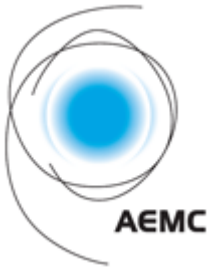
S³ Advisory

Final Report (EMO0001) to



Financing of future energy sector investments in Australia:

The potential effects of the Carbon Pollution Reduction Scheme and Renewable Energy Target

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Acknowledgement

S³ Advisory wishes to thank all those interviewed for making themselves available to meet at short notice to discuss the issues pertinent to this report. We particularly wish to acknowledge those that made reports and data available in addition to their valuable insights on key financial and energy market issues. Not all of the reports or data provided to S³ Advisory could be included in the report, where is has been it is appropriately referenced. All other material provided useful background information to the preparation of this report.

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The views of those interviewed for the report are emphasised through this report and S³ Advisory has sought to represent these fairly and without embellishment. S³ Advisory has sought to respect the wishes of those interviewed for this report that did not wish to be named or have their comments included in the report. Where there are views expressed in this report which are similar to those wishing anonymity it is because the views were shared by others.

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1 Executive Summary

This report was provided to the Australian Energy Market Commission just prior to the release of the Government's White Paper.

The Australian energy sector is a particularly dynamic industry sector within our economy which is facing significant pressures resulting from: the internationalisation of our fuel sector; the pending introduction of a Carbon Pollution Reduction Scheme (CPRS) and the enhanced national Renewable Energy Target ("RET") (with associated uncertainty); and the fallout of the current credit crisis. The energy sector for the purposes of this report includes the electricity and gas supply industries. The sector has public and privately owned assets with the private sector responsible for approximately 67% of the installed capacity of all new fossil fuel powered electricity generation investment since 1998[1].

This report addresses the factors affecting the availability and cost of capital for an investment as a result of the introduction of an emissions trading scheme, in particular the CPRS and RET.

In preparing this report a range of Market Participants[2], debt and equity providers, rating agencies and other stakeholders were interviewed. Each of those interviewed were selected because of their detailed involvement in or interest in the Australian energy sector and knowledge of financial markets.

The credit crisis has a created new environment in which capital allocation and cost need to be considered. Prior to the crisis, capital providers[3] were competing to find projects to invest in. This has now totally reversed with capital now able to exercise control.

1.1 Capital availability

Australia is a net capital importer, its demand equates to about three percent of total global demand and as such is a price taker in the global capital market. Financial Market Practitioners[4] consider that the global pool of capital has reduced and will take years to replenish as will the balance sheets of our domestic Banks (potentially five years or more depending on Governments' actions). The view is that global financial markets took a turn for the worse around the beginning of October 2008, the situation at December 2008 is now much more serious.

Global demands for capital are enormous, to state just a small number of examples:

[1] Historic and projected energy sector investment, Draft Report, Firecon Ventures, 2008

[2] The term Market Participant is used throughout this report and refers to entities operating within the energy sector.

[3] Note that the term capital provider is interchanged with investor(s) though out this report as capital providers, debt or equity are investors in projects.

[4] The term Financial Market Participant is used throughout the report and refers to entities that provide debt or equity, advice on its application or provide ratings of debt and equity.

- US$26 trillion cumulative investment in 2007 dollars required in energy infrastructure between 2002 to 2030[5];
- US$13.6. trillion required for the power sector of that $6.1 trillion is required for generation alone between 2007 and 2030[6]; and
- US$33.0 trillion is required to bring the world's water infrastructure up to par now[7].

Just over half of the projected global energy investment between 2007 to 2030 goes simply to maintain the current level of supply capacity. Much of the world's current infrastructure for supplying oil, gas, coal and electricity will need to be replaced by 2030.[8]

In Australia, the private sector is responsible for approximately 67% of the installed capacity of all new fossil fuel powered electricity generation investment since 1998[9], which in aggregate (public and private expenditure), has been estimated at a value of $15.6 billion. In relation to future investment, ACIL Tasman forecast the costs of the expanded RET at $23 billion over ten years[10]. Further, it is estimated that Regulated electricity networks are expected to require a capital spend of around $4.4 billion per year over the next ten years.[11] Further spend will be required on gas networks, however advice to the AEMC indicates that it is more problematic to estimate the capital expenditure required for gas networks.

In addition to the limited capital pool, there will be a step change to a more conservative approach to the provision of debt and equity as investors seek to manage a more limited supply and address an underestimation of risk in recent years. This has already begun to affect investment as Banks take the opportunity to modify loan covenants in order to reduce their risk exposure and transfer it to equity. Financial Market Practitioners expect that the more conservative approach to lending will last for at least until post 2020.

Australia's domestic energy sector must source its capital from domestic banks and equity providers, and international financial markets. Our domestic Banks do not have sufficient capital to service the needs of the sector and their balance sheets could take considerable time to repair from the effects of the global credit crisis. International Banks have begun to retract to their home markets and as sovereign Governments have invested equity in their main domestic Banks, the pressure to focus on home markets in increasing. Equity providers have faced substantial losses and are increasingly risk averse under the current climate.

Capital providers (debt and equity) have a choice of where their capital will be allocated. If capital providers are considering an investment in infrastructure they will compare the various infrastructure classes (e.g. transport, energy) and decide where the best returns are for the lowest risk.

The strong view from Financial Market Practitioners and a number of international investors with interests in the energy sector is that Australia will find it increasing difficult to attract

[5] World Energy Outlook 2008 - GLOBAL ENERGY TRENDS TO 2030, OECD/IEA 2008, Reference scenario

[6] World Energy Outlook 2008 - GLOBAL ENERGY TRENDS TO 2030, OECD/IEA 2008, Reference scenario

[7] Global Water Intelligence, 2008

[8] World Energy Outlook 2008 - GLOBAL ENERGY TRENDS TO 2030, OECD/IEA 2008, Reference scenario

[9] Historic and projected energy sector investment, Draft Report, Firecon Ventures, 2008

[10] Historic and projected energy sector investment, Draft Report, Firecon Ventures, 2008

[11] Historic and projected energy sector investment, Draft Report, Firecon Ventures, 2008

sufficient capital to the domestic serving sector in aggregate, as a result of the introduction of CPRS and RET given the fallout of the credit crisis. Certain segments may attract sufficient capital but this is a matter of capital allocation which is discussed below.

1.2 Cost of capital

Investors require an adequate return for the allocation of their capital, commensurate with the risk embodied in the investment. This required return is often referred to as the cost of capital.

There are a number of practical matters that influence how capital providers determine how much return they require for committing their capital. Finance theory helps with the understanding of how these decisions are made; however it can only ever provide a guide as investors develop their own perceptions of risk and what they need as a return in order to compensate them for that risk.

There is a strong view from the Financial Market Participants interviewed as part of this process that the cost of capital has risen and will and remain at a higher rate than it has been in recent years. There was agreement that the risk has increased and, as discussed in the report, the corporate cost of debt has increased substantially. Given that the cost of capital represents the opportunity cost for capital and that Australia is a price taker on global capital markets, this would imply a higher opportunity cost to capital allocated to Australia and its energy sector. It is understood that some international investors in the energy sector have already raised their required rates of return[12].

In relation to debt capital providers, they expect to be able to extract a higher price for their capital for a number of reasons including:

- A retreat from the under estimation of risk over recent years which some in the financial markets attribute to excess global liquidity;
- Debt providers now reducing their risk exposure and requiring equity providers to take more of the risk, therefore increasing equity risk premiums;
- Greater ability by providers of capital to be more selective in allocations of their capital, therefore requiring more reward for lower risk;
- Equity providers are risk shy given the losses faced by some equity providers since the credit crisis began;
- Both debt and equity providers being increasingly risk averse, therefore requiring higher rewards for the risk they take;
- As a response to the high demand for the limited available capital; and
- A movement back to fundamentals such as investing in the assets as opposed to hybrid instruments.

[12] The required rate is also referred to as the hurdle rate.

The introduction of CPRS and RET will create differential risks for each segment of the energy sector and will be influenced by the way in which the institutional, regulatory and policy frameworks interact.

Overall the view is that all segments of the energy sector will attract a higher risk premium.

1.3 Investor (debt and equity) decision making process

Investors have a number of reasons for making investments, not all of these are strictly economic. Often corporations/Banks/Funds will make decisions to allocate capital consistently with corporate strategy, investment portfolio mix, regional investment diversification, strategic positioning, learning about reformed markets[13] and the expected returns from the project. For example a predominantly Australian owned energy business may see its core business as generating electricity for the domestic market. As such the firm, to comply with its corporate objectives and pursue its strategy, it needs to continue to invest in domestic capacity or it will no longer be able to provide adequate services to its market. So it has the choice of investing, changing strategy or ceasing to be competitive and closing down.

A firm such as this does not, without a change of strategy, have an opportunity to consider pursuing offshore investment therefore its capital should remain available to the energy sector. Whereas an international energy firm, investing in electricity generation in Australia clearly has more opportunity to deploy its capital elsewhere.

Many of the private sector investments in the Australian energy sector have used project finance as a means of funding their projects. Some public sector plant has also been financed using this technique. True project financing arrangements are non recourse to the proponent's balance sheet and only have recourse to the cash flows of the project's assets. Project financing arrangements are usually quite complex, managed by a lead arranger Bank on behalf of a banking syndicate (sometimes up to 25 Banks) and can have quite specific and onerous covenants applied as part of the loan agreement and often require commitments from third parties in support of credit for the project (e.g. suppliers).

As discussed in this paper, Banks will have access to virtually all available cash flow in the forward years of a "project financed" project and impose covenants, through the loan agreement, on the use to which the cash flows must be put. Small reductions in the project's cash flow can often produce a breach in a covenant causing a series of cascading events. Under an extreme case a Bank may need to step in and take control of the project (this has occurred in the past[14]). Should this occur in relation to an Australian electricity generator there is the potential for a work out of the project to require a change in bidding strategy. It is also likely that the equity invested in those projects would suffer serious loss.

[13] In which case some investors have been prepared to invest without pricing the full risk in to take the learnings from a reformed sector back to their home markets

[14] AES Corporation walked away from the £1.87 billion Drax Power Station acquisition in the UK after four years of operations. The 4000MW Drax coal-fired power station in the UK was initially purchased by AES Corporation (a US-based Independent Power Producer) in 1999 for £1.87 billion. Due to structural changes and a regulatory change to the England & Wales electricity market rules, power prices dropped significantly and the plant went into financial distress in 2002. AES walked away from the plant in August 2003. For further details, see Fitch (2002, 2003) and http://www.draxpower.com/aboutus/history (accessed 16 November 2008). In this particular case, Senior Debt needed to be restructured and participating project banks incurred losses (FITCH).

Financial Market Practitioners interviewed for this project were aware of a number of generation plants that might find themselves in a position of breach and consider such an event, should it arise, as very damaging to the way in which investors would view any allocation of capital to the sector. This would increase Australia's sovereign risk and perceptions of investment risk in the energy sector. This prospect is also being considered by energy market participants and would be sufficient for some international investors to exit the Australian market despite interests in investing in renewable plant under the proposed RET.

1.4 Capital allocation

The capital that can be attracted to Australia and the energy sector will be allocated throughout the sector on the basis of the strategic objectives of the provider and the risk return trade off. Once a capital provider has decided to make the capital available to the energy sector they will consider the merits of the investments on the basis of a risk assessment and the implied cost of capital (expected return from the project).

On this basis, the CRPS and RET have a number of incentives and disincentives which can be valued by investors, these are discussed in the report.

1.4.1 Regulated assets

The majority of regulated network assets are owned by Government, although some of these assets have been privatised. SP AustNet is an example of a private owner of regulated network assets[15].

Regulated assets are considered relatively low risk and their earnings potentially match the needs of a number of investors with long redemption profiles. These assets are expected by Financial Market Practitioners and industry participants as being least adversely effected by the introduction of the CPRS and would normally be a strong class of assets for which capital would be allocated. However, there is concern about the precise nature of the arrangements and the ability of network asset owners to pass through the carbon costs. Any lack of pass through or delay in passing through the cost will increase risk to investors (public or private) in the sector.

There is potential for an increase in gas fired plant (as a lower emitter than coal fired) resulting in a change in the demand profile for gas supply therefore requiring augmentation of gas networks. These augmentations may not be considered economic and may not be undertaken by the network providers under the current regulatory arrangements. There is also a review of the regulatory WACC underway by the Australian Energy Regulator, the outcome of which, will influence whether augmentations of the networks, as a result of RET, will be considered economic by capital providers.

Given a number of international energy Market Participants have recently increased their hurdle rates it is hard to conceive of a reason for them to invest in regulated assets that will potentially have their economic returns reduced by the regulator. Of course there may be other investors who will fill this gap but at this stage it is unclear who they might be given that

[15] SP AusNet provides electricity and gas network services to the Victorian market and is majority owned by Singapore Power.

the cost of funds accessed by corporate investors has increased substantially (see Figure 5.1).

1.4.1.1 Summary

Overall regulated network assets are seen by capital providers as having increased risk as a result of the introduction of CPRS and RET. This risk will be priced by investors. To the extent that the full cost of carbon can't be passed through there will be a reluctance to invest in any non-economic infrastructure. In addition, the cost of funds has increased for any private providers of capital meaning that a reduction in the regulatory WACC and a significant increase in private funding are in obvious conflict.

1.4.2 Generation

Coal fired generation faces the highest risk from the introduction of the CPRS and RET. At this point there is a lack of certainty about the revenue and value effects on these generators and the arrangements for potential compensation. Owners of generation plant with reporting dates as at 31 December 2008 will need to consider whether the assets would face impairment under *AASB 136*.

As noted above and discussed in more detail throughout this report, there is market awareness that there is potential for a number of coal fired generation plants, where they have been Project Financed, to breach their debt covenants. Many of the Financial Market Participants interviewed commented on this and there has clearly been some analysis undertaken by a number of parties on this matter.

Should there be a serious breach of covenants, (the way in which that can occur is discussed in the report), there will be a considerable risk weighting added to investing in Australia not just the energy sector.

If the Banks need to take control of a project financed generator, and work it through as a result of its financial difficulties, it is unlikely the Bank would wish to own the generator for any length of time (probably not more than six months). A forced step-in and sale would disrupt the allocation of capital to, and increase its cost, in relation to thermal plant for the period under consideration for this review, as investors would consider the risk to their investment has increased.

1.4.3 Renewable projects

The expanded RET is estimated to require an investment of $23 billion over ten years[16].

Capital allocation to renewable projects is clearly advantaged under the RET and this is understood by the providers of capital. Capital providers are also aware that much of this investment would not be economic other than through the support of a subsidy. This creates risk for investors because a change in policy could make their renewable investments uneconomic. Depending on the outcome for the coal fired sector (i.e. adequate compensation

[16]Historic and projected energy sector investment, Draft Report, Firecon Ventures, 2008

for the introduction of the CPRS and RET), this view could be reinforced. This uncertainty goes to risk that will increase the cost of capital for some investors in this segment. It may also cause some investors to direct their capital elsewhere permanently or until the policy certainty is assured. A number of international NEM participants have indicated that they have identified more attractive renewable investment opportunities outside Australia, at least in their view, until the cost of carbon in Australia is in the order of $50/t or above[17].

In addition, investors will attach risk to the potential for a second regulatory change to occur at sometime in the future as Australia integrates with a global carbon emission reductions scheme.

The groups interviewed identified a higher risk profile for renewables because of the political driven incentives included in RET, and the potential for the target to be changed at a whim. As a result, investors considered regulated assets, as a class, have become a more attractive investment than renewables.

1.4.4 Competition between public and private sectors for capital

Government is still heavily invested in the energy sector in a number of States, with the predominant involvement for most States being the network sector.

Government has the ability to access capital at a lower cost to that of the private sector simply because of its credit standing. This will be important in times of capital constraint. To the extent that capital is constrained globally, investors perceive uncertainty (and hence increased risk) in investing in Australia, or capital is not allocated to the energy sector or a particular segment, Government will need to provide the capital. This may be a challenge for Governments as they are also facing tightening budget conditions as a result of the global economic slowdown.

1.5 Conclusion

In the absence of some detail about the precise nature of the CPRS and RET uncertainty is heightened for investment. When some of this detail is available some of the risks perceived by investors may dissipate as they will be able to identify and quantify the risks. Those interviewed for this project acknowledged this point. However, it would be incorrect to assume that knowledge of the detail and the precise nature of the CPRS and RET arrangements will remove all risk to investors. The concerns are more fundamental than that. Although it will allow investors to more precisely identify which risk they would be prepared to take and how they will mange those risks. For example, some investors will manage the risk away by exiting the sector whereas others might be prepared to invest under new terms and conditions for access to their capital.

