technologies.
- Technology revenues
  Electricity prices were sourced from the "Strong Growth, Low Pollution" modelling released by the Federal Treasury in 2011, drawing upon the "Clean Energy Future" scenario carbon price. Solar technologies received 10 percent higher than average wholesale prices (since they tend to capture peak periods) and wind technologies received 20 percent lower than average wholesale prices (due to concentration of the merit order effect in periods when wind generators are operating). Embedded technologies received avoided retail costs. Solar boost retrofits received avoided carbon and fuel costs.
- Weighted Average Cost of Capital (WACC)
  Project returns were calculated under a pre-tax real WACC of 10 percent (representative of a typical project WACC in the absence of the CEFC), and a pre-tax real WACC of 6.6 percent (representing a possible concessional CEFC rate, including 50 percent private co-financing at typical market rates). Technologies were considered eligible for CEFC financing if they demonstrated both a positive net present value (NPV) at the 6.6 percent WACC (showing that the project can make a positive return), and a negative NPV at the 10 percent WACC (demonstrating financial barriers). Eligibility was considered to be maintained for five years following the first date when a technology achieved a positive NPV with concessional financing.

The technologies assessed to be eligible for CEFC financing under these criteria are illustrated in Figure 1. Photovoltaics are likely to dominate CEFC investment in the first decade. On-shore wind may experience a brief period of eligibility from the point where the LRET target flattens (2020), if electricity prices remain insufficient to support further growth beyond that point. However, the CEFC is likely to consider this technology mature and therefore preference investment in other technologies that demonstrate a greater potential for cost reductions over time.

Geothermal (hot sedimentary aquifer) technology achieves eligibility from 2020, closely followed by solar boosting retrofits to coal-fired power stations (provided the carbon price is sufficient). Based upon the AETA cost data, the first stand-alone solar thermal technologies achieve eligibility from 2024. However, significantly lower costs for solar thermal technologies have been proposed[2]. Based upon those lower estimates, a range of solar thermal technologies could become eligible for CEFC financing from 2020.

A number of technologies considered were assessed to be unlikely to achieve eligibility for financing under the CEFC prior to 2030 for a range of reasons. Well established technologies such as landfill gas, sugar cane waste and other biomass projects did not demonstrate financial barriers (in terms of the limited definition applied in this study). Off-shore wind, wave/ocean and enhanced geothermal systems did not achieve a positive return within the study timeframe, even at the concessional CEFC financing rate.

Figure 1
Projected eligibility of technologies for CEFC financing



Scale of investment

The CEFC has at least $5 billion available to invest in renewable energy technologies. To provide an indication of the scale of renewable investment that could eventuate, this funding was distributed across the eligible technologies in each year.

Key assumptions included:

- The fund was assumed make an ongoing return of 3 percent per annum across the aggregate portfolio.
- 20 percent of the fund was assumed to be allocated to enabling technologies (such as transmission).
- A funding ratio of 1:1 CEFC to private financing was applied. This is likely to be relatively conservative; other similar funds such as Low Carbon Australia have achieved a higher proportion of private investment, which would extend the CEFC funds to a larger quantity of renewable generation.

It was found that in order to invest the entire amount available in the first decade, the CEFC would need to finance 3.3GW of solar photovoltaics over a five year period, with an installation rate exceeding 600 MW per annum. This is likely to be beyond the technically feasible limit.

To provide a more technically realistic representation of likely outcomes, annual installation in each technology was limited to twice the typical unit size defined in the AETA data set.

This limited investment to 200 MW per annum in each of the eligible photovoltaic technologies over the first decade. Applying this across all technologies to 2030 leads to the installed capacities illustrated in Figure 2. In total, this analysis finds that around 6 GW of renewable capacity could be directly financed by the CEFC by 2030.

It is anticipated that the CEFC will accelerate deployment of renewable technologies following their eligibility period due to increased private investor confidence and experience.

Thus, in addition to direct investment impacts, the CEFC could act to significantly increase the deployment of solar photovoltaics in the period 2020 to 2030, as illustrated by comparison of Figure 3a) and b).

Figure 2
Technologies financed by the CEFC from the present to 2030

Solar photovoltaic (PV) – single axis tracking
800 MW

PV – dual axis tracking
510 MW

Solar boost retrofit (black coal)
1000 MW

Solar boost retrofit (black coal)
1000 MW

Solar thermal – parabolic trough with storage
90 MW

Solar thermal – central receiver without storage
210 MW

Solar thermal – central receiver with storage
190 MW

Geothermal – hot sedimentary aquifer (HSA)
270 MW

Potential limitation on clean energy technology investment

The Clean Energy Finance Corporation Bill 2012 states:

"In performing its investment function, the Corporation must ensure that, at any time on or after 1 July 2018, at least half of the funds invested at that time for the purposes of its investment function are invested in renewable energy technologies"

This modelling indicates that there is a realistic possibility that the CEFC will not be able to invest the full amount of finances allocated to renewable energy technologies during the first decade of its operation.

Only photovoltaic technologies are assessed to be likely to be eligible prior to 2020, and $5 billion investment in these technologies alone is not likely to be technically feasible.

This may limit the ability of the CEFC to invest in other (non-renewable) clean energy technologies, such as energy efficiency. A re-phrasing of this clause may be appropriate to avoid this limitation.

