



Australian Government

# CLEAN ENERGY FINANCE CORPORATION

The Hon. J. B. Hockey MP  
Treasurer

Sen. the Hon. Mathias Cormann  
Minister for Finance

27 February 2015

Dear Ministers

Thank you for your correspondence of 17 February 2015 conveying the Ministerial Direction in the form of the *Clean Energy Finance Corporation (Investment Mandate) Direction 2015* ("2015 Investment Mandate").

We appreciate that you have considered our comments on the earlier draft. We note that the 2015 Investment Mandate requires the CEFC to maintain its existing level of portfolio risk while targeting a significantly higher investment return over the medium term. Achieving these increased returns would require CEFC to consistently out-perform the market by a large margin.

Within the narrow field of investment allowable under the CEFC Act, achieving such increased returns without increasing risk, is highly challenging, and in my experience, outside the scope of normal market opportunities. In this respect, the 2015 Investment Mandate requires the CEFC to seek out additional investments that are outside market norms, in addition to carrying on its existing investment activities.

I want to reiterate that the CEFC Board shares the objective of protecting and minimising risk exposure in the investment of public funds.

The stated object of the CEFC Act under Section 3 is "to facilitate increased flows of finance into the clean energy sector". The new 2015 Investment Mandate creates a tension between the object of the Act and the achievement of the increased returns. In fulfilling its responsibilities, the CEFC will continue to pursue its investment function, applying commercial rigour, to invest responsibly and manage risk prudently, utilising a robust, commercial risk management approach.

The attached paper highlights the challenge presented by the 2015 Investment Mandate. This paper is supported by independent analysis from Dr Steve Bishop and Professor Bob Officer which explains the observed correlation between investment risk and return. This independent analysis confirms that in order to achieve the increased returns specified under the 2015 Investment Mandate without increasing risk exposure would require the CEFC to find a body of investments that demonstrate a risk-return profile inconsistent with traditional

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market based principles to deliver out-of-market investment returns.

The CEFC notes Australian Government policy remains to abolish the Corporation. That is the prerogative of Government, but so long as the CEFC remains in existence, we again reiterate our utility and ability to work in a complementary way to assist realisation of other Government policy initiatives such as the Emissions Reduction Fund, in energy, environment, regional development, agriculture, industry, innovation and infrastructure.

The Board will continue to pursue its duties under the CEFC Act. Consistent with our obligations under that Act, I want to assure you we will seek to take all reasonable steps to comply with the 2015 Investment Mandate, even if, as all evidence suggests, it will prove highly challenging to significantly increase the rate of return of the portfolio whilst maintaining the current portfolio credit risk profile.

Yours sincerely



Jillian Broadbent AO  
Chair of the Board  
Clean Energy Finance Corporation



Australian Government

# CLEAN ENERGY FINANCE CORPORATION

## CEFC COMMENT ON 2015 INVESTMENT MANDATE

### General Summary

The CEFC currently expects an average *lifetime* investment portfolio yield of approximately 6.5%. This yield reflects a weighted average 5 year long-term Government Bond Rate (LTGBR) rate of 3.1% and a margin therefore of approximately 3.4%.

This margin of 3.4% above the five year LTGBR rate represents the weighted average rate at which the CEFC writes loans and does not include cash holdings drawn as part of pre-funding which generate typically deposit rates.

The new *Clean Energy Finance Corporation (Investment Mandate) Direction 2015* ('the 2015 Investment Mandate') increases the CEFC's benchmark performance rate to 5 year LTGBR + 4.0-5.0%. This 2015 Investment Mandate requires the CEFC to target this return over the medium term while not increasing from the current level of portfolio credit risk. Achieving these increased returns would require CEFC to consistently out-perform the market by a large margin. Achieving increased returns without increasing risk is a challenging requirement for any investor.

For the CEFC to achieve the new higher benchmark rate of return than the current benchmark, it would ordinarily have to move from its current 90% debt-based portfolio towards higher risk debt and equities and hence take a higher-risk profile. The CEFC Board shares the objective of protecting and minimizing risk exposure in the investment of public funds.

The supporting analysis of Dr Bishop and Professor Officer (attached) has examined the historical spread of listed Australian equity returns and Corporate Bond yields over the five year LTGBR by rating, and indicates that in order to achieve the new benchmark rate of return, the CEFC would be forced to increase its exposure to sub-investment grade debt (if its portfolio was restricted to debt securities), to leverage the portfolio or to increase investments inequities.

The *Clean Energy Finance Corporation Act 2012* ('CEFC Act' or 'the Act') effectively prevents the CEFC from borrowing other than for bridging, so leverage is not possible. Greater sub-investment grade debt in the CEFC portfolio will increase credit risk which is contrary to the requirement to restrict portfolio credit risk to current levels (Paragraph 8 of the 2015 Investment Mandate). In order to have a chance of achieving the returns targeted and constraints imposed under the 2015 Investment Mandate while fulfilling its statutory obligations, the Corporation will need to find additional investment opportunities that:

1. produce out-of-market credit investment returns; and
2. involve additional equity risk and returns.

Under its existing Investment Policies, the Corporation has taken a conservative risk approach and significantly limited the CEFC's current equity exposure. This is

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consistent with ensuring private sector participation in investments. The Corporation has sought to maintain a balanced portfolio approach. In order for the CEFC to continue to do this and fulfil its investment function to service the eligible market under the CEFC Act the Corporation will need to continue providing:

- Low-risk low-return investment facilities that service manufacturing, SME, not-for-profit and government/local government sectors for energy efficiency and on-site renewables to catalyse investment activity in areas underserved by the traditional banking sector;
- Corporate facilities of longer tenor for energy efficiency and on-site renewables; and
- Funding for vehicles co-financed with banks and energy utilities designed to incentivise SMEs and other businesses to invest in building efficiency upgrades, top performing efficiency equipment and vehicles.

While the 2015 Investment Mandate is similar to that of the Future Fund mandate, there are some critical differences between the purpose and scope of activities of the two entities:

- The Future Fund targets yield and return maximisation, while under its Act, the CEFC has to fulfil a significant public purpose to drive capital investment in the clean energy sector.
- The Future Fund is permitted to develop a portfolio with substantial investments in classes with higher-risk, particularly Australian and Global equities. The CEFC is restricted to only Australian investments.
- Under the CEFC Act, the CEFC's investment universe is much more restricted than the Future Fund, and hence the CEFC has more limited opportunity to find 'out-of-market' returns or additional equity risk exposure than is available to the Future Fund.
- Reflecting their different purpose, the Future Fund's portfolio is based on listed equities which are liquid, while the CEFC, in facilitating increased flows of finance into the clean energy sector, has an illiquid portfolio which is primarily debt focused.

The statutory object of the CEFC Act under section 3 requires the Corporation to 'facilitate increased flows of finance into the clean energy sector'. Under the 2015 Investment Mandate, the CEFC is required to pursue the increased benchmark as a medium term target in a manner which does not compromise this statutory object under the Act or obligation to 'apply commercial rigour' and build a portfolio that in 'aggregate has an acceptable but not excessive level of risk'

The requirement that the CEFC adopt a commercial approach to investment would ordinarily require that risk and return be commensurate as is commercial practice. The requirement to increase returns without increasing credit risk would not normally meet the standard of a commercial approach.