It is important to note that the conclusions drawn in this report represent the current knowledge of Energy Market and Financial Market Participants of CPRS and RET.

[17] All references to $ is AUD unless otherwise noted

2 Summary of Findings

This report has examined the issues associated with financing of future energy sector investments in Australia and in particular the allocation and cost of capital to the sector as a result of a CPRS and RET out till 2020. The report necessarily needs to deal with these issues at an aggregate and energy segment level rather than a project specific level except in a number of key areas. In addition, there will be timing issues that influence individual investment/projects and their access to and the relevant cost of capital applied, it is beyond the scope of this report to address these.

In considering the allocation of and cost of capital going forward, it is clear the significance of the current credit crisis and the limit it is likely to place on access to and cost of capital should not be underestimated as it establishes a new paradigm in which investment must be considered and will have a significant influence throughout the period till 2020.

Given the affect of the credit crisis, many project proponents seeking capital will need to be significantly more sophisticated in their approaches to capital providers. Project proponents will need to understand the requirements of the capital providers and their strategic objectives for investment. It will not be sufficient for the investment evaluation to be rigorous, the returns attractive and the risks seen to be removed/managed or appropriately priced. Capital providers want a strategic alignment with their objectives and without a demonstration of how this can be achieved they will have many other alternatives for allocation of their capital.

The key findings of the report are summarised below:

2.1 Access to capital

Access to capital has become increasingly difficult as a result of the credit crisis and risks are perceived to have risen for investments in the energy sector as a result of the commitment to introduce a CPRS and RE. Findings include:

- There is a significant prospect that there will not be sufficient capital to meet the RET objectives, which has been estimated to require $23 billion of capital by 2020, with some capital providers indicating that there simply won't be sufficient capital available to meet the requirements;
- Competition for global capital will be intense given the demand for it to be allocated elsewhere (there are huge capital demands from a number of infrastructure sectors globally);
    - Australia has for a number of years been viewed by many international capital providers as an increasingly complex place to invest and with demising reward. This perception has intensified with the Government's commitment to the introduction of CPRS and RET;
    - The demonstrated behaviour of Government in addressing the transactional cost for the generation sector associated with the introduction of CPRS and

RET will be important. This will send a clear message to foreign investors about the degree of sovereign risk associated with investment in the Australian energy sector;

- The current global credit crisis has significantly reduced the international pool of capital that can be accessed for investment in Australia. Our domestic Banks appear unlikely to have sufficient capital to support the level of investment required in the Australian energy sector;
    - Australia is a price taker in global capital markets and if it is to be able to access capital for the energy sector the projects will need represent attractive reward for the risk investors will need to accept. This may require that the price of energy rises above that necessary to recover both the cost of carbon and a risk adjusted cost of capital. To be able to attract capital the cost of capital may need to rise above that implied by the risk of the investment;
    - It may take 5 to 7 years to repair the capital stock internationally and around the same time to repair the capital base of Australian Banks following the credit crisis;
    - International Banks are retracting their balance sheets from application in Australia to focus on their home markets thereby reducing access to the capital;
    - Access to project financing will be extremely limited with the number of Banks offering this form of finance in Australia reducing as a result of the credit crisis. Where project financing is available the Banks are unlikely to accept any risk and the counterparties will need to be first class;
    - The magnitude of the credit crisis will leave a step change to a more conservative approach to capital allocation which is likely to last a generation reducing debt allocation and requiring additional equity to be committed to projects. In the absence of the additional equity, the projects will not proceed. Where the equity capital is available it will come at a higher price as a result;
    - There will be an institutionalising of a more conservative approach to the provision of capital in response to the current credit crisis which will transfer risk to equity and increase the risk premium attached to investment in general and for the energy sector;
    - Governments are better placed when capital is severely constrained to access capital and at a reasonable price (see Figure 5.1) and may need to step in to provide capital where the private sector can't. Governments may also need to consider underwriting projects for a number years or until the private sector can access capital at a more competitive price;
- Additional capital, beyond the capital required to meet the RET requirements, maintain existing service capacity and expand networks, will need to be accessed for the following:
    - It is understood that around $6.1 billion of energy sector Project Financed debt will need to be refinanced between 2009 and 2012 within a background of tight

credit conditions and a significant number of general corporate refinancings placing pressure on debt providers given the quantum of debt needed. It is unlikely that the loans can be rearranged on equally favourable terms therefore increasing the cost of funds for these entities, potentially reducing the level of debt in the capital structure and increasing a call on equity providers to inject additional capital;

- Potential additional equity injection for projects where the assets may be impaired;
- Renegotiation of Bank guarantees for operations in the NEM. The introduction of CPRS and RET is likely to require that relevant market participants renegotiate Bank guarantees for operations in the NEM. There is unlikely to be the same favourable terms offered by Banks and there is potential for some existing participants to not be able to access a guarantee given the current credit conditions;
- Purchase of permits or abatement will require significant funding support. If there is a perfect pass through of costs the issue can be minimised however the working capital requirement of some entities will need to increase to deal with this expenditure. If the private sector needs to access either debt or equity capital to fund this expenditure and the costs associated with it will be higher, than would have been the case 12 months ago;
- Additional equity to reduce gearing of existing and future projects as debt providers reduce their exposure to risk; and
- Additional equity to fund the transactions costs associated with existing generators transitioning from existing higher emitting plant to lower emitting plants. While the transition may have occurred over a longer time frame without the introduction of CPRS and RET the bringing forward of this expenditure will place additional funding pressure on energy sector participants.

2.2 Allocation and reallocation of capital

Should Australia be competitive in attracting capital, the allocation of capital and reallocation of existing invested capital will play an important role in determining whether the investment needs of the sector can be met. Findings include:

- Existing investment in all segments of in the Australian energy sector will face increased risk to some extent as a result of the introduction of CPRS and RET. The precise nature of the arrangements (e.g. carbon price trajectory, compensation for high emitters and how this is applied) will determine the degree of risk and how it is allocated. This will force capital providers to re-examine their allocation of capital to their investment and the cost of that capital they apply;

- Capital providers recognise that the energy sector segments have differing risk profiles (eg electricity has a different risk profile to that of gas networks) and expect that the introduction of CPRS and RET will potentially change the relative risk between sectors;
- Existing investors in the energy sector that will be materially disadvantaged by the introduction of CPRS and RET are likely to exit the sector all together;
    - this will potentially direct some investment in renewable projects intended for the Australian energy sector to other countries;
- Capital providers, where they have an interest in investment in Australian infrastructure, consider the energy sector to be one of the least attractive areas for investment as a result of the additional risks imposed by CPRS and RET;
- Some international capital providers commented that they see potentially more attractive energy sector renewable investment opportunities outside Australia until the price of carbon is around $50/t or above in Australia.
- Some capital providers considered that the renewables sector would present more risk as a result of the introduction of CPRS and RET and as a result are likely to allocate their capital elsewhere; and
- While regulated assets are considered to be the lowest risk of any segment, the potential of a reduced regulatory WACC and the potential under funding of network augmentations create considerable uncertainty for some investors and may delay allocation of capital to the sector.

2.3 Cost of capital

There are a number of important factors affecting the cost of capital at present and into the future including: the perceptions of risk under CPRS and RET; the cost of funds and how this will change over the period till 2020 and the reweighing of risk and capital allocations between debt and equity providers, Findings include:

- The reward capital providers expect for the risk they accept in an investment has increased in general because of the credit crisis and in relation to investment in Australia, as a result of CPRS and RET;
- A number of international investors in the Australian energy sector have already increased their hurdle rates as a result of the credit crisis;
    - It is clear that the private sectors cost of funds has increased substantially (see Figure 5.1) as has some State Governments regardless of debates over the theoretical calculation of cost of capital using tools such as CAPM and WACC;
    - Debt costs have increased substantially in recent months with the differential between Commonwealth Government debt and BBB corporate debt (which would be equivalent to an electricity generator) now at 482.5 basis points (4.825%), as at 1 December 2008 (see Figure 5.1). Resulting from a marked increase in the price put on risk and the lack of available capital;

  - Debt providers have responded to reducing their exposure to risk by forcing equity providers to assume more of a project's risk. That is, a risk that can be reallocated away from a debt provider to an equity provider and is likely to attract at higher price after reallocation;

- The credit crisis has resulted in capital providers being able to be very selective in the application of their limited capital and are now requiring a higher return for the risk they bear. In other words they expect their returns to increase to compensate for the same level of risk that they previously accepted for a lower return; and

  - CPRS and RET have increased risk, increased uncertainty and volatility translates directly to risk for capital providers. These risks must be mitigated, managed and priced. Where the risk can't be removed completely it results in a higher risk premium being attached to the investments and therefore a higher return required to compensate for the risk.

3 Background to the report

3.1 Role of this paper

The Australian Energy Market Commission (AEMC) has been directed by the Ministerial Council on Energy (MCE) to review the impacts on the energy market of the proposed CPRS and enhanced national RET frameworks. The purpose of the review is to advise the MCE on whether changes to energy market frameworks are warranted, on the basis that they will better promote the market objectives (relating to efficient, secure, safe, and reliability supplies of electricity and gas).

On 10 October 2008, the AEMC released its Scoping Paper about the Review that outlines the key issues which are considered relevant to the Review. Eight broad issues were identified in the Scoping Paper. This Report focuses solely on Issue 8 – financing energy sector investments. It is expected that the introduction of climate change policies will require large investment in renewable and non-renewable generation and in energy networks. The purpose of this report is to provide an assessment of factors affecting the availability and cost of capital for that investment, and the competitive position of Australia in seeking finance for the energy sector.

3.2 Introduction

This report discusses issues associated with the availability, allocation and the cost of capital to the Australian energy sector as a result of the introduction of a CPRS and RET. This report has been written to cater to readers of varying levels of understanding of capital provider investment considerations, practices and processes, finance theory and the workings of the energy sector.

In particular, the report addresses the issues of availability, allocation and the cost of capital in the context of the introduction of a CPRS and a proposed increase of the RET as part of the Federal Government's response to climate change and commitment to the Kyoto Protocol.

Sections 3 to 6 of the paper provide background to the issue with Section 3 addressing the methodology used in the report, Section 4 addressing the availability of capital, Sections 5 addressing how capital providers make their decisions to invest, Section 6 addresses the forms of finance and project financing, and Section 7 addresses the implications of the CPRS and RET on investment in the energy sector.

Key considerations for the assessment of how CPRS and RET will effect investment in the sector include:

- How investors will consider and accommodate uncertainty associated with the effects of CPRS and RET in their expectations for existing or potential investments in the sector;
- The degree of alignment between Australia's approach to carbon reduction and that pursued internationally and the timeframe for alignment in approaches. A lack of alignment internationally adds increased uncertainty for investors in the Australian energy sector; and

- The long-term effects resulting from the current global credit crisis on the availability, allocation and the cost of capital for the period to 2020.

Extensive modelling is being undertaken by various groups to understand the behaviour of energy markets as a result of the introduction of the CPRS and RET and to identify the expected investment needs of the industry going forward, these and other reports provided by the AEMC have been reviewed in preparing this report[18].

As a result of the CPRS and RET schemes the energy sector will require investment in a number of specific areas over the period to 2020, this investment is required:

- To maintain and refurbish existing generation plant to meet its expected engineering life and in some cases extend its life;
- To establish new plant to meet demand growth; and
- For redirected investment into renewable generation and support infrastructure (e.g. transmission, gas supply).

[18] Historic and projected energy sector investment, Draft Report, Firecon Ventures, 2008

4 Methodology

This report was provided to the AEMC just prior to the release of Government's White Paper

There is a long history to and sound understanding of financial economics and corporate finance as it applies to the energy sector. As such it is not the intention of this paper to focus on the theoretical aspects of finance unless it helps illustrate the issue or point. Rather, but consistent with finance theory, this paper is predicated on the principle that it is the provider of the capital that determines whether the potential investment provides the appropriate risk reward relationship to entice a commitment of the investor's capital.

Finance theory and the application of techniques such as the CAPM[19] and Weighted Average Cost of Capital ("WACC")[20], which are widely used, can assist us in interpreting what investors consider is a reasonable risk reward relationship. This concept is sometimes referred to as the opportunity cost of capital as it represents the best alternate use to which the capital can be put. However, it is the entity with the capital to commit that ultimately makes the decision based on its risk reward criteria and the range of opportunities open to them for investment. Tools such as WACC and CAPM are no substitute for the reality of the investor's decision process and allocation of risk to reward of an investment (Attachment 1 outlines the basic formula used in calculating the CAPM and WACC and the way in which investment specific and systematic risk are dealt with by the models).

An important distinction to make in relation to the cost of capital and the theoretical basis of models such as CAPM is that CAPM assumes for the purposes of estimating the cost of capital that it contains two primary elements. These are: the risk free rate (i.e. the rate of return on an investment with no risk, ten year Government bonds are often used as a proxy for this rate[21]); and the premium above the risk free rate to compensate for the risk of the investment. As such, the cost of capital, when estimated using techniques such as this, may vary as the risk free rate moves up or down and because of changes in the risk premium.

For the purposes of this paper, the risk premium is the more pertinent consideration as it distinguishes the differential risk of investments (the risk free rate will be or assumed to be the same for investments under consideration). Importantly, as financial capital is largely free to move within global markets, investors can compare the risk premium of an investment on a consistent basis regardless of the location of the investment. The risk premium will be determined by the risks inherent in the investment and those risks that can't be diversified away.

It is recognised that the assertions made in this report need to be supported by extensive financial market experience and, if possible, empirical evidence where available. As such this report draws heavily on meetings with energy market participants (with domestic and international shareholders), debt and equity providers (domestic and international), advisers to investors in the sector, rating agencies and relevant industry groups. A full list of those

[19] CAPM is a widely used model to estimate the required return to equity from an investment.

[20] WACC is a widely used methodology applied to estimate the required rate of return on an asset by weighting the required returns on the debt and equity used to finance the asset in proportion to which they are applied. WACC therefore estimates the required return on the asset by applying the cost of the financial capital used for the investment.

[21] Other benchmark rates can and are widely used depending on the country of application and purpose to which CAPM is applied.

interviewed is provided at Attachment 2. This group represents the capital providers themselves, their advisors or the managers of the capital and therefore are well informed of the required reward for the risk accepted by the investors. The capital providers are "the people that put the dollars on the table and take the risk". It is important to understand how they assess and will assess the allocation and cost of capital to the energy sector and to gain their views on the appetite for investment in the Australian energy sector.

The series of meetings held with many of the leaders in the investment field is supported by review of a number of reports provided to or prepared for the AEMC, the Green Paper and Treasury's modelling[22] [23]

The views of those interviewed are emphasised through the report and S3 Advisory has sought to represent these fairly and without embellishment.

[22] Market impacts of CPRS and RET, ROAM Consulting, 1 November 2008

As part of its undertaking of its project for the AEMC, ROAM Consulting reviewed other modeling work on the RET and CPRS and their forecast effects on the electricity and gas networks, the following modeling studies where reviewed:

1. Impacts of the Carbon Pollution Reduction Scheme on Australia' Electricity Markets, Report to Federal Treasury by *Mclennan Magasanik Associates* (MMA), 27th October 2008
2. The Impact of an ETS on the energy supply industry. Modeling of the impacts of an emissions trading scheme on NEM and SWIS. Report by *ACIL Tasman* to the Energy Supply Association of Australia (ESAA), June 2008
3. Market Modeling to Assess Generator Revenue Impacts of Alternative GHG Policies. Report by CRA International to the Nation Generators Forum, June 2008.

23 The S3 Advisory report was provided to the AEMC in final draft prior to the release of the Government's White Paper therefore the interviews undertaken for the project did not have the benefit of being informed by the White Paper.

5 Availability of capital

5.1 Credit crisis implications for future investment

Globally, it is accepted that there has been an under spend on infrastructure. In addition increased urbanisation is driving a considerable application of capital to meet the growth needs of many countries. Much of the under spend on infrastructure is yet to be addressed so as well as growth in demand for infrastructure to meet future requirements there is a need to bring existing infrastructure up to an appropriate standard.

Global demands for capital are enormous, isolating just two infrastructure sectors power and water:

- US$26 trillion cumulative investment in 2007 dollars is required in energy infrastructure between 2002 to 2030[24];
- US$13.6. trillion required for the power sector of that $6.1 trillion is required for generation alone between 2007 and 2030[25]; and
- US$33.0 trillion is required to bring the world's water infrastructure up to par now[26].

