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Statutory Review of the Clean Energy Finance Corporation

Report prepared for the Department of the Environment and Energy

10 October 2018

Deloitte.

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The Hon. Angus Taylor, MP
Minister for Energy
PO Box 6022
House of Representatives
Parliament House
Canberra ACT 2600

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Dear Minister

Statutory Review of the Clean Energy Finance Corporation Act 2012

Deloitte Touche Tohmatsu (Deloitte) is pleased to provide the enclosed report detailing the findings of its statutory review of the *Clean Energy Finance Corporation Act 2012* (the Act).

Under the Act, the nominated Minister (in this instance, the Minister for Energy) must arrange for a review of the Act to be undertaken as soon as practicable after 1 July 2016. This review must include a review of the effectiveness of the Clean Energy Finance Corporation (CEFC) in facilitating increased flows of finance into the clean energy sector, make provision for public consultation, and include a written report of the review.

Deloitte was engaged by the Department of the Environment and Energy to undertake this review in November 2017. Under the Terms of Reference, Deloitte was asked to consider:

01. The effectiveness of the CEFC in facilitating increased flows of finance into the clean energy sector; and
02. Other matters considered relevant to the operation of the CEFC Act more generally.

The enclosed report finds that the CEFC has been effective in facilitating increased flows of finance into the clean energy sector over the period of its operation to 31 December 2017. Over this time, the CEFC directly invested $4.3 billion in projects across the clean energy sector, leveraging over $7.8 billion of private sector finance in support of these projects.

We are grateful to those who assisted us in the course of the review. This includes the Department of the Environment and Energy, Department of the Prime Minister and Cabinet, Department of Finance, the CEFC and CEFC stakeholders who engaged with us in the process of this review.

Yours faithfully

Kumar Padisetti
Deloitte Touche Tohmatsu

Content

Glossary

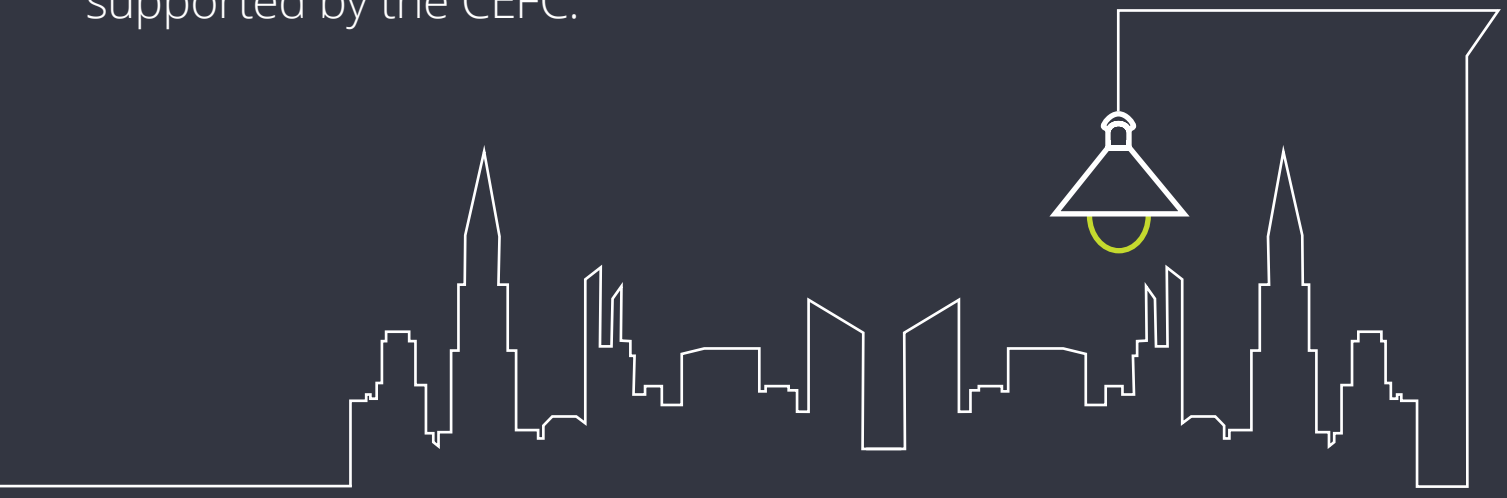
Acronym	Full name
2013 Mandate	Clean Energy Finance Corporation Investment Mandate Direction 2013
2015 Mandate	Clean Energy Finance Corporation Investment Mandate Direction 2015
2015 Mandate No. 2	Clean Energy Finance Corporation Investment Mandate Direction 2015 No. 2
2016 Mandate	Clean Energy Finance Corporation Investment Mandate Direction 2016
2016 Mandate No. 2	Clean Energy Finance Corporation Investment Mandate Direction 2016 No. 2
the Act	The Clean Energy Finance Corporation Act 2012
ACT	The Australian Capital Territory
AEMO	The Australian Energy Market Operator
AFIA	The Australian Financial Industry Association
AFPA	The Australian Forest Products Association
AGBR	Australian Government Bond Rate
AI Group	Australian Industry Group
AIP Plan	Australian Industry Participation Plan
ANZ	Australia and New Zealand Banking Group
ARENA	Australian Renewable Energy Agency
ASX	Australian Securities Exchange
ATSE	The Australian Academy of Technology and Engineering
AUD	Australian dollar
BRIG	Bundaberg Regional Irrigators Group
CAFBA	Commercial and Asset Finance Brokers Association
CBA	Commonwealth Bank of Australia
CBD	Central Business District
CCS	Carbon capture and storage
CDC	Caisse des Dépôts
CEC	Clean Energy Council
CEFC	Clean Energy Finance Corporation
CfD	Contract for differences
CHP	Community housing providers
COSBOA	Council of Small Business of Australia

Acronym	Full name
Committed	This refers to investments that have been allocated capital, but have not reached financial close
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Deloitte	Deloitte Touche Tohmatsu
the Department	The Department of the Environment and Energy
EEF	Energy efficiency fund
EIB	European Investment Bank
ERF	Emissions Reduction Fund
EU	European Union
Finncorn	Finncorn Consulting Pty Ltd
GBCA	Green Building Council of Australia
GFO	Green Finance Organisation
GIG	Green Investment Group
GRESB	Global Real Estate Sustainability Benchmark
ICPF	The Investa Commercial Property Fund
IGCC	Investor Group on Climate Change
Innovation Fund	Clean Energy Innovation Fund
Invested	This refers to investments that have reached financial close
KfW	The German Development Bank
KKR	Kohlberg Kravis Roberts
KPI	Key Performance Indicator
LCAL	Low Carbon Australia Limited
LCOE	Levelised cost of energy
LGC	Large scale generation certificate
LRET	Large-scale Renewable Energy Target
the Minister	The Minister for the Environment and Energy
MW	Megawatt
NAB	National Australia Bank
NABERS	National Australian Built Environment Rating
NAIF	Northern Australia Infrastructure Facility

Acronym	Full name
NatHERS	Nationwide House Energy Rating Scheme
NEM	National Electricity Market
NFP	Not-for-Profit
NORD/LB	Norddeutsche Landesbank Girozentrale
NSW	New South Wales
NYGB	New York Green Bank
OECD	Organisation for Economic Co-operation and Development
PPA	Power Purchase Agreement
PV	Photovoltaic
QFF	Queensland Farmers Federation
QIC	Queensland Investment Corporation
QTIC	Queensland Tourism Industry Council
Ratesetter	RateSetter Australia Pty Limited
RET	Renewable Energy Target
RIAA	Responsible Investment Association Australasia
SGCH	St George Community Housing
SME	Small and medium-sized enterprises
UK	United Kingdom
US	United States
WWF	World Wildlife Fund

Executive summary

The Clean Energy Finance Corporation (CEFC) was established in 2012 with the object to facilitate increased flows of finance into the clean energy sector, which is defined under the Act by reference to renewable energy, energy efficiency and low emission technologies (collectively clean energy technologies). From inception to 31 December 2017, the CEFC invested $4.3 billion in projects across the clean energy sector, with a further $0.8 billion in commitments to finance clean energy technology projects. Further to the $4.3 billion of CEFC investment, $7.8 billion in private sector finance had been invested in projects supported by the CEFC. That is, more than $12 billion of combined CEFC and private capital had been invested in projects supported by the CEFC.



The CEFC is a Commonwealth statutory authority, set up to be a specialist clean energy financier. Under the *Clean Energy Finance Corporation Act 2012* (the Act), the CEFC is able to invest, directly and indirectly, in clean energy technologies. The Explanatory Memorandum to the *Clean Energy Finance Corporation Bill 2012* outlines that the CEFC is expected to invest in businesses or projects for the development or commercialisation of clean energy technologies, at the later stages of development, to catalyse and leverage the flow of funds. Further, it outlines that the CEFC is a mechanism to mobilise investment using financial products and structures to address the barriers inhibiting investment, while valuing public benefit and leveraging private sector finance.

Under the Act, the nominated Minister[1] must arrange for a review of the Act to be undertaken as soon as practicable after 1 July 2016.[2] This review must include a review of the effectiveness of the CEFC in facilitating increased flows of finance into the clean energy sector, make provision for public consultation, and include a written report of the review. Deloitte Touche Tohmatsu (Deloitte) was engaged by the Department of the Environment and Energy to undertake this review in November 2017. Under the terms of reference, Deloitte was asked to consider:

01. The effectiveness of the CEFC in facilitating increased flows of finance into the clean energy sector; and
02. Other matters considered relevant to the operation of the CEFC Act more generally.

This report sets out the findings of the review.

Effectiveness of the CEFC in facilitating increased flows of finance into the clean energy sector

In undertaking this review, Deloitte has considered the effectiveness of the CEFC in facilitating increased flows of finance into the clean energy sector, via investment in clean energy technologies, through examination of:

- The object of the Act, which is to establish the CEFC to facilitate increased flows of finance into the clean energy sector
- The counterfactual, which involves analysis of whether the relevant outcome would have occurred in the absence of the CEFC

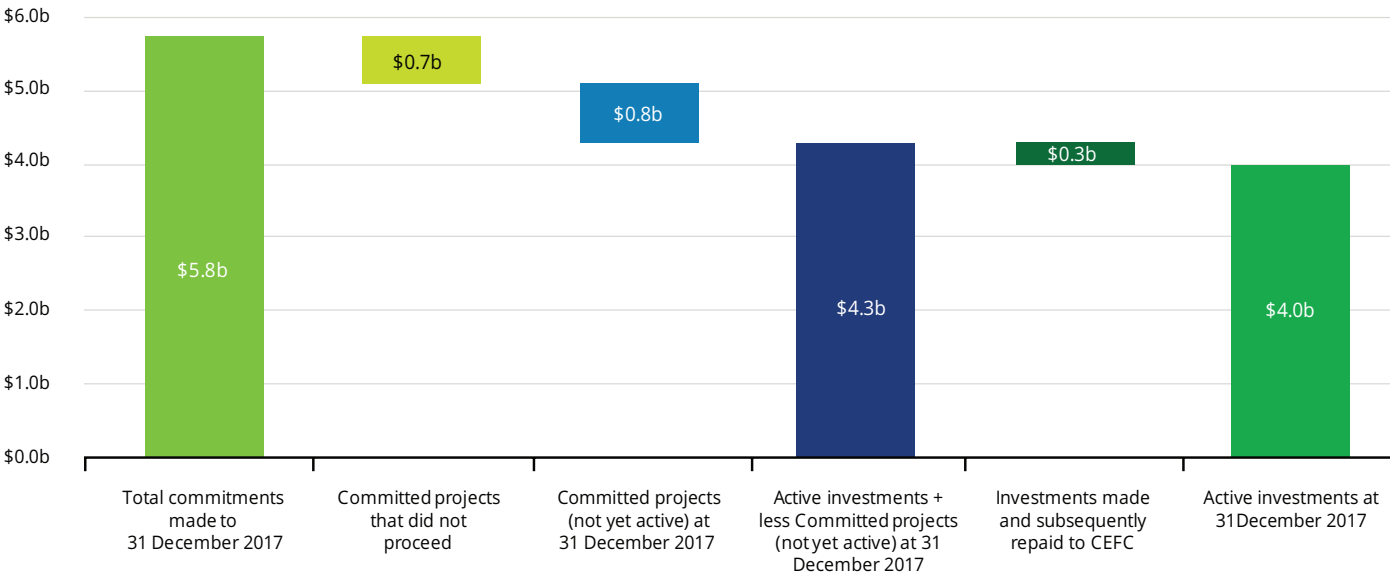
Our analysis through this review supports a finding that the CEFC has been effective in facilitating increased flows of finance into the clean energy sector projects it supported. The CEFC has invested its own capital in the sector, as well as attracted further private investment in the clean energy projects it supported. There is evidence to support a finding that in the absence of the CEFC a range of projects it supported may not have proceeded. However, given the nature and immaturity of a number of CEFC investments, it is difficult to measure the full impact of the CEFC's involvement on private investment in the clean energy sector more broadly.

Figure i shows the total value of the CEFC's investment activity to 31 December 2017. The $5.8 billion of total commitments made by the CEFC captures the total value of capital approved and allocated by the CEFC Board to clean energy technology projects. At 31 December 2017, $0.7 billion of commitments made by the CEFC Board had expired, meaning that the commitments had not and would not proceed for various reasons, including that: the project proceeded without the CEFC's finance; the facility was reduced or expired; or the project was abandoned.

To 31 December 2017, $300 million of capital invested by the CEFC had been repaid, and was available for redeployment for other projects. This includes amounts invested under Low Carbon Australia Limited (LCAL), or related programs. At 31 December 2017, the CEFC had made a further $0.8 billion in commitments to projects that had not yet reached financial close. Although the CEFC was contractually committed to most of these investments, not all conditions had been met by the respective counterparties. As such, these counterparties were not able to draw on the funds.

