NSW ELECTRICITY INFRASTRUCTURE ROADMAP

Weighted Average Cost of Capital Report

November 2020

TABLE OF CONTENTS

Important notice and disclaimer

This document ("Report" or "document") is being provided by National Australia Bank Limited (ACN 004 044937) ("NAB") to the New South Wales Department of Planning, Industry and Environment ("Recipient") pursuant to, and subject to, the terms of an agreement dated 7 July 2020 between NAB and the Recipient ("Agreement").

The NAB Report is not intended as a recommendation, invitation, offer, solicitation or inducement to engage in or refrain from engaging in any transaction or any other course of action or inaction. The Report does not purport to contain all relevant information and may include or be based on information prepared by third parties obtained from public sources or provided on a non-confidential basis which NAB has not, and cannot, verify. The Report may include estimates and projections and involves elements of subjective judgment and analysis. Past performance is not indicative of future results and any statement as to any future matter is a present prediction of a possible future outcome, the accuracy of which cannot be guaranteed. Neither the Recipient nor any other person should rely solely upon the contents of the Report, but should make their own assessment and evaluation, undertake an investigation and enquire and seek advice to enable them to make any decision.

The Report is provided to the Recipient upon the express understanding that, so far as the law allows, NAB (including its related bodies and any officer, employee, agent, adviser or contractor thereof) does not warrant or represent (expressly or impliedly) that the document (or the information, recommendations, opinions or conclusions set out or referred to in it) are accurate, reliable, complete or contemporary.

This document is confidential to NAB and the Recipient and, except as permitted by the Agreement, should not be reproduced or disclosed by the Recipient in whole or in part to any other person without the prior written consent of NAB. NAB expressly advises that, to the extent permitted by law, it disclaims all and any responsibility for and shall not be liable in any way whatsoever (whether in negligence or otherwise) for any loss or damage which may be suffered by any person relying upon the document (or any Information (including errors, defects, misrepresentations or omissions) contained in the document.

Without limiting the foregoing, NAB understands that the Report is to accompany the NSW Electricity Infrastructure Roadmap ('Roadmap") and will not be used for any other purpose. NAB has not seen the Roadmap and, other than preparing the Report, has had no involvement in the preparation of the Roadmap. NAB accepts no responsibility, and shall have no responsibility, for or in relation to the Roadmap.

This Important Notice forms part of the NAB Report and must be included with the NAB Report at all times.

1. INTRODUCTION

1.1 Introduction and purpose of report

In November 2019, the NSW Government ("State") released the NSW Electricity Strategy including a series of actions to improve the reliability and affordability of NSW electricity supply and use. In March 2020, the State also released the Net Zero Plan: Stage 1 2020 to 2030 which is expected to help NSW reduce emissions to 35% below 2005 levels by 2030.

The Minister for Energy and Environment has requested the Department of Planning, Industry and Environment ("Department") develop recommendations on the next stage of implementing several of the energy related policy and program actions in these plans as part of the NSW Electricity Infrastructure Roadmap ("Roadmap").

The Department has commissioned KPMG to work with the Department to manage the Roadmap. The Department has also appointed NAB to prepare a report on the impact of the relevant policy proposals on investment certainty in the energy industry. This includes advice on debt and equity markets as they relate to energy infrastructure, investment risks which can be reduced through government action and the possible reductions in Weighted Average Cost of Capital ("WACC") from potential policies being examined ("Report").

The purpose of this Report is to provide a peer review of the WACC assumptions used in the preparation of the Roadmap. This Report is not intended to be a comprehensive review of WACC for renewable energy projects in Australia. This Report should be read in conjunction with the Roadmap and it is envisaged this Report will accompany the broader Roadmap provided to the Department and not be used for any other purpose.

1.2 Industry survey findings

A survey of equity investors active in the Australian renewable energy market was conducted by KPMG and the Department to obtain insight into WACC assumptions across a mix of technology revenue risk factors ("Survey"). Key assumptions for the Survey are detailed in Appendix 4.1.

Survey responses were directed solely to the Department and was subsequently anonymised and amalgamated by the Department. NAB has been provided a copy of the key outputs from the Survey on an anonymised and amalgamated basis as follows:

Table 1.1 – Survey results

Metrics	Median Survey result				
Technology	Wind	Wind	Solar PV	Solar PV	New Build Gas
Offtake counterparty	Investment Grade Retailer	Sovereign or near-sovereign	Investment Grade Retailer	Sovereign or near-sovereign	Sovereign or near-sovereign
Cost of equity (post-tax)	9.20%	8.50%	8.96%	8.61%	9.80%
Cost of debt (pre-tax)	3.03%	2.76%	2.86%	2.71%	2.86%
Gearing	65.00%	65.00%	65.00%	67.50%	65.00%
WACC (vanilla, nominal)	5.25%	4.77%	4.99%	4.42%	5.37%
WACC (vanilla, real)	3.29%	2.81%	3.04%	2.47%	3.41%

In preparing this Report, NAB has relied on the Survey data to provide a reflection of the contemporary investment landscape and our findings are assessed against the Survey data. NAB has reviewed the Survey results and the nominal vanilla WACC for each category are within a +/- 10% range of NAB's own estimates based on market observations and internal reference data around the time of the Survey.