Just over half of projected global energy investment in 2007 to 2030 goes simply to maintain the current level of supply capacity: much of the world's current infrastructure for supplying oil, gas, coal and electricity will need to be replaced by 2030.[27]

Australia is a net capital importer but its requirements make up only around three percent of the total global demand for capital. As such, Australia is a price taker in the market for global capital. This means that in terms of the cost of capital, Australia is largely at the mercy of foreign markets as investors have opportunities to use that capital freely elsewhere. Anything that adds uncertainty or additional risks in the eyes of investors needs to be mitigated, managed and/or priced by them and the opportunities for them to invest their capital are wide and varied.

While totally independent events, the introduction of the CPRS will occur as international financial markets are traumatised by the effects of the current collapse of global credit availability resulting in an increase in capital risk premiums. Figure 5.1 illustrates the debt margins on Government and Corporate debt since 1998 (as at 1 December 2008). A significant rise in the debt spreads has occurred only in the last 2 months as financial institutions have again sought to protect and restrict access to their capital. To provide a guide to the cost of debt for a generation corporation, the light blue line is equivalent to a BBB rated entity and would be similar in credit worthiness to most of the existing generators (even though many are not formally rated). The implications of this rise in funding cost are that any imminent refinancing of existing debt will occur at a significantly higher cost and any new projects seeking finance will need to raise capital in an environment of high debt margins as shown in the graph below.

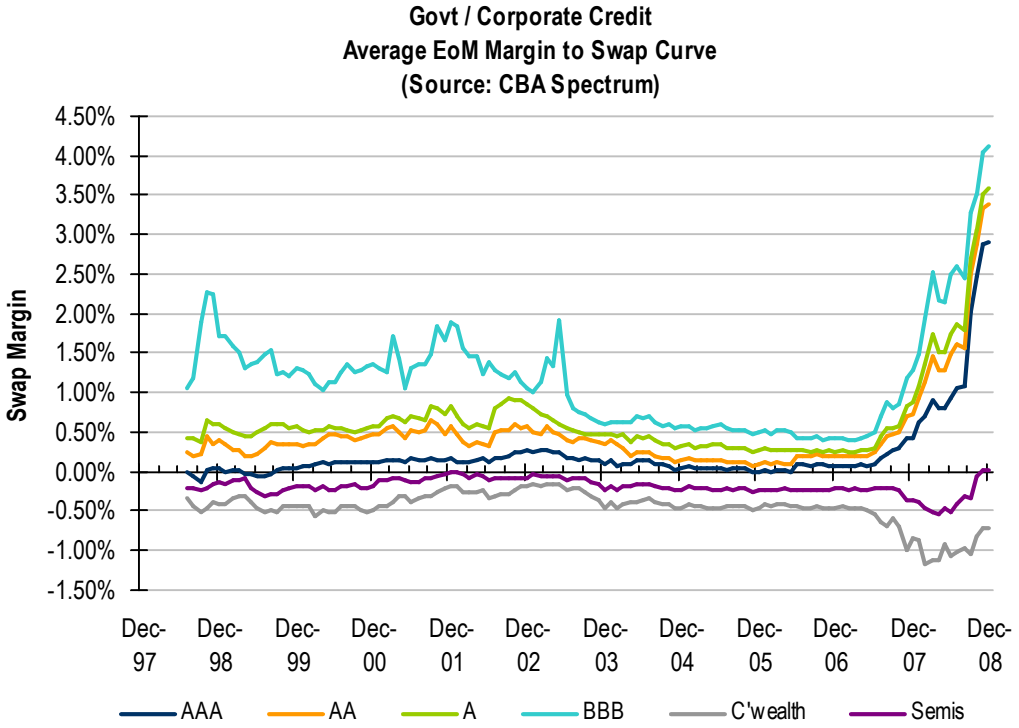
[24] World Energy Outlook 2008 - GLOBAL ENERGY TRENDS TO 2030, OECD/IEA 2008, Reference scenario

[25] World Energy Outlook 2008 - GLOBAL ENERGY TRENDS TO 2030, OECD/IEA 2008, Reference scenario

[26] Global Water Intelligence, 2008

[27] World Energy Outlook 2008 - GLOBAL ENERGY TRENDS TO 2030, OECD/IEA 2008, Reference scenario

Figure 5.1[28]



There is about $6.5 billion of existing debt to be refinanced by privately owned generators between 2009 and 2012[29]. If they can get access to any debt capital in order to refinance, it is likely their debt costs will be significantly higher (as represented in Figure 5.1). Banks might also require the equity providers to increase their equity in the plant to reduce debt exposure. This will be taking place at the same time as a large amount of general corporate debt needs to be refinanced.

Risk premiums for debt and equity have increased for a number of reasons including:

- A retreat from the underestimation of risk over recent years, which some in the financial markets attribute to excess global liquidity;
- Debt providers now reducing their risk exposure and requiring equity providers to take more of the risk, therefore increasing equity risk premiums;
- Greater ability by providers of capital to be more selective in allocations of their capital, therefore requiring more reward for lower risk;
- Equity providers are risk shy given the losses faced by some equity providers since the credit crisis began;

[28] Chart provided by Queensland Treasury Corporation. The figures used for the graph are current as of 1 December 2008.

[29] On emissions trading, toxic debt and the Australian Power Market, Paul Simshauser, November 2008, working draft

- Both debt and equity providers being increasingly risk averse, therefore requiring higher rewards for any risk they take;
- As a response to the high demand for the limited available capital; and
- A movement back to fundamentals such as investing in the assets as opposed to hybrid instruments.

It is unclear at this stage how long it will take international credit markets to recover to a point of stability. However, investors are likely to be fatigued and unsettled given the significant events affecting global financial markets and the domestic energy sector (e.g. CPRS and RET).

There is a consistent view from Financial Market Practitioners interviewed, that following the required work out of the current financial market turmoil and a return to freer levels of liquidity in financial markets, there will be a return to more conservative investment practices by capital providers. As such, it is expected that the consequences of the current financial market stress will leave a step change effect in the way in which investors allocate and price their capital which could last a generation. This is likely to occur via the following institutional, structural and behavioural responses:

- Increased international regulation of financial markets limiting the use of some of the financial products widely used before the credit crisis broke. Some of these products had the effect of levering up or providing a multiplier effect to the liquidity in the market. As these products become more highly regulated or removed from financial markets the level of liquidity in the market will be reduced all else being equal. For example, many Financial Market Practitioners spoken to as part of this project expressed a view that Hedge Funds were unlikely be prominent once financial markets rationalised;
- Financiers responding to the current financial stress by implementing tight lending practices including the introduction of tighter loan covenants. Financiers will be able to exert pressure on borrowers during the period of tight credit to increase their protections under loan agreements and will be unlikely to release or reduce these until there is excess liquidity in the market again encouraging increased competition amongst capital providers. This effect will be felt directly by the Australian energy sector in 2009 as there is expected to be some $6.5 billion in loan refinancing on existing generation facilities to take place between 2009 and 2012[30];
- Equity providers are likely to be increasingly conservative in their investment allocations given that equity providers have been significantly harmed by the current financial market turmoil and the losses that have been sustained to equity values;
- Where projects are financed by equity and debt, debt providers will ensure a tighter control of project cash flows than had previously been the case requiring equity providers to provide more equity (which carries a higher level of residual risk). This is likely to require a new business model to be developed by equity providers in pursuit of projects as debt

[30] Impact of the CPRS on Power Station Financings, 15 October 2008, presentation provided to the AEMC by Paul Simshauser

providers will be unwilling to carry risk including any equity counterparty risk, or volume risk; and

- The behavioural consequence resulting from the trauma caused by the credit crisis, which could have lasting effects on the psyche of capital providers making them more risk averse.

Overall we are likely to move to a new paradigm for the finance sector following the settling of the current credit crisis, resulting in a more conservative approach to evaluating investments and the introduction of new liquidity structures with Banks being more conservative in their approach to lending. Illustrative of this is an expectation that, the distinction between debt and equity will become clearer e.g. pseudo debt instruments such as mezzanine debt will increasingly be treated by the Banks as equity. Debt providers will simply not be willing to expose themselves to risk yet will require a higher return for their capital than has been the case in recent years.

5.2 Global capital and Australia's competitive position in attracting it

Australia is a net importer of capital with net capital inflows increasing by $43.3 billion to a liability of $658.0 billion in the September 2008 quarter. This importation of capital arises because Australia's domestic savings are not sufficient to support investment or consumption required by the domestic economy. Given that Australia's capital inflows make up only about three percent of the total global capital demand Australia is a price taker for capital.

Global financial markets had, until the financial crisis, been flush with capital making access to capital relatively easy and at a low cost. There is a strong view from the Financial Market Practitioners interviewed for this project that our domestic banks will not have sufficient capital to support the necessary investment in the Australian energy sector therefore necessitating a need to access global financial markets.

The size of the available global capital pool is likely to be reduced considerably as a result of the credit crisis and it is likely to take considerable time to recapitalise the global financial sector and our domestic banks.

In addition, many sovereign Governments have taken equity in their Banks to increase the liquidity in their home markets which is likely to result in these Governments requiring their Banks, where they have had an international operational focus, to retract their international operations and focus on their home markets. This could be the case for many years and continue until there is sufficient replenishment of global capital to allow the Banks to again expand into global markets. This process has already begun with some foreign Banks retracting their balance sheets from Australia making access to global capital more difficult. The retraction of the international banks in the domestic banking environment will reduce competition in our domestic market and likely remove some of the downward pressure on debt pricing that has resulted from competition. While these international Banks have largely retracted their balance sheets from the Australian market they have retained a shopfront and presence in the market and may selectively pursue projects in Australia.

Australian banks have been accessing international capital to support their lending to the domestic market. There is a view among the Financial Market Practitioners consulted during this project that our domestic banks will find it more difficult to source the equivalent amount of

capital going forward and it will be at a higher cost. Some estimates indicate that it may take up to 7 years to fully recapitalise Australia's domestic banks following the current credit crisis, which will limit their ability to fund investments in energy infrastructure in Australia in the short to medium term.

Australia's ability to attract capital from offshore is dependent on a number of factors but particularly the perceptions by international investors of the risk reward trade off offered by the Australian market and the sector in which they would consider investing.

Clearly there is potential for Australia to be competitive in attracting capital however the energy sector must compete with other infrastructure sectors, some of which may not be facing the same level of regulatory uncertainty or sector risk as the energy sector, as a result of the introduction of CPRS and RET. In this regard, there is a general view amongst some Financial Market Practitioners that the order of preference (4 being the least preferred) for investing in infrastructure in Australia is:

1. Regulated assets as long as the policy environment is stable and the return economically appropriate;
2. Airports and ports;
3. Toll roads; and
4. Non-regulated energy electricity and gas[31].

The first two in the list above are a clear preference with non regulated energy investment a clear least preferred. Financial Market Practitioners commented that they have traditionally been quite comfortable with investing in the energy sector in general, but this view has now changed given the proposed introduction of the CPRS and RET.

The attraction of capital and its allocation are separate issues. Energy market specific competitiveness in attracting and retaining capital is discussed below.

5.3 Competition for global capital – what affects risk and perceptions?

Australia is generally considered a stable country in which to invest. It has a relatively low sovereign risk with a sound economy, stable political system, predicable investment climate and advanced financial regulatory arrangements. However, risk reward perceptions can and do change because of a range of factors including, but not limited to:

- Regulatory changes e.g. introduction of CRPS and RET;
- Lack of certainty created by changes in policy or political environment;
- Lack of confidence in consistent application of policy by Government;
- Lack of clarity regarding industry/economic responses to significant change;
- Inconsistencies within a country's jurisdictional approaches, adding complexity to doing business;

[31] The non regulated electricity and gas sector includes generation, retail and upstream gas

- Competition for investment pushing prices up thereby reducing the rewards for the commensurate risk;
- Uncertainty regarding the interplay of key polices on the effected sector. For example, the way the RET incentives will operate in conjunction with the economic regulation of the network sector;
- Lack of understanding or willingness to understand the nature of the market and its complexities (e.g. wholesale electricity market in Australia); and
- Past negative experiences in the country.

However, it is clear from experience[32] and meetings during this project that some international investors have and do consider Australia as offering less and less value over recent years as a place to invest (of course this depends on the investor and their target market). This is also the case for some Australian based investors with significant capital to deploy e.g. infrastructure and superannuation funds (Australian Superannuation Funds hold roughly $1.1 trillion of funds under management) and so will seek those returns in whichever asset class and regions that is appropriate.

5.3.1 Superannuation Funds

At this point it is important to understand the approach to investment by Superannuation Funds, these funds would usually allocate a proportion of their capital base for investment in particular asset classes. For example, it would be normal for some to invest up to 10% of their capital in infrastructure; this could be domestic or internationally focused. There may be strong preference to invest in Brownfield projects where there is a critical mass of projects and the proponents have a long successful track record in operating and managing such projects. As a result of financial market turmoil over the past 12 months, some Funds have realised significant losses in the value on their assets resulting in many cases in an over allocation to some assets classes (e.g. because the equity value has fallen on the investment the proportion invested in the class of assets has risen outside the Fund's Board agreed limits on a percentage basis). This could result in the Fund needing to cease to invest in infrastructure until its capital base is repaired and the equity value returns to a point where the Fund's investments in that sector are within the Board agreed limit.

It is clearly the case from discussions with Fund representatives that their ability to invest in the energy sector could be significantly constrained regardless of interest because of the effect of reductions in the values of investments. Depending on the Fund, it may take many years for this position to be rectified.

As is the case for many investors, Superannuation Funds have a fiduciary duty in allocating their capital, which includes seeking the best returns for their unit holders (in the case of a Fund) given an investment's risk reward trade off.

[32] While it may be considered anecdotal, S^3 Advisory has direct experience with a number of major international clients/investors who have redirected their investments away from Australian infrastructure and energy sectors specifically because of lack of reward for the risk and complexity of investing in Australia.

5.3.2 Complexity of the investment environment

Australia has increasingly been seen as offering a much more complex investment environment and a deteriorating reward for investing in the country (this was confirmed in a recent report by the Productivity Commission)[33]. A number of organisations have been firm in stating on a confidential basis that they see much better investment value and less complexity elsewhere. Many of these have been investors who have had long-standing investments in Australia. There is certainly a strong view that the regulatory shock and uncertainty resulting from of the introduction of CPRS and RET will cause a material quantum of investment capital, at best waiting to see how the arrangements work in practice before considering new investment in Australia. At worst, the capital will leave and not return for many years. Some uncertainty will dissipate as the precise nature of the CPRS arrangements becomes clearer. However, some investors would prefer to examine the consequences on the sector and the behaviour of the market participants over time before making a decision to invest.

5.3.3 Competition between public and private sectors for capital

All investment opportunities must compete for capital and the private sector will also compete with Government for this capital. In addition to private investment, Governments' have needs for capital to invest in their social, economic and infrastructure programs. Australian Governments may at some point need to access international capital to finance their programs (as is the case for the private sector). This is particularly relevant where State Governments are still significant investors in the energy sector. The States' various investments in the physical energy infrastructure assets will need to be supported by further investment or the assets transferred to the private sector, either way the refurbishment and maintenance of the service potential embodied in those assets needs to be maintained or replaced requiring additional capital.

Australia's domestic banks are unlikely to either have the interest or the capital to provide all of the debt required in the financing of the energy sector in Australia. Given the small number of local banks their balance sheets need to be allocated for a number of purposes and across a number of sectors.

[33] Review of Regulatory Burden on the Upstream Petroleum (Oil and Gas) Sector, Productivity Commission Draft Research Report, November 2008.

6 How capital providers make their decisions to invest

6.1 Investment drivers and high level considerations

There are various reasons that an investor, domestic or international, might select a particular investment opportunity over another, including consistency with corporate strategy, investment portfolio mix, regional investment diversification, strategic positioning for growth, technology development and the expected returns from the project. For example, a predominantly Australian owned energy business may see its core business as generating electricity for the domestic market. As such the firm, to comply with its corporate objectives and pursue its strategy, needs to continue to invest in domestic supply capacity. It has the choice of investing, changing strategy or ceasing to be competitive and closing down. A firm such as this does not, without a change of strategy, have an opportunity to consider pursuing offshore investment; as such its capital should remain available to the Australian energy sector while it can achieve its hurdle rate on investment.

Whereas, an international energy firm investing in electricity generation in Australia clearly has more opportunity to deploy its capital elsewhere. There are a significant number of foreign investors in the Australian energy sector including: International Power, Shell, Mitsui, TEPCO, BG, Singapore Power, China Huaneng Power, InterGen, TruEnergy/CLP, Ontario Teachers Pension Fund, Gamesa Power, ATCO Power, Epuron and Meridian Energy.