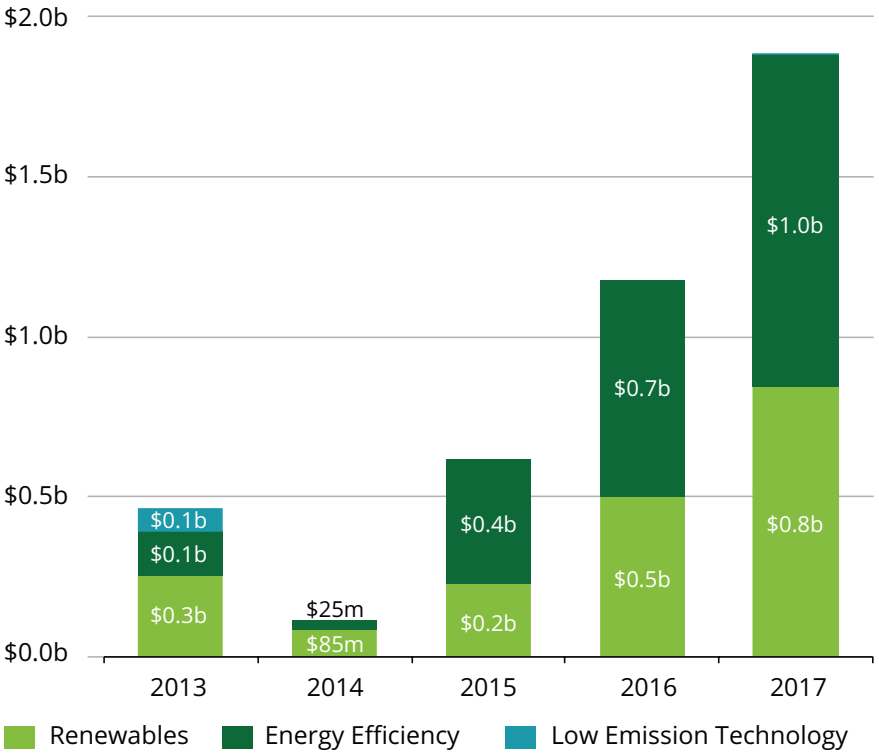
A total of $4.0 billion was 'active' as of 31 December 2017 and, accordingly, the full amount of this capital was available to be drawn by the counterparties. Although some projects may not actually draw down all of the funds available to them, these funds cannot be used for other purposes. To 31 December 2017, the CEFC has invested $4.3 billion, being the combined value of the $4.0 billion in active investments and $0.3 billion invested and subsequently returned to the CEFC.

Figure i: CEFC investments and commitments since inception to 31 December 2017



Source: CEFC database extract at 31 December 2017

Figure ii: CEFC investments by technology to 31 December 2017



Investment by clean energy technology

Under the Act, the CEFC may only invest in renewable energy, energy efficiency and enabling technologies, and low emission technologies.

Figure ii shows the CEFC's investments from inception to 31 December 2017 by technology type. The CEFC's investment in renewable energy technology remained relatively constant over its period of operation to 31 December 2017, with the exception of 2014 where investment in this technology was impacted by policy uncertainty created by the Review of the Renewable Energy Target (RET). In contrast, investment in energy efficiency technology was smaller in the early years of the CEFC's operation, but has rapidly grown since 2015. There have been limited investments in low emissions technologies to date due to the comparatively limited availability and size of investable opportunities.

It should be noted that a number of investments that the CEFC made in

financial products, including in aggregation loans, were captured as investments in energy efficiency for the purpose of the database from which this figure is derived. Not all of the funds invested in these loans were used to finance energy efficiency projects, with a proportion of the funds going to renewable energy technologies (such as rooftop solar). As a result, the extent of the CEFC's investment in renewable energy technology is likely to be understated by Figure ii.

Under the Act, the CEFC is required to ensure that at any time on or after 1 July 2018, at least half of the funds invested are invested in renewable energy technologies. The CEFC has indicated that 54% of its funds were invested in renewable energy technologies as of 31 December 2017. We note that the analysis by technology type has been completed at a greater level of detail than other analysis in this report, and may not reconcile with other analysis as a result. In supporting clean energy technology projects, the CEFC invests in different industries and sectors across the Australian economy, including in the Energy sector, the Property and Industrial sector, Government and Not-for-Profit (NFP) sector, and the Transport sector. The CEFC also invests in these sectors indirectly via investments in financial products.

Investments by sector

The CEFC has supported projects across a range of these sectors. As shown in Figure iii, CEFC's investments have been concentrated in the Energy and Property and Industrial sectors. Within each sector the CEFC's investment activity has concentrated around specific sub-markets: wind and solar in the Energy sector and property investments for the Property and Industrial sector. Investments in financial products grew sharply from 2016, including investment in climate bonds and aggregation loans.

Investments by financial product

In making investments in clean energy technologies, the CEFC has used different financial products. Investments can broadly be categorised as follows: direct investments, totalling $2.7 billion (62% of total investment) over 54 projects, and investments through a financial intermediary (such as a bank), totalling $1.6 billion (38% of total investments) over 24 projects. [3] For this analysis, direct investments include project finance, corporate loans (as they are largely allocated to specific projects) and equity. Finance provided through an intermediary includes climate bonds and aggregation loans. Aggregation loans allow the CEFC to invest in smaller scale (i.e. small business) projects.

As shown in Figure iv, the majority of the investments that the CEFC has made are in project finance (31%), aggregation partnerships (29%) and corporate loans (19%).

Figure iii: CEFC investments by sector 2013 - 2017

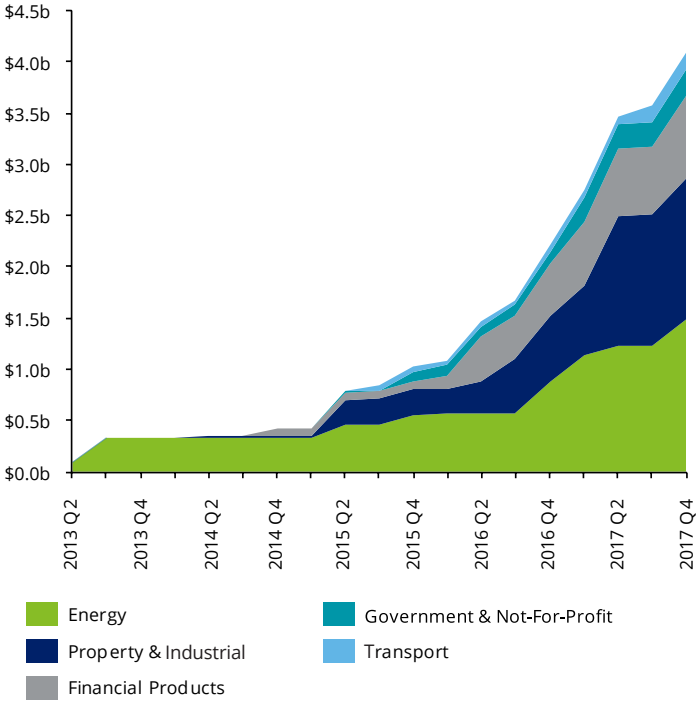
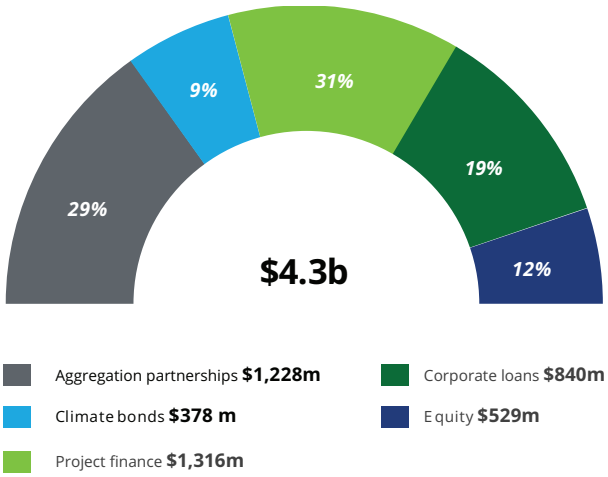


Figure iv: CEFC investments by financial product to December 2017

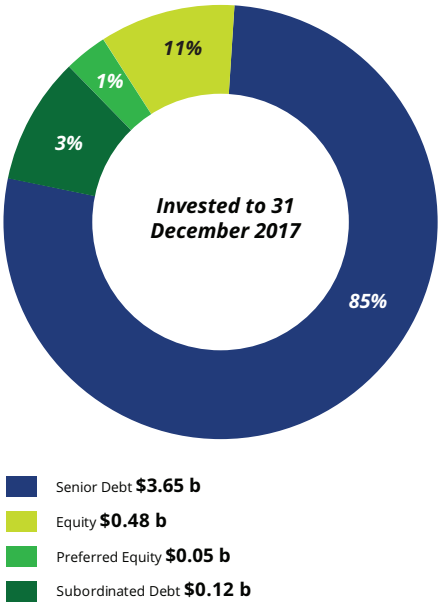


Investments by financial instrument

In making investments in clean energy, the CEFC has tended to prefer investing in lower risk financial instruments, including senior debt. As shown in Figure v, as of 31 December 2017, $3.65 billion, or 85% of investments were made in senior debt.

In contrast, only $0.65 billion, or 15%, was invested in potentially higher risk and higher return financial instruments such as equity. For clarity, this is not to imply that the CEFC has not made higher risk investments. While the CEFC has adopted financial instruments that are comparatively lower risk (i.e. senior debt), the projects supported have remained generally higher risk, including, for example merchant renewable energy generation projects.

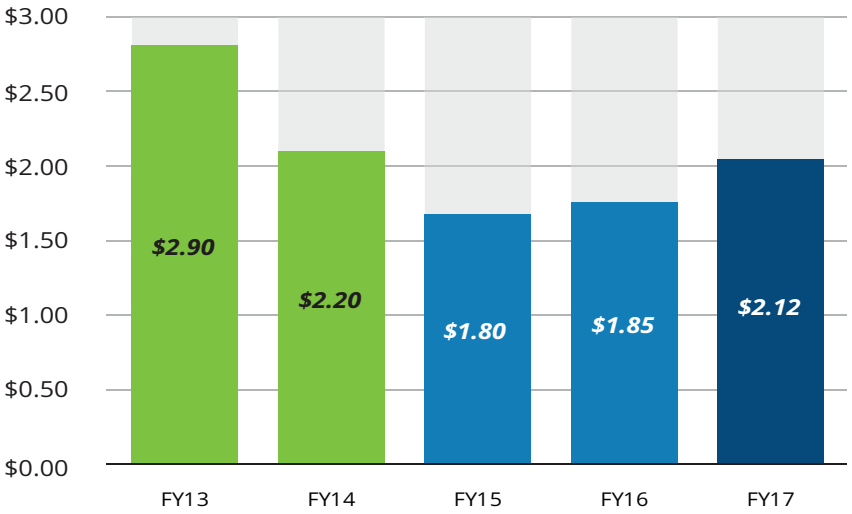
Figure v: CEFC investments by financial instrument



Private sector leverage

The CEFC calculates private leverage as the amount of private finance contributed in each project relative to the CEFC investment. The CEFC reports the amount of private capital it has leveraged in each financial year in its annual report. In the financial year ended 30 June 2017, the CEFC reported that for each dollar of CEFC investment, it leveraged $2.12 in private sector investment.[4] The investment that the CEFC has leveraged over the five years of its operation has varied, as shown in Figure vi, with the CEFC leveraging a high of $2.90 per dollar of investment in its first year of operation and a low of $1.80 per dollar of investment during FY15.

Figure vi: Portfolio investment per $1 of CEFC capital



In addition to leveraging private sector funds, the CEFC has also had a positive indirect impact on flows of finance into the clean energy sector through knowledge and capability development in the market. While the CEFC's focus on knowledge and capability development is not as strong as that of the Australian Renewable Energy Agency's (ARENA) focus, this is appropriate as the "return" that ARENA seeks from a grant is the development of industry capability rather than a financial return. Stakeholder consultation has indicated that the staff of the CEFC are well respected in the industry and their involvement in a project reportedly provides comfort to other commercial financiers about the strengths of a project.

Collectively, this evidence supports a finding that since inception, the CEFC has been effective in directly and indirectly facilitating increased flows of finance into a range of clean energy projects across a number of sectors utilising different financial products consistent with its objective.

Key findings

- The CEFC has directly invested in the clean energy sector and, to 31 December 2017, had invested $4.3 billion with commitments to a further $0.8 billion of investment.
- The CEFC has invested in renewable energy and energy efficiency technologies, and to a lesser degree, in low emissions technology. As of 31 December 2017, the CEFC had invested approximately 54% of its funds in renewable energy technologies, consistent with the requirements under the Act. The CEFC has indicated that it had at least half of its active investments at 1 July 2018 invested in renewable energy technology.
- The CEFC has been effective at facilitating increased flows of finance into clean energy projects across different sectors of the Australian economy. Most of its investment activity has been targeted at the energy industry, the property and industrial sector and financial products.
- The CEFC has developed a broad range of debt financial products. The primary focus on debt products may shift as the sector matures similar to other green banks around the world.
- The CEFC has been effective at leveraging private capital, leveraging between $1.80 and $2.90 in private capital for every $1 invested since its inception. This has been primarily driven by project finance investment and climate bonds.
- The knowledge, expertise and experience of the CEFC provides benefit to the market, in that it builds market capability with respect to financing clean energy projects. The application of this knowledge, expertise and experience is not as public as ARENA's knowledge sharing initiatives, but this is appropriate given the function of the CEFC.

Was the CEFC's involvement integral to the outcome?

To consider the effectiveness of the CEFC against the counterfactual – that is, whether projects would have proceeded in the absence of the CEFC – a sample of CEFC investments was reviewed. Specifically, this review considered:

- The extent to which the involvement of the CEFC in a deal or transaction was integral to that deal proceeding; and
- Whether the involvement of the CEFC changed the behaviour of the partner investor or other investors.

From the case studies, there is evidence that the CEFC has been effective relative to the counterfactual. The case studies suggest that in a number of instances, the project that proceeded with the CEFC's support may not have otherwise successfully completed due to the perceived risk associated with the project or the low return expectations. The case studies also show that the CEFC's involvement in different projects appears to have resulted in greater clean energy commitments than may have otherwise been the case.

However, for some investments it is difficult to conclude that the CEFC's investment addressed a financing gap in the form of a lack of capital. In particular, while the CEFC was able to support energy efficiency investment through its investment in property funds, it is difficult to conclude that this would not have occurred to a greater or lesser extent in its absence. This is because there is an increasing trend towards greater sustainability in commercial real estate, specifically, premium office space property, driven in part by the preferences of high profile tenants and the higher rental yields these spaces attract. Although the change in behaviour targeted through commercial property fund investments, specifically lower emissions operations, may not have occurred at the same scale or pace without CEFC involvement, it is likely that these highly rated investment grade property funds would have been able to raise at least some of the capital independently.

Key findings

- Case studies suggest that in the absence of the CEFC, a number of the projects that it supported would not have proceeded due to the perceived risk of the project or low return expectations. The CEFC does appear to have been effective in overcoming barriers to finance, enabling projects to proceed where otherwise they may have not successfully completed. There is evidence to support a finding that the CEFC has declined to proceed with an investment where private finance was available, to limit displacement of private sector capital.
- There is evidence that the involvement of the CEFC in different projects has had an impact on the profile of those projects. The CEFC appears to have been able to effect greater clean energy commitments for project proponents than would have otherwise been the case in its absence. However, in relation to investments in property funds, while it appears that the CEFC has been able to support greater energy efficiency outcomes through its investment in property funds, it is difficult to conclude that this would not have happened to a greater or lesser extent in the absence of the CEFC given the trend towards increased sustainability in the commercial property sector more broadly and the immaturity of the investments. In addition, the evidence base is limited by the immaturity of the investments and the long-term nature of the desired outcome (i.e. over 10 years).

Factors enabling and constraining the ability of the CEFC to facilitate increased flows of finance

In the course of considering the effectiveness of the CEFC in facilitating increased flows of finance into the clean energy sector, a range of factors that have enabled or constrained the CEFC can be observed. These include:

- The policy ecosystem
- The requirements of the Act
- Directions provided under the Investment Mandate
- The availability of capital
- Investor appetite.