Therefore, we consider the median ranges presented to be a reasonable basis of estimates for the nominal vanilla WACC for each category.

1.3 Merchant assumption adopted by the Roadmap modelling

We understand that the Department and KPMG, in consultation with Aurora, have adopted a nominal post-tax cost of equity assumption of 12%, which we consider reasonably reflective of the higher level of risk borne by equity for projects fully exposed to the National Energy Market ("NEM") price around the time of the Survey.

1.4 Offtake counterparty

The offtake counterparty for the purposes of this Report is assumed to have a sovereign or near sovereign credit rating, consistent with the assumption described in the Survey. The Department has advised that the intention is for a scheme financial vehicle to be created supported by a regulated consumer levy ("Levy") to act as the offtake counterparty for the Roadmap policies ("Scheme Financial Vehicle", or "SFV"). The Department has advised NAB that:

- The SFV will be a vehicle with no recourse to government funds or balance sheet, being solely supported by the scheme's regulatory framework. The inability for SFV to seek funds from the State is expected to be enshrined in the SFV constitution.
- Because the regulations provide the SFV with comprehensive rights to allocate any scheme costs via a Levy, the Department and KPMG expect the SFV to obtain a credit rating of up to AAA. Depending upon the robustness of the regulatory construct, the SFV may be rated one to two notches below AAA.
- It is not expected that any deterioration of State credit rating would impact the credit rating of the SFV. Conversely, the Department and KPMG do not expect the SFV to have any impact on the State credit rating.

1.5 WACC formulation

We have adopted the following simple definition of WACC:

$$\boldsymbol{Nominal\ Vanilla\ WACC}\ \% = \boldsymbol{K_d} \times \boldsymbol{G} + \boldsymbol{K_e} \times (\boldsymbol{1} - \boldsymbol{G})$$

Where

K_d	Represents the pre-tax nominal cost of debt
G	Represents the weighting of debt in the capital structure
K_e	Represents the post-tax nominal cost of equity as determined under the Capital Asset Pricing Model[1] ("CAPM")

As the Survey data did not provide a breakdown of the individual elements for K_d and K_e, further consideration of implied risk premia, beta and gamma were not possible.

The deflated WACC has been calculated using the Fisher equation[2]:

$$\boldsymbol{Real\ Vanilla\ WACC}\ \% = \frac{(\boldsymbol{1} + \boldsymbol{Nominal\ Vanilla\ WACC}\ \%)}{(\boldsymbol{1} + \boldsymbol{r})} - \boldsymbol{1}$$

Where

r	Represents the inflation assumption of 1.90%[3]

[1] Sharpe, W. (1970), *Portfolio Theory and Capital Markets*, McGraw-Hill, New York

[2] Fisher, I. (1930), *The Theory of Interest: as determined by impatience to spend income and opportunity to invest it,* Macmillan, New York

[3] We understand that the Department and KPMG have utilised the assumption of 1.90% as the expected rate of inflation

2. WEIGHTED AVERAGE COST OF CAPITAL

2.1 Introduction

In assessing the Survey data, NAB has considered each component of the nominal vanilla WACC equation in accordance with NAB's own internal reference cases, market observations and our indicative assumptions for contemporary projects around the time of the Survey.

Our internal reference cases range across a field of renewable energy transactions in the Australian market. They span a mix of technology, specifically wind and solar photovoltaic ("PV") projects with different offtake counterparty risk profiles categorised between sovereign or near-sovereign and investment grade non-sovereign offtakers. All internal references have been anonymised and amalgamated to median values. Additional project financing data from public information sources[4] have also been included to supplement NAB's internal reference cases.

Record breaking investment in large-scale renewable energy projects was observed in 2017, with A$10bn and 5.3GW of projects which were under construction, completed or had attracted finance[5], doubling in 2018 to A$20bn with 14.5GW under construction or fully committed[6]. This period of booming investment activity from 2017 provided for a strong pool of precedent transactions to inform our analysis. However, the limited number of precedent transactions across this period in Australia for standalone Battery Energy Storage Systems ("BESS"), pumped hydro and new build gas projects limits our ability to analyse the historical cost of capital for such projects. Alternatively, we have formulated a set of assumptions for the cost of capital across such projects based on NAB's internal views of the market. These assumptions are detailed under Appendix 4.3.