Much of the investment in the assets owned by these investors has been project specific with a significant amount of the capital invested on a non-recourse basis (this is discussed in detail below).

While there are differences between the processes that debt and equity investors may use in evaluating and approving an investment the issues they consider are similar, as is the case for rating agencies, equity analysts and the market participants in considering further investment. As discussed above the risk reward relationship is critical to any investment decision. In understanding the risks and rewards of an existing or potential investment, debt and equity providers will use a combination of qualitative and quantitative analyses to assist them understand the merits of the investment including an assessment of:

- Industry risk;
- Operating environment;
- Market position;
- Quality of the management;
- Relationship between accounting polices applied and the actual financial performance of the investment;
- Analysis of cash flows to understand earnings, coverage and leverage;
- Capital structure; and
- Financial flexibility.

A key consideration for debt and equity providers is the level of cash flow volatility they are exposed to. Volatility equates directly to risk for investors.

6.1.1 Volatility and risk

An issue raised in a number of reports[34] reviewed for this report noted that the introduction of CPRS and RET would increase volatility in the market given the interment nature of wind dispatch and the need for gas fired plant to manage this. Increased volatility translates directly to increased risk for investors and will need to be addressed by them in the investment evaluation. To the extent that this risk(s) can't be removed it will need to be priced increasing the required return from the investment. Figure 6.1 below illustrates how an investor might view the effect of volatility on the value of their investment.

Figure 6.1 Dynamic valuation of power stations: market, steady-state and accounting[35]

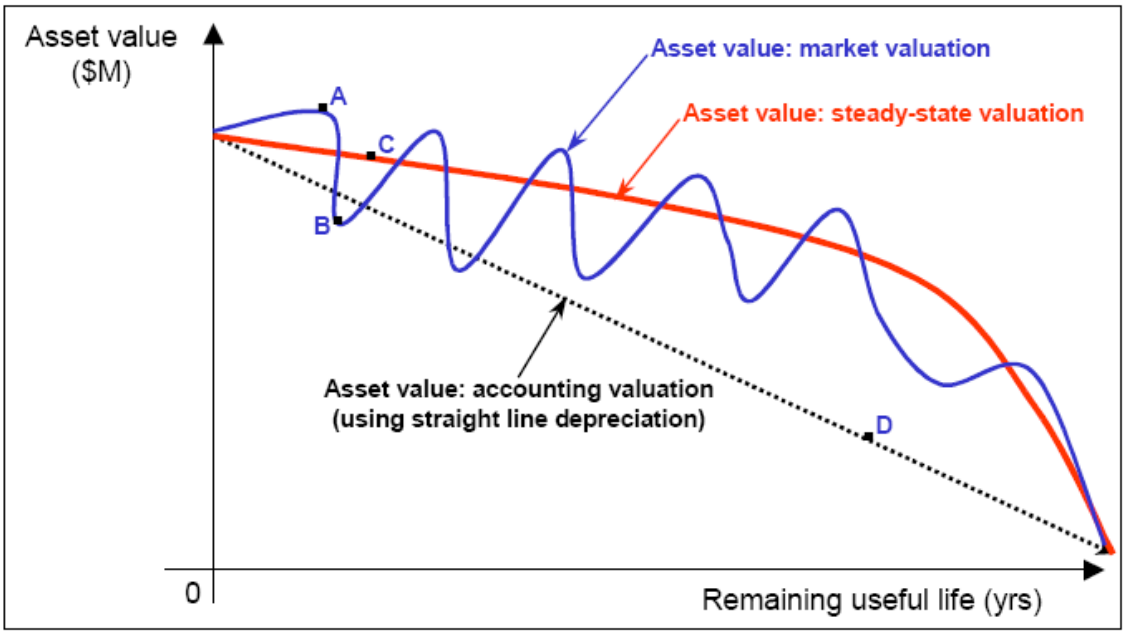


Figure 1 - Dynamic valuation of power stations: market, steady-state and accounting

The blue line's variability results from volatility of a market valuation which is reflecting the volatility in cash flows[36]. If this risk is not totally mitigated it could expose the value of the asset to wide variations. Indications are that volatility will increase as a result of the introduction of CPRS and RET causing investors to reduce their exposure to the risk. For

[34] Market impacts of CPRS and RET, ROAM Consulting, November 2008. The report a modelling study undertaken for the AEMC which also examined number of other modelling reports developed to assess the effects of the introduction of CPRS and RET.

[35] Neville Hathaway, Capital Research Group

36 Not all of this risk will be systematic risk and therefore not included in a required returned calculated using a model such as CAPM, however the risk still needs to be managed by the investor.

'Project Financed' projects significant volatility in cash flow may be sufficient to cause a breach in the covenants if there isn't sufficient headroom between the cash flows allocated to service debt and total free cash flows generated by the project.

Increased revenue volatility in the energy sector will be a significant issue for existing and future capital providers to address. Some will see it as sufficient to exit the market while other will look to manage this risk or price it into their cost of capital.

There are a number of techniques for managing many risks for example, generators in the NEM use contracts to mitigate price and volume risk in the NEM. However, a key issue for exiting investors is that they will face an additional risk that wasn't evident at the time their original investment was made. New investors will be able to make their decision with awareness of these additional risks.

6.2 Generic approach to investment analysis

6.2.1 Equity

Each organisation has its own unique methodology for evaluating investment proposals/opportunities, most follow a basic format of:

- Initial screening;
- Detailed analysis;
- Investment return analysis; and
- Board approvals.

In the first instance if the investor is a strategic investor it will consider whether the investment opportunity is likely to form an appropriate fit within the company's existing operations.

If the investor is a financial investor (e.g. an infrastructure fund), the investor will consider the investment against its defined investment mandate and give consideration to the impact on its portfolio construction.

Once a project has passed the initial screening it will be evaluated for its economic viability. It is usual to begin this evaluation with an analysis of forecasted cash flows over the project's life. This would take into account the initial capital cost of the investment, the project's forecasted revenues and their volatility, and expenses and an anticipated capital structure.

In undertaking this analysis a number of assumptions need to be made, an important part of analysing a project's risk is to test the sensitivity of those assumptions on the investment's cash flows and overall return to the investor.

Out of this process an investor will put together a range of scenarios including a worst, best and expected case. The worst case assumes everything goes wrong, the best case assumes everything goes right and the expected case is if the most likely outcome of each variable occurs.

A hurdle rate is determined according to the investor's own cost of capital, determined either by using a WACC or the marginal cost of capital. If an investment is not expected to return

the investor a return greater than the hurdle rate an investor will generally not proceed with the investment other than for strategic reasons.

A board and/or investment committee will approve or reject a proposed investment based on the above considerations as well as other qualitative factors that may impact the company such as availability of capital and the range of alternate investment opportunities.

6.2.2 Debt

When approached by a prospective borrower, a debt provider will use a number of steps to assess the creditworthiness of the borrower and/or the transaction itself. The initial financing structure will be presented to the debt provider, which will include the level of debt required. The debt provider will calculate the debt/equity ratio to determine the funding commitment they are making compared to the equity owners. The debt provider would assess the earnings/cash flows to determine whether the project can service both principal repayments and interest. Sensitivities will also be modelled to understand the business's cash flow position under varying situations.

Following a financial analysis the lender will undertake a risk evaluation of the project. The financial analysis combined with a risk evaluation will help determine the terms and conditions of the funding commitment required by the lenders to satisfy its desired risk levels and appropriate debt financing.

There are generally three components to the cost of any loan, the market interest rate used to price the type of loan being provided, the margin over the market rate that is applied to reflect the creditworthiness of the borrower and/or of the transaction, and any fees payable.

Typically a debt provider will require covenants/undertakings by the borrower in respect of the loan. The covenants/undertakings encompass both negative pledge provisions and financial covenants. The imposition of financial disciplines is the bank's safeguard that if the company operates within the limitations imposed, the investment will most likely be able to meet debts as they fall due. The debt provider will allow headroom in the covenants, which gives an indication to the financier of repayment risk involved in the transaction.

Typical financial covenants include the Debt Service Cover Ratio ("DSCR"), Loan Life Coverage Ratio ("LLCR") and Gearing ratios (Attachment 3 provides definitions and descriptions of the covenants and ratios). The DSCR is the amount of cash flow available to meet annual interest and principal payments on debt. A DSCR of less than one would mean a negative cash flow.

The breach of a debt covenant can require the immediate and full repayment of a loan. If the equity provider is not in a position to do so the debt provider can take ownership of the asset.

For example if the value of a power station was found to be impaired due to the carbon cost and there was insufficient compensation for the value decrease. The first covenant likely to be breached is the gearing ratio, secondly the LLCR as the future cash flows will need to be downgraded and then eventually the DSCR. Breaching of covenants is discussed in more detail below.

When the global capital pool was liquid, debt providers may have been willing to enter into negotiations in respect of covenant breaches or relax covenants. However with many Banks looking to de-lever and the concern over the current economic environment Banks are less

flexible and are looking to extract maximum strategic leverage and fees. Matters specific to differences between the debt and equity approach are addressed below.

7 Forms of financing and use of project financing

7.1 Financing options

There are a number of financing structures that can be used to provide capital to a corporation or a project. Clearly, debt and equity providers have different interests and arrangements in providing their capital. The specific arrangements entered into by the Banks or equity providers are dependent on the nature of the financing provided (a number of these issues are addressed below). The more common forms of financing a project are touched on briefly below:

- Traditional corporate lending which provides the corporation undertaking the project with commercial debt using its balance sheet and accessing the corporate cash flows as the collateral rather than the specific project;
- Lending on a project basis (usually referred as project financing), this form of financing is asset/project specific and is non recourse to the corporation who is the proponent of the project. This type of financing relies on the assets/project specific cash flows and has been used to finance a number of projects in the energy sector in Australia. The term project financing has in recent years also been used to describe a number of financing arrangements which are not strictly non recourse however to be a true project financing arrangement non recourse to the balance sheet is essential. Project financing arrangements usually have quite specific and onerous covenants applied as part of the loan agreement (these are discussed below); and
- Equity capital, via an injection of capital in exchange for shares in the project. This can be at the project specific level or via the proponent corporation providing access to some of its own balance sheet capacity.

There are hybrids of the above and the arrangements may change at key points in the project's life as the risk changes (e.g. following completion of the project's construction as risk associated with completion has been resolved). An important point is that debt has priority to cash flows of the projects over equity in each of these financing arrangements.

7.2 Project financing in Australia

Project financing as a particular form of financing was introduced into Australia in the late 1980s and early 1990s. The original Financial Market Participants offering this form of financing had originated from the more traditional commercial banking background and established the Project Financing arrangements for the first series of financings on these principles. As such Project Financing arrangements were conservative and the projects financed largely preformed within expectations given the robustness of the financial analysis and management required by in establishing the arrangements.

Overtime as the track record of Project Financed investments demonstrated the robustness of this form of financing and liquidity in the financial markets increased, there was increasing pressure from equity providers to increase debt availability, loosen the covenants and be more

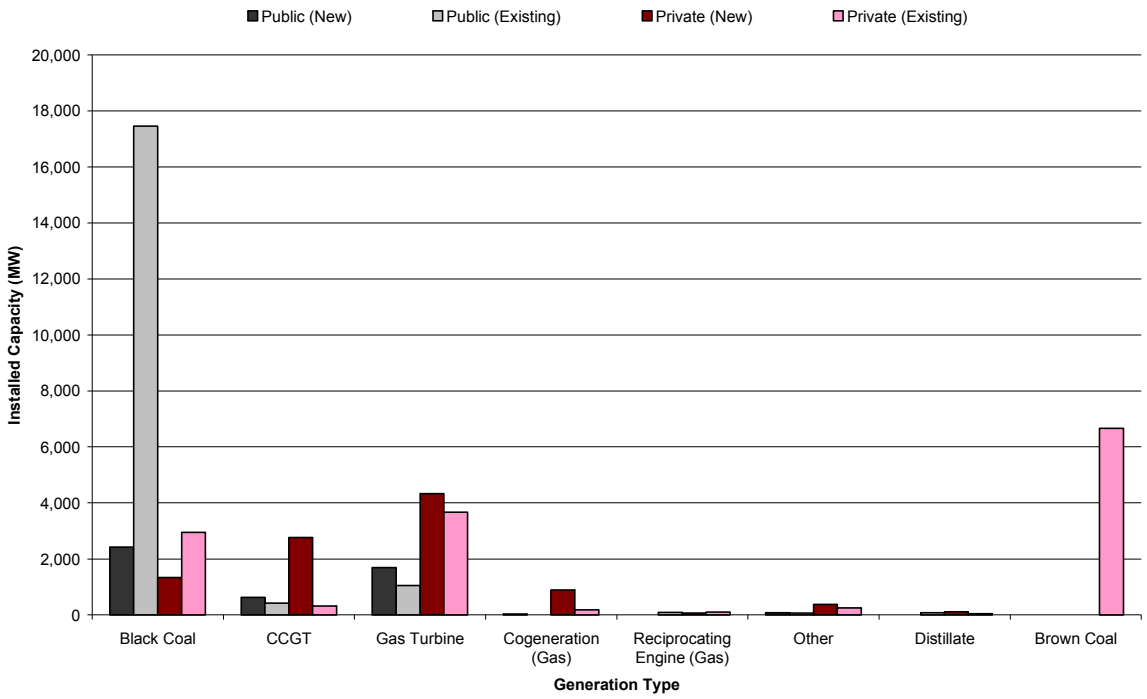
lenient in response to covenant breaches. Generally, Banks acceded to some of this pressure and loosened their requirements given the circumstances of the time.

There have been about 14 to 16 Banks in Australia active in the provision of this form of financing, the majority of these are foreign banks. A number of the foreign Banks have scaled down their presence in Australia and while continuing to maintain a shop front here the access to the Bank's balance sheet for these transactions has been scaled back recently because of the credit crisis. As result, there will be a significant reduction in access to Project Financing for projects in the future.

A number of projects have been Project Financed in the Australian energy sector over the years. The private sector being the dominant user of Project Financing; however Government owned businesses have also used this approach.

The private sector is responsible for approximately 67% of the installed capacity of all new fossil fuel powered electricity generation investment since 1998[37]. The breakdown of this investment, and existing installed capacity is shown in Figure 7.1. Overall, the private sector owns 41% of the installed capacity of fossil fuel powered electricity generation currently operating in Australia[38].

Figure 7.1 Ownership of new (1998 - 2010) and existing (pre-1998) generation investment[39]



[37] Historic and projected energy sector investment, Draft Report, Firecon Ventures, 2008

[38] Historic and projected energy sector investment, Draft Report, Firecon Ventures, 2008

[39] Simshauser, P., 2008, Geoscience Australia

Table 7.1 provides a non exhaustive list of Project Finance plant in the Australian generation sector.

Table 7.1: Coal Power Station Project Financings[40]

Power Plant	Plant Capacity (MW)	Plant Age (Yrs)	Total Debt ($M)	Debt closed (Yr)	Debt margins (bps)	Refi Amount ($M)	Refi Date (Yr)	Lead Project Finance Banks
Yallourn	1,480	30	2,500		75-85	650	2009	NAB, CBA, JP Morgan (NB. Corporate-style facility)
Loy Yang A	2,120	22	2,650		140-185	313	2010	ANZ,
Loy Yang B*	1,000	13	1,100		50-80	620	2012	BOTM, BNP, CBA, ANZ, NAB.
Hazelwood	1,600	39	1,207		155-185	445	2010	BA, RBS, SocGen, ANZ.
Transfield	180	30	800	2006	115-120	800	2011	
Bluewaters I & II	430	0	950		115-145	250	2014	ANZ, NAB, WestLB, SocGen
BBP	780	23	2,700		190-210	1,600	2011	ANZ, BNP, CBA, Dexia, NAB, Natixis, SocGen, UniCredit, WestLB
Millmerran	852	6	1,025		110-160	467	2012	ANZ, Banca Intesa, Calyon, Fortis, HSBC, KBC, Mizuho, RBS, SMBC, UOB, WestLB
Total	8,442	23	12,932		120-140	5,145		

* Loy Yang B also had approximately $200m of Subordinated Debt within its capital structure.
Source: Klyne, S. (2008) Reuters *BasisPoint.*

It is understood that around $6.1 billion of this Project Financed debt will need to be refinanced between 2009 and 2012[41].