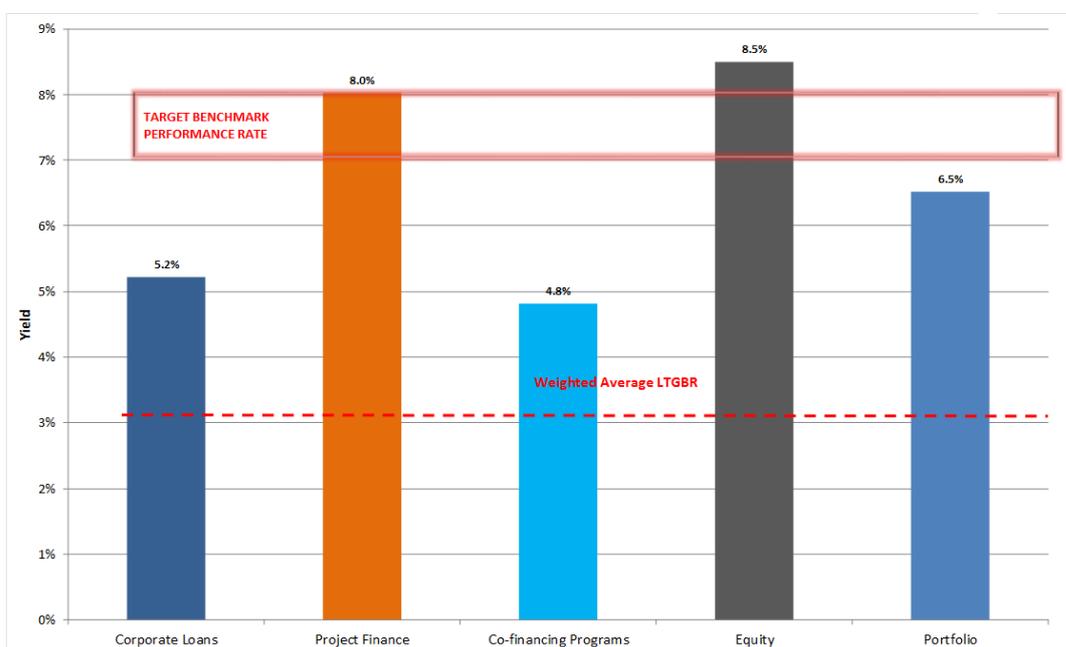
The analysis of both the CEFC and that of Dr Bishop & Professor Officer (attached) illustrates the challenge the 2015 Investment Mandate presents for the CEFC in maintaining current credit risk levels as it grows its portfolio and targets increased returns to the level specified. To that extent, Dr Bishop & Professor Officer conclude that such a benchmark return is highly likely to be unachievable under conditions applying to the CEFC.

**Achieving CEFC investment returns of CGB 5 years +4-5% is highly challenging without increased risk and/or out-of-market investments.**

As shown in Chart 1 below, the CEFC balances lower-risk, lower-return co-financing programs (i.e. sell through finance with major banks and utilities) with higher-risk, higher-return Project Financing activity to produce an average investment portfolio life time yield of about 6.5% being a 3.4% margin to weighted average 5 year LTGBR. The sell-thru co-finance activity earns an average investment portfolio lifetime return of 4.8% (1.7% margin), corporate lending earns an average investment portfolio yield of 5.2% (2.1%), while the project finance activity earns an average investment portfolio lifetime yield of 8.0% (4.9%).

It is worth noting that since 30 June 2014, prevailing market conditions and policy environment have seen more growth in investment in Co-financing and Corporate Loans rather than Project Finance. This has seen a reduction in the proportion of Project Finance in the portfolio, which has influenced portfolio returns.

**CHART 1: CEFC INVESTMENT PORTFOLIO LIFE-TIME YIELD AS AT 23 FEBRUARY 2015**



The new 2015 Investment Mandate requires an investment portfolio lifetime return after operating expenses of 5 Year LTGBR +4-5% which is above the current return of the portfolio.

Our investment experience would indicate that it is generally not possible to increase return without increasing risk (unless there is some information the investor holds that the market is unaware of and hasn't correctly priced).

It is unlikely that the CEFC could push out the yield on its lending portfolio beyond market rates. However it can seek out-of-market returns where available to complement ordinary activity.

In summary, it will be a highly challenging proposition for the CEFC (or for anyone else in the market) to both find viable 'out-of-market' investments while meeting other statutory and commercial constraints in pursuing a broad base of investment opportunities. It is possible that, despite taking 'all reasonable steps', the CEFC is unable to find out-of-market investments achieving the increased benchmark targeted under the 2015 Investment Mandate.

### **Illustrative Effect of 2015 Investment Mandate on CEFC Portfolio and Activity**

Chart 2 below shows the current CEFC investment portfolio broken down by finance type and technology (as at February 2015). Simplified for the purposes of illustration, it demonstrates that Project Finance (i.e. loans for primarily utility-scale renewables projects that are secured against the revenue of the projects and the projects themselves) is more profitable, but this generally comes with higher risk (e.g. higher construction risk, volatility in generated output or volatility in revenues).

Corporate Loans are loans secured against all of the assets of the borrowing entity, not just a project. To date in the CEFC investment portfolio, this has been mainly exposed to bioenergy and waste coal mine gas technologies. The returns and risk are lower, mainly because of the whole-of-entity security (with assets other than the project to repay the debt if the project fails) and there can be additional revenue streams apart from energy generation.

Energy Efficiency and Rooftop PV are lower risk/lower return co-financing arrangements where the CEFC loans finance to a bank, utility or service provider who then sells through the finance to the consumer. The CEFC selects only reputable co-financing program partners, and the effect of bundling small loans together like this should be to spread risk and create an asset class with observed low historical rates of default (e.g. on par with or below finance for similar asset classes) which can then be securitised.

The red broken-line circle is in essence the average of all of these sets, plus a single large equity holding. It shows that the CEFC investment portfolio earns an average *lifetime* investment portfolio yield of 6.5% **which is a margin of 3.4% above the weighted average 5 year LTGBR rate**, and has an average shadow credit rating (i.e. risk rating for our debt securities) of BB.

It should be noted that this investment distribution is in our experience quite typical. The bottom left to higher right is consistent with a normal distribution of investment returns one would expect – that is, the higher the risk, the higher the return demanded.