To supplement the historical observations from our internal reference cases, we have also provided an estimate of indicative assumptions for wind and solar PV projects based on the same set of assumption as the Survey as detailed in Appendix 4.1. Our resulting estimates are detailed under Appendix 4.2. Our Report therefore seeks to provide both a historical and contemporary review of the Survey data results.

The combination of devastating Australian bushfires and the COVID-19 global pandemic has impacted financial markets in Australia and abroad across 2020. Volatility peaked in March 2020 with the Chicago Board Options Exchange's Volatility Index ("VIX") reaching US$ 82.69[7], rivalling peaks observed during the Global Financial Crisis. Volatility retreated leading into July 2020, but remained slightly elevated compared to pre-COVID-19 levels with a gradual easing in financial market pressures also observed as risk sentiment adjusts. While we expect the risk premia elements of the CAPM equation in 2020 to remain comparable to historical observations from 2017, the historically low interest rate environment is expected to continue[8], which will reduce the risk-free rate and contribute towards lower WACC levels.

[4] Sources include Bloomberg New Energy Finance, Inframation, LoanConnector, and public company announcements

[5] Clean Energy Council, *Clean Energy Australia Report 2018*, <https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2018.pdf>

[6] Clean Energy Council, *Clean Energy Australia Report 2019*, <https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2019.pdf>

[7] Observed on 16 March 2020, Source: Bloomberg

[8] Lowe,P., 2020, *Opening Statement to the Senate Select Committee on COVID-19*, 28 May, <https://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id:%22committees/commsen/a3af0917-dc51-4d01-a86f-69153eb93040/0000%22>

2.2 Cost of debt and gearing

The majority of renewable energy projects in Australia have been financed on a non-recourse project finance basis. We have therefore predicated our assessment of the cost of debt for renewable energy projects on the basis of project financings. NAB has also observed that the majority of project financings in Australia have been completed on a "mini-perm" basis, where the initial maturity of the facility is generally five years. We have therefore taken the cost of debt observations to be representative of a five-year facility.

The direct cost of debt in a standard project financing is generally comprised of:

1. an interest rate margin;
2. a base reference rate; and
3. any additional fees related to the financing, including, but not limited to upfront fees and swap premiums.

Changes over time in the interest rate margin can be reflective of several factors, including shifting risk appetites and cost of funds, which acts as a good reference point for the debt risk premium under the CAPM equation. To reflect a more holistic debt risk premium, we have also added any additional fees related to the financing to arrive at an implied debt risk premium (this includes annualised swap margins and dividing the upfront fees over an assumed tenor of five years to derive an annualised fee amount). Base reference rates will be influenced by the hedging policy of each borrowing entity and the interest rate environment at the time of the transaction. To facilitate the comparison against the Survey data, we homogenised the risk-free rate across all projects as a 20-business day rolling average across July 2020 of the Australian ten-year swap rate on a fully hedged basis. The sum of the implied debt risk premium and base reference rate amounts to our assumed the cost of debt.

The relevant observed gearing levels of each internal reference case has also been considered.

In addition to the historical observations from our internal reference cases, we have also provided an estimate of indicative assumptions for project financings across wind and solar projects in the contemporary market context of the Survey.

All values have been amalgamated and median values derived. The table below reflects our views on the cost of debt and gearing for renewable energy transactions based on observations of our internal reference cases and indicative assumptions for the contemporary market context of the Survey:

Table 2.1 – Cost of debt and gearing: NAB estimates compared to Survey results

Metrics	Median results			
Technology	Wind	Wind	Solar PV	Solar PV
Offtake counterparty	Investment Grade Retailer	Sovereign or near-sovereign	Investment Grade Retailer	Sovereign or near-sovereign
Historical internal reference cases				
Cost of debt (pre-tax)	2.90%	2.91%	2.80%	2.66 %
Gearing	62.50%	61.07%	68.65%	72.41%
Indicative assumptions for contemporary projects				
Cost of debt (pre-tax)	3.00%	2.95%	3.00%	2.95%
Gearing	67.50%	67.50%	67.50%	67.50%
Survey results				
Cost of debt (pre-tax)	3.03%	2.76%	2.86%	2.71%
Gearing	65.00%	65.00%	65.00%	67.50%

Initial observations suggest that all three data sets yield relatively similar results. However, we note that the observed gearing levels under NAB's internal reference cases present a higher level of variance to the Survey results, which may be reflective of different levels of offtake for the reference projects. For example, the Survey assumptions detailed in Appendix 4.1 contemplates at least 75% contracting under a Power Purchase Agreement ("PPA") over the project life, but historically, some renewable energy projects have been developed with lower levels of PPA coverage and shorter duration, which may affect the level of resultant gearing. Our indicative assumptions for contemporary projects present a range of 60-75% gearing based on the Survey assumptions and the mid-point of 67.50% corresponds well to the Survey results. As the Survey assumptions do not provide a guide for pricing of the PPA, our broader range 60-75% gearing reflects the potential impact PPA pricing may have on debt sizing.