Project financing arrangements of infrastructure assets are broadly similar with specific requirements incorporated on a project by project basis. Importantly, they are all designed to provide as much certainty to Banks over the project's cash flows until the project has fully serviced its debt or debt is substantially reduced and can be refinanced under other arrangements. The arrangements allow for Banks to ensure that the cash flows of the project are used for specific purposes and risks are managed, these arrangements can include:

- Reserve accounts, which are designed to quarantine some of the project's cash flows and reserves for specific purposes e.g. establishment of a maintenance reserve. These accounts are to ensure sufficient cash is allocated to ensure the ongoing performance of the plant;
- Cash sweeps, which are designed to return excess cash to the Banks in order to service outstanding debt. Effectively Banks can require that the loan arrangements include a provision for regular cash sweeps or that a cash sweep is triggered under defined criteria;
- Insurance covenants, which would require all plants to be covered by an adequate global policy. These policies may fall away at the refinancing of the loan or on sale of the assets; and
- Tax covenants, which need to be taken into account if there is any restructuring of the project.

In relation to the debt tranches it is common in economic infrastructure funding transactions to include senior and subordinated debt and for these to have different terms. This basic

[40] Klyne, S (2008) Reuters BasisPoint

[41] On emissions trading, toxic debt and the Australian power market, Paul Simshauser, November, working paper

structure can lower the debt repayments compared to a single tranche amortising facility while still limiting the duration of the debt.

The maturity profile of the senior debt is usually sculpted to the cash flows of the project. Additionally a small bullet working capital facility (a bullet facility is a facility where capital/principal is repaid in full at a particular date with interest being paid on the loan during the period) with a shorter maturity date is common. The loan arrangements can include a provision to refinance the bullet tranche in the future with a defined margin indicated in the loan agreement.

Senior debt facilities would often be largely hedged to protect against interest rate movements in the base floating interest rate used for the loan. These swaps would normally be subject to standard clauses and likely to have a significant break cost[42] if they needed to be refinanced early or the project is sold. All these facilities could be made subject to step-up debt margins and subject to an additional defined basis point margin if defined percentage of the debt is not repaid by a particular period. Attachment 4 provides an example of major covenants that would be applied to senior debt based on actual arrangements put in place for a generator in the National Electricity Market.

As a result of such stringent arrangements equity providers have little opportunity to access cash flow for distributions for the early period of the project's operations. In other words, the equity provider's returns are back ended over the life of the project.

7.2.1 Breach of Loan Covenants

Project financing arrangements are put in place using a project financing model which has been agreed by the debt provider and the project proponent. The model forms the expected base case for the performance of the project. If there is a significant shock to the cash flows of the project and a covenant is breached, the project debt facility is technically in default and the project proponent needs to rectify the default. This will require negotiating with the provider of capital and normally require the injection of additional equity capital. As the first layer of covenants is breached cross defaults can be triggered requiring all debt to be repaid.

If the equity providers are unwilling to inject further equity they will need to walk away from their investment and the Bank(s) will need to step in[43] [44]. Banks would not generally wish to operate a power station because of the operational risk and would normally appoint a manager/receiver for this purpose. Once the process gets to this point the equity provider has most likely lost all their equity and the Banks interests are only in protecting their investment.

42 A break cost is a penalty for breaking the financing arrangements prior to the scheduled payout date and for major financings could run into many tens of millions of dollars.

[43] AES Corporation walked away from the £1.87 billion Drax Power Station acquisition in the UK after four years of operations. The 4000MW Drax coal-fired power station in the UK was initially purchased by AES Corporation (a US-based Independent Power Producer) in 1999 for £1.87 billion. Due to structural changes and a regulatory change to the England & Wales electricity market rules, power prices dropped significantly and the plant went into financial distress in 2002. AES walked away from the plant in August 2003. For further details, see Fitch (2002, 2003) and http://www.draxpower.com/aboutus/history (accessed 16 November 2008). In this particular case, Senior Debt needed to be restructured and participating project banks incurred losses (FITCH).

[44] The author would like to thank Paul Simshauser for the provision of this information.

8 Implications of CPRS and RET for investment in the energy sector

This section of the report seeks to draw together the themes addressed above to identify the implications for the energy sector and draws heavily on the discussions that have been held with debt and equity providers, rating agencies, Market Participants, other stakeholders and information provided by them (Attachment 2 provides a list of the parties interviewed). This section addresses the key issues and implications for investment in the Australian energy industry as a result of the introduction of the CPRS and RET. The implications for investment are discussed in the context of public and private access to capital, the allocation of capital and the cost of capital.

Given the affect of the credit crisis and the risk perceived under a CPRS and RET regime, many project proponents seeking capital will need to be significantly more sophisticated in their approaches to capital providers. As noted above, investments are made for a range of reasons at any particular time. Project proponents will need to understand the requirements of the capital providers and their strategic objectives for investment. It will not be sufficient for the investment evaluation to be rigorous, the returns attractive and the risks seen to be removed/managed or appropriately priced.

Capital providers want a strategic alignment with their objectives and without a demonstration of how this can be achieved they will have many other alternatives for allocation of their capital. The competition for capital will make it imperative that project proponents compete at this level if they want access to capital for their projects.

A number of significant issues have been identified which affect capital provider's investment considerations in the energy sector. Some points discussed and the behaviours described are evident in the market now (e.g. lack of willingness to enter into contracts prior to July 2010), others will affect the way in which capital is allocated and priced over coming years.

8.1 Access to capital and its allocation

Access to capital and allocation of capital are separate issues. As a country, Australia may be able to access capital from a global pool but the capital providers (i.e. debt and equity investors) will determine its allocation. Therefore access to capital in this case is only relevant in so far as it provides the quantum of capital which can be directed to the energy sector.

8.1.1 Access to capital

Liquidity in global capital markets has contracted with a step change expected to a more conservative approach to investing which could last up to a generation. The demand for capital is increasing as the globe deals with an aging infrastructure and growth in developing nations such as China. Domestic energy infrastructure is only one purpose to which the capital can be put. If investors wish to invest in infrastructure they have a number of sectors in which to invest with varying carbon footprints and CPRS consequences.

The strong and consistent view from Financial Market Practitioners is that access to capital will be constrained for many years as a result of the contracting in the quantum of capital

available following resolution of the current credit crisis. This will be exacerbated by the potential for under compensation or loss by some generation plant or sectors as a result of the introduction of the CPRS. In addition, capital will be more conservatively allocated with projects needing to actively compete for the capital. This will require projects to offer lower risk for commensurate higher reward.

The demand for access to capital for the Australian energy sector will be influenced by a number of factors, including (but not limited to):

- The refinancing of existing debt facilities;
- The potential for asset impairment;
- Capital required to meet NEM prudential requirements;
- Purchasing of permits or abatement; and
- Lower project gearing and a required increase in equity commitments.

These factors are discussed below.

8.1.1.1 Refinancing of existing debt facilities

There is the need to refinance around $6.1 billion of existing debt held by generators over the period 2009 to 2012 (there is potential for some of these firms to face a situation of breaching banking covenants prior to the need to refinance as a result of potential impairment of their assets, this is discussed below).

The refinancing of these loans will occur at the time of major refinancing that will be undertaken in the general economy for firms such as Rio Tinto, Babcock & Brown and its satellite funds, ABC Learning, to name a few, placing pressure on the availability of capital.

With the uncertainty associated with the effects of the CPRS and RET on the energy sector it will be very difficult for those energy firms seeking refinancing to access capital or access it on favourable terms. In refinancing existing debt the Banks will be faced with, among other factors:

- A changing risk profile of the counterparties;
- Lack of forward contracts therefore increased cash flow risk;
- Lack of certainty about the energy sector's response to CPRS and RET;
- The potential background of a 'step in' on a Market Participant as result of loan covenant breach;
- Increased volatility of wholesale energy prices;
- Network constraints creating uncertain wholesale market effects;
- Demand for capital from alternate sources such as renewable projects; and

- A desire by the Banks to reduce their gearing levels.

The ability of any business to refinance debt over the next 3 or 4 years will be challenging with Banks able to exert substantial market power in provision of capital. Based on discussions with Financial Market Practitioners, Banks refinancing energy sector debt will be seeking as a minimum:

- No exposure to risk (Banks will remove any existing risk exposure from the loan being refinanced);
- First class counterparties;
- Increasingly tight covenants; and
- An increase in equity and reduced debt levels.

There is a strong view among Financial Market Participants that there is the potential for some loans not to be refinanced or, where they are, to have requirements for existing equity providers to substantially increase their equity and that they will have little appetite to do so.

Conclusion

When faced with the additional risks of the energy sector some Banks may have little appetite to refinance existing loans or will require that a significantly higher level of equity is committed. This is likely to increase the return required from the investment and, without a corresponding increase in the cash flow, reduce the value of the plant. Should this happen, it will present an immediate risk to the stability of the market as the Banks could determine the fate of the plant.

8.1.1.2 Asset Impairment at 31 December 2008 and 30 June 2009

An almost immediate implication for capital access arises for energy sector entities which are preparing a full year financial report as at 31 December 2008 (these are predominantly foreign owned entities) as these entities will need to consider the potential for impairment of their assets as a result of the CPRS and RET (when an asset is impaired its value needs to be written down). Entities with 30 June reporting dates will also need to address this mater in preparing their accounts.

Under Australian Accounting Standards AASB *136 Impairment of Assets*[45] an entity must estimate the recoverable amount of the assets under consideration if there are indicators of impairment existing at the reporting date[46]. The effect of the application of AASB *136* on asset values may affect access to and the price of capital to the generation sector (the sector expected to be most affected) as a result of the introduction of CPRS and RET. It is highly likely that Boards of energy sector entities that need to report at 31 December 2008 will need to consider factors such as:

[45] Significantly, AASB *136 Impairment of Assets* does not require legislation to be enacted

[46] n measuring the recoverable amount of an asset, the recoverable amount of an asset is the higher of its 'fair value less its costs to sell' and the 'value in use'.

- The ability to pass through the full cost of carbon;
- Effects on supply chain costs;
- Any Government compensation;
- Opportunities for abatement of the cost; and
- Potential effects on financing costs.

It will be very difficult for Boards to resolves these issues with any certainty as a range of factors are unknown at the time of the consideration of impairment, these include:

- The precise nature of the CPRS AND RET legislation;
- The ability to fully recover the cost of carbon;
- An inability to access forward contracts (there is a lack of contracts in the market leading up to 31 July 2010 and none on offer for the period after that);
- Contracts are unable to price carbon at this stage;
- Lack of knowledge of or firm commitment of any assistance from Government; and
- Lack of the permits that will need to be purchased.

Boards will need to try to quantify the effect of these matters on the carrying value of their assets. If these assets are impaired it is likely to trigger a series of events particularly if the assets have been Project Financed.

Where an asset is significantly impaired, (which in this case might result from an expectation that the full carbon costs associated with the project may not be able to be passed to end users in the future) the asset's value would have been assessed as having reduced. As the value of the asset falls it changes the gearing of the project (i.e. debt will become a higher proportion of the assets total value if no further equity is injected), therefore the impairment could cause a breach of the project's gearing covenants. It is also likely the Service Cover Ratio would breach as a result of reduced cash flow (which would be the primary driver of the need to impair the asset). As discussed above, the Banks would act quickly to protect their interests in such a case. In the case of entities reporting at 31 December, this situation could occur in only a matter of weeks as investors begin to address the way in which the introduction CPRS and RET effect the investments. Many of the Financial Practitioners spoken to during this project were aware of this potential and those with exposure to these entities are currently considering their options in anticipation of a breach.

ROAM Consulting[47] has identified in its report to the AEMC that a number of electricity generation plants may have their revenues, dispatch volumes and plant value reduced as a

[47] Market impacts of CPRS and RET, ROAM Consulting,1 November

result of the introduction of CPRS and RET. Those with the greatest exposure to an immediate impairment event are likely to be generators, vertically integrated energy supply firms and retailers with a reporting date at 31 December 2008. ROAM Consulting has identified in its report that the following assets are likely to have either their economic life shortened, cash flows reduced or dispatch volumes reduced[48]:

- International Power's Hazelwood Power Station and possibly Loy Yang B;
- InterGen's Millmerran Power Station;
- Mitsui, and other investors in Loy Yang A Power Station;
- TEPCO and Mitsui in relation to their investment Tarong North Power Station; and
- TruEnergy in relation to Yallourn Power Station.

While, modelling assumptions can change and produce different results, the investors in these assets (there may be other assets) are likely to need to consider the potential for the asset to be impaired. It is for the Boards of those entities to determine whether they decide to impair assets.

Conclusion

Most, if not all, of the above plant has been Project Financed. Should the Banks need to take action, the availability of capital to these firms could be constrained, all else being equal. Importantly, it will send a strong signal to the capital market that there is a serious difficulty with the financing of existing Market Participants and their future allocation of capital to the sector may be constrained now and in the future to minimise any expose to that risk.

A number of Financial Market Practitioners interviewed for this project went so far as to say that should Banks need to take action because of impairment as a result of CPRS or RET that there would be no more lending to that sector by a range of capital providers not just those Banks affected.

Equity providers are exposed to such an event because the equity that exists in the asset is the first capital to be impaired. Those interviewed for this project also indicated that if impairment occurred in these circumstances it would be almost impossible to have their Board's support further investment in the sector.

8.1.1.3 NEM prudential requirements

The NEM prudential requirements necessitate a relevant Market Participant having a Bank or Parent guarantee which needs to be lodged with NEMMCO in order to be allowed to trade in the NEM.

[48] These plants have been identified in ROAM Consulting's report 'Market impacts of CPRS and RET', 1 November 2008

The changed risk profile of Market Participants resulting from the introduction of CPRS and RET is likely to result in some parties needing to renegotiate their guarantee with Banks. It is likely that Banks will have discussions with all parties to which they are guarantor.

It is clear from discussions with Financial Market Practitioners that there is an expectation that some Market Participants may no longer have the creditworthiness to retain a Bank guarantee. If an electricity generator or retailer is unable to secure a Bank guarantee it will be unable to operate in the NEM under current rules. If the entity needs to access its parent for the guarantee, the capital allocated to meeting this requirement will not be available to support other investment projects.

8.1.1.4 Purchase of permits or abatement

An additional area of expenditure which arises under the introduction of CPRS will be the need to acquire permits or to abate carbon exposure. To the extent any entity is not fully compensated for the cost of carbon it will have an exposure that it will need to manage. It will be necessary for most firms to apply additional capital to deal with this exposure. This is likely to require firms to draw on debt and/or equity providers. It is likely the equity providers would prefer that debt is accessed for this requirement. Either way there will be the need to allocate additional capital to the sector to manage these issues.

Conclusion

The introduction of CPRS and RET is likely to effect the working capital needs of energy sector participants. The cost of carbon is already being taken into account by firms in anticipation of the introduction of CPRS and RET. Banks are aware that the energy sector is likely to be seeking capital in order to manage its carbon exposure and working capital needs. In the current environment of extremely tight credit it is not at all clear where the capital for this need will come from.

Some Financial Market Practitioners interviewed expressed a view that there simply wasn't sufficient capital available in the market to meet this need for the sector in aggregate.

8.1.1.5 Equity capital

During the current credit crisis equity values have fallen significantly placing considerable pressure on the providers of equity to provide the additional capital that debt providers will not, and at a lower return on equity (all else being equal).

If firms such as International Power, Mitsui, Singapore Power, to name a few, were to inject additional equity into their investments in the Australian energy sector they would need to access equity from their parent companies who would in turn would need to access capital from their own resources or equity markets (e.g. via a placement of shares). Equity markets across the globe have been severely affected by the credit crisis with the value of equities falling considerably (e.g. recently in the US, equity as measured by the S&P 500 had fallen to levels of five years ago).

As debt providers constrain their allocation of capital either at the time of refinancing existing projects or reducing their exposure to future energy projects, equity providers will need to provide the additional capital or the projects will cease.

There appears to be a general view that Superannuation Funds offer a solution to the provision of equity to the domestic infrastructure sector given the global shortage of capital. Domestic Superannuation Funds have roughly $1.1 trillion under management (the way in which Funds such as these invest their capital is discussed above). The value of most Superannuation Fund's equity investments has reduced considerably as a result of the credit crisis. Depending on Fund's asset allocation policy and the aggressiveness of their holdings in equities and cash, Australian Superannuation funds will be impacted by different degrees by the current credit crisis. In some instances the reduction in the value of the Fund's assets under management has resulted in the allocation of investments by some Funds breaching their internal allocation protocols for particular asset classes such as infrastructure. In order for these funds to be in a position to further invest they will need to repair their capital base which could take many years.

In addition, a number of domestic Funds have exposure to the Australian energy sector via their existing investment portfolios. To the extent that these Funds face increased risk or loss on those investments they will be unlikely to support investment in the sector again or at least for many years. A number of other infrastructure sectors are considered to offer better value for less risk than the energy sector. Any retraction from the sector would result from the simple application of existing internal investment policy rather than any punitive action. This was confirmed by a number Financial Market Practitioners interviewed.