**CHART 2: CEFC INVESTMENT PORTFOLIO RISK-RETURN MATRIX AS AT 23 FEBRUARY 2015**



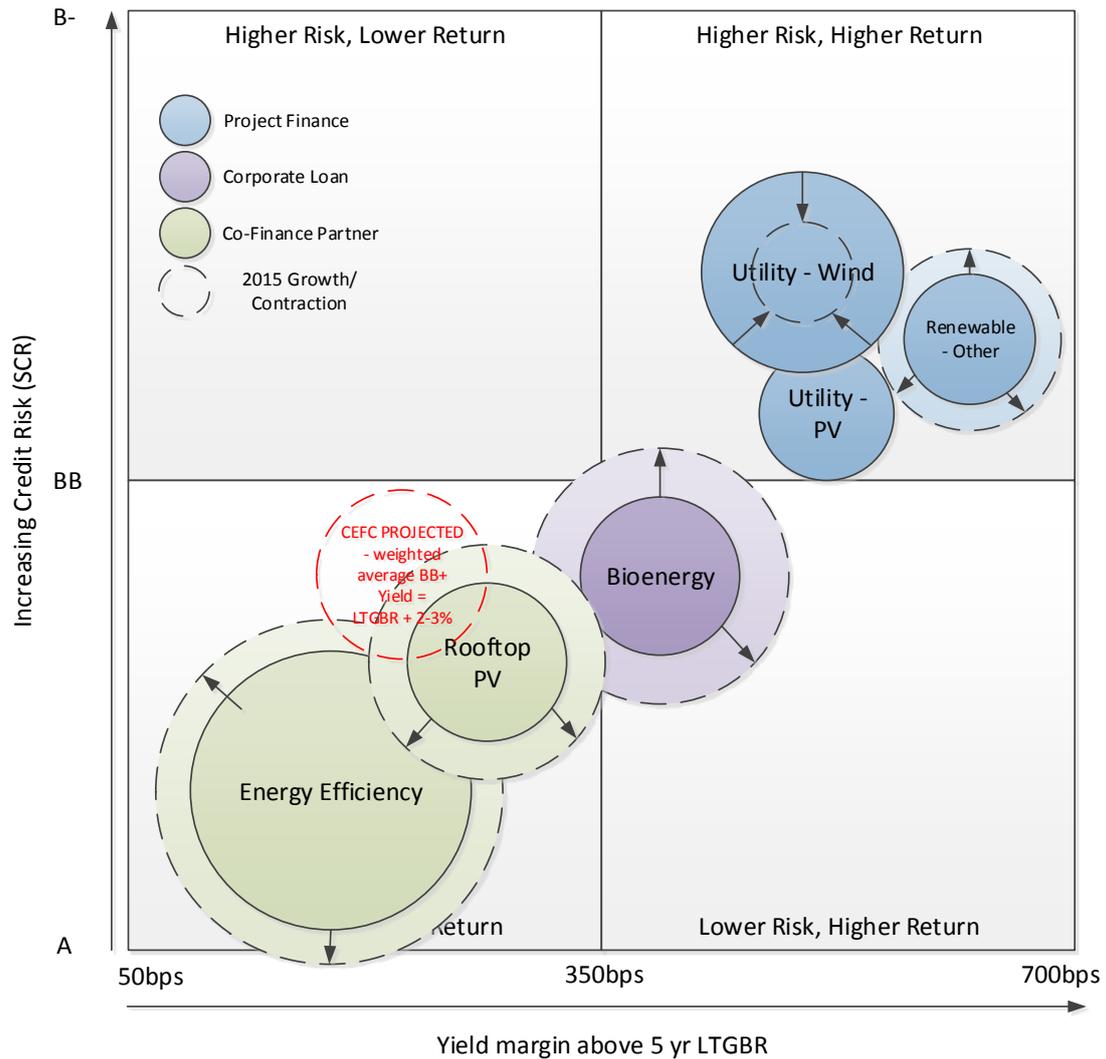
Chart 3 below shows what the CEFC currently expects its investment portfolio to look like as at 30 June 2015 (as opposed to February 2015 above). It reflects market conditions in the energy sector with generation oversupply, uncertainty over both the Renewable Energy Target and long term energy policy settings generally. Many utility scale projects have payback periods of 10 to 20 years or more and the observed market conditions are that investors will not commit to capital funding investments while policy settings remain in flux.

Accordingly, the CEFC expects no growth in the share of its portfolio in Project Finance for utility scale solar PV by end of financial year, and a contraction in share of portfolio dedicated to Project Finance for utility scale wind. In Project Finance, we expect this to be partially offset by potential growth in larger-scale bioenergy.

We also expect Corporate Lending for bioenergy (and perhaps for some energy efficiency and commercial scale rooftop solar PV) to grow, as well as expansion in co-financing for these purposes.

The overall effect is that, as Project Finance investment opportunities in utility scale renewables (wind and solar PV) contract, we expect the CEFC's lifetime portfolio yield to fall from about 7% (as at 30 June 2014) to between 5-6% at 30 June 2015 which is 2-3% above the current weighted average 5 year LTGBR rate.

**CHART 3: CEFC INVESTMENT PORTFOLIO RISK-RETURN MATRIX PROJECTED FOR 30 JUNE 2015 (UNDER 2013 INVESTMENT MANDATE)**

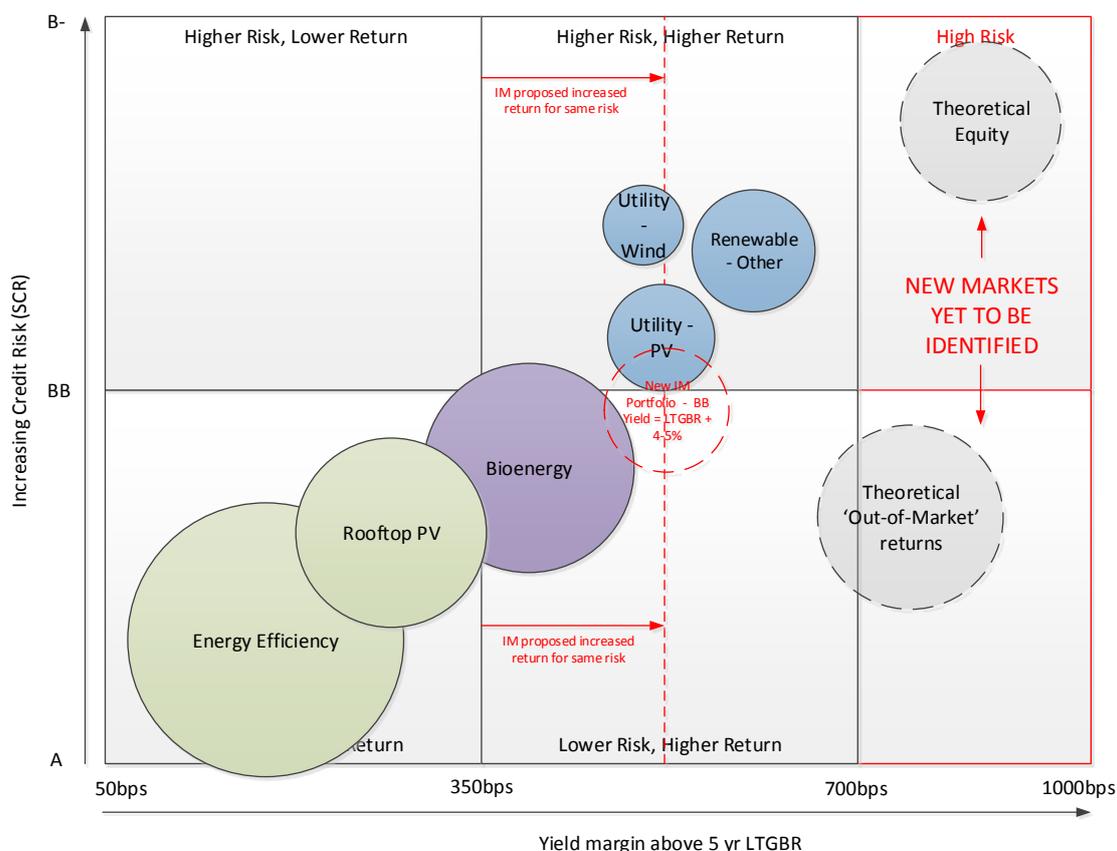


The final chart (Chart 4) shows the anticipated impact of the 2015 Investment Mandate with a hypothetical targeted CEFC portfolio which would be necessary in order to significantly increase the investment rate of return while seeking to maintain the current investment portfolio credit risk profile around BB.

