Appendix 1 - Case studies of Concentrating Solar Thermal projects recently reaching financial close

There are lessons that can be learnt from ongoing, recently completed projects in other countries that are relevant to the operating structure of the CEFC, and exactly how the corporation may approach the fulfilment of its stated aims. Several CST projects in the United States that have recently reached financial close and have commenced construction are a useful benchmark for what would be necessary in the Australian context.

The process through which they achieved financial close was complex and drew upon a multitude of different government policies. Many of these proven policies can provide a good basis and example for which the CEFC can use to begin to formulate some of its operational and investment strategies upon (Note: unless otherwise specified, all monetary values referred to in this section are in nominal US dollars.)

The three key financial incentive policies used by these projects in the U.S.A. were:

U.S. Department of Energy Loan Guarantees

These guarantees, provided under Sections 1703 and 1705 of the Energy Policy Act[i], operated in two ways. One method being where The U.S. Federal Government will cover an eligible company's debt obligation to a financial institution if they default on the debt. The other method being where the U.S. Treasury directly provides the debt portion of the company's project financing requirements. To be eligible for such a Loan Guarantee, an extensive process of due diligence is required to be carried out by the U.S. Department of Energy in regards to the corporation/s involved, as well as the necessity to ascertain the reliability of the proponent technology. The provision of this loan guarantee allows the project to access financing at a much lower interest rate (the U.S. Treasury risk free rate) than it would otherwise, which has a significant impact on project economics.

Investment Tax Credit Cash Grant

The U.S. Investment Tax Credit policy basically allows renewable power projects to claim a tax deduction to the value of 30 percent of the capital value of the project. This was then changed from a tax deduction to an upfront cash grant receivable upon completion of project construction, known as the cash grant in lieu of ITC[ii]. This is received upon successful commencement of operations of the facility.

Renewable Portfolio Standards (RPS)

The Renewable Portfolio Standards operate similarly to Australia's Federal Renewable Energy Target (RET). California's RPS requires 25 percent renewables by 2016 and 33 percent by 2020[iii]. Nevada's RPS requires a total of 25 percent renewable energy by 2025, with solar making up 6 percent of the annual requirement by 2025 (1.5 percent of total sales)[iv]. Further information on all states can be found through U.S. DoE EERE[v].

The two CST projects listed below both required assistance from the three areas listed above in order to reach financial close and commence construction. They both negotiated PPAs based on electricity market revenue and Renewable Portfolio Standards; the ITC Grants will allow a significant amount of their debt and/or equity to be paid off as soon as the projects are successfully completed; and the Loan Guarantees provided the access to low interest finance, which for such capital intensive projects make a very significant difference to the magnitude of yearly interest payments. It is unlikely these projects would have been successful without all three of these financial factors lining up, along with all the planning and permitting activities.

Ivanpah SEGS, Brightsource Energy

The Ivanpah project is a 392 MW (gross) facility comprising three separate solar thermal power towers. The technology utilised is direct steam generation in a power tower/heliostat field configuration, and is only intended to provide 'on-sun' electricity, i.e. when the sun is shining, with a small provision for use of natural gas in startup mode. It commenced construction late 2010. It is located in California, near the border with Nevada on the main Highway 15 to Las Vegas.

Figure 1: Ivanpah Solar Facility under construction in November 2011. Source: Brightsource Energy

Debt Financing

$1.6 billion of Ivanpah's financing come from the Federal Financing Bank, a branch of the US Department of Treasury[vi]. This $1.6 billion is guaranteed by the US Department of Energy (US DoE)[vii].

Equity Financing

$598 million of Ivanpah's financing has come from private equity: $300 million from NRG Solar, $168 million from Google, and $130 million from Brightsource itself[vi].

Grants

Ivanpah is also eligible for the cash grant in lieu of ITC (30 percent of project capital value), which Brightsource's IPO indicates will be approximately $570 million[vi].

Power Purchase Agreement

While the exact details of Ivanpah's PPA remain confidential, Pacific Gas and Electric indicate that it "will not exceed the 2008 MPR [Market Price Referent], adjusted for the on-line date."[viii], which is set by the Californian Public Utilities Commission. For a 25-yr PPA commencing in 2012, this is $125.09/MWh in 2008 nominal US dollars[ix]. However this is then usually adjusted by a Time-Of-Day factor to take into account higher electricity prices during times of solar production[x], which can be in the order of 1.2 times the base price[xi].

Crescent Dunes, SolarReserve

The SolarReserve's Crescent Dunes Project, located in Tonopah, Nevada, is a 110MW (gross) project utilising molten salt power tower technology. The use of molten salt storage will allow the facility to continue to operate long after the sun has set, in the case of Crescent Dunes for the equivalent of 10 hours at full output. This allows it to fully take advantage of peak electricity prices.

i
gure 2: SolarReserve Crescent Dunes project under construction in November 2011, and artists rendering of completed facility. Source: SolarReserve

Debt Financing

$737 million of debt financing from the U.S. Treasury's Federal Financing Bank, fully guaranteed by the U.S. DoE[xii].

Equity Financing

$260 million[xiii] in equity from SolarReserve, ACS Cobra and Banco Santander[xiv]. ACS Cobra is a major global construction firm based in Spain who will be constructing the Crescent Dunes Project, while Banco Santander, a Spanish bank, is the 13th largest public company in the world according to Forbes[xv] and has experience of lending to solar thermal power projects in Spain.

Grants

The Crescent Dunes Project is eligible for the Federal cash grant in lieu of 30 percent ITC upon project completion[xiii].

Power Purchase Agreement

SolarReserve's 25-year PPA with Nevada's NV Energy for 100 percent of the electricity from Crescent Dunes is publicly available, at $135/MWh[xiii].

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