Conclusion

Given the discussion held with Financial Market Practitioners it is clear that there will be no easy access to equity capital to fill the gap left by constrained debt capital.

Further, debt and equity providers will perceive additional risk (e.g. increased market volatility) from investment in the energy sector so where capital is available it will be provided at a higher cost.

8.1.2 Reallocation of existing committed capital

Where capital can be readily released from existing investments and the returns are adequate, capital can be reallocated. However investors will have to make decisions about capital reallocation at a time when the risk profile of the sector is changing under CPRS and RET. The regulatory shock presented by the introduction of the CPRS and the secondary regulatory shock to come in the future when the Australian and global emissions reduction approaches align will remove capital from the energy sector possibly for many years (or until the global response to carbon emissions integrates and capital considers the barriers to entry are removed). This has been confirmed in a number of discussions with Financial Market Participants.

There are a few key barriers to ready reallocation of capital faced by existing energy sector investors, including:

- Economic losses and lack of incentives;
- Transaction costs;

- Network capex; and
- Complexity of the Australian market.

These are discussed in detail below.

8.1.2.1 Economic loss and lack of incentives

As noted above there is the potential for some coal fired plant to have its economic life shortened, be impaired and/or breach banking covenants. Under these circumstances the existing capital providers may have their investments significantly devalued. It is likely that in this case, the private equity providers will have little interest or ability to continue to allocate capital to maintaining their assets or reallocate the capital to renewable projects. There is a real potential that equity providers to these plants could lose their equity in the plant. Under some scenarios where Banks are also equity investors to those plants, Banks may also lose some of their capital (this would not be the first case of this happening)[49] [50].

Where Government is still an owner of coal fired generation and its plant has its economic life shortened, the assets is impaired and/or banking covenants breached it will need to consider the merit of continuing to maintain an increasingly stranded asset[51].

It is important to note that the private sector does not have a fiduciary obligation to ensure the plant is maintained or the existing services are provided to the market, where as Government has a social obligation.

Should debt providers need to respond to a situation of financially distressed energy assets they are likely to be unconcerned about plant availability other than to ensure that the debt is serviced or repaid.

Should the above scenario eventuate, affected equity providers would achieve neither the required return on their capital nor return of it in full. It would be extremely difficult to conceive that these investors will wish to continue investing in the sector and they would most likely exit the sector all together.

While NEMMCO has step in rights to ensure plant is made available such an action as a result of the introduction of CPRS and RET is likely to significantly increase Australia's sovereign risk in general and for the energy sector specifically.

[49] AES Corporation walked away from the £1.87 billion Drax Power Station acquisition in the UK after four years of operations. The 4000MW Drax coal-fired power station in the UK was initially purchased by AES Corporation (a US-based Independent Power Producer) in 1999 for £1.87 billion. Due to structural changes and a regulatory change to the England & Wales electricity market rules, power prices dropped significantly and the plant went into financial distress in 2002. AES walked away from the plant in August 2003. For further details, see Fitch (2002, 2003) and http://www.draxpower.com/aboutus/history (accessed 16 November 2008). In this particular case, Senior Debt needed to be restructured and participating project banks incurred losses (FITCH).

[50] The author would like to thank Paul Simshauser for the provision of this information.

[51] Governments owning energy assets do so for a number of reasons including public policy objects and do not make decisions on purely economic ground so may continue to support an uneconomic investment

8.1.2.2 Transaction costs

Some capital that is committed to the energy sector via investment in coal fired plant may be reallocated over time to investments with a more appropriate risk reward relationship such as regulated assets. However, the transaction costs associated with a reallocation of the capital may be prohibitive for some investors and they will simply exit the Australian energy sector.

These transaction costs would include direct losses on the existing investment; foregone future expected earnings, transactional advisory costs, stamp duty on new investment, loss of focus on core operations, diversion of management resources, the creation of uncertainty with capital providers which could affect access to future capital. For a base load generator this could run into many tens of millions of dollars even when excluding the cost associated with loss on the investment and access to future cash flows.

8.1.2.3 Network Capex

The change in demand profile for gas and the additional expenditure to connect remote wind farms resulting from the introduction of RET may divert existing committed capital from its intended use for planned augmentation of the existing networks. This may create network constraints which will affect the efficient operation of the market and potentially increase price volatility[52]. In addition to the cost of connection of remote renewable projects, the transmission network will require expenditure on deep network augmentation to overcome network constraints resulting from these connections.

Network businesses have defined capital expenditure funding requirements agreed with the regulator for the regulatory period[53]. Substantial expenditure is unlikely to be able to be redirected without the approval of the regulator. If it were redirected, it may call into question the stability of the network as a result, given the original expenditure needed to meet a strict test to gain regulatory approval. Regardless, the timing associated with resolving this issue or providing additional capital is likely to result in increased electricity wholesale market price volatility which will likely defer new investment in some generation plants.

8.1.2.4 Complexity of the Australian market

There has been an increasing view by international investors over recent years that there is too much risk to investing in Australia and the market no longer offers good value. This will be reinforced by any additional uncertainty created by CPRS and RET, additional transaction costs associated with investment or network difficulties as capital relocates.

8.1.3 Allocation of new capital

In order to meet the proposed RET it has been estimated that $23 billion will need to be spent over the next 10 years on renewable projects and $7 to $10 billion in thermal plant over the

[52] As noted throughout the report price volatility creates risk for capital providers. This in turn necessitates lower levels of gearing on projects and as a result pushes more risk to equity providers if the risk is not fully removed.

[53] Network businesses need regulatory approval of their forward capital expenditure program as part of their regulatory determination, which covers a five year period. Regulatory approval is also required if their capital expenditure program needs to change materially and certain regulatory test apply.

same time. In addition, there will be expenditure required to ensure that existing base load plant stay operational until there is sufficient new generation available. Electricity networks need to be expanded and maintained (which has a cost of around $4.1 billion per year over recent years). Estimates of the expenditure required for gas networks vary widely depending on assumptions used about future gas price.[54]

If Australia can attract sufficient capital it is then important for the energy sector to demonstrate that capital should be allocated to the various segments of the energy sector. Issues that will influence the allocation of new and existing capital are discussed below.

8.1.3.1 Existing capital providers to the sector

To the extent that existing capital providers have their existing investments devalued by the introduction of CPRS and RET there will be little incentive to allocate additional (new capital) to investment in renewable projects.

In addition, as the relative risks change between investments (e.g. different infrastructure sector within the economy) as a result of the introduction of the CPRS and RET, investors will change their preferences for particular investments.

A significant concern raised during the interviews for this project was the ease at which Government policy might change in relation to ongoing support for uneconomic investment, the interaction with State based schemes designed to encourage investment in reduced emission technology.

These uncertainties are creating a wait and see approach from a number of significant existing capital providers to the energy sector. While many of these uncertainties may be addressed in the future any delay in the committing of capital will mean a back ending of the capital provision over the next ten years in order to meet the RET. This will create additional difficulties as the capital will be highly constrained over at least the next five years and the approach to investments will be more conservative in the future which is likely to last for the period to 2020.

An area which may be considered by some investors as offering greater certainty in the short to medium term is gas fired generation when there is greater clarity regarding gas price availability. However, modelling undertaken for the AEMC as part of its review indicates that gas fired generation may or may not increase significantly under CPRS depending on demand a range of assumptions used[55]. That is, because of the unpredictable nature of key assumptions, such as future gas prices, it is very difficult to model the likely outcome for gas fired generation.

For investors with an interest in the gas fired generation sectors this illustrates that capital providers will be wanting clear mitigation of these risks if they are going to commit capital to such projects.

[54] Historic and projected energy sector investment, Draft Report, Firecon Ventures, 2008

[55] Market impacts of CPRS and RET, ROAM Consulting, November 2008. The report is a modelling study undertaken for the AEMC which also examined number of other modelling reports developed to assess the effects of the introduction of CPRS and RET.

8.1.3.2 Domestic providers of capital

Some of these investors see some difficulty in reallocating their existing capital form high emitting projects to lower emitting plant as a result of the fallout from the credit crisis and the potential for being under compensated for any loss in existing investments in the sector (transaction costs associated with reallocating capital are discussed above). If these firms suffer such an impact they will neither receive their required return on their capital nor return of it in full limiting the capital at their disposal

In order to maintain a strong investment pipeline these firms need the support of debt and equity providers and the access to additional capital. If capital is constrained domestic energy investors will need to recycle their existing capital in order to further invest increasing their transaction costs.

A significant issue is the extent to which existing domestically focused capital will maintain existing plant if it is not fully compensated as a result of the CPRS. There is a strong view from Financial Market Practitioners that their appetite for investment will be affected negatively if the transaction costs are high. As a number of groups noted 'there are good opportunities to invest elsewhere with less complexity and better returns'.

8.1.3.3 International providers of capital

There was a strong and consistent view from those currently invested in the sector that the energy sector in Australia following the introduction of CPRS and RET, would pose an increased risk to investment in the sector and there was generally no particular need to have any exposure to it.

Some of these investors also have exposure to coal fired generation which could be financially stressed by the introduction of a CPRS and considered they would not be investing in renewable projects if their existing investment remained economic.

Significant international capital has entered the Australian energy sector in recent times with the acquisition of Queensland coal seam methane interests by BG and Shell, however this capital is directed primarily at satisfying an international demand for gas not the provision of energy supply to the local market. As such aggregate capital for the sector may appear to be strong given these recent transactions however its allocation would not appear that much of this capital would be allocated to meeting the demand for necessary domestic energy infrastructure over the years to 2020.

8.1.3.4 Attraction of new investors

To gain the access to sufficient capital to meet RET requirements, provide for additional thermal capacity and to maintain existing plant, it will be necessary to attract new sources of investment to the sector.

Australia is competing for capital as is the energy sector. Demand growth in the energy sector in many parts of the globe is high, particularly in Asia. For example, Vietnam has excellent wind and hydro resources, demand growth for electricity averaging 15.5% between 2008 and

2020 and is considered as politically stable as Hong Kong. Vietnam needs to spend around US$85 billion on electricity generation between 2008 and 2015[56].

The bulk of equity investment in the Australian energy sector has traditionally been from the US, UK, Asia, Australian Governments and the domestic market. US investment has largely retracted to their home market with the exception of InterGen Energy (its US shareholders recently sold their interests). UK investors have also retracted with the major exception of International Power. A number of Asian firms are still investors in the market including Mitsui, Marubeni, CLP and Singapore Power. This direct equity from these firms has been supported by indirect equity from listed and non listed Funds. Each of the international energy firms invested in the Australian energy sector has a global presence and strong opportunities elsewhere. Their willingness to invest further in Australia's energy sector will be influenced by their global strategy and the attractiveness of investments in Australia compared to other opportunities. New sources of capital may come from:

- International Funds seeking to diversify their investment portfolio;
- Aggressive international sovereign wealth funds/pension funds seeking to grow their exposure to the international utilities/infrastructure sector;
- Entrepreneurs and their backers wishing to take advantage of the subsidies implied by RET and capitalise on the potential commercialisation of renewable technologies;
- Recycling of capital into 'green' investments or ethical funds; and
- Government grants or under righting of projects.

8.1.3.5 Summary

Overall, there is significant potential for a lack of capital to be allocated to the sector between 2008 and 2020. The majority of expenditure on capital for the sector is likely to back ended during this period given the fallout from the credit crisis and uncertainty about the way in which the market will respond to the CPRS and RET arrangements.

While the renewable sector may attract funding a number of investors see it as having the highest relative risk and are of the view that there is better value for investment in renewable opportunities in Europe. This means that of the pool of investors wishing to invest in energy infrastructure, those with a focus on the domestic energy sector will need to be prepared to increase their exposure to the sector with its attendant risks. Should this result in a further concentration of ownership in the sector there is potential for it to raise market power issues for regulators to consider, further influencing investor risk perceptions.

8.1.4 Where will capital be allocated?

The uncertainly created by the introduction of CPRS and RET and the consequences of the credit crisis will remove some investors from the Australian market and energy sector for a

[56] Vietnamese Government Power Master Plan VI

number of years. Those that remain will face a more conservative environment for access to debt and equity. As a result the relative risk and reward will be increasingly important in determining preferred asset classes/ projects to invest in. Potential for future investment in the market segments of the energy sector are dealt with below:

8.1.4.1 Regulated assets

Regulated electricity networks are expected to require a capital spend of around $4.4 billion per year over the next ten years.[57] While the majority of these assets are owned by Government there is private debt and equity exposure (e.g. SP AusNet).

Regulated energy assets such as transmission networks are largely self-financing up to a point, because the regulatory arrangements ensure 'efficient' costs are passed through to customers. The assets are generally long-lived assets with a low risk profile and suit the needs of a number of long-term investors e.g. superannuation funds. Unless regulators continue to reduce returns to a level where investors perceive that the risk is not commensurate with the reward then regulated assets in the sector should continue to attract reasonable levels of investment.

Another regulated assets class is gas networks. Most forecasts suggest a substantial increase in gas-fired generation over the next decade. This may lead to a substantially increased investment in gas pipelines. There is expected to be a change in the demand profile for gas resulting from CPRS and RET, in particular placing pressure on existing gas infrastructure in order to meet peak demand as investment is increased in gas fired plant. This will require additional currently unplanned augmentation of some of the existing networks.

There are a number of factors that impact on regulated networks that will influence the access and allocation of capital to them under a CPRS and RET framework some of which is discussed below.

Regulatory arrangements and their effects

A number of those interviewed noted that the proposed reduction in the regulated WACC for transmission assets is making it increasingly risky for equity investors to invest in the regulated assets.

An important consideration for current and future investors in regulated network assets is whether they can access capital at price that is implied in the regulatory WACC. Entities that can't access capital at the implied price of the regulatory WACC or lower will find any investment where its return is determined by the regulatory WACC uneconomic.

As indicated in Figure 5.1 for the cost of BBB corporate debt as at 1 December 2008 has increased considerably in recent months with the spread between the Commonwealth's cost of debt funds and corporate cost of debt funds blowing out to 482.5 basis points (4.825%). An unintended consequence of this might be that private capital will be unable to compete with public capital given the implied regulatory price for capital (Government's price of capital is discussed below) resulting in a further contraction in the access to capital for the sector. If the WACC is further reduced to a point where investment becomes uneconomic it will prevent the

[57] Historic and projected energy sector investment, Draft Report, Firecon Ventures, 2008

commitment of any additional capital to address network constraint issues generated by changing demand profiles or energy demand growth.

The majority of electricity network assets are still owned by Government. Government will need to determine its commitment to provide the necessary capital to address expected demand growth and network connection and augmentation arising from CPRS and RET.

While not part of the scope of this report, the issue of a reducing regulatory WACC is material in the context of the other factors affecting the energy sector which all go to the risk and reward that can be achieved on an investment. As noted above, it is expected that the risk premium required on investments[58] will increase, with those in the regulated energy sector being no exception.

In addition to the WACC issue, the introduction of the CPRS and RET pose, at this stage, some uncertainty for the regulated businesses as to whether the full cost of carbon can be passed through to customers. There is also an issue of a mismatch in timing between incurring the cost and recovery of the cost potentially placing pressure on working capital requirements.

As a result, where private capital that is invested in regulated networks is mobile the CPRS and RET may be the last straw. It appears that if additional capital is required to be committed to augment the network to with deal changing demand profiles, the capital will not be applied without significant additional incentives to those that exist under the current proposed CPRS, RET and regulatory arrangements.

To the extent that private capital is not available Governments will need to fill the gap, or the efficiency of energy markets will diminish.

The combination of the introduction of the CPRS and RET (uncertainly about its operation) and possible reductions in the WACC have the potential to create a negative environment for investment for a significant part of the next 10 years, in a sector that would ordinarily be attractive to long term conservative investors.

8.1.4.2 Generation

It is forecast that the costs of the expanded RET will be $23 billion over ten years[59] in addition to other expenditure required by the sector.

Each of the different types of generation plants will have a different risk profile and hence attractiveness for investment, this is described below.

[58] As discussed above the risk premium is the margin above the return on a risk free investment which is sufficient compensate the investor for the systematic risk of the investment

[59] Historic and projected energy sector investment, Draft Report, Firecon Ventures, 2008

Coal Fired Generation

Coal fired generation faces the highest risk from the introduction of the CPRS and RET. At this point there is a lack of certainty about the cash flow and value effects on these generators and the arrangements for potential compensation.

There is market awareness of the potential for a number of coal fired generation plants, where they have been Project Financed, to breach their debt covenants. Many of the Financial Market Participants interviewed commented on this and there has clearly been some analysis undertaken by a number of parties on this matter.