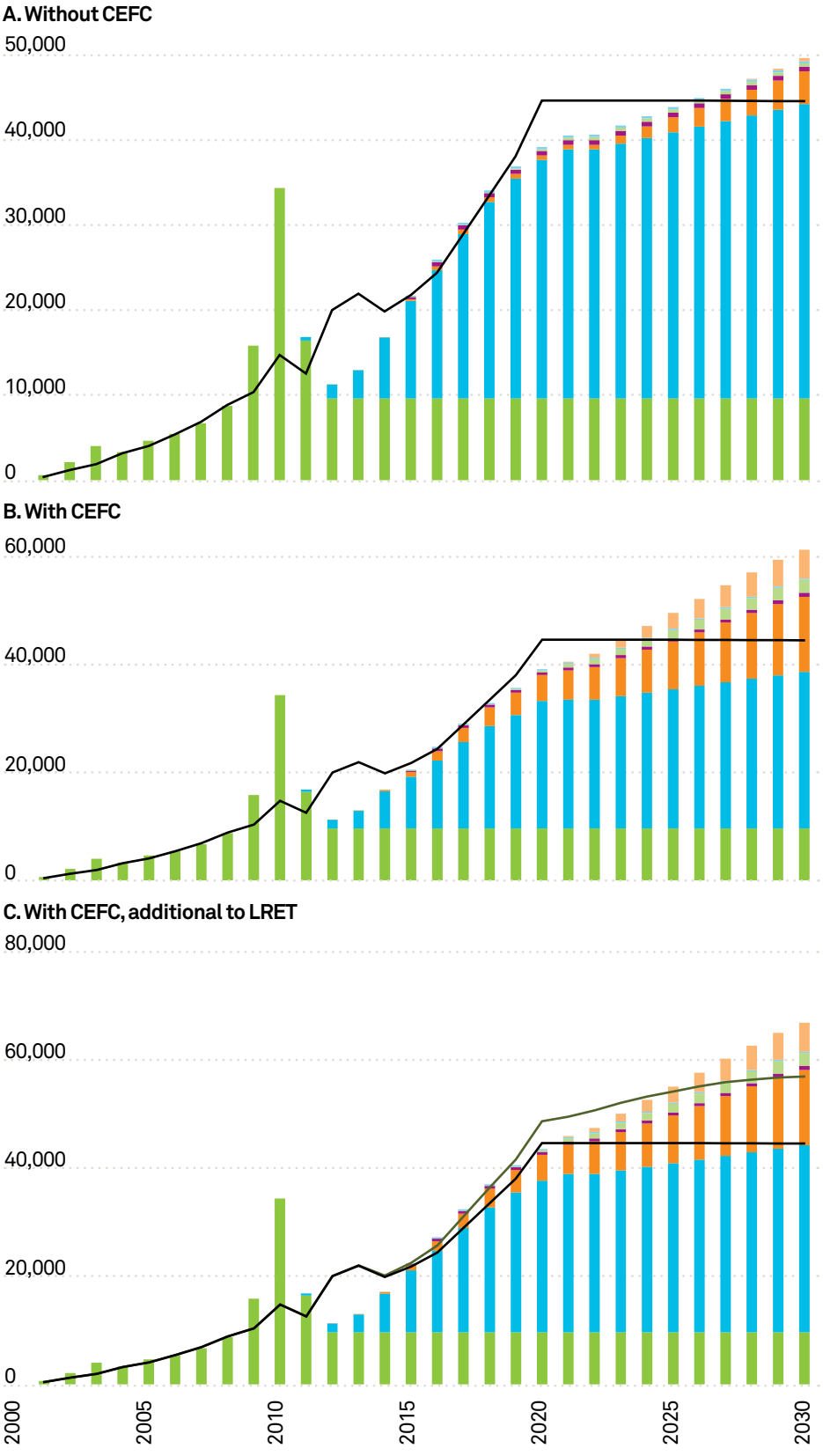
Interaction with the LRET

This analysis indicates that the CEFC is likely to invest strongly in solar photovoltaics over the coming decade. The potential quantity of solar generation could act to crowd out wind investment under the LRET in the period to 2020.

Retailers are likely to be relatively indifferent to meeting their liability with LGCs created by wind projects, or solar projects financed by the CEFC on the "least generous terms possible". This analysis suggests that the total wind capacity installed could be reduced by 2-3 GW in 2020, illustrated in Figure 3b). This impact could be avoided by increasing the LRET target to account for LGCs created by CEFC financed projects, as illustrated in Figure 3c).

The Renewable Power Percentage change to implement CEFC additionality to the LRET is projected to cost consumers only 0.2 to 0.3 c/kWh.

Figure 3 (A-C)
Possible interaction of the CEFC with the LRET



Conclusions

This analysis finds that the CEFC is likely to invest primarily in solar photovoltaic technologies over the next decade, diversifying into solar thermal and geothermal technologies in the period 2020-2030.

Up to 6 GW of emerging renewable technologies could be financed by 2030, with growth likely to be further accelerated beyond the period of direct CEFC support.

This suggests that the CEFC has the potential to significantly increase the deployment of a diverse range of renewable technologies in Australia.

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