Incentives and uncertainty in the policy ecosystem

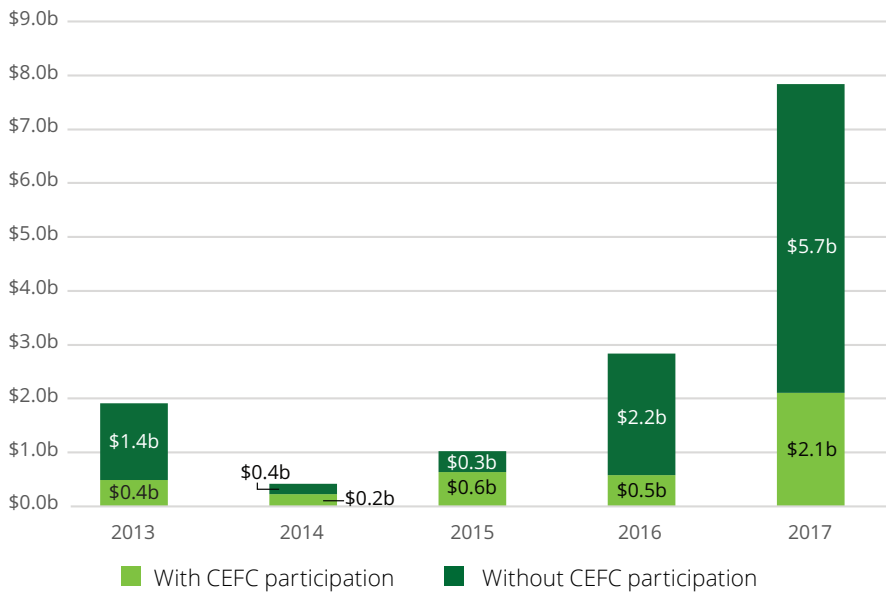
The policy ecosystem: the policy ecosystem can either enable or constrain the ability of the CEFC to directly and indirectly facilitate increased flows of finance into the clean energy sector.

The uncertainty in the policy ecosystem and lack of investor appetite during the RET review is demonstrated by the decline in value of large-scale renewable clean energy financing in 2014-2015 shown in Figure vii.[5] This figure also highlights the increased reliance on CEFC investment in projects during this period, however private capital flows have significantly increased post-2015, with clean renewable energy investment experiencing a boom in 2017 as a result of a more stable policy ecosystem.

The requirements of the Act

Under the Act, the CEFC is required to ensure that at least half of its funds are invested in renewable energy technologies at any time on or after 1 July 2018. Further to this requirement, the CEFC is prohibited from making investments that are not solely or mainly Australian based. It is also prohibited from investing in carbon capture and storage technologies, nuclear technology or nuclear power.

Figure vii: CEFC participation in Australian, large-scale clean energy investment relative to market



Note: Only includes investment data on large-scale asset financings.

These requirements under the Act appear to have influenced the investments the CEFC has made.

Directions provided under the Investment Mandate

The Investment Mandate, issued by the responsible Ministers, provides directions to the CEFC in relation to the performance of its investment function. These directions appear to have influenced the composition of the CEFC's portfolio. In particular:

- The portfolio benchmark return: The current Investment Mandate directs the CEFC to target an average return of the five–year Australian Government bond rate plus 3 to 4% per annum over the medium to long term measured before operating expenses. The CEFC has not been able to achieve this target return, achieving an actual return and forecast return lifetime investment return of 4.5% and 5.4% respectively, both below the bottom end of the target range of 5.8% to 6.8% in 2016-17. The CEFC Board has repeatedly submitted that it considers the portfolio benchmark return setting to be too high, particularly given the relative market-based returns on its investments, and its narrow investable universe and public policy purpose.
- Risk: Under the current Investment Mandate, the CEFC is directed to develop a portfolio that has an "acceptable but not excessive" level of risk. In general, the CEFC has taken a conservative approach to risk. Again, this is not to imply that the CEFC has not made higher risk investments. The particular projects that the CEFC has invested in are generally higher risk but that the CEFC has generally taken the least risky position in these projects, evidenced by its limited exposure to financial instrument and counterparty risk. However, given the relative immaturity of the market and the

CEFC, targeting these opportunities may have been an effective way to facilitate flows of finance into the clean energy sector.

- Investment focus areas: The Investment Mandate has also provided direction on specific investment focus areas. The CEFC has been directed to make capital available for emerging and innovative technologies, as well as three other focus areas: The Clean Energy Innovation Fund; The Sustainable Cities Investment Program; and The Reef Funding Program.

The availability of capital

The appropriation of a total $10 billion of capital to the CEFC over the five years between 2013 and 2017 has resulted in the CEFC being highly capitalised, with no capital constraint impacting the portfolio investments to date.

Lack of adequate private sector capital to finance projects has empirically been one of the key barriers to developing the clean energy sector in Australia. The CEFC has repeatedly taken the first or early mover, which has enabled the CEFC to play a leading role in developing new projects

Investor appetite and private capital

The debt and equity markets in Australia for clean energy investments were relatively immature. This created a role for the CEFC to provide debt and institutional equity.

Key findings

- Uncertainty in the broader policy ecosystem likely had an impact on the opportunities available to the CEFC to invest in the clean energy sector. This uncertainty created a clear role and need for the CEFC to provide confidence to the sector, but did affect the number of projects being considered and developed in the Australian market, which limited opportunity for investment.
- The requirement that half of the CEFC's funds invested at 1 July 2018 be invested in renewable energy appears to have driven steady investment by the CEFC in renewable energy generation over the period, and increased investment closer to 1 July 2018.
- A broader technology neutral approach may better enable the CEFC to make investments that support the role of clean energy technology in the wider energy markets.
- In 2016-17, the CEFC's actual investment return and forecast lifetime investment return was 4.5% and 5.4% respectively, both below the bottom end of the target range of 5.8% to 6.8%. That the CEFC did not meet the targeted portfolio benchmark return may indicate that the return expectation is not consistent with the current mandate, the returns available in the market or may not reflect the public benefit of the CEFC. It is possible that the portfolio benchmark return has impacted the investment decisions of the CEFC, but no evidence was found to support this.
- The CEFC maintained a conservative approach to risk to 31 December 2017, focusing on investing primarily in senior debt and a preference toward lower risk counterparties. The risk setting in the 2015 Mandate was likely one of the factors that drove this conservative approach. However, since the 2016 Mandate and under current settings, the CEFC is able to assume a higher level of risk, and evidence suggests it is beginning to do so.
- The Sustainable Cities Investment Program has driven significant investment in property. The CEFC has invested less in projects under the Reef Funding and Innovation Fund programs, largely due to the limited availability of opportunities under each program.
- The lack of a capital constraint to date has afforded the CEFC with the flexibility to be responsive to the opportunities that manifest rather than needing to make decisions on competing investments that may provide different benefits to the clean energy sector. This has been a key factor in the breadth of markets in which it has invested.
- For most of the CEFC's operational life, both debt and equity markets in Australia for clean energy investments have been relatively immature, which has been one of the key barriers to the development of the sector in Australia. As such the CEFC has played a leading role in developing these markets.

Enabling future flows of finance

There is a significant amount of investment yet to occur in the energy industry, within which the clean energy sector sits, in order to transition to a lower emissions economy in line with Australia's Paris Commitment targets. One study from Energy Networks Australia and CSIRO estimates that up to $880 billion in investment may be needed between now and 2050. With this level of investment needed to transition the market, there will likely be a role for the CEFC in the future, both in terms of directly investing in the sector and in leading the market to de-risk investments and foster innovative new financial products. Further, with this level of investment, the risk of CEFC crowding out private sector finance is minimal.

Given the uncertainty of the future environment in which the CEFC will operate, and the barriers to finance that may emerge in that environment, it is important that the CEFC retain flexibility to make investments that reflect the challenges and opportunities in the market at a given point in time.

Key findings

- The directions set out in the Investment Mandate should be reflective of the role that the Government considers appropriate for the CEFC into the future and should provide a balance between discretion and prescription. Depending on the role envisioned for the CEFC in the future, the directions in the existing Investment Mandate may need to be adjusted to provide more guidance to the CEFC on expected public benefits and more flexibility to structure its portfolio to respond to rapid changes in the market. We consider there is merit in a review of the Investment Mandate, focused on establishing the public benefits that may be sought from the CEFC into the future and the settings that may allow the CEFC to pursue these public benefits in a rapidly changing market. This could limit the need for further future changes to the Investment Mandate.
- The CEFC's current risk appetite may become incompatible with the requirement that it invest half its funds in renewable energy technology at, and at any time after, 1 July 2018 without crowding out private finance. The CEFC may need further clarity in relation to the level of risk it can assume if it is required to invest half its funds in renewable energy technology without crowding out private finance in the future. This could form part of a broader review of the Investment Mandate settings.
- The CEFC will need to continue to build a wider range of financial products, particularly in subordinated debt and equity investments, which will need to be considered in tandem with the risk appetite of the organisation.
- The CEFC will need to consider options for capital management when its allocated funding is fully utilised, which may involve capital recycling or raising.

1
Introduction and scope of this review

The Clean Energy Finance Corporation Act 2012 (the Act) was passed by the Australian Parliament on 22 July 2012, establishing the Clean Energy Finance Corporation (CEFC) with the object of facilitating increased flows of finance into the clean energy sector.[6] In making his second reading speech, the former Minister for Climate Change and Energy Efficiency, the Honourable Greg Combet AM, MP, set out three principles for the operation of the CEFC:

01. The CEFC is to help mobilise private investment in renewable energy, low-emissions and energy efficiency projects and technologies in Australia, including manufacturing businesses that provide inputs to the clean energy sector. The CEFC is to provide financial products and structures that address the financial barriers currently inhibiting private investment in these projects and technologies and require private co-investment in projects. At least half of the funds are to be invested in renewable energy;
02. The CEFC is to apply a commercial filter in making investment decisions, focusing on projects and technologies at the later stages of development. However, the public policy purpose of the CEFC enables it to have different financial risk and return requirements, including that for a given financial return the CEFC can accept higher risk, and for a given level of risk can accept a lower financial return; and
03. The CEFC has the capacity to offer concessional finance to directly influence financial barriers that inhibited the financing of the sector. The CEFC can tailor concessionality in each case and apply it through availability, tenor or cost of finance providing only the least generous terms required for a proposal to go ahead. [7]

The CEFC was formally established on 3 August 2012, commenced operations in April 2013, and commenced investment commitment activity on 28 June 2013. Since this time, and as of 31 December 2017, the CEFC has invested in 78 projects, as well as a number of other smaller size investments, along with commitments to a further 12 projects across renewable energy, energy efficiency and low emissions technologies.[8]

Further background to the Act and the CEFC is at **Appendix A**.

1.1 Scope of this review

Under section 81 of the Act, the nominated Minister[9] must arrange for a review of the Act to be undertaken as soon as practicable after 1 July 2016. This review must include a review of the effectiveness of the CEFC in facilitating increased flows of finance into the clean energy sector, make provision for public consultation, and include a written report of the review.[10]

In November 2017, the Department of the Environment and Energy (the Department) engaged Deloitte Touche Tohmatsu (Deloitte) to undertake a review of the CEFC in accordance with section 81 of the Act. Specifically, under the terms of reference for this review, Deloitte was asked to consider:

01. The effectiveness of the CEFC in facilitating increased flows of finance into the clean energy sector; and
02. Other matters considered relevant to the operation of the Act more generally

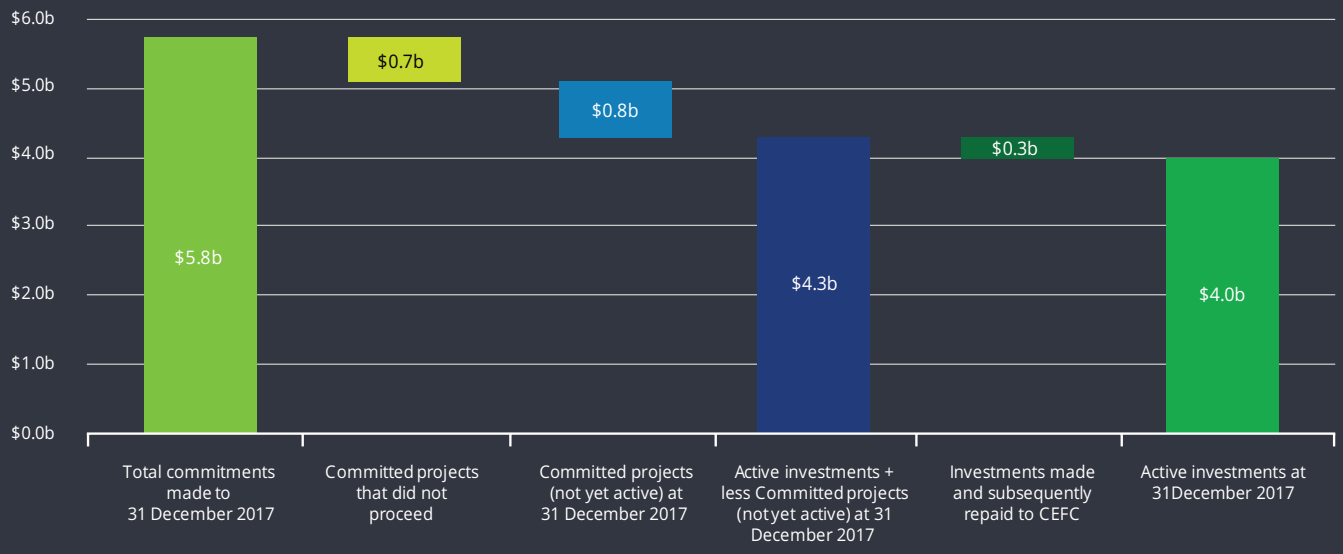
.

Consistent with the requirements of the Act and the terms of reference, this review focuses on the effectiveness of flows of finance into the clean energy sector facilitated by the CEFC since it commenced operations. We have considered both the direct and indirect flows of finance into the clean energy sector as a result of the investment activity of the CEFC.

For the purpose of this review, **direct investment** refers to capital invested in the sector by the CEFC. This includes the total dollars that the CEFC has committed to invest or has invested (see box below) and the catalytic effect of CEFC capital, which includes the extent to which CEFC capital addressed a barrier to finance in investing in a project.

CEFC commitments and investments [11]

Figure 1.1 CEFC investments and commitments since inception to 31 December 2017



Source: CEFC database extract at 31 December 2017

Total commitments

The $5.8 billion of total commitments made by the CEFC to 31 December 2017 captures the total value of capital approved and allocated by the Board over the first five years of operation. It therefore represents the amount of clean energy technology investment contractually committed by the CEFC, regardless of whether the investments occurred.