Long term financial viability of a plant can exist in conjunction with breaches in banking agreements. The breach can occur because cash flow variability from changed market conditions causing cash flows to dip below the requirements of the Banks which can then start a series of cascading events which can include the Bank stepping in. However, with the restructuring of the capital the ongoing viability of the plant may be addressed. This may require replacing all debt with equity and if the equity provider is satisfied with their return the plant can kept operational.

Should there be a serious breach of covenants, there will be a considerable risk weighting added to investing in Australia not just the energy sector. International equity participants in any defaulting generators could exit the Australian market, even though they may have interests in pursuing renewable projects in the sector, and not return as investors for many years.

If the Banks need to take control of a Project Financed generator and work it through its financial difficulties, it is unlikely the Bank would wish to own the generator for any length of time (probably not more than six months). A forced step in and sale, would disrupt the allocation of capital to and increase the cost of financing in relation to thermal plant. This is expected to last past the period under consideration for this review as investors would consider the risk to their investment has significantly increased.

Gas Fired Generation

Work undertaken for the AEMC as part of its market modelling of the energy sector indicated that gas fired plant may or may not play a significant role in Australia's future energy needs depending on a number of assumptions (e.g. gas price)[60]. There is however an estimated requirement for $7 to $10 billion to be spent on thermal plant in order to meet electricity demand out till 2020[61].

Regardless of which modelling assumptions prove to be correct the gas sector will play an important role in Australia's energy future. Gas is expected to be the transitionary fuel to allow the switch from coal fired power to cost effective renewable power. However competitively priced access to gas and the degree of international integration of the Australian domestic gas market will have a significant impact on the role gas fired generation will play in Australia's future energy provision, this is discussed below.

[60] Market impacts of CPRS and RET, ROAM Consulting, 1 November 2008

[61] Historic and projected energy sector investment, Draft Report, Firecon Ventures, 2008

Access to gas

It has becoming increasingly difficult for some investors wishing to enter the electricity generation market using gas fired generation because of the tightness with which gas supplies are held in Australia. In order to be competitive in the market a gas fired generator must have access to gas and at a competitive price. A number of existing gas fired plant is finding it difficult to access gas.

It would be extremely difficult for a proponent to raise capital for a gas fired plant without a long term competitive gas supply contract to underwrite it. The risk to potential investors without the gas supply would be prohibitive. Under current ownership of gas supplies in Australia, this potentially limits the number of proponents that could pursue these projects. This would present a risk to capital providers because they would have little opportunity to diversify their proponent and operational risk.

Price of gas: international demand and domestic use

It is likely that the increasing internationalising of the Australian fuel sector (traditional input sectors to electricity generation) will continue to drive considerable investment in the energy sector as a means of satisfying international demand for energy. There is a view in the market that BG and Shell, two major international energy sector players, may invest in electricity generation facilities in Australia in addition to the infrastructure necessary to take the gas to the international market. How much of this investment supports the needs of the domestic sector is unclear at this stage, given their key markets for the gas is offshore.

International gas prices may offer a higher return for gas suppliers that can access international markets than their gas would attract in the domestic market. Where this is the case there is a strong incentive for the suppliers of gas to supply international markets rather than Australia. This implies that an increase in gas supplies to the domestic market will need to occur to meet the demand for gas fired plant.

While capital providers are not particularly interested in the relative merits of domestic versus international supply of Australia's gas reserves it does however raise a significant risk for consideration of any allocation of capital to the sector. For example, capital providers would not be prepared to expose themselves to the risk that an agreed gas price which underpins the economics of the plant might be reopened and the price increased to international price levels.

Renewable projects

Capital allocation to renewable projects is clearly advantaged under the RET and this is understood by the providers of capital. They are also aware that much of this investment would not be economic other than through the support of a subsidy. This creates risk for investors because a change in policy could make their investment uneconomic at any time. Depending on the compensation outcomes for the coal fired sector, this view could be reinforced.

Some interviewed for this report consider the renewables sector as presenting the highest risk to capital providers going forward under CPRS and RET for a considerable period of time (at

least 5 to 10 years). This is due to the significance of the regulatory shock of the introduction of the CPRS and RET and Government's apparent willingness to impose huge transaction costs on investors in the sector without adequate compensation or adequate regard to the consequences for existing capital[62]. This could have a lasting effect on international perceptions of increased sovereign risk and funding of otherwise non economic investments in Australia.

This uncertainty goes directly to the availability of capital and its cost for some potential investors in this segment. It may also cause some investors to direct their capital elsewhere until policy certainty is assured. A number of international NEM participants have identified the potential for more attractive renewable investment opportunities outside Australia at least until the cost of carbon in Australia is in the order of $50/t and above. Once large firms make a commitment to shift their focus and allocation of their capital elsewhere they often don't revisit the issue for many years in the absence of a compelling reason.

In addition, investors will attach risk to the potential for a second regulatory change to occur at sometime in the future as Australia integrates with a global carbon emission reductions scheme.

Conclusion

While some of the groups interviewed were more favourably disposed to renewables because of the incentives included in the RET, overall there was strong reservation as to whether the amount of capital required to meet the RET could be accessed either internationally or domestically.

8.1.4.3 Public and private access to capital

Government is still heavily invested in most segments of the energy sector in a number of States with the predominant involvement for most States being the network sector (with the exception of Victoria which has exited all segments of the sector). The States may own different types of assets (e.g. some have exited retail while other haven't) while the Commonwealth Government predominately has a policy interest.

Government has ability to access capital at a lower cost than the private sector because of its credit standing. This is evident in Figure 5.1 where the margin spreads between AAA rating Government debt is markedly lower than corporate debt. This will be important in times of capital constraint.

A traditional role for Government has been to invest where the risk return relationship has been such that the private sector will not be prepared to commit its capital. Given the credit crisis and additional risk private capital perceives as a result of the introduction of CPRS and RET, Governments may need to consider allocating additional capital to investments in the sector, which would normally have attracted private capital, until the investment climate improves.

[62] Note that transactions cost in this regard are distinguished from potential under compensation of economic loss which may affect existing providers of capital.

Another important role for Government may be as a strong counterparty to the private sector in transactions. Strong counterparties will be essential for Banks when considering the provision of debt to the private sector in the future. This may lead to a need for the public and private sector to consider joint ventures in order to achieve adequate involvement from the private sector in the industry. Alternatively, Governments may need to consider effectively underwriting some projects until debt costs improve and then have the private sector take greater share of the risk.

This may be a challenge for Governments as they are facing tightening budget conditions as a result of the global economic slowdown and they may neither wish allocate additional capital or take on private sector counterparty risk.

8.2 Cost of capital

The cost of capital represents the opportunity cost for investment. Australia is a price taker in the international market for capital and as shown in Figure 5.1 above debt margins have increased substantially in recent months.

As illustrated in Figure 5.1 above, AAA rated entities will attract a lower cost of debt to that of a BBB rated entities. In the last three months the cost of debt provided to BBB rated entities has increased 140 basis points. The differential between Commonwealth Government debt and BBB corporate debt is 482.5 basis points (or 4.825%) as at 1 December 2008. This difference was 236 basis points (or 2.36%) at a 1 December 2007.

As the cost of debt rises so does the cost of equity.

8.2.1 Factors affection cost of capital

Investors require an adequate return for the allocation of their capital commensurate with the risk embodied in the investment. This required return is referred to as the required return on capital, hurdle rate or the cost of capital. Ultimately, the cost of capital that investors apply in considering their investment decisions is based on the price they pay in attracting their own capital.

There are a number of practical matters that influence how capital providers determine how much return they require for committing their capital, a number of these are discussed below.

8.2.2 Current market conditions

There is a strong view from the Financial Market Participants interviewed as part of this process that the cost of capital has risen and will continue to rise for some time and remain at a higher rate than it has in recent years.

The introduction of CPRS and RET will change the differential risk relationship for each segment of the energy sector and will be influenced by the way in which the institutional, regulatory and policy frameworks interact. Consistent with the concept of opportunity cost of capital, the returns offered by the Australian energy sector will need to increase sufficiently to reflect the increased cost of capital and risk perceived by investors as a result of CPRS, if the Australian energy sector is to attract sufficient capital.

Some firms that have traditionally invested in the energy sector have already increased their hurdle rate as a result the credit crisis. This is a result of their cost of financing increasing so they have increased their target returns on the future investments. These same firms perceive additional risk in investing in Australia under a CPRS and RET regime than they did previously so are likely to require and even higher hurdle rate for investments in Australia's energy sector.

8.2.3 Factors affecting the increase in cost of debt capital

Debt capital is expecting to extract a higher price for its capital for a number of reasons including:

- A retreat from the underestimation of risk over recent years which some in the financial markets attribute to excess global liquidity;
- Debt providers now reducing their risk exposure and requiring equity providers to take more of the risk, therefore increasing equity risk premiums;
- Greater ability by providers of capital to be more selective in allocations of their capital, therefore requiring more reward for lower risk;
- Equity providers are risk shy given the losses faced by equity providers since the credit crisis began;
- Both debt and equity providers being increasingly risk averse, therefore requiring higher rewards for the risk they take;
- As a response to the high demand for the limited available capital; and
- A movement back to fundamentals such as investing in the assets as opposed to hybrid instruments.

Debt providers effectively have market power as a result of limited capital availability and will use that position to extract maximum protection and returns from borrowers.

8.2.4 Factors affecting the cost of equity

Equity assesses similar risks associated with an investment to those considered by the debt providers, however equity also has the risk of its exposure to debt where debt is used jointly with equity fund and investment. Two outcomes appear likely for equity given recent changes in financial markets and the introduction of CPRS/RET:

1. There will be an absolute increase in risk to equity providers; and
2. There will be a reweighing of risk between debt and equity providers as debt pushes more risk to equity.

As debt providers seek to reduce their risk exposure as a result of the credit crisis, the residual risks will be transferred to equity, to either mitigate or account for in their cost of capital. This will be a transfer of risk away from debt but without a corresponding reduction in

the return required by debt (in fact it is likely to increase). In other words debt will in achieve an enhanced risk reward relationship at the benefit of this arrangement.

Since risk will always be mitigated by investors if it is economical to do so it can be assumed that residual risk transferred to equity providers by debt providers would be difficult to mitigate so it is likely to increase equity's cost of capital. One means of reducing debt's risk is for equity to commit additional equity to the project (i.e. reduce the gearing).

As equity providers consider the risks embodied in the energy sector they can identify a number of risks that differ across the sectors. For example, regulated gas assets have a different risk profile to merchant generation and are considered to have a lower systematic risk and therefore cost of capital.

Equity providers will face tighter requirements from Banks where projects are jointly funded or be faced with funding the project fully with equity. As noted above some of these requirements will arise because of the credit crisis and others will be related to the introduction of CPRS and RET). Either way the cost of the funds applied to the project will increase as a result requiring the returns to also increase to cover this increase in the cost of funds.

Ultimately, to attract capital the returns offered by the investment will need to increase for no increase in risk to the capital providers when compared to pre credit crisis and the introduction of CPRS/RET. To achieve this, energy prices will need to increase more than necessary to simply recover the cost of carbon.

8.2.5 Summary

The cost of debt capital has clearly risen substantially for private providers of capital over the past 12 months while the Federal Government debt costs are slightly lower than they were for the same time.

Capital providers understand that the price for energy will rise to the extent that costs are passed through to end users. One of these costs will be an increase in the cost of capital which implies that the total cost pass through will be higher than the price of carbon. This raises an additional uncertainty for capital providers in that to the extent that full economic costs are not passed through to end users either the business (and the its providers of capital) or Government must absorb the cost. This leaves capital providers with a high residual risk which they must also price into their capital.

Overall, capital allocated to all segments of the energy sector will attract a higher risk premium. The extent this transfers into a higher cost of capital for all investment will depend on movements in the risk free rate and an investor's funding costs.

Investors will consider the risk associated with alternate investments before making a commitment to the Australian energy sector. To insure investment, energy prices and returns on infrastructure will need to rise to a point sufficient to attract investment which capital providers expect will be above the cost of carbon. Alternatively, the value of some assets in the sector will need to fall to allow an appropriate return to be generated from them.

Clearly, private sector cost of funds has increased significantly potentially putting more pressure on Government to directly fund or underwrite the energy sector investment given Government's cost advantage in funding.

Attachment 1: CAPM and WACC

Capital Asset Pricing Model ("CAPM")

The CAPM is a simple model for estimating the expected return on an investment. From the point of view of the user of the capital (typically a company) this is seen as the cost of capital. This model has existed and been used extensively for about 40 years. Whilst it has its critics, it has stood the test of time and no other model has supplanted it in general use, especially in corporate finance and valuation activities. Fund managers use more refined versions of the model as they wish to splice the risk into finer strata and typically have shorter investment horizons but the concept is essentially the same.

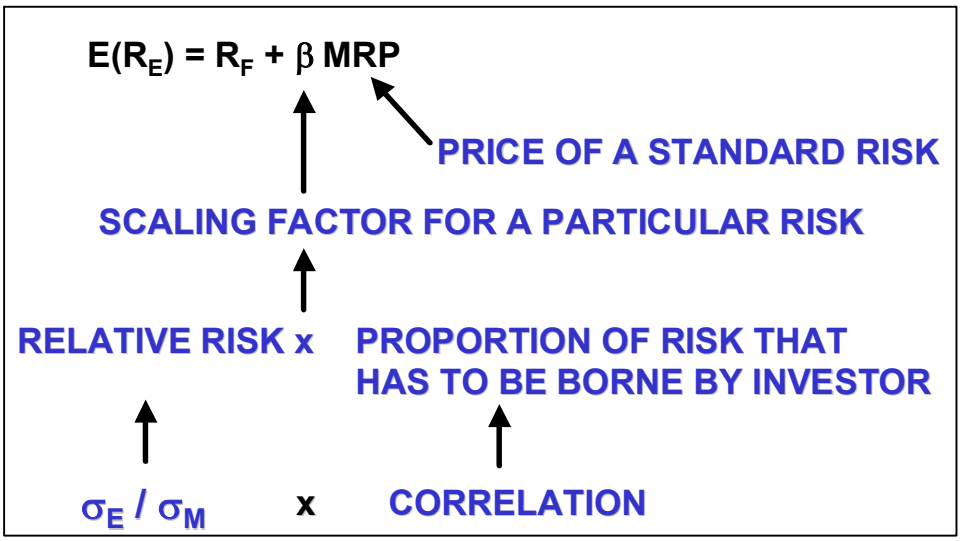
The CAPM model is:

$$R_i = R_{FREE} + \beta \times MRP + e_i \qquad or \qquad E(R_i) = R_{FREE} + \beta \times E(MRP)$$

The reason it is so simple is that it provides the expected return for a risky investment as the combination of the price of time (the risk free rate) and the price of risk (a scalar multiplied by the general price of risk). The logic for the risk premium is compelling. We start with a general or market risk premium. We use the stock market index as a proxy for a general risky investment because the set of listed companies includes most of the risks we are likely to encounter. This general premium is then scaled up or down accordingly as to whether the particular case in hand is more or less risky than a general risk premium. The relative risk is just the ratio of the volatility (or standard deviation of returns) of the particular investment divided by the volatility of the market. However, in the broad market place not all of this risk needs to be borne by a diversified investor so this risk is next scaled down to the proportion of the total risk that a well-diversified investor would be forced to bear. This is the risk that they cannot diversify away which is that part of the risk that is correlated with their general portfolio risk. The uncorrelated risk can be lost for free in a well-diversified portfolio so it is not rewarded with returns in the market place. The following figure outlines the logic[63].

[63] Neville Hatahway, Capital Research Group

Figure 1: Logic of the CAPM



The risk in investing in large firms is very much one of acquiring a combination of risk in which a large part is the underlying market risk and not much is company specific risk. For instance, when buying BHP shares one is buying (in order) equity risk, Australian (and possibly foreign country) risk, resource sector risk and finally BHP specific company risk. The CAPM captures the first three because they are systematic risks. The last risk is only captured indirectly within the company beta.

Non-systematic risks

There are many risks that one may need to take into account when valuing an asset or regulated enterprise cash flows where such risks are not included in the CAPM. These are called non-systematic or idiosyncratic or insurable risks. These risks need to be examined in two ways: those non-systematic risks that are purely random with zero expected payoff and those that have a non-zero expected value. The former are diversified away at zero cost. A widely diversified holder of the assets will have pleasant surprises that cancel out (i.e. diversify away) nasty surprises. That is the very nature of these risks. They represent pure uncertainty in outcome. It would, in theory, be costless to insure these risks. Therefore, if an average investor carries such diversifiable risk they will not earn a return premium for the risks because such investors do not have to bear these risks and competition will effectively eliminate them. As a consequence, the CAPM does not include an allowance for the expected return for such a non-systematic risk. These are the types of risks that are typically included in textbook comments on diversifiable risks in the CAPM.