The CEFC will continue its important investment work in the energy efficiency space, supporting SMEs, manufacturing and not-for-profits, where availability of finance is a continual challenge.

To take 'all reasonable steps' to achieve the proposed benchmark risk-return target, the CEFC will need to maintain balance in its portfolio by **additionally** investing in higher risk and/or higher return deals than it has to date. These higher risk/return deals might theoretically be equity investments in early stage developments, or opportunities with 'out-of-market returns'. These 'out-of-market returns' remain a hypothetical possibility only, with such opportunities only rarely identified and practically non-existent, given the CEFC's limited investment universe.

#### CHART 4: IMPACT OF CHANGES TO CEFC INVESTMENT MANDATE





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## Return and Risk Profiles for Investments

Prepared by

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For Clean Energy Finance Corporation

27<sup>th</sup> February, 2015

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## Background

1. This opinion has been prepared jointly by Dr Steven Ross Bishop. And Professor Robert Officer.
2. Dr Steven Ross Bishop is an Executive Director of Education and Management Consulting Services Pty Ltd, a business that specialises in business valuations, cost of capital estimation for regulatory and business purposes and financial education. A brief Curriculum Vita is attached.
3. .Professor Robert Rupert Officer is a Professor Emeritus of the University of Melbourne and has been closely involved in company tax policy and the effect of changes in company tax systems since the early 1980's. He is a board member of a number of fund managers. He has written extensively on cost of capital matters. A brief Curriculum Vita is attached.

## Terms of Reference

4. We have been asked for an independent view of the likely risk profile of an investment portfolio that would be expected to earn..."a benchmark rate of return of the five-year Australian Government bond rate plus 4 to 5 percent before operating costs ..." [Letter from Treasurer and Minister of Finance, dated 17-2-15]

## Summary of Opinion

5. A basic tenet in finance is that long term returns are a function of risk. For CEFC to achieve a higher benchmark return than the current benchmark would necessitate taking a higher risk profile.
6. In our opinion the risk profile of a portfolio that was expected to earn the benchmark return plus 4 to 5 percent before operating would be need to be greater than the current risk of the Clean Energy Finance Corporation's (CEFC) portfolio; a portfolio comprising mainly (90%) fixed interest securities. Our view is informed by a number of data points including returns from holding debt securities and from estimating the risk return trade-off as implied by the Capital Asset Pricing Model. Given the current (relatively historically low) risk free rate, using the yield on a 10 year Commonwealth Government Bond as a proxy, whose current rate (18<sup>th</sup> February) is approximately 2.6% and the widely used market risk premium of 6%, the expected return on a portfolio of equities of average risk is circa 8.6% or 860 basis points. Whereas, the current yield on a 5 year bond is approximately 2.2% so that a 4% to 5% premium, proposed by Treasury and Finance gives benchmark yields of between 620 and 720 basis points.

7. On a longer term basis the typical premium of the 10-year Commonwealth bond over the 5-year is about 20 basis points, so that the risk premium required under that proposed is 380 to 480 bp (i.e. 4 to 5 % less 20bp). This requirement is lower than the average equity risk premium suggesting a beta of less than one for the benchmark requirement. This is still well above the premium typically offered on investment grade debt securities (securities with a minimum rating of BBB). The only times premiums on BBB reach the premium levels required of that proposed by Treasury and Finance are during times of significant market financial stress.
8. We have examined the historical spread of listed Australian and Corporate Bond yields over government debt securities and, if history is a guide to the future, then CEFC would need to move to a portfolio dominated by sub-investment grade debt (e.g. a B rating or below) if its portfolio was restricted to debt securities. Alternatively it would need to lever up a portfolio to earn the required yield to meet the benchmark or include equities in the portfolio. Both of these strategies increase risk. We note the new benchmark is above the current risk premium of BB rated debt of circa 3% which is the current rating of the current CEFC portfolio.
9. The final data point was to examine the portfolio mix of the Future Fund which we understand to have similar benchmark return to that contained in the new CEFC Investment Mandate. While we have not quantified the risk characteristics of the asset classes, we note that there is a substantial investment in classes with higher risk than in the current CEFC portfolio, particularly Australian and Global equities.

## Basis for Opinion

Our view that the new CEFC Investment Mandate benchmark is unlikely to be achievable without an increase in the risk profile of the portfolio above the current BB level. A portfolio that reflects leverage (gearing) or a mix of debt and equity securities or equity securities alone. Evidence supporting these contentions comes from:

- The Capital Asset Pricing Model ["CAPM"] which is the current paradigm in the finance discipline. This model is widely used in the business and regulatory processes in Australia.
- Using the CAPM to assess the likely risk profile of a portfolio of investments that can be expected to meet the proposed revised benchmark.
- Examining the historical record of yields on investment and sub-investment grade bonds over and above the 5 year bond rate to establish whether a portfolio of such bonds would meet the proposed revised benchmark; and
- examining the nature of investments (asset classes) undertaken by the Future Fund. We understand that the new benchmark for CEFC is similar to that of the Future Fund.

## Framework

10. A basic tenet of finance theory is that investors act as if they require a reward for bearing risk – the higher the risk, the higher the required reward. The required reward is usually expressed in terms of a positive premium over a "risk free" rate of return.
11. The Capital Asset Pricing Model ["CAPM"] is the current paradigm in Finance. It reflects this basic tenet by expressing an expected rate of return on an asset as a linear function of risk with the risk premium applying above the risk free rate.
12. The CAPM describes the pricing of assets in the following way.

$$E(r_i) = r_f + E(\text{MRP}) \beta_i \quad (1)$$

Where:

$E(r_i)$  is the expected rate of return from investing in the asset;

$r_f$  is the risk free rate;

$E(\text{MRP})$  is the expected market risk premium and it is positive. It is defined as the expected return on the market  $E(r_m)$  less the risk free rate ( $r_f$ )

$\beta_i$  is the beta or risk of the asset relative to the market (It reflects the relative contribution of the asset to the risk of a well 'diversified portfolio' e.g. the market portfolio).