To 31 December 2017, $0.7 billion worth of commitments made by the CEFC did not proceed. These may have ceased for various reasons, including that: the project proceeded without the CEFC's finance; the facility was reduced or expired; or the project was abandoned.

Investments repaid

To 31 December 2017, $300 million of capital invested by the CEFC had been repaid, and was available for redeployment for other projects. The $300 million includes amounts invested under Low Carbon Australia, or related programs.

Committed projects (not yet active)

At 31 December 2017, $0.8 billion of CEFC commitments were to projects that had not yet reached financial close. Although the CEFC was contractually committed to most of these investments, not all conditions had been met by the counterparty. As such, the counterparty was not able to draw on the funds.

Active investments

A total of $4.0 billion was 'active' as at 31 December 2017. Accordingly, the full amount of this capital was available to be drawn by the counterparty (although some projects had not drawn all funds). These funds could not have been used for another purpose.

Invested to 31 December 2017

The combined value of the CEFC's active investments and investments repaid represents the value of investments made by the CEFC since inception, including a relatively small number of projects inherited from LCAL. As of 31 December 2017, this was $4.3 billion.

Indirect investment refers to the impact or follow on effects of the CEFC's activity in the sector. This includes the leverage of private sector finance, de-risking the sector, signalling new opportunities and educating investors. In essence, indirect investment represents the multiplier of direct CEFC investment. While the direct leverage of private sector finance can be measured quantitatively, analysis of other indirect flows of finance is discussed qualitatively as information and data in relation to investment as a result of de-risking, for example, is not readily available in the market.

The strategy of the CEFC in pursuing outcomes in the sector has informed our analysis. That is, in conducting this review, both the outcomes of the CEFC's investment activity and its strategy to effect these outcomes were considered. We also considered the factors both internal and external to the CEFC that impacted on the outcomes of the CEFC's investment activity. This analysis is important to understanding potential barriers or limitations within the Act, the CEFC's Investment Mandate, and the broader sector that influence the CEFC's ability to facilitate increased flows of finance into the clean energy sector.

It is important to note that in the course of this review, we have not reviewed:

- The CEFC's investments with a view to assess the appropriateness of the investment. This includes, but is not limited to, whether the investment was the best use of capital, and whether the deal was structured to ensure maximum returns. This is in line with our terms of reference which did not include a detailed review of CEFC investments or audit of its services. Having said that, we are not aware of any investments that the CEFC has made that are not consistent with the investments that it is able to make under the Act [12]
- The financial return or environmental and social outcomes as a result of the CEFC's investments. While these are positive externalities, and the ultimate purpose of CEFC investment, they are not relevant to the flow of finance into the clean energy sector over the time period
- The CEFC's governance arrangements. This includes reviewing the appropriateness of governance arrangements as well as the processes and steps that the CEFC undertakes to assess an investment opportunity. This was not included in the scope of services for this review. Statutory auditing requirements are performed separately by the Auditor General via the Australian National Audit Office.

The approach we took to consider effectiveness is outlined below.

1.1.1 Effectiveness

Effectiveness is not defined under the Act, nor is it defined under the explanatory memorandum. As such, it has been necessary for us to establish what is required to assess effectiveness in the context of this review.

In doing so we have had reference to a staff note the Productivity Commission issued to provide clarity in relation to how it assesses the effectiveness of a policy or program in the course of its inquiries and studies.[13] We have used this note to interpret what is required in an assessment of the effectiveness of the CEFC in facilitating increased flows of finance into the clean energy sector.

The Productivity Commission makes the following statements that are relevant to the scope of this review in relation to effectiveness:

"In general, effectiveness [is] the extent to which stated objectives are met — the policy achieves what it intended to achieve. The goal can be as broad or as narrow as is deemed appropriate — a continuum exists, ranging from achieving very specific outputs (such as 'increasing the number of solar heating panels installed in new houses') to very general outcomes (such as 'improving the environment' or even 'improving community living standards or wellbeing')." [14]

"...measures of outcomes alone do not provide information about causality — that the program inputs caused the outcome. Economists apply the concept of the counterfactual to determine what would have happened in the absence of the program or policy. The effectiveness of a program should be measured by the change in the outcome relative to this counterfactual." [15]

Drawing on the Productivity Commission's approach to assess effectiveness, in the course of this review we have assessed effectiveness using two different measures.

The first measure we used assesses the outcomes of the CEFC's investment activity in the clean energy sector against the object of the Act. As stated at the beginning of this chapter, the object of the Act is to establish the CEFC to facilitate increased flows of finance into the clean energy sector. [16] Therefore, we have considered whether the CEFC has facilitated increased flows of finance into the clean energy sector, and quantified the value of its direct investment activity, and where feasible, the indirect flows of finance.

The second measure we have used to assess the effectiveness of the CEFC considers the extent to which the outcomes of CEFC's investment activity were independent of the CEFC or if the involvement of the CEFC changed the behaviour of the partner investor or other investors. As outlined by the Productivity Commission in the quote above, by applying a counterfactual, causality or additionality can be determined which provides a measure of effectiveness. To do this, we reviewed a sample of CEFC investments to determine whether the CEFC was instrumental in the project proceeding. For investments where it was likely that the investment would have proceeded without the CEFC (i.e. fund investments), we reviewed whether the CEFC's investment in the fund changed the behaviour of the project proponent or other investors in the market.

In considering the counterfactual, we had reference to other factors that may have influenced the outcome. For example, in the property sector, higher rated energy efficiency buildings are generally of a higher value, attract greater rents resulting in better rental yield and are desired more by organisations conscious of their social responsibility and sustainability. Similarly, for renewables, the RET and the price of large-scale generation certificates (LGCs) helped projects become more commercially viable.

Both of these measures of effectiveness are limited by practical issues related to the completeness and availability of information to undertake this analysis. Accordingly, we have analysed a representative sample where appropriate. We note that as the scope of works specified does not include assurance services, we have not undertaken an extensive level of diligence.

1.2 Our Approach

To assist us in the review, we released a discussion paper in January 2018 which outlined several questions regarding the operation of the Act and the effectiveness of the CEFC. This paper is available from the Department's website.[17] We received 30 submissions from a range of stakeholders in response to the discussion paper – including three confidential submissions. The views expressed by stakeholders in submissions informed the key findings of the review. We have included these views where relevant to the discussion in this report, and have outlined the high level sentiment of submissions in Section 1.2.1. A full list of public submissions received is at **Appendix B.**

We have used publicly available information to inform the views outlined in this report. We have had some limited access to commercial in confidence information, but have not referenced this material in this public report. However, we did receive a number of confidential submissions and interviewed a number of different parties that wished for their views to be unattributed. We refer to these stakeholders as "confidential stakeholders" in this report.

We also met with a number of CEFC Board members, executives and staff. This provided us with valuable insights into the rationale of the CEFC in relation to its strategies and investments. We have drawn extensively on the information provided in these meetings throughout this report.

Further, the CEFC provided us with information, including an extract from the CEFC project database. This information included

- All investment opportunities that the CEFC has considered, including investments under consideration, committed and repaid investments, closed, expired and inactive investments
- The total project value and the CEFC's total investment commitment
- The clean energy technology category of each proposed, committed or closed investment
- The financial instrument sought for a number of proposed, committed or closed investments
- The externality or public benefit furthered by the proposed, committed or closed investment
- The terms, including tenor, yield, and target return for committed investments
- The date the investment was committed.

We used this information to understand the CEFC's investment activity. In particular, we considered the range of technologies that the CEFC has invested in, the financial instruments utilised and private sector leverage.

Deloitte has acted independently in the course of this review. A Steering Committee, consisting of representatives of the Department of the Environment and Energy, Department of the Prime Minister and Cabinet, Department of Finance and a former member of the CEFC Board, had oversight of this review and provided guidance in relation the scope of the review. We were also assisted by a secretariat provided by the Department.

1.2.1 Submissions

Submissions were received from a range of stakeholders, including from industry associations, private organisations, think tanks and government organisations. Although there were a variety of sectors represented in the submissions, in part reflecting CEFC's target platforms and markets, no submissions were received from commercial lenders, clean energy project developers who have not received an investment commitment from the CEFC, general energy market participants (such as non-renewable generators, networks or retailers), or energy market bodies.

In general, stakeholders regarded the CEFC favourably, with many explicitly supporting the CEFC's role in the clean energy sector and advocating for greater scope in its objectives. Although there were no stakeholder submissions that opposed the establishment of the CEFC, some provided recommendations to improve the mandate or approach of the CEFC. The common sentiment across most submissions was that the CEFC was successful in leveraging private sector finance and enhancing investor confidence in underdeveloped technologies across a number of industries in Australia.

A number of stakeholders, including the Australian Academy of Technology and Engineering (ATSE), the Australian Financial Industry Association (AFIA), Australian Ethical Investment and Clean Energy Council (CEC) agreed that the CEFC plays a significant role in financing technologies at an early stage of development. ATSE notes, the CEFC is able to facilitate earlier adoption and help new technologies transition along their cost curves. This has allowed clean energy technologies to become more commercially viable in Australia than they would otherwise have been without the CEFC's continued funding.

The Australian Conservation Foundation and The Australia Institute commented on the counter-cyclical role of the CEFC, with its ability to facilitate investment stability in renewable energy during times of uncertainty or economic downturn.

AFIA, the Council of Small Business of Australia (COSBOA) and the Commercial and Asset Finance Brokers Association (CAFBA) all highlighted the importance of CEFC's Energy Efficiency Program for small businesses. The program provides a 0.7% pricing discount on specified energy efficient equipment and has been, "highly successful in encouraging the uptake of improved energy efficient assets by small businesses." [18] However, both COSBOA and CAFBA note that there should be more ministerial direction for more funding to ensure continued viability of the program.

A number of stakeholders expressed concern that the CEFC's Investment Mandate limited opportunities available in their respective sectors. For example, the Queensland Tourism Industry Council (QTIC) commented that the majority of businesses in the tourism industry lacked the resources or awareness to access funding offered by the CEFC.

The Australian Forest Products Association (AFPA), Bioenergy Australia and Queensland Farmers Federation (QFF) discussed the need for further development in bioenergy investment. Bioenergy Australia suggested that governments and industry do not fully understand the benefits of biofuel and biomass. Their view is that an additional focus of funds into bioenergy is required by the CEFC to overcome a lack of policy support mechanisms, and to address the new opportunities in the agricultural sector.

1.3 This report

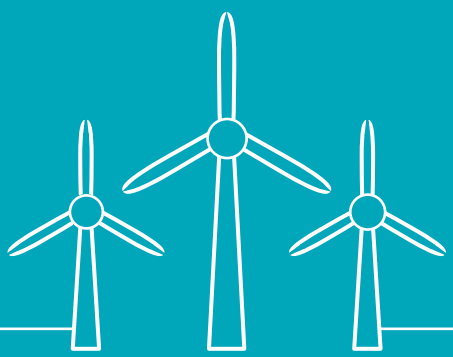
This report outlines the findings of our review of the CEFC in accordance with section 81 of the Act and the terms of reference of our engagement. Under the requirements of the Act, it is to be tabled by the nominated Minister in each House of Parliament within 15 sitting days of receiving the report. [19]

The report is structured as follows:

- **Chapter 2** outlines the clean energy sector and the drivers of, and barriers to, its development
- **Chapter 3** summarises our findings on the CEFC's effectiveness at increasing flows of finance into the clean energy sector consistent with the object of the Act
- **Chapter 4** assesses the extent to which the CEFC was instrumental to investments proceeding, or the extent to which CEFC's participation in an investment changed the behaviour of partner investors or other investors in the market
- **Chapter 5** discusses some of the key factors that enable and constrain the CEFC's ability the facilitate increased flows of finance into the clean energy sector
- **Chapter 6** considers how to enable the CEFC to continue to facilitate increased flows of finance into the clean energy sector in the future
- **Appendix A** provides background to the Act, Investment Mandate and CEFC
- **Appendix B** lists the stakeholders who made public submissions to the Discussion Paper
- **Appendix C** outlines the shadow credit rating of CEFC investments.

2

The Clean Energy Sector



Technologies and business models that work to reduce carbon emissions are occasionally classified collectively as the "clean energy sector." However, there is no global definition of the clean energy sector, nor the types of technologies and business models it includes. In contrast, the different technologies and business models that decrease the ratio of carbon emissions to energy consumed are generally considered to be subcomponents of the energy industry. This is because these technologies and business models recover revenue through the markets that exist within the energy industry.

The Act requires the CEFC to invest, directly and indirectly, in the clean energy sector, which for the purposes of the Act, includes renewable energy and energy efficiency technologies enabling technologies, and low-emissions technologies. [20] In making investments in clean energy technologies, the CEFC may invest in businesses or projects "for the development or commercialisation of, or in relation to the use of, clean energy technologies."[21] It may also invest in businesses that "supply goods or services needed to develop or commercialise, or needed for use in, clean energy technologies." [22] However, investments must be solely or mainly Australia based. [23]

This chapter provides a brief overview of the trends impacting the energy industry, and thereby investment in clean energy sector over the period of the CEFC's operation to 31 December 2017. The purpose of this chapter is to provide context in relation to the environment in which CEFC investment was, and is, occurring. It is not intended to be a comprehensive background to the factors influencing the attractiveness of investment in the sector, nor the barriers to investment and we acknowledge that some factors that have influenced the market are not included in this discussion.

2.1 Overarching trends in the energy industry

The Australian energy industry is undergoing a period of transformation, as it moves towards a lower emissions future. Historically, energy was supplied from centralised generation plants, transported via transmission and distribution networks to an end user and retailed by an energy retailer primarily on the volume of consumption. For an end user, the only way to decrease energy bills was to reduce consumption of electricity. With new technologies, new business models and more engaged consumers, the industry is increasingly being disrupted as different ways to produce and consume energy emerge.

While there are a number of factors driving these changes in the industry, these can be categorised into two broad overarching trends:

- **Decarbonisation of energy supply** – There has been increased investment in technologies and business models that support lower emissions outcomes in the supply side of the market, and divestment in technologies and business models that do not support lower emissions outcomes. As part of this shift, large-scale renewable generation has seen significant new investment, while coal fired generation has started to exit the market
- **Decentralisation and changing energy demand** – There has been substantial growth in consumer investment in technologies that enable consumers to reduce their demand for energy from the centralised energy system, including small-scale distributed energy resources, demand management and energy efficiency technologies.