The Survey results demonstrate a slight reduction in cost of debt (0.27% for wind and 0.15% for solar PV) for sovereign or near-sovereign offtake counterparty risk as compared to investment grade offtake counterparties. The Survey results also demonstrate a slight improvement in gearing between the offtake counterparty risks for solar PV projects, which has a subsequent effect of improving the implied credit rating of the project. The NAB results share a similar direction of lower cost of debt and higher gearing for sovereign or near-sovereign counterparty risk when compared to investment grade offtake counterparties. The cost of capital improvement between the two different offtake risk profiles across both cost of debt and gearing is reflective of the stronger counterparty credit quality. This can manifest through the project achieving better project financing terms, pricing and healthier debt sizing parameters. For example, this may result in improved applicable Debt Service Coverage Ratios ("DSCR") across the contracted revenue stream, which provides capacity for higher gearing.

The Survey results indicate that solar PV projects have traditionally benefitted from slightly lower cost of debt as compared to wind projects (0.17% for investment grade and 0.05% for sovereign or near-sovereign counterparty risk). NAB's internal reference cases depict a similar trend in cost of debt reduction for solar PV projects indicating that they have historically benefited from approximately 6.2 to 11.3 percentage point improvement in gearing when compared to wind projects. However, the Survey results and our contemporary indicative estimates suggest very little difference in gearing for new projects. This differential between the two different technologies has been historically reflective of perceived lower risk associated with solar PV project, including for example, shorter build times. However, solar PV has faced recent challenges ranging from Engineering, Procurement and Construction ("EPC") contractor insolvency[9] and withdrawal[10], grid related issues, curtailment and depressed wholesale prices during daytime hours. Our contemporary estimates suggest that the perceived historical advantages of solar PV over wind technologies may be eroding, resulting in limited improvement in cost of capital.

[9] RCR Tomlinson Ltd, 2018, *Appointment of Administrators*, Australian Stock Exchange, 22 November, <https://www.asx.com.au/asxpdf/20181122/pdf/440jp3zv9nhgw4.pdf>

[10] Wiggins, J., 2020, *'We're out': Downer EDI shuns solar, coal, iron ore construction*, Australian Financial Review, 12 February, <https://www.afr.com/companies/infrastructure/we-re-out-downer-edi-shuns-solar-coal-iron-ore-construction-20200211-p53zuk>

2.3 Cost of equity

The internal reference cases we have considered for the purposes of this Report presents gaps across several transactions in relation to the cost of equity. Consequently, we are unable to complete a project by project WACC analysis and have taken the approach to formulate a nominal vanilla WACC from the median or mid-point results from each WACC component. To inform the analysis, we have combined the data across our internal reference cases for cost of equity with our assumption for cost of equity, to form a consistent set of assumptions. These figures have been estimated based on levered Internal Rate of Return ("IRR") for equity on a post-tax basis at the project level based on the assumptions detailed in Appendix 4.1. The table below reflects our estimates of the cost of equity for renewable energy transactions as compared to the Survey results:

Table 2.2 – Cost of equity: NAB estimates compared to Survey results

Metrics	**Median results**			
Technology	Wind	Wind	Solar PV	Solar PV
Offtake counterparty	Investment Grade Retailer	Sovereign or near-sovereign	Investment Grade Retailer	Sovereign or near-sovereign
Indicative assumptions for contemporary projects and historical internal reference cases				
Cost of equity (post-tax)	9.00-10.00%	8.25-9.25%	8.75-9.75%	8.25-9.25%
Survey results				
Cost of equity (post-tax)	9.20%	8.50%	8.96%	8.61%

The Survey results also demonstrate a reduction in the cost of equity for sovereign or near-sovereign counterparty risk (0.70% for wind projects and 0.35% for solar PV projects) as compared to investment grade offtake counterparties. A long-term offtake supported by sovereign or near-sovereign counterparty provides a stable platform for a longer-term investment horizon with lower implied risk, which increases the pool of available equity investors. These factors can be reasonably expected to support the reduction in cost of equity observed in the results.

However, the differences between cost of equity for solar PV projects and wind projects in the Survey results does not follow the same consistent direction. Cost of equity results for solar PV are 0.24% lower for investment grade offtake counterparties, but 0.11% higher for sovereign or near-sovereign counterparty projects. While we note this inconsistency, the Survey results remain within NAB's own expected ranges and could be considered reasonable.