13. The model is widely used for estimating the required rate of return for investments in both 'real' and financial assets. By way of illustration, all Australian regulators use the CAPM for estimating the cost of equity in the building block approach to pricing the use of transmission and distribution assets in the utility sector. The regulators include ACCC, Australia Energy Regulator, ESCOSA (SA) Economic Regulation Authority (WA), IPART (NSW), Queensland Competition Authority (Qld). The regulated sectors include electricity, gas, water, telecommunications, ports and rail. Surveys of the private sector find the CAPM to be the most widely used approach to estimating the cost of equity. For example Kester et al (1999)<sup>1</sup> found that 73% of respondents used the CAPM for estimating the cost of equity. Truong, Partington and Peat (2005)<sup>2</sup> found 72% of respondents in their Australian Survey used the CAPM. Bishop (2009)<sup>3</sup> found 87% of respondents to the Australian survey used the CAPM for this purpose.
14. Typically the risk free rate used is the yield on a 10 year Commonwealth Government Security. This rate has also been used when estimating the market risk premium and it is essential that there be consistency in the term of the risk free rate used in both parts of the CAPM equation – the risk free rate and the market risk premium.
15. In theory the CAPM can be used to assess an expected return for all financial assets e.g. both debt and equity. In practice, however the required yield on debt / bonds can be directly observed for traded debt. The risk profile is usually assessed from some form of rating process.

## Risk Return Profile

16. In this section we examine the current and historical risk return trade-off for equity and debt securities. From this we can infer the risk profile necessary to provide an expected return of 620 to 720 basis points under current capital market conditions.

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<sup>1</sup> Kester, G., Chang, R., Echanis, E., Haikal, S., Isa, M., Skully, M., Kai-Chong, T. & Chi-Jeng, W., "Capital budgeting practices in the Asia-Pacific Region: Australia, Hong Kong, Indonesia, Malaysia, Philippines, and Singapore, Financial Practice and Education, vol. 9, 1999

<sup>2</sup> Truong G, G Partington & M Peat, "Cost-of-Capital Estimation and Capital-Budgeting Practice in Australia", Australian Journal of Management, Vol. 33, No. 1 June 2008

<sup>3</sup> Bishop, S., A conservative and consistent approach to WACC estimation by valuers, Value Advisor Associates, 2009.

## CAPM and Equity Risk Return Trade-off

17. Adding the market risk premium most commonly used for the CAPM of 6% to the current risk free rate provides an expected return on a market portfolio of equity securities of 860 basis points i.e.

$$\begin{aligned}\text{Expected Return} &= r_f + E(\text{MRP}) \beta \\ &= 2.6 + 6 \times 1 \\ &= 8.6\%\end{aligned}$$

18. The 6% expected market risk premium ["MRP"] has been adopted by most regulatory bodies in Australia for use in estimating the required rate of return on capital when setting prices for the regulated businesses cited above.<sup>4</sup> Further survey evidence of business practice suggests that 6% is the most widely used estimate for the MRP.
19. The estimate is largely derived from the long term average of historical excess returns of the market over the risk free rate. We have reservations about the level and consistent use of this number over time but acknowledge that it is widely used.<sup>5</sup>
20. The expected market return of circa 860 basis points derived from the CAPM is above the benchmark range proposed for CEFC of 620 – 720 using the current yield on the 5 year CTB. The benchmark can be viewed as reflecting a required rate of return commensurate with a portfolio of equity securities with a beta in the range 0.6 to 0.77 with a midpoint of 0.7 (rounded).
21. The actual outcome for a portfolio of this risk ( $\beta = 0.6$  to  $0.77$ ) will, of course, be different from this. This is the nature of risk.
22. While the actual outcome will have a similar probability of being above or below this estimate of 6.2% to 7.2%, of concern is the downside risk to capital invested in a portfolio which contains equities with average risk in the range  $\beta = 0.6$  to  $0.77$ . If it is assumed that the distribution of possible returns on the market and our benchmark portfolio is (log) normally distributed (as is the case in the CAPM), then the profile of possible returns can be derived from the expected return and from the standard deviation of the distribution.

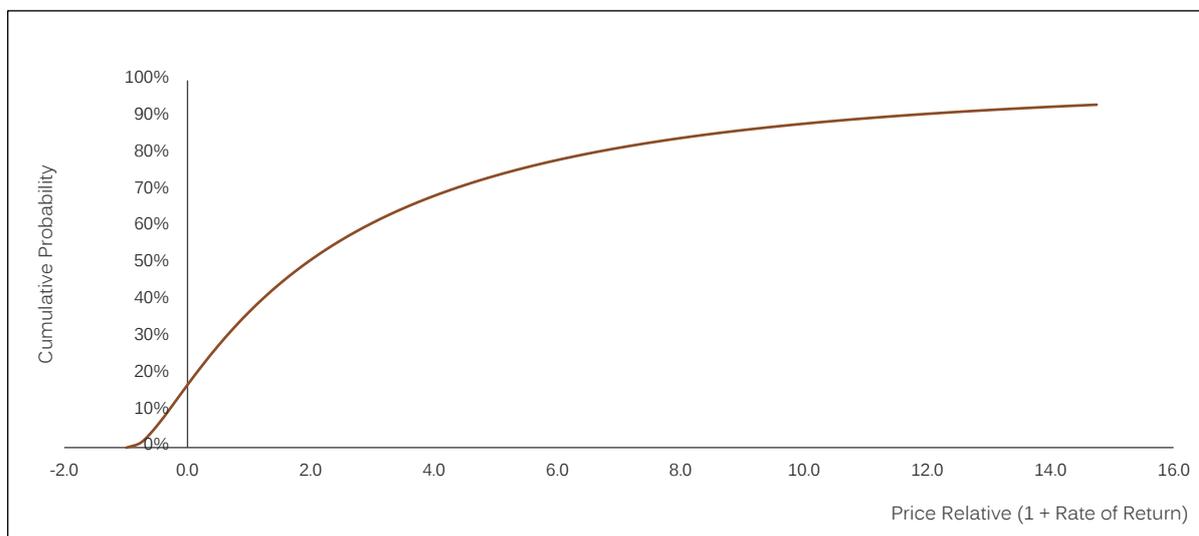
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<sup>4</sup> A detailed discussion of this choice is available in Australian Energy Regulator, "Better Regulation, Explanatory Statement, Rate of Return Guidelines (Appendices) December 2013 pp78 - 113

<sup>5</sup> Bishop, Fitzsimmons, Officer, 'Adjusting the market risk premium to reflect the global financial crisis', The Finsia Journal of Applied Finance, Issue 1, 2011

23. While we do not know the standard deviation of the forward view of possible returns on the market we can infer from the historical record. Such an inference is consistent with the assumption that the forward view of the MRP can be estimated from the historical view.
24. The standard deviation of annual market returns for the Australian Stock Exchange over the period 1883 to 2013 is 17.5%.<sup>6</sup> For illustrative purposes we assume the distribution of expected returns for the efficient benchmark portfolio with a beta of 0.7 is currently described by a mean of 6.7% for a single year and a standard deviation of 12.25%.<sup>7</sup> The mean of 6.7% reflects the mid-point of the benchmark range and corresponds with a beta of 0.7.
25. Consequently, under the above assumptions, there is a 17% chance that the actual return will be negative and erode capital.
26. Figure 1 shows the cumulative probability of the distribution of possible returns under an assumption that returns are described by a normal distribution with a mean return (expected return) of 6.7% and a standard deviation of 12.25%. The area under the curve to the left of zero is the probability of the return being negative i.e. 17% in this case.