Figure 2.1: Cumulative generation capacity entry and exit 2013-2017 [24]

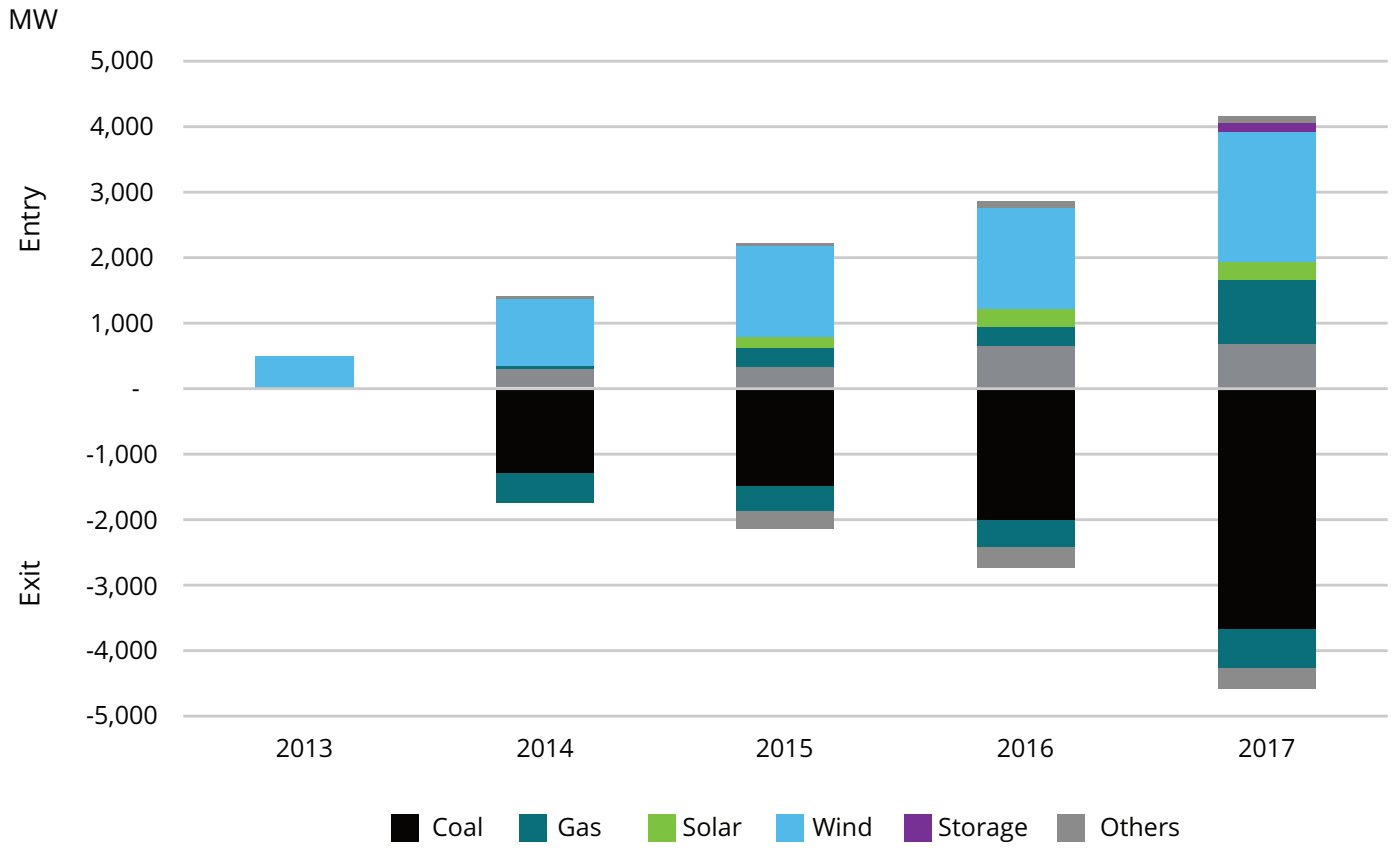
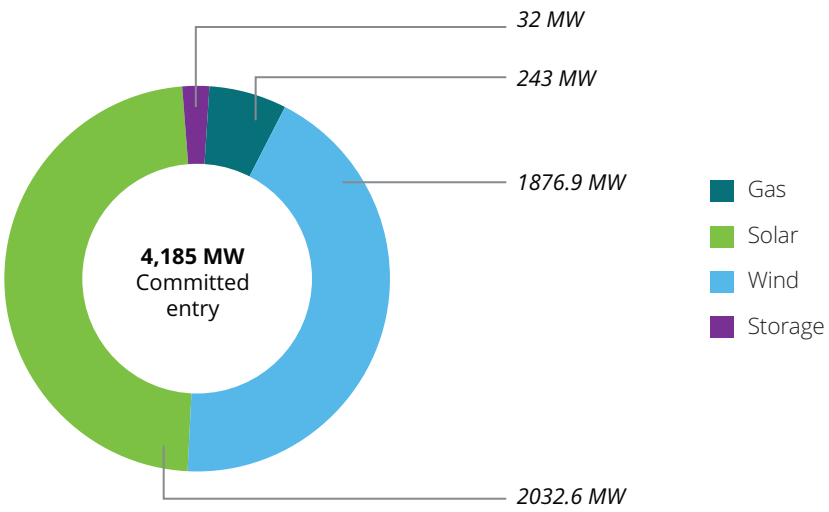


Figure 2.2: Generation committed new entry (MW) (1Q 2018) [25]



2.1.1 Decarbonisation of energy supply

There has been an observable trend towards lowering the emissions intensity of the energy industry either through increasing the proportion of electricity generated from low emission sources or decreasing the amount of electricity generated from high emission sources. Generally, a shift from high emitting sources of generation and an increased penetration of renewable generation can be seen in Australia, as shown in Figure 2.1 and Figure 2.2.

These figures show cumulative entry and exit of generation capacity from 2013, and committed new entry as of quarter 1, 2018. [26] These figures show that from 2013,

1,974MW of wind capacity has entered the market, with a further 2,033MW of capacity committed to enter the market. 274MW of solar has entered the market from 2013 to 2017, with the Australian Energy Market Operator (AEMO) reporting that there is 1,877MW of committed capacity to enter into the market.

In contrast, 3,864MW of coal fired generation has exited the market from 2013 to 2017. This includes the closures of Northern Power Station in South Australia and Hazelwood Power Station in Victoria. While Figure 2.1 does show that 700MW of coal capacity entered the market between 2014 and 2016, this increased capacity is a result of two 350MW upgrades to Tarong Power Station in Queensland. AGL has announced that it will close Liddell Power Station in New South Wales (NSW) in 2022, which will result in a further 2,000MW reduction in coal capacity.

Decarbonisation of the energy industry has been significantly impacted by Government policies designed to encourage the entry of new renewable energy generation capacity in order to lower the emissions intensity of the Australian energy industry. In particular investment in renewable energy generation has been significantly impacted by:

- **The Commonwealth Large-scale Renewable Energy Target (LRET):** the LRET is designed to incentivise additional large-scale renewable energy generation in Australia. It does this by requiring liable entities to purchase a set quantity of LGCs annually, with the final target being 33,000 gigawatt-hours in 2030. Renewable energy generators, who entered the market or increased historical output post 1997 are eligible to produce LGCs. The RET review in 2014 stalled investment in renewable energy generation due to uncertainty in relation the future of the scheme (see box below).
- **State based renewable energy targets:** A number of states have introduced separate renewable energy targets that apply within their jurisdiction. These include the Australian Capital Territory's (ACT) reverse auction scheme, which awarded financial entitlements in the form of Contract for Differences (CfDs) to support up to 650MW of renewable energy generation across Australia. This scheme sits within the ACT's 100% RET by 2020, as well as the federal LRET program, as all eligible generation's LGCs are voluntarily surrendered under this scheme, thereby encouraging additional renewables investment beyond the LRET. Furthermore, the Queensland Government has committed to supporting up to 150MW of solar capacity in its Solar 150 program.
- **ARENA grant funding:** ARENA aims to accelerate a reliable and affordable transition to renewable energy generation in Australia, partly through its grant funding of the development and commercialisation of renewable energy projects and technologies and industry capability development activities. [27]

The RET Review

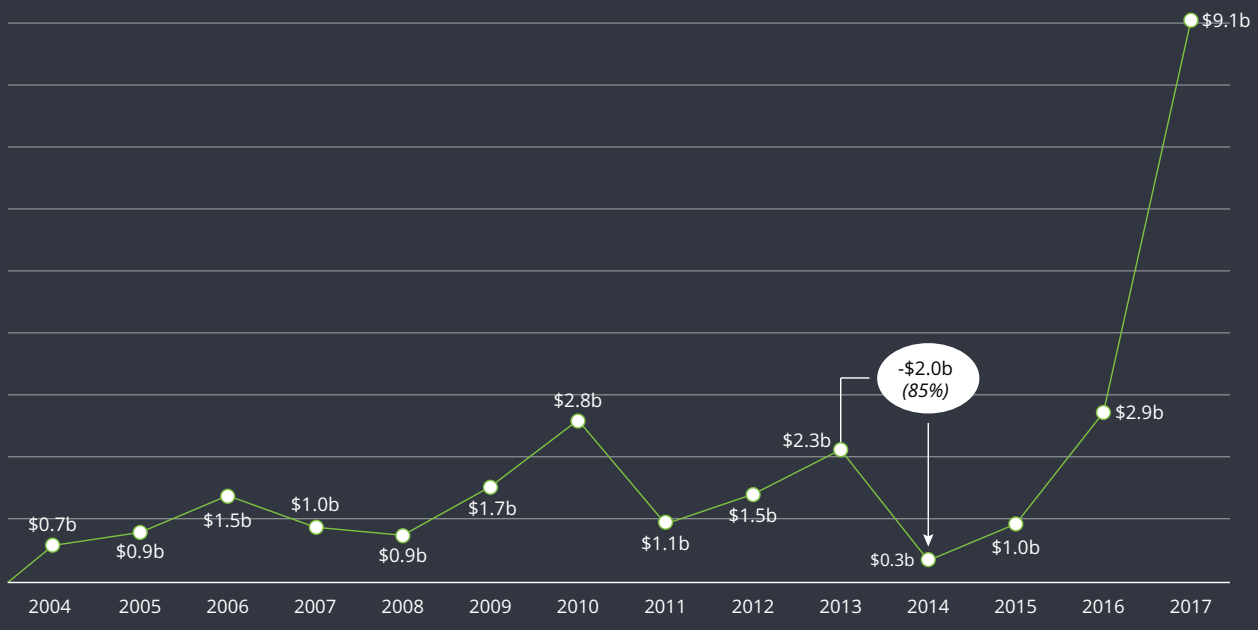
On 17 February 2014, the former Minister for the Environment, The Hon. Greg Hunt MP, and the Minister for Industry, The Hon. Ian Macfarlane MP, announced that the Government had appointed an expert panel to undertake a review of the RET scheme.

The final report from the Expert Panel on the RET summarised the terms of reference for the review as the following:

> *The Terms of Reference state that the review is to examine the operation, costs and benefits of the RET scheme including the economic, environmental and social impacts, the extent to which the objectives of the scheme are being met and the interaction of the RET with other Australian Government and state and territory government policies. The review is to provide advice on whether the objectives of the RET scheme are still appropriate and the range of options available for reducing its impact on electricity prices.* [28]

The RET review had a substantial impact on investment in renewable energy technologies. Over the period of the review, and the corresponding period in which the Government considered its response, investment in renewable energy generation fell. As shown in the figure below, between 2013 and 2014, investment in renewable energy declined by 85% as renewable energy investors responded to uncertainty in relation to the future of the scheme. During 2014, only $300 million was invested in renewable energy generation.

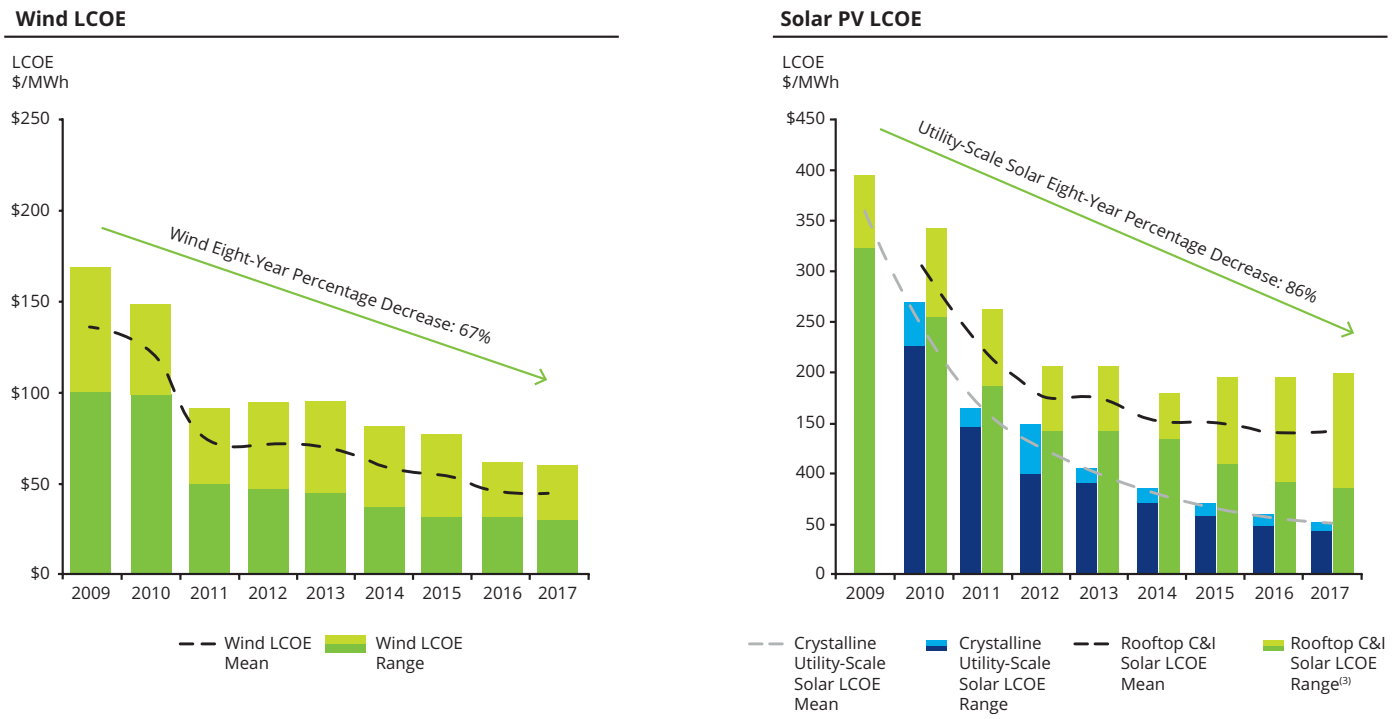
Figure 2.3 Investment (AUD$) in large scale renewable energy technology [29]



Investment has recovered as the RET settings have become more certain and in response to high LGC prices, with significant growth in 2017. However, it took two years for investment levels to return to pre-2014 levels. The RET review and the corresponding investment strike are important context to understanding both market investment in renewables over the period of the CEFC's operation and to the CEFC's own investment activities in renewable energy.

Note: Large-scale investment includes asset finance, public market, private equity, venture capital and R&D.