NAB has observed an increasing level of risk borne by equity investors on solar PV projects when compared to 2017/2018 years. With respect to project delivery, risk allocation under recent EPC contracts has seen a shift in passing connection risk back to the project, which in turn has been mostly borne by equity as further risk sharing with debt has been limited. Connection risk has also been highlighted on recent projects, which have been required to adopt grid augmentation requirements at a late stage[11]. Upon completion, projects have also been faced with curtailment risk and negative Marginal Loss Factor ("MLF") impacts, which conveys further risk to equity. As a result, NAB believes that addressing these and other related risks form a critical component in tapering otherwise rising risk sentiment for equity on solar PV projects. The Survey assumptions provide a positive framework for addressing these related risk elements, which are reflected in our internal estimates and suggest that slight improvement in cost of equity for solar PV projects may still apply, regardless of offtake counterparty risk.

[11] Filatoff, N., 2020, *Long read: Faltering grid curtails, delays, stalls solar*, PV Magazine, 11 April, <https://www.pv-magazine-australia.com/2020/04/11/long-read-faltering-grid-curtails-delays-stalls-solar/>
Varrath, S. & Parkinson, G., 2020, *Victoria intervenes to try and solve wind and solar bottlenecks in local grid*, RenewEconomy, 18 February, <https://reneweconomy.com.au/victoria-intervenes-to-try-and-solve-wind-and-solar-bottlenecks-in-local-grid-57577/>
Matich, B., 2019, *Connection issues continue to hamper large scale solar PV projects*, PV Magazine, 27 July, <https://www.pv-magazine-australia.com/2019/07/17/connection-issues-continue-to-hamper-large-scale-solar-pv-projects/>

2.4 Inflation and tax

We understand that the Department and KPMG have utilised the assumption of 1.90% as the expected rate of inflation and a corporate tax rate of 30% in their modelling. We have subsequently adopted these assumptions in the transformation of the nominal vanilla WACC to the real vanilla WACC by adjusting on a pre-tax basis.

We also understand that in amalgamating the Survey responses, the Department have also utilised the corporate tax rate assumption of 30% to adjust between pre-tax cost of equity response data and post-tax cost of equity response data.

2.5 WACC conclusions

We have calculated the nominal vanilla WACC for each category based on the median values or mid-point values for each component across our internal reference cases and our indicative assumptions for contemporary projects. The table below reflects our estimates of the nominal vanilla WACC and real vanilla WACC as compared to the Survey results:

Table 2.3 – WACC: - NAB estimates compared to Survey results

Metrics	Median results			
Technology	Wind	Wind	Solar PV	Solar PV
Offtake counterparty	Investment Grade Retailer	Sovereign or near-sovereign	Investment Grade Retailer	Sovereign or near-sovereign
Historical internal reference cases				
WACC (vanilla, nominal)	5.38%	5.18%	4.82%	4.34%
WACC (vanilla, real)	3.41%	3.22%	2.87%	2.39%
Indicative assumptions for contemporary projects				
WACC (vanilla, nominal)	5.11%	4.84%	5.03%	4.84%
WACC (vanilla, real)	3.15%	2.88%	3.07%	2.88%
Survey results				
WACC (vanilla, nominal)	5.25%	4.77%	4.99%	4.42%
WACC (vanilla, real)	3.29%	2.81%	3.04%	2.47%

Previous observations on the differences in cost of capital between offtake counterparties and technologies is also reflective in the WACC ranges. The Survey results demonstrate a reduction in nominal vanilla WACC (0.48% for wind and 0.57% for solar PV) for sovereign or near-sovereign offtake counterparty risk as compared to investment grade offtake counterparties. From a technology perspective, the Survey results also demonstrate a lower nominal vanilla WACC for solar PV projects as compared to wind projects (0.26% for investment grade offtake and 0.35% for sovereign or near-sovereign offtake).

The Survey nominal vanilla WACC figures across all categories are within +/- 10% range of NAB's own estimates based on market observations and internal reference data. Therefore, we consider the median ranges presented to be a reasonable basis of estimates for the nominal vanilla WACC for each category.

The renewable energy market has been impacted by a wide range of issues across the project lifecycle over the last few years ranging from construction and connection risks, MLF and curtailment, pricing and contractual risks. We note the Survey results have been predicated on the set of assumptions detailed in Appendix 4.1, which largely assumes these risks are addressed and that a long-term offtake regime will apply. Therefore, it can be expected that higher WACCs may apply to the extent these risks are not addressed and highlights the importance of addressing these risks in a co-ordinated, government-led fashion.