**Figure 1: Cumulative Distribution of Possible Return on an Equity Portfolio of Average Risk**



<sup>6</sup> Data from Officer see Officer 1989: Officer, R. R. (1989), 'Rates of Return to Shares, Bond Yields and Inflation Rates: An Historical Perspective', in Ray Ball, Philip Brown, Frank J. Finn and R. R. Officer(eds.), Share Markets and Portfolio Theory: Readings and Australian Evidence, University of Queensland Press., Bloomberg

<sup>7</sup> The standard deviation of an efficient portfolio will lie on the security market line and its risk will be equal to  $\beta$  times the risk of the market portfolio i.e.  $0.7 * 0.175$

27. Table 1 describes the expected return from a benchmark portfolio of securities with a beta of 0.7 over a 1, 3 and 5 year period. It also shows the probability of a negative return and therefore erosion of capital. The estimates were derived with an assumption that annual expected returns are log normally and independently distributed.

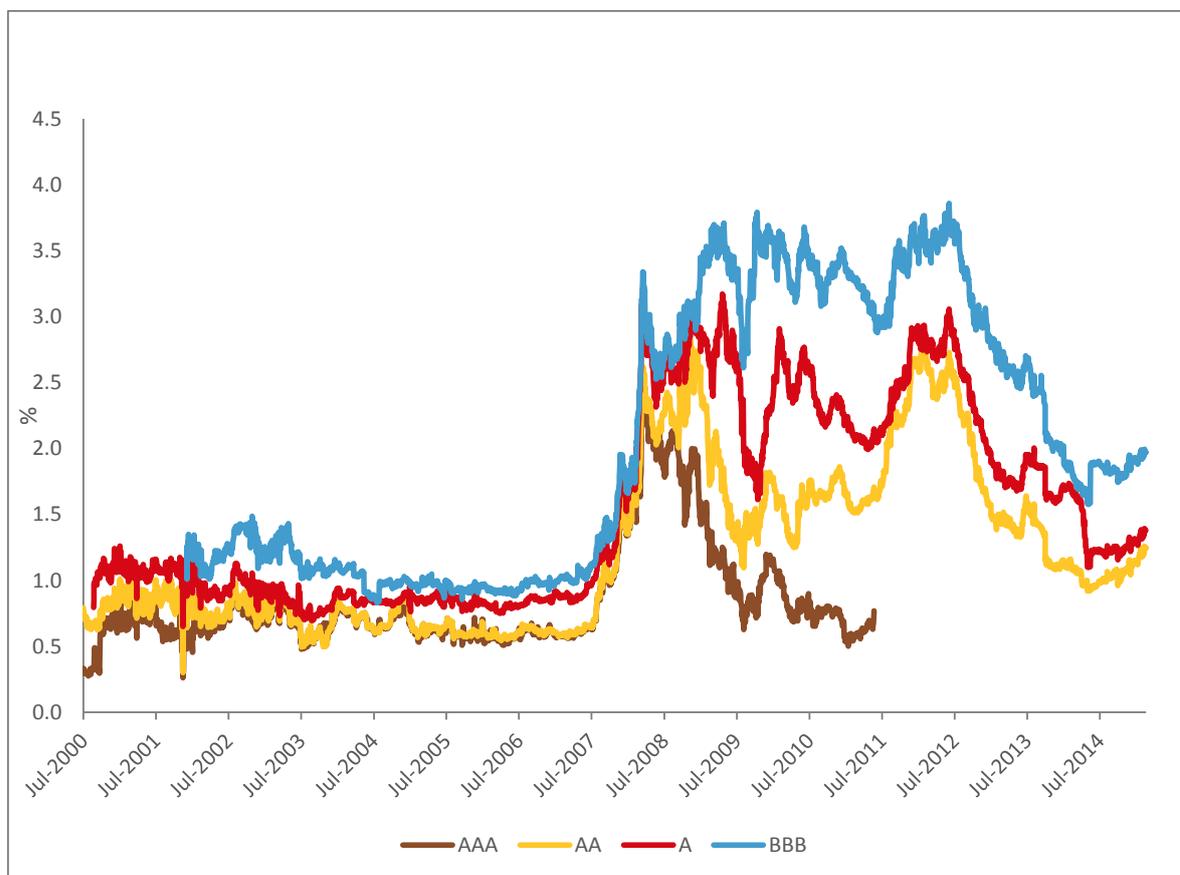
**Table 1: Probability of eroding capital over various time periods**

	1 Year	3 Year	5 Year
Expected Return	6.7%	21.5%	38.3%
Standard Deviation	12.3%	21.2%	27.4%
Prob. of Negative Return	17.1%	15.8%	13.9%

## Debt Yields and Risk Return Trade-off

28. We understand that portfolio of investments in the current CEFC portfolio are largely debt securities which are a mix of investment and sub-investment grade securities. A question arises as to whether maintaining a debt portfolio similar to the current mix would yield sufficient returns to meet the proposed revised benchmark.
29. We cannot answer this directly as we don't have a detailed knowledge of the composition and risk profile of the portfolio. Nevertheless we can assert that it is unlikely to meet the new benchmark in the future without increasing the risk profile. As noted in the prior section, this risk profile would need to have risk that is about 70% of the average risk of the market for equities.
30. We have examined the historical record of investment yields for investment grade corporate bonds since 2001 to provide some insight into the spread of yields above 5 year Commonwealth Trading Bonds ["CTBs"] actually achieved. Figure 2 presents the yield on traded investment grade bonds less the yield on 5 Year CTBs. Table 2 provides summary statistics for the underlying data. Of interest is how often a portfolio of the different rated bonds have achieved the 'premium' over the 5 year CTB yield in the past.
31. We recognise that unlisted bonds / debt may provide a liquidity premium over and above the yields on listed corporate bonds. We understand CEFC debt investment portfolio is unlisted consequently and may achieve higher returns than the listed counterpart as is necessary to cover the additional risk of liquidity.
32. It is apparent from Table 2 that the average bond yields less the yield on 5 year CTBs for all ratings falls short of the benchmark of 400 to 500 basis points. This suggests that if history repeats then a portfolio of listed investment grade corporate bonds would not meet the required benchmark return. CEFC would need to invest mostly in low sub-investment grade bonds to achieve the benchmark with substantive increase in risk. However, this is not consistent with the new Investment Mandate which requires the risk in the portfolio to remain unchanged (i.e. remain at the current level of BB).
33. The market for corporate bonds is relatively illiquid consequently there are some quarters when there isn't a yield reported by Bloomberg. This leads to a different number of observations for the rating categories in Table 2 and therefore non contemporaneous data.

**Figure 2: Corporate Bond Yields less 5 Year Commonwealth Treasury Bonds**



Source: Bloomberg, RBA Website

**Table 2: Corporate Bond Spread over 5 Year CTB 2001 to Feb 2015**

	AAA (%)	AA (%)	A (%)	BBB (%)
Average	0.83	1.21	1.55	2.06
Current <sup>8</sup>		1.25	1.38	1.97
Maximum	2.56	2.85	3.22	3.86
Minimum	0.26	0.30	0.65	0.83
No. Observations	2,837	3,814	3,777	3,443

Source: Bloomberg, RBA

34. The market for rated debt in the USA is more liquid than in Australia and has data across a wider range of ratings. Table 3 summarises the spread of the yield on 5 year corporate bonds less the yield on 5 year maturing Treasury Bonds in the USA.