Figure 2.4: LCOE of large-scale wind and utility scale solar (United States, indicative of global trends).[30]

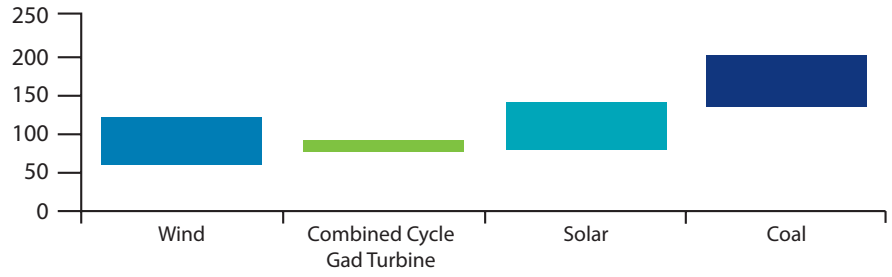


Further to specific policies aimed at driving increased investment in renewable energy generation, declining renewable energy technology costs and high wholesale market prices have increased the attractiveness of investment in renewable energy generation. This is evident in the boom in investment experienced in 2017 in large-scale renewable energy technology.

Globally, new technology costs have fallen rapidly as new technologies become better understood and proven. Figure 2.4 shows that the levelised cost of energy (LCOE) of wind and solar photovoltaics has decreased rapidly in the United States since 2009. For wind, the LCOE has fallen from US$101-$169/MWh in 2009 [31] to US$30-$60/MWh in 2017.[32] Similarly, utility scale solar has declined from US$323-$394/MWh in 2009 to US$46-$53/MWh in 2017. [33]

In Australia, renewable energy generation is now thought to be the cheapest form of new generation, with Bloomberg New Energy Finance estimating the LCOE of new wind at $61-118/MWh, combined cycle gas at $74-90/MWh, solar generation at $78-140/MWh and ultra-super critical coal fired generation at $134-203/MWh. [34] This is shown in Figure 2.5.

Figure 2.5: 2017 LCOE for new build technologies in Australia (AUD/MWh) [35]



High wholesale electricity prices in the National Electricity Market (NEM) have also encouraged investment in renewable energy generation. As shown in Figure 2.6, average monthly wholesale electricity prices in the NEM increased between 2015 and 2017. These higher prices were a result of structural changes in the wholesale electricity market, including but not limited to, the closure of coal fired power stations and increased reliance on higher cost gas fired generation in some regions at a time of rising gas prices as well as emissions reduction policy uncertainty.

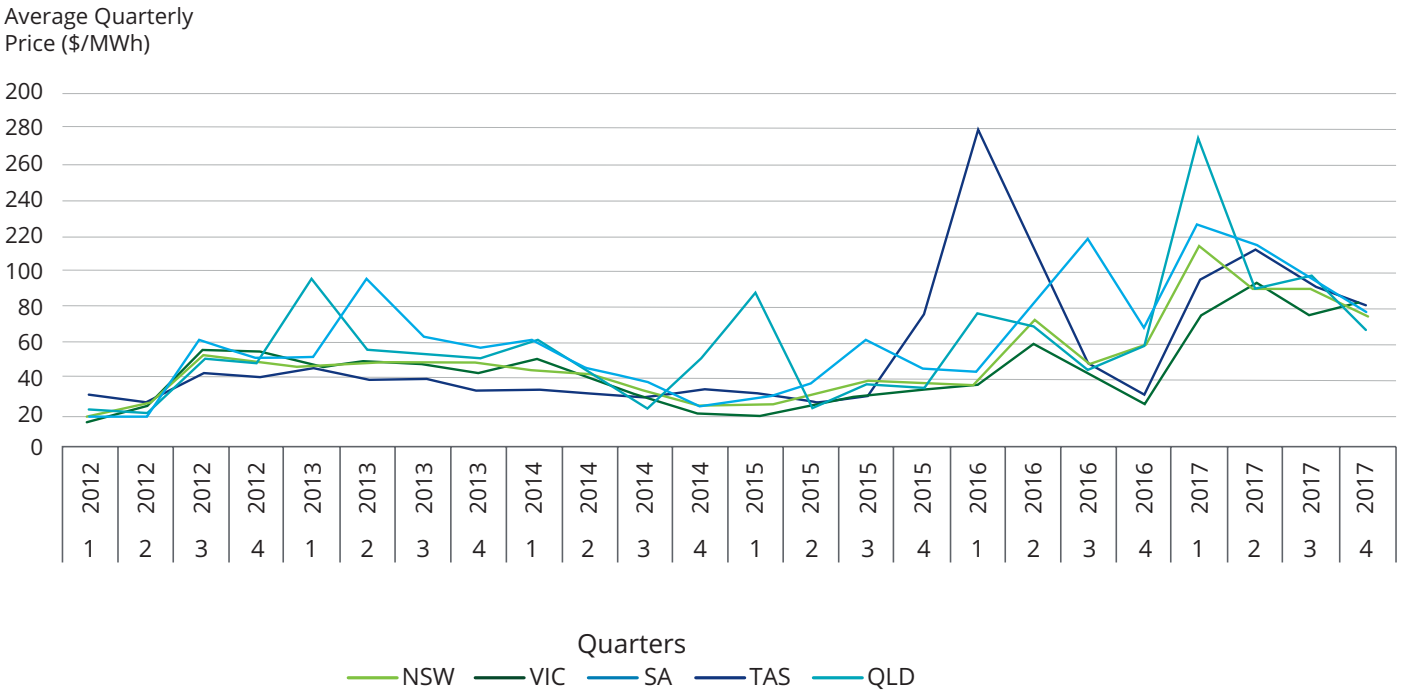
Higher wholesale electricity prices increase the attractiveness of the electricity industry with investors looking for cost-efficient methods of building new capacity. Renewable generation is increasingly becoming the cheapest form of new energy generation given its low operating cost, relative decrease in upfront investment costs and supportive (albeit uncertain) policy environment. As such, the recent increases in the wholesale electricity price have been favourable to encouraging more investment in the clean energy sector.

2.1.2. Decentralisation and changing energy demand

Decentralisation refers to a trend of increasing small-scale units of local generation connected to the grid at distribution level, also known as distributed energy resources. Rooftop solar units, natural gas turbines, microturbines, wind turbines, biomass generators, fuel cells, tri-generation units, battery storage, electric vehicles and electric vehicle chargers, and demand response applications are all examples of distributed energy resources.

Some use of decentralised energy resources is not a new feature of the market, as diesel and natural gas generators have been used for many years by remote users and those who cannot risk energy outages (such as hospitals). However, there is a distinct increase in the level of investment in these assets,

Figure 2.6: Wholesale electricity prices in the NEM (2012-2017) [36]



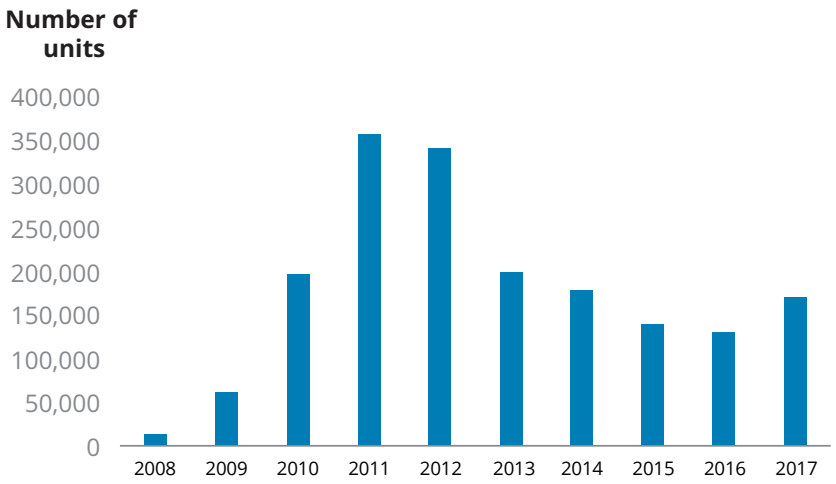
leading to an increased proportion of total generation capacity being distributed. This is most obvious in the uptake of rooftop solar systems shown in Figure 2.7.

Uptake in small scale rooftop solar systems has rapidly grown, increasing by close to 1.8 million rooftops between 2008 and 2017. Similarly, while battery technology is relatively new and, despite steady decline in its costs, currently expensive, the Clean Energy Regulator reports strong growth in small scale solar systems with concurrent battery storage in the four years from 2014 to 2017. This is shown in Figure 2.8.

Further to increased investment in distributed energy resources, there has also been a trend toward greater investment in technology that is more energy efficient, including at the small and large scale. It is difficult to track investment in energy efficiency in the same way as investment in decentralised energy resources. Much of the investment in decentralised energy resources is occurring in the context of government incentive programs, which require the surrender of a certificate in exchange for financial rewards. Similar schemes have not typically applied to energy efficiency projects, and as such, there is not as much comprehensive data available to quantify investment in energy efficiency.

However, the impact of energy efficiency is observable in energy demand data. Figure 2.9 shows demand in the NEM from 2005-06 to 2016-17. [39] Over this period, there were some reductions in demand associated with the exit of large industrial loads (including the closure of two aluminium smelters) and increased uptake of rooftop solar systems. However, these factors do not alone explain the large reduction in demand observed between 2008-09 and 2014-15, with some of the reduction likely attributable to increased uptake of energy efficiency technology.

Figure 2.7: Installed small scale rooftop solar systems per annum 2008 – 2017 (Australia wide) [37]



The level of investment in energy efficiency in office buildings can also be inferred from the National Australian Built Environment Rating System (NABERS) Energy rating. NABERS Energy rating is the most widely used tool to measure the energy efficiency of office space. The tool rates the energy efficiency of an office base building, whole building or tenancy by comparing its measured energy consumption against a set of benchmarks developed using actual building performance data.

Not all office space is NABERS Energy rated. However, the Commonwealth Government's Commercial Building Disclosure Program requires that the NABERS Energy rating be disclosed where a commercial office space of 1,000 square metres or more is offered for sale or lease.[40] In its 2015-2016 Annual Report, NABERS reported that 82% of national office stock had been rated.[41] This increased in 2016-17, with Office Energy

Figure 2.8: Small scale solar systems with battery storage per annum 2014 – 2017 (Across Australia) [38]

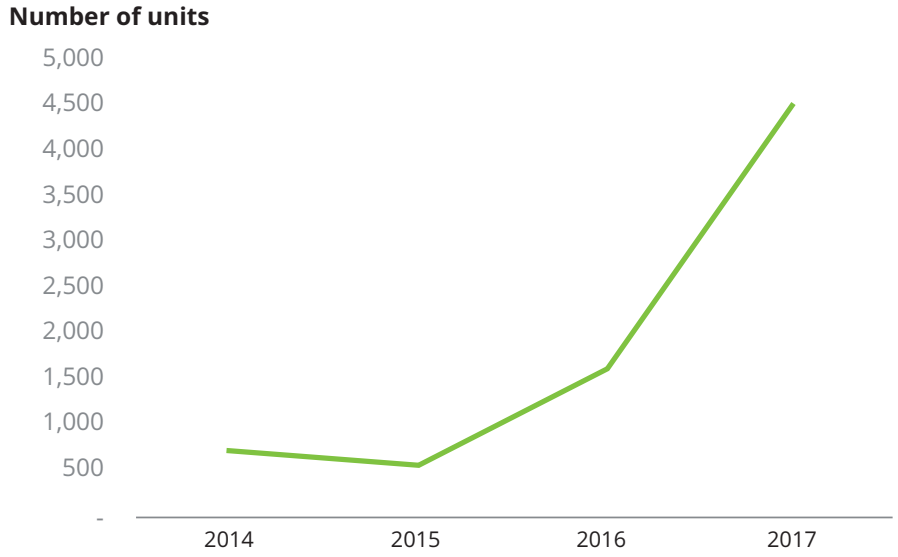


Figure 2.9: Annual energy consumption in the NEM 2005-06 to 2016-17 (terawatt hours)

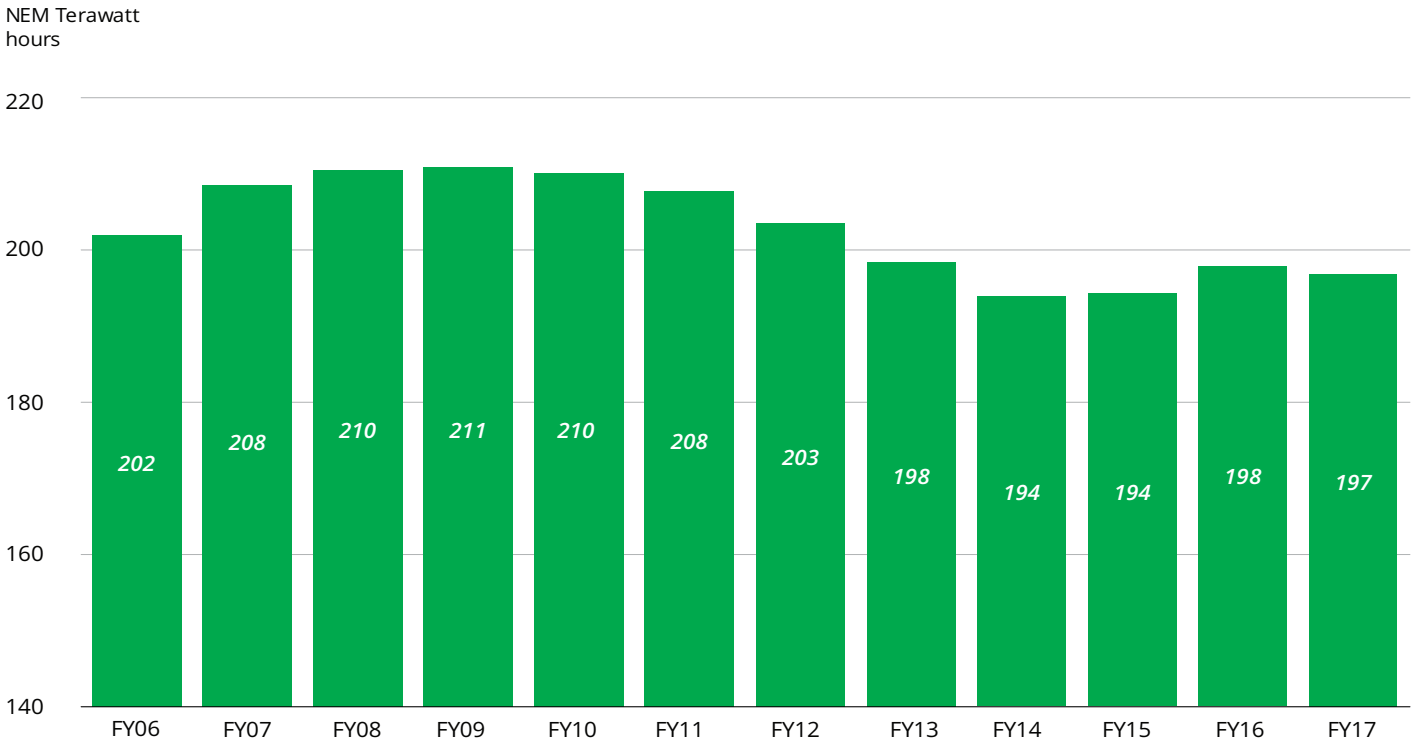
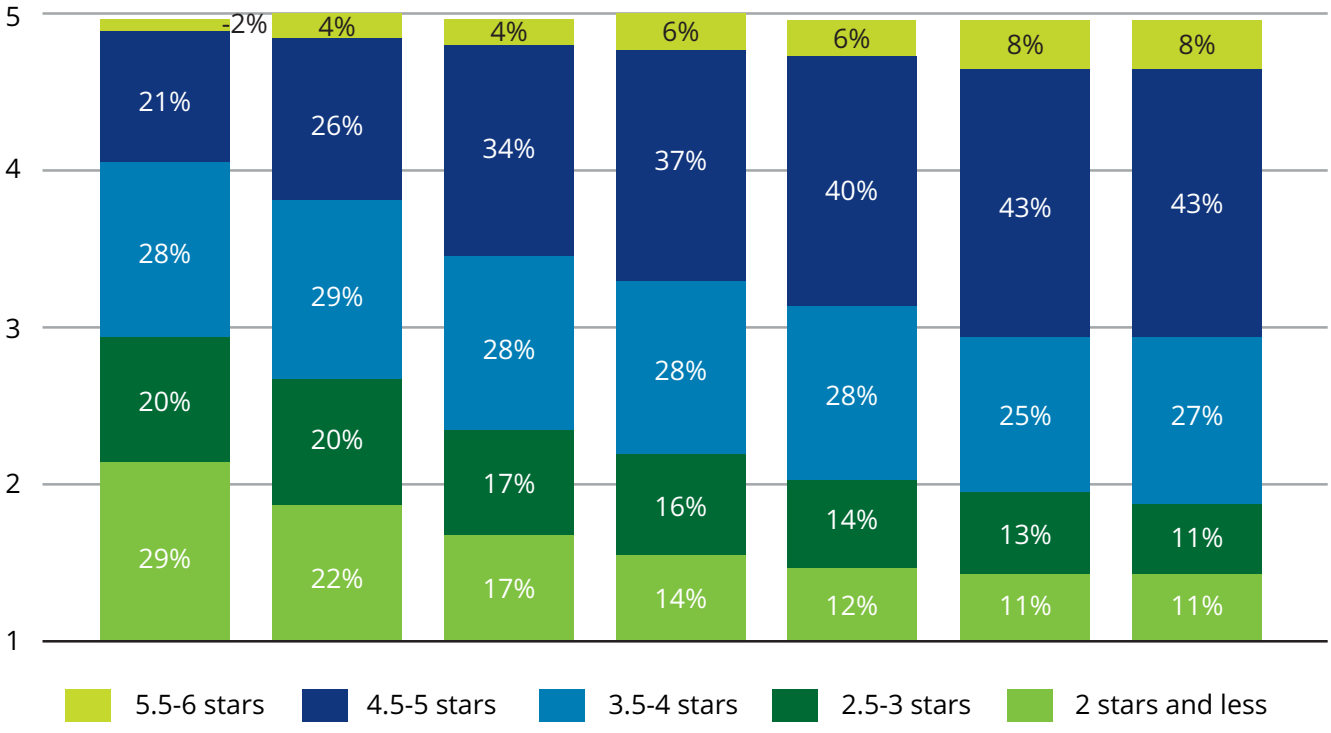