3. NSW ELECTRICITY INFRASTRUCTURE ROADMAP IMPACTS ON WACC

3.1 Introduction

NAB understands that the planning and design of the Roadmap has considered a range of potential schemes to support the development of renewable energy projects and achieve the objectives of the Net Zero Plan. We have been requested to comment on the potential WACC impacts of a potential scheme involving the public tender or reverse auction run by the SFV to select energy projects, which are then provided with financial support through contracts ("Long Term Energy Services Agreements").

In addition, we have considered the potential benefits of Renewable Energy Zones ("REZ") in supporting the development of renewable energy projects through the REZ Transmission Development Scheme. The State's first planned 3GW REZ in the Central-West Orana region, which has received consideration interest amounting of 27GW of projects[12], demonstrates the strong reception of REZ by the market.

The combination of the Long Term Energy Services Agreements and REZ address the majority of risks and challenges faced by renewable energy projects and have provided the basis for the Survey assumptions outlined in Appendix 4.1. However, the dynamic nature of the market has resulted in the development of new risk factors not able to be addressed by the Long Term Energy Services Agreements and REZ. We have also considered a number of these risk factors and their potential impact on WACC based on a representative greenfield wind project with sovereign or near-sovereign risk from the Survey results, which has a nominal vanilla WACC of 4.77% (refer to Section 1.2) ("Representative Project").

[12] NSW Energy, 2020, *Renewable Energy Zone sparking investment boom*, 23 June, <https://energy.nsw.gov.au/renewable-energy-zone-sparking-investment-boom>

3.2 Long Term Energy Services Agreements

NAB understands that the Long Term Energy Services Agreements are designed to award successful proponents a long-term offtake arrangement through a series of progressive competitive tenders. The Long Term Energy Services Agreements will be structured to match the project being supported and is expected to take the form of put option swap contracts providing price protection through a "floor" mechanism set by a strike price. Proponents will have the ability to nominate the commencement of each block of contracts up to twelve months ahead of time ("Option Block"), but ultimately have flexibility in calling the option over time. This flexibility enables proponents to procure project financing on the basis of the Long Term Energy Services Agreements, which assists to "bridge" the construction phase of the project. The intention is to increase the delivery certainty of the project and empower the proponents to negotiate for new offtake arrangements without needing to rely on these agreements to catalyse project financing ("Risk Management Contracts"). The Long Term Energy Services Agreements also contemplate a pay-back mechanism when the wholesale price is higher than the strike price, to assist in cost recovery for amounts paid out by the Scheme Financial Vehicle in earlier periods. The progressive nature of the volume target, tender processes, storage and firming targets, will also combine to support the implementation of the Long Term Energy Services Agreements in a sustainable manner.

In estimating the indicative nominal vanilla WACC levels (refer to Section 2.5), we have considered the Survey assumptions detailed in Appendix 4.1. The specific assumptions around "Contracted generation" and "Power price forecast" are designed to provide greater certainty over revenue streams and we have assumed that respondents viewed the "Contracted generation" assumption as a traditional fixed price Contract for Difference ("CFD") arrangement. While the Long Term Energy Services Agreements may serve as a proxy for the "Contracted generation" assumption, it is different to a traditional CFD and we understand from KPMG and the Department that the design of the Long Term Energy Services Agreements seeks to incentivise generators to contract with other counterparties through Risk Management Contracts.

Depending on the design of the auction and contracting process, we believe that the bidding behaviour by proponents for the Long Term Energy Services Agreements may result in lower strike prices, which may not cover the full equity return requirements, with the balance in equity returns instead reliant on potential upside from re-contracting gains and merchant exposure. Therefore, in considering the potential WACC impact of the Long Term Energy Services Agreements, we have approached this as a comparison between the Long Term Energy Services Agreements and a traditional CFD, which would represent the full contracted cash flows for both debt and equity:

Table 3.2 – Long Term Energy Services Agreements impacts on WACC compared to Survey results

Metrics	Potential example impact	Indicative change (%)
Cost of equity (post-tax)	Potential for an element of equity returns to be reliant on re-contracting and merchant exposure may increase the level of equity risk. Low to moderate level of increase in cost of equity may apply.	+0.25 to +0.50%
Cost of debt (pre-tax)	Put option structure provides price "floor" protection while allowing project to benefit from any upside (subject to pay-back arrangements). Low level of reduction in cost of debt may apply.	nil to -0.25%
Gearing	Lower expected strike prices may reduce cash flows and impact debt capacity. Low level of reduction in gearing may apply.	No change in gearing level to 5.00% reduction in gearing
WACC (vanilla, nominal)	Improved gearing will be the key driver impacting WACC. Low reduction to moderate increase in WACC may apply.	-0.08 to +0.49%

We expect the overall impact of the Long Term Energy Services Agreements as described in the Roadmap may lead to lower PPA strike prices than would be expected under a standard CFD contract, which could result in a nominal vanilla WACC that is between 0.08% lower to 0.49% higher for a Representative Project, depending on the design of the auction and contracting process.