<sup>8</sup> As of 19 February 2015 – data not available for AAA rated bonds

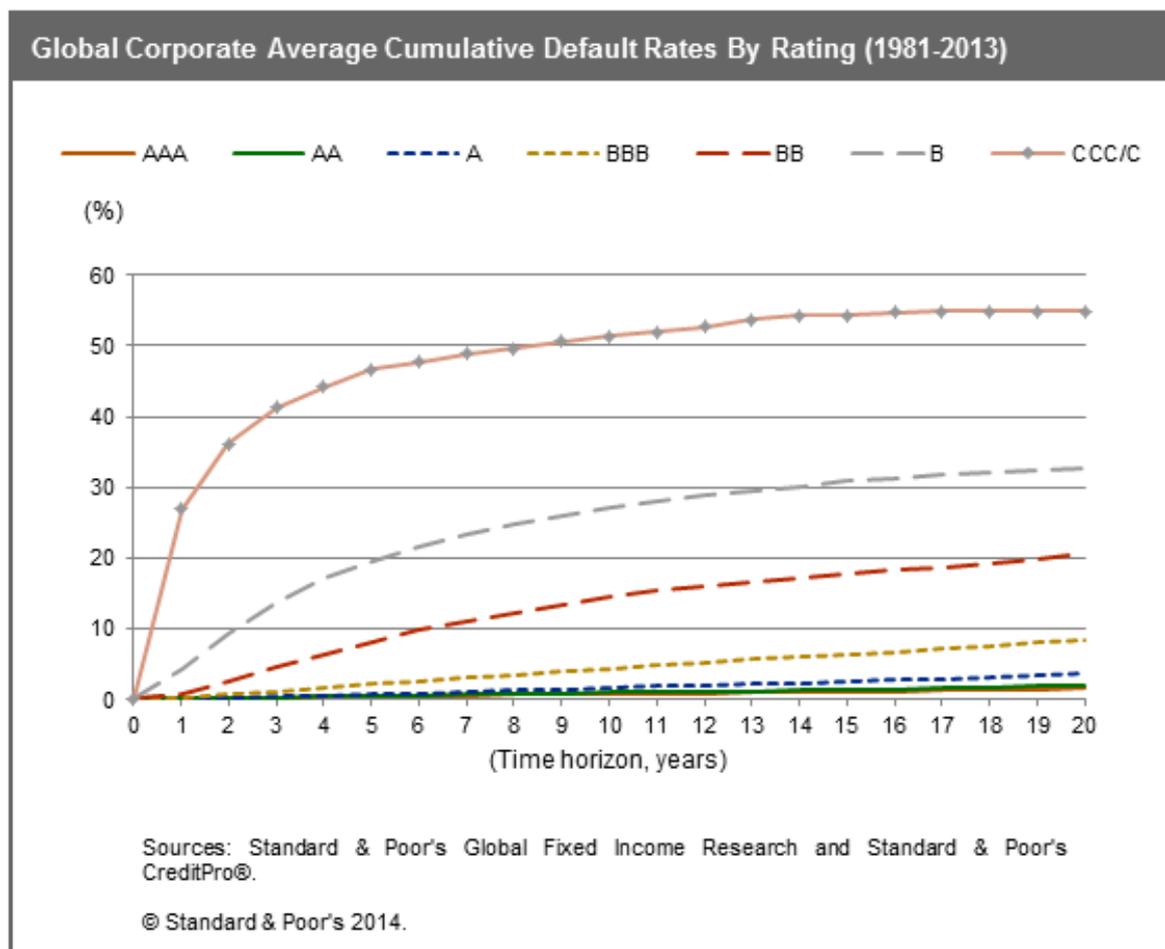
35. It is apparent that, if the Investment Mandate called for investment in corporate debt, it would be necessary to invest in sub investment grade bonds with, based on current yields, a credit rating of B or below in the USA to earn, on average, the required 400 to 500 basis point spread. There is a step jump in risk from investment to sub-investment grade risk (from BBB to lower ratings, such as B) as is captured in Figure 3. Figure 3 shows the global cumulative default rates by rating as prepared by Standard & Pools. A question arises as to whether such a step jump is consistent with the constraints imposed under the new CEFC Investment Mandate. It would appear that the requirement to retain the current level of risk equivalent to a BB rating would not be feasible.

**Table 3: Bond Spread over 5 Year Treasury Bonds 2001 to 2015 by Credit Rating - USA Data**

	AAA	AA	A	BBB	BB	B	CCC
Average	1.2%	1.3%	1.8%	2.7%	4.4%	6.2%	12.0%
23 Feb 2015	0.8%	0.8%	1.1%	2.1%	3.0%	4.9%	8.7%
Maximum	6.4%	5.3%	7.0%	8.5%	14.8%	20.9%	43.5%
Minimum	0.5%	0.2%	0.7%	1.1%	1.8%	2.4%	4.2%
No. Observations	3,675	3,675	3,675	3,675	3,675	3,675	3,675

Source: Federal Reserve Economic Data, (BofA Merrill Lynch US Corporate Bonds Effective Yield)

Figure 3: Standard & Poors Bond Default Rates



Source: Standard & Poors, "Default, Transition, and Recovery, 2013 Annual Global Corporate Default Study And Rating Transitions"

### Future Fund Portfolio

36. We understand the new CEFC Investment Mandate is similar in style to that of the Future Fund. The Future Fund's mandate is "to target a return of at least CPI + 4.5% to 5.5% pa over the long term with acceptable but not excessive risk."<sup>9</sup>
37. We regard this as a lower target (ignoring expenses) than the proposed target of the Yield on 5 year CTBs plus 400 to 500 basis points proposed for CEFC. This is because the difference between the average yield on the 5 year CTBs is higher than 50 basis points above the CPI (the average difference from 1972 to 2014 was 272 basis points suggesting the target is in the order of 220 basis point higher if expenses are ignored).

<sup>9</sup> See footnote 2, Future Fund Portfolio Update at 31 December 2014

38. The portfolio mix chosen by the Future Fund provides useful guidance as to what a portfolio with acceptable but not excessive risk might look like. Table 1 summarises the asset class mix in the portfolio over the last 5 years. The portfolio is dominated by equity with the debt component decreasing over time.