Figure 2.10: Distribution (%) of Office Energy Ratings 2010-11 to 2016-17 (without Greenpower)



(base building and whole building) growing by 6.3% and Office Energy (tenancy) growing by over 20% in terms of square metres rated.[42] NABERS has cited this increase in the amount of office space being rated as evidence of the success of the Commercial Building Disclosure Program.

Figure 2.10 presents the NABERS Energy rating of office space with a NABERS Energy rating from 2010-11 to 2016-17.[43] This figure shows an increase in the amount of office space with a NABERS Energy rating of four to six stars, and a corresponding decrease in office space with less than three stars. A trend towards increased NABERS Energy ratings is supported by stronger financial outcomes for properties that are higher rated. A 2011 report commissioned by the Australian Property Institute and the Property Funds Association found that:

- A 5-star NABERS Energy rating delivers a 9% green premium in value and the 3-4.5 star NABERS Energy ratings deliver a 2-3% green premium in value
- Major discounts in rents were evident in the lower NABERS Energy ratings for the Sydney central business district (CBD) (9% discount in rents) and Canberra (6% discount in rents)
- In the 5 star NABERS Energy rating, the Sydney CBD office market showed the largest green premium in rents (3%), as well as the largest discount in rents (9%) in the lowest NABERS Energy rating
- Higher NABERS rated buildings also enjoyed reduced vacancy, reduced outgoings, reduced incentives and reduced yields.[44]

Trends in increased investment and uptake in distributed energy resources and energy efficiency technology have been driven by a number of different factors, including but not limited to higher retail energy prices, Commonwealth and state government policies and programs, and declining technology costs.

2.2. Submissions

Approximately a third of stakeholder submissions included comments in relation to the current state of the energy sector. This included commentary on climate change policy, clean energy and energy efficiency technology, energy prices, and household and industry trends. The Investor Group on Climate Change (IGCC) summarised the trends impacting investment in clean energy as follows:

"The falling cost of technology, the increasing penetration of distributed energy in the National Energy Market and ongoing policy volatility with the introduction then repeal of a carbon price and the review of the Renewable Energy Target have all been characteristics of the investment landscape for clean energy. There have also been substantial wholesale and retail price shifts for energy consumers which have changed the economics of energy investment." IGCC

Renewable energy sector

Many stakeholders noted that Australia is lagging behind other Organisation for Economic Co-operation and Development (OECD) nations in clean energy technology investment. This has primarily been attributed to policy uncertainty, demand uncertainty, and general lack of awareness of new innovations.

The CEC observed that, in the large-scale renewables market, the mid 2000s saw a slow investment increase due to the modest RET in force at the time. The expansion of the RET in 2007 did not result in a significant increase in investment until 2010 due to lags in legislation and finalisation of project decisions. According to the CEC increased investment activity was short lived, due to an oversupply in renewable energy certificates and the RET review. Despite the return of investors in 2015 following agreement to a reduced RET, investment remained subdued limiting the growth of new long-term Power Purchase Agreements (PPAs).

Investment activity in renewable energy increased in the last quarter of 2016, with 965MW in new renewable energy commitments. The CEC attributed this surge in part to the 2016 Large-Scale Solar program (ARENA & CEFC). Both the CEC and the ATSE noted that in 2017 there was a major escalation in investment commitments across Australia, and in particular, in investment in solar and wind technologies.

ATSE also considered that federal policy uncertainty had been an impediment to renewable energy investment over the past decade. Further, ATSE identified that structural issues in the NEM and the preferred risk management strategies of retailers, whose customers are unwilling to enter long-term contracts, have jointly constrained the availability of PPAs. Recent increases in investment were perceived to be largely driven by the RET and other State and Territory government policies, and declining capital costs, notably of large scale solar. ATSE remarked that while banks have often expressed an interest in renewable energy investment, in practice many projects do not meet their risk criteria or are too small to consider worthwhile.

One stakeholder commented that finance

has primarily been in the form of non-recourse project finance supported by long-term offtake and long-term financing from European and Japanese lenders. Although this was initially based largely on fully contracted projects, stakeholders also believe long tenor debt has become available for part merchant projects more recently. In response, domestic lenders have increased the term of their offering. However, this remains limited and the interest in funding fully merchant projects by commercial lenders is virtually non-existent.

Built environment and industry

The Green Building Council of Australia (GBCA) submitted that, in general, Australia is performing well in the built environment sector relative to global trends. According to the GBCA, buildings account for almost a quarter of national emissions and nearly half of national electricity consumption. Thus, the GBCA noted that the property sector is a key contributor to Australia's emissions and productivity goals, referring to the Australian Sustainable Built Environment Council's 2016 report, which states that buildings present low cost opportunities to reduce emissions and deliver almost $20 billion in energy savings.

The GBCA cited the 2017 Global Real Estate Sustainability Benchmark (GRESB), which ranked Australia as the world's most sustainable real estate market for the seventh year in a row. However, the GBCA believes that there are segments of the property sector, such as the mid-tier sector, where energy efficiency investment has been limited. Despite these developments, the GBCA remarked, achieving zero-emissions buildings is likely to require a decarbonisation of grid-supplied electricity alongside distributed solar.

The CEC found that in the small-scale energy market, rooftop solar installations experienced rapid growth between 2007 and 2012, caused by reductions in installation cost, large rises in retail electricity prices and the availability of government rebates and premium feed-in-tariffs. The CEC also noted that such expansion was almost entirely in the residential market, and rarely purchased via a finance deal, with the majority of systems purchased outright. A cut-back in government rebates and potential market saturation led to a decline in new householder solar installations.

The CEC noted that some of the decline in household solar installations was offset by larger capacity installed per system and growth in non-residential markets, characterised by larger systems. This was driven, at least in part, by the provision of finance products which allowed retailers to market systems as cash flow positive from day one by, for example, charging businesses per kilowatt-hour generated and circumventing the limitation of three-year payback period benchmarks. The CEC observed a resurgence in rooftop solar in 2016, attributed to wholesale electricity price increases and media and political attention. This resurgence was supported by a temporary fall in the price for solar systems in mid-2016/17 and an overall reduction in installation costs per kilowatt of rated capacity.

A number of stakeholders also discussed trends in the uptake of energy efficient technologies. ATSE noted that increasing energy prices have led to a greater uptake in energy efficient technologies, and suggested that while it is unclear as to whether capital availability is a barrier to uptake of energy efficiency technologies, government support would drive growth in energy efficiency investment.

QFF and the Bundaberg Regional Irrigators Group (BRIG) observed that farmers and irrigators have increased their investment in energy efficient processes and renewable energy technologies as a consequence of higher energy prices. The two associations stated that developments in technology reduced some barriers of implementing blended alternative energy sources (such as solar, battery and diesel mix) in the agricultural sector. However, BRIG noted that there are still barriers to accessing finance for energy efficiency upgrades in the agricultural sector.

3

CEFC's effectiveness in increasing the flows of finance

As outlined in Chapter 1, effectiveness can be assessed by reference to the extent to which the policy or program has achieved its objective. That is, whether the outcomes of the policy or program are consistent with the outcomes specified for the policy or program when it was designed and implemented. This chapter outlines our findings in relation to the effectiveness of the CEFC in accordance with the object of the Act. Overall, our analysis supports a finding that the CEFC has met the object of the Act.

3.1 Object of the Act

The object of the Act is to establish the CEFC to facilitate increased flows of finance into the clean energy sector, which is distilled into three different types of technologies: renewable energy, energy efficiency and low emissions technology.[45] This object is broad and it provides limited guidance as to a level of investment in the clean energy sector that could be considered to be effective beyond "increased".

In relation to where the CEFC should direct its investment focus, the Act does provide some guidance. Under the Act, the CEFC is required to ensure that "at any time on or after 1 July 2018, at least half of the funds invested at that time for the purposes of its investment function are invested in renewable energy technologies." [46] We have considered the extent to which the CEFC is likely to meet this target in the course of our review of its investments.

Further to the Act, we have also had reference to the Explanatory Memorandum to the *Clean Energy Finance Corporation Bill 2012*, second reading speech and report from the Expert Panel advising on the design of the CEFC. [47] These documents provide some further guidance on the particular ways that the CEFC was expected to facilitate increased flows of finance into the sector, including addressing barriers to finance, applying a commercial filter, valuing public benefit and leveraging private sector finance. The extent to which these factors are a feature of the CEFC investments is addressed throughout this chapter and Chapter 4.

In its staff note on effectiveness, the Productivity Commission outlined that the objective against which a policy or program is assessed can be defined as a specific outcome or can be expressed as a general outcome. [48] Consistent with this approach, and in summary, we consider that a finding of effectiveness requires it to be demonstrated that the CEFC facilitated increased investment into the clean energy sector, taking into consideration both direct investment and indirect flows of finance, while also ensuring the CEFC has invested an adequate amount of capital in renewable energy in accordance with its requirement under the Act. This does not assess whether the level of investment that the CEFC facilitated was effective, as the object of the Act does not provide guidance in relation to this. [49]

3.2 CEFC investment

Invested

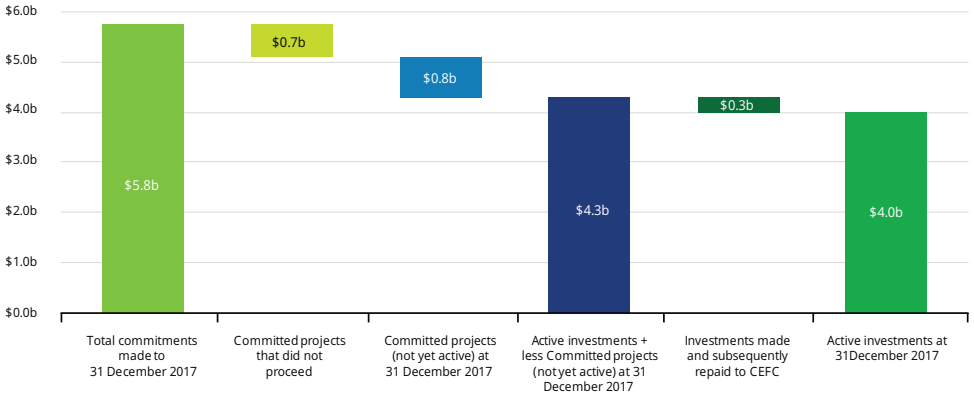
The CEFC's investment activity to 31 December 2017 is shown in Figure 3.1.

Since commencement of operations on 28 June 2013, and as of 31 December 2017, the CEFC has invested $4.3 billion in clean energy sector projects. As shown in Figure 3.1 below, this is calculated as 'Active investments' plus approximately $300 million that has subsequently been repaid.[50]

The value of the 'Active investments' by the CEFC refers to the amount of CEFC capital that has been or can be utilised by counterparties (i.e. borrowers) as per the CEFC database. It is noted that this 'Active investment' amount may not be fully drawn down yet. For example, aggregation partnerships programs are dependent on bank customers loaning the full allocation. The capital allocated to these programs cannot be used by the CEFC for other projects (during the life of the program).

In total over $12 billion of combined CEFC and private finance was invested in these projects. [51] That is, in addition to the CEFC's $4.3 billion investment, $7.8 billion of private finance was invested in these projects. The value of projects 'invested' in to 31 December 2017 by the CEFC includes investments approved under Low Carbon Australia Limited (LCA) and associated programs (legacy programs) totalling approximately $200 million, some of which has been subsequently repaid. Per Table 3.1 below, this makes the CEFC one of the largest green banks globally.