This is calculated by applying the above indicative changes for each component of the WACC formulation to the Representative Project. The Survey results under Section 2.5 also highlights the standalone impact of sovereign or near-sovereign counterparty risk, which demonstrates a reduction in nominal vanilla WACC (0.48% for wind and 0.57% for solar PV) as compared to investment grade offtake counterparties.

3.3 Renewable Energy Zones

The State is establishing the REZ Transmission Development Scheme, a framework for developing and investing in the Central-West Orana REZ and other potential REZs. We support the development of a REZ as it facilitates the co-ordinated development of new energy projects that is reinforced by robust transmission infrastructure. The REZ assists to address some issues that have recently adversely affected generators, by providing:

- Greater certainty of grid access and connection;
- Lower expected levels of network congestion;
- Improved certainty of marginal loss factors; and
- Coordination of planning requirements.

Apart from any potential cost of capital improvements, the more material impact is the enabling of sustainable development of energy projects in NSW that may have otherwise been stalled. The planning component to the REZ Transmission Development Scheme in facilitating the co-ordinated development of projects may also have a positive impact in the overall reduction in risk. While accessing the REZ will have an attached cost for the generator, the oversubscription in the registration of interest for the Central-West Orana REZ implies that the benefits of the REZ are highly valued for generators and will spur further investment.

In estimating the indicative nominal vanilla WACC levels (refer to Section 2.5), we have taken into the account the benefit of the REZ through the Survey assumptions detailed in Appendix 4.1. The specific assumptions around "Location and grid position" and "Connection status" are designed to provide greater certainty around grid stability, certainty of MLF projections, constraint risk, access rights and connection requirements. We consider the potential impact of the REZ on WACC could include the following benefits when compared to a project outside the REZ:

Table 3.3 – REZ impacts on WACC compared to Survey results

Metrics	Potential example impact	Indicative change (%)
Cost of equity (post-tax)	Risks related to location, grid position and connection will likely be mitigated to some extent for the equity provider. Moderate reduction in cost of equity may apply.	-0.50 to -1.00%
Cost of debt (pre-tax)	Lower perceived level of risks may improve a project's risk profile. Low to moderate reduction in cost of debt may apply.	-0.25 to -0.50%
Gearing	More certain MLFs may impact the cashflow profile and increase debt capacity, while potential lower connection costs will decrease the cost base and improve debt capacity. Overall increase in gearing may apply.	5.00 to 10.00% increase in gearing
WACC (vanilla, nominal)	Lower cost of equity and higher gearing will comprise the majority of the impact on WACC. Moderate decrease in WACC may apply.	-0.64 to -1.30%

By applying the above indicative changes for each component of the WACC formulation to the Representative Project and all else being equal, a project that is REZ located/connected would be expected to have a WACC that is 0.64-1.30% lower than a project that does not have the benefits conferred by the REZ.

3.4 Other selected sources of risk

The rapid development of the renewable energy market over the last few years has resulted in a dynamic environment that is shifting rapidly to adjust to the evolving landscape. Project developers and sponsors now face new risk factors, which were not as prevalent as before. The Department has requested NAB to comment on the potential impacts of some of these risk factors on WACC. The table below outlines some of these risk factor considerations:

Table 3.4 – Other selected sources of risk

Risk factors	Potential impact on WACC	Main WACC impact	
Connection risk allocation under EPC	The "EPC Contract" Survey assumptions in Appendix 4.1 outlines the recent developments of EPC contractors shifting connection cost and timing risk back to the project. Project financiers will also require protections to mitigate this risk for them, which deposits the majority of this risk factor with equity.	↑	Cost of Equity
PPA delay flexibility	Delays in meeting fixed commencement dates under PPAs, for example as a result of construction delays, may result in penalties, which can include the payment of liquidated damages by the project to the PPA counterparty. In the worst case, severe delay may exceed the "Sunset Date" and result in termination of the PPA. If the PPA can provide flexibility in delaying the commencement date, this will improve the risk profile for equity and to a lesser extent for debt too.	↓	Cost of Equity
Construction currency hedging	Currency risk for offshore components of the EPC package may be hedged by either the EPC contractor or project related parties to arrive at a fixed Australian dollar ("AUD") price. In general, the project is exposed to currency risk until financial close or such time set out in the executed EPC contract to firm the AUD price. Where currency risk is hedged prior to such milestones, this may result in minor improvements in the risk profile for equity, which will need to be considered against the cost of procuring such hedging.	↓	Cost of Equity
Merchant exposure	Full merchant exposure projects may need to rely solely on equity funding with materially higher cost of equity as the domestic commercial banking landscape has yet to support a project financing of merchant projects in the absence of guarantees or other protections.	↑	Cost of Equity
	We understand that the Department and KPMG, in consultation Aurora, have adopted a higher nominal post-tax cost of equity assumption at 12%, which is reasonably reflective of the higher level of risk to borne by equity.	↓	Gearing