Table 4: Future Fund Portfolio Mix by Asset Class

	30-12-14	30-06-13	30-06-12	30-06-11	30-06-10
Australian equities	8.8%	9.7%	10.4%	11.2%	11.8%
Global equities					
Developed Markets	20.9%	23.8%	17.5%	21.3%	21.8%
Emerging Markets	9.4%	7.1%	5.0%	5.1%	3.1%
Private Equity	9.5%	7.3%	6.4%	3.9%	3.0%
Property	6.3%	6.0%	6.4%	6.5%	5.0%
Infrastructure	7.4%	8.1%	6.4%	5.3%	4.5%
Debt Securities	10.8%	15.6%	18.3%	19.4%	21.9%
Alternative Assets	14.0%	16.6%	19.0%	18.6%	15.6%
Cash	12.8%	5.8%	10.6%	8.8%	13.1%

Size AUD M	109,214	88,889	77,012	74,213	63,074
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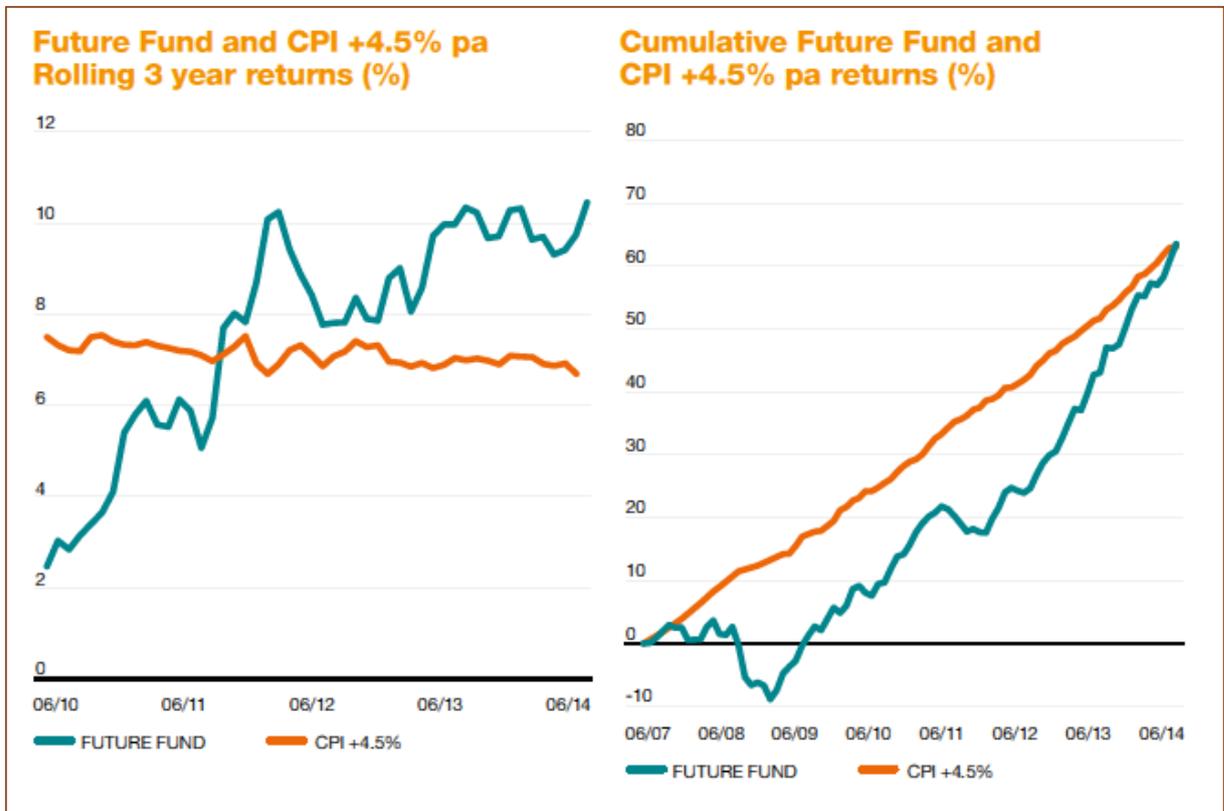
Annual FY Return FY	7.5%	15.4%	2.1%	2.9%	10.6%
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The annual return shown for 30/12/14 is the prior 6 month return

Source: Future Fund Update Reports on Website

39. The Future Fund's performance against the benchmark is captured in Figure 4. This has been extracted from the FY 2014 annual report. It is clear that it is only in recent years that long term cumulative performance has reached the benchmark.

Figure 4: Future Fund Performance against the benchmark



Source: Future Fund Annual Report 2014

40. The investment opportunity set for the CEFC is substantially narrower than the Future Fund - an issue not addressed at this stage. However it is apparent from the investment profile of the Future Fund that it takes a risk profile much higher than a debt portfolio and that of the CEFC - as evidenced by the equity component of the portfolio.

## Biographical Notes

### Professor Bob Officer

B AgSc (Melbourne), M AgEc (New England), MBA (Chicago), PhD (Chicago), SF Fin

Bob has primarily focused on academic and consulting work. His expertise and research includes corporate and international finance, capital markets, industrial organisation, takeovers and antitrust.

He has played a substantive role in advising both regulatory bodies and regulated bodies on a whole range of issues associated with regulatory price setting for infrastructure assets. He has an international reputation for his pioneering work on the impact of dividend imputation on valuation

Bob was Chair of Victorian Funds Management Corporation until May 2006 with about \$37 billion under management and he has been integrally involved in the Australian Pension Fund industry for many years. He has held several other appointments including Chairman of both the Victorian and National Commissions of Audit, and has consulted to a large number of public, private and government organisations.

He sits on the Board and Investment committee on a number of Fund Managers including Acorn Capital, CP2 and JCP Investment Partners. In addition he has held seats on a number of significant government and private sector organisations.

Bob has held Professorial positions in Finance at Monash University, University of Queensland and Melbourne Business School. He has held visiting Professor roles at Stanford Graduate School of Management and the Wharton School. He is Professor Emeritus at University of Melbourne.

### Dr Steven Bishop

B Ec (Monash), MCom (Hons) (UNSW), PhD (AGSM), FCPA

Steve is a valuation and corporate finance consultant. He a founding director of Education and Management Consulting Services Pty Ltd ["EMCS"].

Steve's primary consulting interest is around the application of valuation insights to business decisions. In particular, he has guided the implementation of value-based management in a number of large and medium sized corporations. In addition, he has prepared a large number of expert opinions on matters relating to the cost of capital and business valuations.

Assignments have included business valuations for compliance, cost of capital estimation, merger and acquisition advice, the development of strategic and business plans, strategy advice, transfer pricing analysis and aspects of price determination in utility regulation.

Steve has worked in a number of industries including Aquaculture, Chemicals, Electricity, Financial Services, Forestry, Gas, Infrastructure, Minerals and Mining, Property, Rail, Retailing, Shipping & Transportation, Telecommunications, Water and Waste-water.

Steven was also a founding Executive Director of Value Adviser Associates, a business valuation and corporate advisory practise with offices in Melbourne, Brisbane and Adelaide. Prior to VAA, Steve was a partner in L.E.K. Consulting, a world-wide management consultancy business; with Marakon Associates, as a senior manager in the firm that was a foundation consulting business in value based management principles and application; with Andersen Consulting as a Senior Manager in the Strategic Services section.

Prior to joining the consulting sector, Steve worked as an academic for over 15 years. He held academic positions at AGSM, University of NSW, Monash, Melbourne Business School and the Bendigo Institute of Technology. Steven co-authored "Corporate Finance" by Bishop, Faff Oliver and Twite (now in the 5th edition). He continues to teach in the Masters of Applied Finance offered by Macquarie University.