In contrast, other non-systematic risks may have an expected value and so they must be recognised in the regulation of the cash flows and the valuation of a business. If these risks have a non-zero expected value then it would incur a cost to insure the risk. They may have no correlation with a widely diversified portfolio and so they are not included in the CAPM. However, just because a risk is uncorrelated does not mean that it should be ignored. It must be accounted for or else the valuation or price regulation could very well be in error.

The important point about these uncorrelated risks is that they are included in the expected cash flow of an investment.

Risk Free Rate

In the absence of an official risk free rate, most valuation practitioners adopt the yield on Government Bonds (in the appropriate jurisdiction) of a term matching the cash flow forecast period as a proxy. A more accurate approach would be to use the one-year spot bond rate for each future discounting period. This would avoid possible distortions when a single long-term bond rate is adopted in circumstances in which the yield curve is steeply sloping or the cash flows are significantly front or back ended. However, such forecasts are not readily available and the ten-year Australian Commonwealth Government Bond rate is broadly accepted in practice as an appropriate substitute when discounting long-term cash flows.

Market Risk Premium

The market risk premium ("MRP") arises out of the CAPM. The MRP is the stock market's price of risk relative to a risk-free rate of return such as the yield on 10-year Government bonds. The MRP is a real measure of risk as distinct from a nominal measure. The rationale for using historical data as a measure of the ex-ante MRP is that investors' expectations will be framed on the basis of their past experience. Historically, the MRP tends to be mean reverting but there have been 10-year periods when the returns from equities have been below the yield of 10-year bonds.

A figure of 6% is commonly used in Australia and the US by regulators and academics, although some market participants use more recent data and subjective measures to justify using a lower MRP figure. When calculating ex-post MRP figures as a basis for determining the ex-ante MRP, the use of arithmetic average stock returns is favoured over the geometric measure because arithmetic average returns are probably a closer proxy for what are expected by investors or how the expectations are framed by investors. The Australian historical MRP data has been reasonably consistent with that of the US, UK and New Zealand.

Weighted Average Cost of Capital ("WACC")

The WACC is a model which allows investors to determine the required return on an investment calculated using the cost of the financing. The WACC weights the cost of debt and equity in the proportions of debt and equity use to finance the investment.

Under a classical tax system the WACC is calculated as follows:

$$\mathbf{WACC_{post\text{-}tax} = [R_e \times (E / V)] + [R_d \times (1 - t_c) \times (D / V)]}$$

Where:

WACC = post tax weighted average cost of capital
R_e = required rate of return on equity capital
E = market value of equity capital
D = market value of debt capital
V = total capital base, or D+E, the market value of debt and equity capital
R_d = required rate of return on debt capital

t_c = statutory corporate tax rate in Australia

Converting the above for use with pre-tax cash flows gives a WACC formula as follows:

$$\mathbf{WACC_{pre\text{-}tax} = [R_e / (1 - t_c) \times (E / V)] + [R_d \times (D / V)]}$$

This equation can be simplified as follows:

$$\mathbf{WACC_{pre\text{-}tax} = WACC_{post\text{-}tax} / (1 - t_c)}$$

Debt Margin and Gearing (Leverage)

The difference between the interest rate or yield on debt issued by the entity and the comparable yield on the Commonwealth government issued security of the same term is called the debt margin. This margin will reflect the risk of the entity's debt relative to the Commonwealth debt's security. The risk of the security can be divided into diversifiable and non-diversifiable risk both of which will reflect the default risk of the entity or borrower.

Clearly, the risk of the entity's debt will be a function of the amount of asset backing to the debt or equivalently the degree of leverage or gearing that the entity has. The greater the debt to value or debt to equity ratio of the entity, other things being equal, the greater the risk and therefore the greater the required return or debt margin. Similarly, the cost of equity will increase as the proportion of debt in the capital structure increases but this does not imply the cost of capital for the entity's assets changes. The change in proportion of equity to debt can offset the relative increase in equity and debt costs such that the WACC or asset cost of capital remains unchanged – this is an illustration of the Proposition that "a company's value is invariant with changes in its capital structure". As a practical proposition the so called Modigliani Miller[64] hypothesis is considered valid within reasonable ranges of debt/equity for most entities. The consequences are that in setting a debt margin, we are implicitly setting a level of gearing. If the observed equity beta is used together with a debt beta to derive an asset beta the assumptions employed will imply a particular level of gearing.

[64] F. Modigliani and M. H. Miller. 'The Cost of Capital, Corporate Finance and the Theory of Investment', American Economic Review, June 1958

Attachment 2: List of interviewees

The vast majority of interviewees were met in person the balance was interviewed via a phone conference. Meetings were usually attended by more than one person from the organisation being interviewed. Only the most senior person interviewed is listed below. A number of organisations asked not to be identified or their comments alluded to, those wishes have been respected. Those interviewed include:

Ian Greer, Managing Director, Rating Services, Standard & Poors

Robert Zivicic, Director, Global Infrastructure & Project Finance, Asia Pacific, Fitch Ratings

Steve Durose, Senior Director Regional Co-Hand of Energy & Utilities, Asia Pacific, Fitch Ratings

David Sidoti, Head of Structured Finance – Sydney Structured Finance Asia Pacific, Sumitomo Mitsui Banking Corporation

Richard Cottee, Managing Director, Queensland Gas Company

Tony Concannon, CEO, International Power

Nino Ficca, CEO, SP AusNet

Gordon Gardine, CEO, Powerlink and Chair Grid Australia

David C. St John, Chief Investment Officer, UniSuper

Steven Rotchester, CEO, Queensland Treasury Corporation

Don Woodrow, Chair, Green House Gas Working Group, NGF

Paul Simshauser, Chief Economist, AGL (former CEO, Babcock & Brown Power)

John Clarke, Managing Director, ANZ Infrastructure Services

Ian Wainwight, Head of Project Finance Australia, KBC Structure Finance Ltd.

Perry Clauson, Head of Infrastructure Investment, Australia, Colonial First State Global Asset Management

Max Matsumoto, Managing Director, Mitsui Power Investments

Neville Hathaway, Principal, CapitalResearch (former Associate Professor of Finance, Melbourne Business School)

Gavin Maher, Utilities Analysis, Divisional Director, Macquarie Research Equities, Macquarie Securities

Andrew Hislop, Asset Manager, DUET Group

David Bartholomew; DUET Group

Kirsty Morris, General Manager, Carbon Solutions, AGL

Kevin Cosgriff, Deputy Secretary, Fiscal and Economic, NSW Treasury

Attachment 3: Cash flow and debt covenants ratios

Cash Flow Ratios[65]

FFO Interest Cover

Defined as: Funds Flow from Operations plus Gross Interest Paid plus Preferred Dividends; divided by Gross Interest Paid plus Preferred Dividends

This is a central measure of the financial flexibility of an entity, which compares the operational cash generating ability of an issuer (after tax) to its financing costs. Many factors influence coverage – including general funding costs, the mix of fixed-rate versus floating-rate funding, the use of zero-coupon or PIKable debt, and so on. For this reason, the coverage ratios should be considered alongside the appropriate leverage ratios.

FFO Fixed Charge Cover

Defined as: Funds Flow from Operations plus Gross Interest Paid plus Preferred Dividends plus Rental Expenditure; divided by Gross Interest Paid plus Preferred Dividends plus Rental Expenditure.

Is a measure of financial flexibility of particular relevance for entities that have material levels of lease financing. Note that this ratio inherently gives a more conservative result than interest cover (i.e. coverage on a debt-funded and lease-funded capital structure are not directly comparable), as the entirety of the rental expenditure (i.e. the equivalent of interest and principal amortization) is taken in both the numerator and denominator.

Free Cash Flow Debt Service Coverage

Defined as: Free Cash Flow plus Gross Interest Paid plus Preferred Dividends, divided by Gross Interest Paid plus Preferred Dividends plus Prior Year's Debt Maturities due in one year or less.

Is a measure of the ability of an issuer to meet debt service – both interest and principal – from organic cash generation, after capital expenditure and assuming the servicing of equity capital. This indicates the entity's reliance upon either refinancing in the debt or equity markets or upon conservation of cash achieved through reducing common dividends or capital expenditure or by other means.

FFO Adjusted Leverage

Defined as: Gross Debt, plus Lease-Adjustment minus Equity Credit for Hybrid Instruments plus Preferred Stock; divided by Funds Flow from Operations plus Gross Interest Paid plus Preferred Dividends plus Rental Expense

[65] Fitch Ratings

Is a measure of the debt burden of an entity relative to its cash generating abilities, using a lease-adjusted debt-equivalent, and taking account of equity credit deducted from hybrid debt securities that may display equity-like features.

FFO Return on Adjusted Capital

Defined as: Funds Flow from Operations plus Gross Interest Paid plus Preferred Dividends plus Rental Expenses; divided by Gross Debt plus Lease-Adjustments plus Common Equity plus Preferred Stock plus Minority Interests.

A measure of the general profitability of an issuer indicative of its ability to cover its capital costs. This also provides an indicator of an issuer's ability to attract and successfully employ capital in future.

CFO/Capital Expenditure

Defined as: Cash Flow from Operations divided by Capital Expenditure.

Is a measure of the ability of a company to meet its capital expenditure requirements from organic cash generation. This includes a commentary on the sustainability of the entity's financial profile, and the entity's vulnerability to external financing constraints.

Additional Ratios

FFO Net Interest Cover

Defined as: Funds Flow from Operations plus Gross Interest Paid minus Interest Received plus Preferred Dividends; divided by Gross Interest Paid minus Interest Received plus Preferred Dividends.

A measure that is useful where interest income or receipts are modest, where a consistent data series of gross interest paid is not available, or to provide a consistent data series with forecasts that may be computed on a net debt basis.

FFO Adjusted Net Leverage

Defined as: Gross Debt plus Lease-Adjustments minus Equity Credit for Hybrid Instruments plus Preferred Stock, minus Unrestricted Cash and Marketable Securities; divided by Funds Flow from Operations plus Gross Interest Paid minus Interest Received plus Preferred Dividends plus Rental Expenses.

Is a measure that is useful where unrestricted cash and marketable securities are de minimis, where they are known to be held to defease debt or debt-like obligations, or where cash balances are expected to be maintained at a consistent level, on a non-seasonal basis.

FCF/Total Adjusted Debt

Defined as: Free Cash Flow divided by Gross Debt plus Lease- Adjustments minus Equity Credit for Hybrid Instruments plus Preferred Stock

Is an additional measure using the organic cash flow of an issuer to measure ability to repay debt, assuming the annual servicing of debt and equity capital.

Debt Ratios

Post tax Debt Service Coverage Ratio (DSCR)

The Debt Service Coverage Ratio (DSCR) is a debt metric widely used in Project Finance models to analyse the project's ability to repay debt periodically.

Debt Service Ratio (DSCR) Post tax = Post tax Cash Available for Senior Debt Service/Senior Debt Service.

Post Tax Cash available for Senior Debt Service = Operating revenue – operating expense – maintenance reserve (deposits, withdrawals and maintenance expense) – tax paid.

Senior Debt Service = Interest and fees on senior debt facilities and working capital facility + Principal repayment on senior debt and working capital facility.

Annual DSCR, backward looking four quarters.

Annual DSCR, backward looking four quarters.

The DSCR is calculated using several different methods:

- Quarterly CFADS / Quarterly Debt Service;
- Semi-Annual CFADS / Semi-Annual Debt Service;
- Annual CFADS / Annual Debt Service;
- Forward-looking CFADS (X periods) / Forward-looking Debt Service (X Period); and
- Backward and forward looking CFADS and Debt Service (e.g. six months look-back and six months look-forward)

CFADS = Cash flow Available for Debt Service

A DSCR of less than one means that the cash flows from the project are not strong enough to support the level of debt. In a debt sizing phase of a project, this could be managed by using one of the following structures:

- Sculpted debt repayments - This will ensure that a lower principal repayment is applied in a period with lower Cash flow Available for Debt Service (CFADS)
- Grace Period - A Grace Period is the number of months or years in the beginning of the debt term, where there is no obligation by the borrower to repay debt. This is particularly

common in projects where there is a ramp-up phase, such as toll roads and other types of infrastructure projects; and

- Debt Service Reserve Accounts (DSRA/c) - A Debt Service Reserve Account works as an additional security measure for the lender as it ensures that the borrower will always have funds deposited for the next x months of debt service. Commonly the Debt Service Reserve Account target is defined as six or twelve months of debt service.

Loan Life Cover Ratio

The LLCR is the ratio of the net present value (NPV)* of cash available for debt service during the term of the senior debt to the outstanding balance of the senior debt. Similarly to the DSCR, the contracts may specify the lock-up and default values for the LLCR.

Loan Life Cover Rations = NPV of cash available for debt service during the term of the loan / Senior Debt

The Net Present Value (NPV) is the value of future cash flows at the present point, allowing for the change in value of money over time.

The graph (accessed via link below) shows the typical healthy profiles of the DSCR and LLCR, together with the lock-up and default values. The steep rises towards the end of the concession occurs because most of the debt is repaid by this stage and the debt service (interest plus principal) is significantly lower.

Attachment 4: Examples of major covenants

This example is based on actual loan arrangements that were put in place for an electricity generator in the National Electricity Market

Major Covenants

Summarised below are the key Senior Debt covenants:

- Refinancing of Senior Debt in excess of $500 million requires prior written consent from the Agent. Where the amount to be refinanced is less than $500 million the following conditions are to be met:
    - Forecast average Total Debt Services Coverage Ratio is not less than that set out in the Company Base Case Financial Model as at Financial Close;
    - The minimum forecast Total Debt Service Coverage Ratio is in excess of 1.35;
    - The lockup DSCR under the Refinancing is not greater than the lesser of 1.20x and 1.1x plus an amount equal to the increase in the average forecast debt service coverage ratio under the revised Financial Model over the remaining term of the agreement;
    - The event of default DSCR under the Refinancing is not greater than the lesser of 1.10x and 1.0x plus an amount equal to the increase in the average forecast DSCR;
    - If the DSCR test is increased in the refinancing, then this agreement is amended to increase the DSCR figure by the same amount.
- Prepayments cannot be withdrawn and break costs apply if the prepayment is made other than on the last day of the relevant interest period. Voluntary repayment fees:
    - On or before the first anniversary of Financial Close – 2% of the amount prepaid.
    - After the first but before the third anniversary of the Financial Close – 1% of the amount prepaid.
- Under the financing agreement, for the Subordinated Syndicated Facilities Agreement, the Company must establish a Company Lock-up Account. There are restrictions on the release of funds from this Agreement, and the Security Trustee is only required to release funds if:
    - No event of default; and
    - The DSCR for the preceding 4 quarters was equal to or greater than 1.10 (or higher if the Senior Debt facility is refinanced).

- The key requirements for equity distributions are as follows:
    - Sufficient funds should be available for payments relating to project expenses, financing costs (including swaps), repayments, income tax; other items (as set out in the Security Sharing Deed); and
    - Average DSCR for the four quarters preceding be greater than 1.10x.
- The key requirements relating to interest rate risk management are as follows:
    - In relation to the bullet facility, 100% of the principal outstanding be hedged within 90 days after the first drawdown date for a period of at least 5-years; and
    - In relation to the amortising term facility, 60% of the principal outstanding be hedged within 1-year after the first drawdown date for a period of at least 5-years.
- Prior to first drawdown, Maintenance Reserve Account is required to be established to a balance of $8 million.
- An undertaking in respect of Debt Service Reserve requires standby letter of credit with a face value of $60.0 million be provided to Security Agent. The letter of credit must comply with terms set out a Security Sharing Deed.
- Insurance undertakings requires that appropriate insurance policy be maintained, with contents of insurance policy include as insured the Representative of the project and Security their interest. Also, under the policy, the Security Agent is direct loss payee of all losses and other amounts payable under the policy in excess, for any one claim, of $20 million.
- Requirements for further secured creditors include that amount raised are used to repay secured creditors and the revised DSCR be greater than 1.35 until the last Termination Date under the Credit Agreement.

The primary repayment covenant is a Debt Service Cover Ratio (“DSCR”) test: a DSCR of 1.10 or below for four quarters triggers an event of default, and distributions to equity holders are restricted if the DSCR falls below 1.20 for four quarters (Attachment 3 provides the cash flow definitions used for the purpose of this agreement).

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