3.5 Conclusion

The Long Term Energy Services Agreements and the REZ are both positive initiatives to support the development of renewable energy projects and achieve the objectives of the Net Zero Plan. However, we note that the creation of alternative pricing dynamics that are not accessible to existing generators will accelerate new renewable energy development with a likely resulting merit order effect, which existing generators may not be prepared for. From a WACC perspective for new renewable energy projects, the REZ impacts are estimated to have the most significant contribution in reducing WACC for renewable energy projects. The Long Term Energy Services Agreements could also have positive impacts on the WACC as contemplated by the Survey results in Section 1.2, but this will depend on the award criteria that the State will establish, which will drive bidding behaviour by proponents and ensuing cost of equity impacts.

The ability to mitigate the other selected sources of risks contemplated by this Report will generally provide for improvements in equity risk profile and subsequent improvements in the cost of equity component of WACC. The merchant risk factor may present the most material impact on WACC as such projects are generally expected to be funded with higher cost of equity and minimal to no support of project finance. The introduction of the Long Term Energy Services Agreements will assist in reducing this risk.

4. APPENDICES

4.1 Survey: wind and solar standard assumptions

Description	Assumption to use when populating WACC
State	New South Wales
Project status	Greenfield and at financial close.
Contracted generation	Project has a PPA for at least 75% of generation over the project life. There is a merchant tail exposure for residual generation.
Power price forecast	Central case as provided by a reputable forecaster in the Australian market. Assume that the forecaster is the medium forecaster in the market.
Location and grid position	The project is located in NSW in a stable part of the grid with average or better MLF (e.g. 330kv line but with usual risks of future projects being built) and minimal constraint risk.
EPC Contract	EPC contract is fully negotiated with a Tier 1 EPC contractor with market standard or better terms. In 2018 the EPC contractor is taking connection cost and timing risk. In 2020 the project is taking these risks. The EPC contractor is undertaking all contestable grid works on a fixed price, fixed time basis.
Connection Status	Offer to Connect has been issued and connection costs are known. GPS is agreed and grid augmentation requirements are known.
Equipment	All equipment is provided by Tier 1 Original Equipment Manufacturers with whole of life warranties.
Project Leverage	Debt finance is available and the project is leveraged at 60-70%. Debt is via mini-perm (e.g. 5yrs). Base rate risk is hedged for term of loan but no further.
Project Size	Project is at a size to achieve efficient construction costs and be appealing to a broad variety of investors (e.g. >100MW solar and >200MW wind).

4.2 Indicative nominal vanilla WACC assumptions for wind and solar

Metrics	Indicative assumption ranges			
Technology	Wind	Wind	Solar PV	Solar PV
Offtake counterparty	Investment Grade Retailer	Sovereign or near-sovereign	Investment Grade Retailer	Sovereign or near-sovereign
Cost of Equity (post-tax)	9.00-10.00%	8.25-9.25%	8.75-9.75%	8.25-9.25%
Cost of Debt (pre-tax)	2.75-3.25%	2.70-3.20%	2.75-3.25%	2.70-3.20%
Gearing	60.00 - 75.00%	60.00 - 75.00%	60.00 - 75.00%	60.00 - 75.00%
WACC (vanilla, nominal, mid-point)	5.11%	4.84%	5.03%	4.84%
WACC (vanilla, real, mid-point)	3.15%	2.88%	3.07%	2.88%

4.3 Indicative nominal vanilla WACC assumptions for additional technologies

Metrics	Indicative assumption ranges		
Technology	Battery Energy Storage System	Pumped Hydro	New Build Gas Peaker
Offtake counterparty	Sovereign or near-sovereign (capacity)	Sovereign or near-sovereign (capacity)	Sovereign or near-sovereign (capacity)
Cost of Equity (post-tax)	7.50-9.00%	8.00-9.50%	9.00-10.50%
Cost of Debt (pre-tax)	2.80-3.30%	2.80-3.30%	2.65-3.15%
Gearing	60.00-80.00%	60.00-80.00%	60.00-80.00%
WACC (vanilla, nominal, mid-point)	4.61%	4.76%	4.96%
WACC (vanilla, real, mid-point)	2.66%	2.81%	3.00%