Figure 3.1: CEFC investments and commitments since inception to 31 December 2017



Source: CEFC database extract at 31 December 2017

Committed

As of 31 December 2017, an additional $0.8 billion had been committed by the CEFC to projects that had not reached financial close, Although the CEFC was contractually bound to deliver these committed funds at 31 December 2017, pending events outside of the CEFC's control (i.e. satisfaction of conditions precedent), these agreements had not yet reached financial close. While this captures a portion of the CEFC's future investment pipeline as of 31 December 2017, it does not capture the entire pipeline of projects the CEFC was considering but had not yet committed to, which was substantially higher. Since inception, the CEFC has committed $5.8 billion to projects in total, however $0.7 billion of these commitments did not proceed. In determining the total amount invested by the CEFC, we have not included the $0.7 billion worth of past commitments to projects which either: proceeded without the CEFC's finance; have been indefinitely deferred; or were abandoned.

Table 3.1 Capital committed by green banks [52]

Comparison to other green banks	CEFC	Connecticut Green Bank	Green Finance Organisation (GFO) (Japan)	New York Green Bank (NYGB)	Green Investment Group (GIG) (UK)	GreenTech Malaysia
Capital committed	**AU$5.1 billion** Excluding expired Commitments	**US$175 million** Approximately AU$230 million	**JP¥11 billion** Approximately AU$130 million	**US$441 million (invested)** Approximately AU$600 million	**US$4.5 billion** Approximately AU$8 billion	**US$800 million (targeted)** Approximately AU$1 billion
Reported date	December 2017	June 2017	March 2017	September 2017	June 2017	December 2017

Key findings

The CEFC has directly invested in the clean energy sector and, to 31 December 2017, had invested $4.3 billion with commitments to a further $0.8 billion of investment.

3.2.2 Investment focus

Under the Act, the CEFC can invest in renewable energy, energy efficiency and enabling technologies, and low emissions technologies.

Figure 3.2 shows the CEFC's investment in each of these technologies from inception to 31 December 2017. The CEFC's investment in renewable energy technology remained relatively constant over its period of operation to 31 December 2017, with the exception of 2014 where investment in this technology was impacted by policy uncertainty created by the review of the Renewable Energy Target (RET). In contrast, investment in energy efficiency technology was lower in the early years of the CEFC's operation, but has rapidly grown since 2015. There have been limited investments in low emissions technologies.

This figure also shows the rapid growth that has occurred in the CEFC's portfolio over the period since it commenced operations. Each year from 2015 to 2017, the CEFC's total investment commitments nearly doubled, with $3.1 billion (72%) of the CEFC's $4.3 billion total investments committed in 2016 and 2017. As noted in Chapter 1, and covered in Chapter 4, the relative immaturity of the CEFC's portfolio means that the outcomes of some of the CEFC investments are not yet able to be fully identified and quantified.

A number of investments that the CEFC made in financial products, including aggregation loans were captured as investments in energy efficiency for the purpose of the database from which Figure 3.2 is derived. Not all of the funds invested in these loans were used to finance energy efficiency projects, with a proportion of the funds going to renewable energy technologies (such as rooftop solar). As a result, the extent of the CEFC's investment in renewable energy technologies is likely understated by this figure.

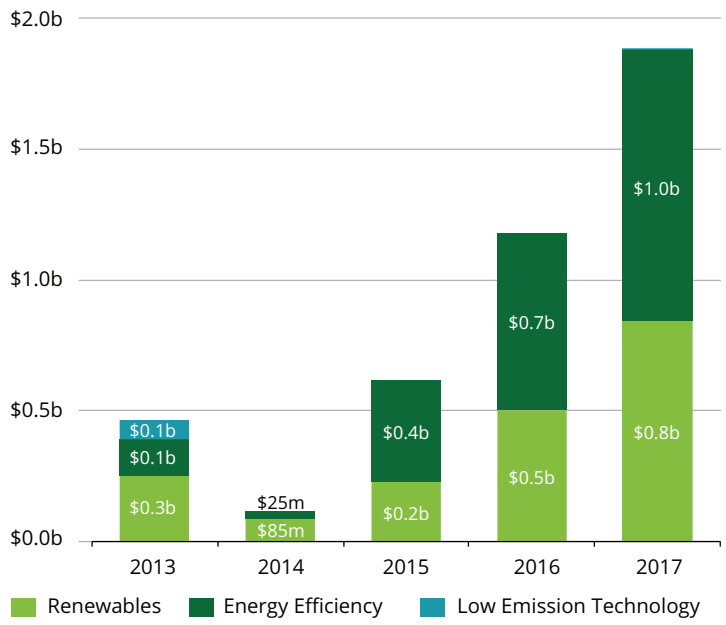
While the Act provides the CEFC with discretion in relation to its focus on these three types of technologies, section 3.1 requires that *"at any time on or after 1 July 2018, at least half of the funds invested at that time for the purposes of its investment function are invested in renewable energy technologies."*

Figure 3.3 outlines the CEFC's progress as of 31 December 2017 against this requirement. This figure is derived from data provided by the CEFC which is explicitly collated for the purposes of measuring the proportion of the portfolio invested in each clean energy technology type. This data does not reconcile exactly to the data used elsewhere in this report sourced from the CEFC's project database as it is calculated at a greater level of detail, including the ultimate allocation of aggregation loans to the respective technologies This figure shows that CEFC was, at 31 December 2017, invested in:

- $2.4 billion (54% of total) in renewable energy
- $1.8 billion (43% of total) in energy efficiency
- $0.1 billion (3% of total) in low emissions technology.[53]

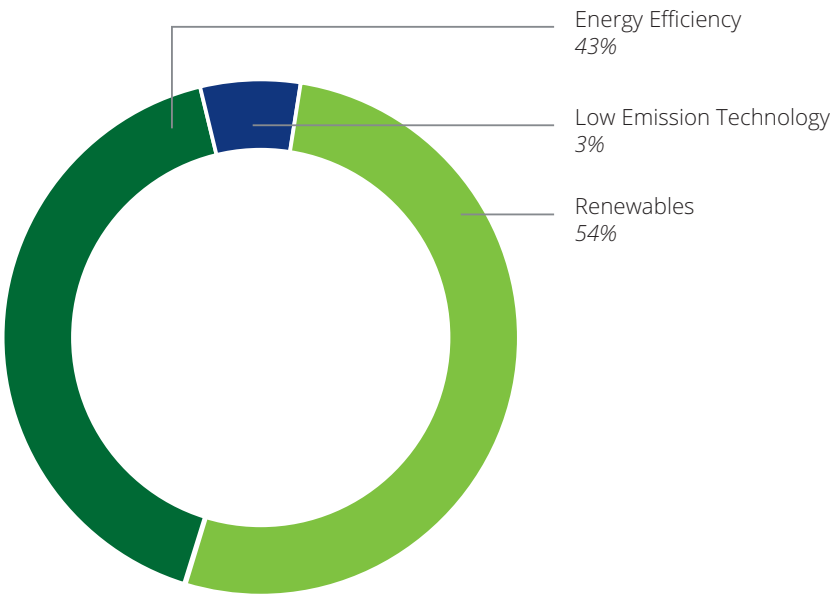
The CEFC has indicated that it had at least half of its active investments at 1 July 2018 invested in renewable energy technologies.

Figure 3.2: CEFC investment in clean energy technologies from 2013 to 2017



Note: a proportion of amounts invested in each year in Figure 3.2 may have been subsequently repaid.

Figure 3.3 CEFC portfolio investment as at 31 December 2017



Key findings

The CEFC has invested in renewable energy and energy efficiency technologies, and to a lesser degree, in low emissions technology. As of 31 December 2017, the CEFC had invested approximately 54% of its funds in renewable energy technologies, consistent with the requirements under the Act. The CEFC has indicated that it had at least half of its active investments at 1 July 2018 invested in renewable energy technology.

3.2.3 Investments by sector

Another way to assess how the CEFC has facilitated increased flows of finance into clean energy is to consider the investments that the CEFC has made within the different sectors that the technologies operate in. Clean energy technologies are utilised across a range of different industries and sectors within the Australian economy. For example, large-scale renewable energy technology is utilised in the energy industry for the generation of electricity.

The CEFC's strategic framework appears to intrinsically recognise that clean energy technologies and business models relate to assets which sit within different industry sectors.[54] The framework contained in its 2017-18 Corporate Plan, published August 2017, outlines that the CEFC targets its investments activity in a number of different sectors (which has evolved and continues to shift as the clean energy sector changes), which include:

- Renewable generation, energy retailers, network service providers (the energy industry)
- Government and NFP
- Property, infrastructure, manufacturing, agriculture (the Property and Industrial sector)
- Transport. [55]

The CEFC records the investments it makes against each of these sectors in its database, and from the extract of the database we received from the CEFC, we have identified the level of investment that has flowed into each sector as a result of direct CEFC investment. The database also includes financial products alongside sectors within which the CEFC targets investments. This includes the investments the CEFC has made in climate bonds or aggregation loans made to one of the commercial banks that have not been categorised into a single sector. Financial products have been an important part of the CEFC's investment strategy over its first five years of operation and as such, we have considered them alongside the relevant industry sectors in this analysis.

Table 3.2 shows CEFC investments by sector.

Table 3.2 CEFC investments by sector [56]

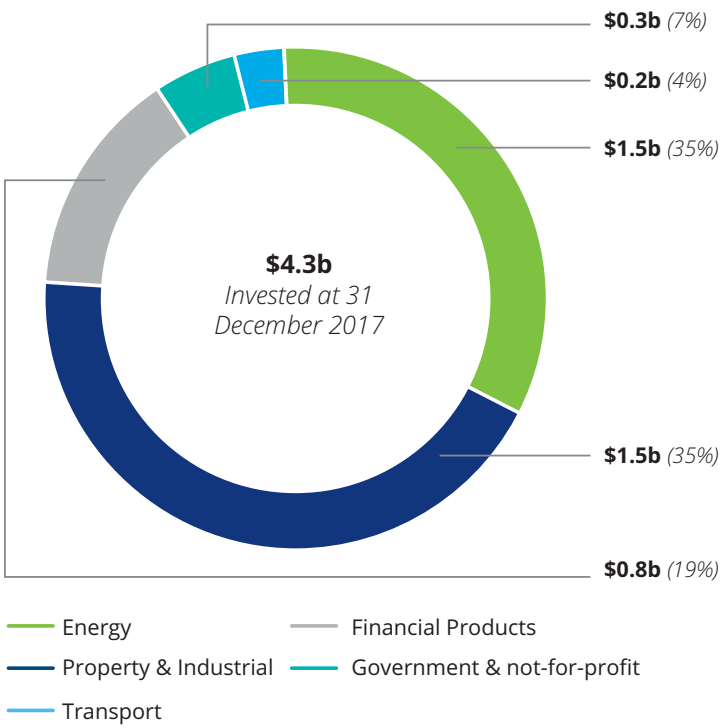
Sectors & financial products	CEFC invested to 31 December 2017 $b	Project size $b	Private leverage	No. projects	Commitments $b	Types of investment
Energy industry	$1.5	$5.0	2.4x	35	$0.6	Large scale wind and solar farms, bioenergy and grid solutions
Property & industrial	$1.4	$3.2	1.3x	22	$0.2	Property, infrastructure, manufacturing and industrial
Government & NFP	$0.2	$0.6	1.2x	6	-	Local governments, universities and community housing providers (CHPs)
Transport	$0.2	$0.2	0.3x	5	<$0.1	Vehicles and biofuels
Financial products	$0.8	$2.8	2.5x	10		Investments into a financial product (i.e. climate bond) where the investment was not categorised into one of the above sectors. Includes debt markets, investment funds and the innovation fund
Total	**$4.1**	**$11.8**	**1.9x**	**78**	**$0.8**	
Legacy programs	*$0.2*	*$0.3*	*0.6x*	*72*		Separated due to lower value, higher volume projects (includes energy industry, Property and Industrial, and Government & NFP investments)
Total (including legacy programs)	$4.3	$12.1	1.8x	150	$0.8	

It is important to note the categorisation of projects into these sectors does not necessarily match with the breakdown of the CEFC's investments by technology. In some instances, the CEFC has provided finance for a renewable energy technology (i.e. small scale solar) within a property sector project. This project would be classified under renewable energy technology, but categorised as a Property and Industrial sector project.

Figure 3.4 and Figure 3.5 show the investments that the CEFC has made in different sectors and products over time. There are a number of observations that can be made from this figure and the data that sits behind it for each sector the CEFC targets:

- **Energy industry sector:** the CEFC has focused investment on renewable energy generation, primarily large-scale wind and solar. The CEFC has made investments in renewable energy since 2012-13 (its first year of operation), however it experienced a significant increase over 2016-17 (boosted by the ARENA large-scale solar program).
- **Property & industrial sector:** CEFC investment in this sector has experienced significant growth over the last 18 months, primarily in the property market. While the CEFC has been active in this sector since inception, it started making significant investments, such as property fund investments, from early 2015.
- **Government & not-for-profit sector:** investments are largely represented by community housing (a combined $190 million to two related projects project) but capital deployment has been difficult due to inherent barriers to investing in these markets.
- **Transport sector:** this sector is the smallest area of investment since inception for the CEFC. This is primarily due to a lack of viable investment opportunities being presented to the CEFC.
- **Financial products:** there has been significant growth in financial product investments since 2016. However, this category does not include all financial products, which are categorised under a specific sector in some instances.[57]

Figure 3.4: CEFC investments by sector



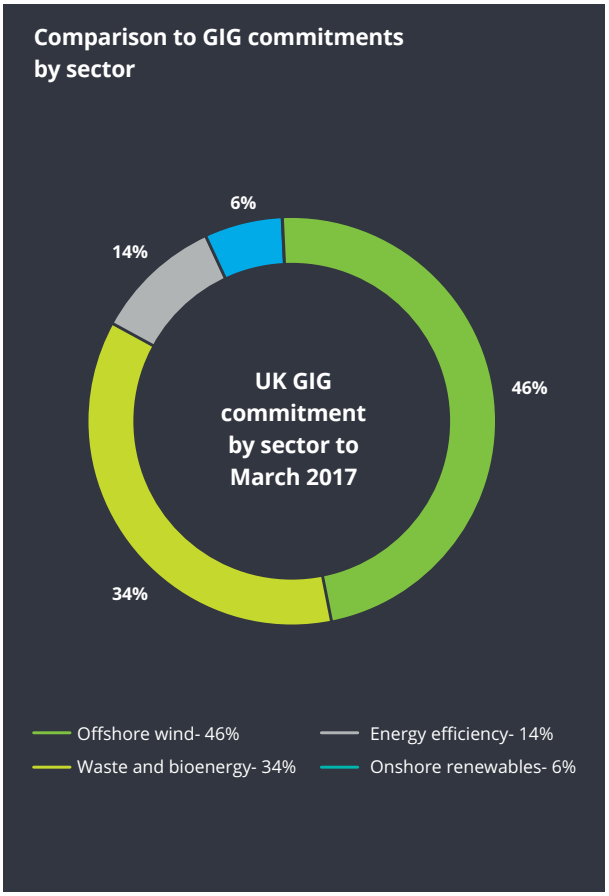


Figure 3.5: CEFC cumulative investments by sector since inception

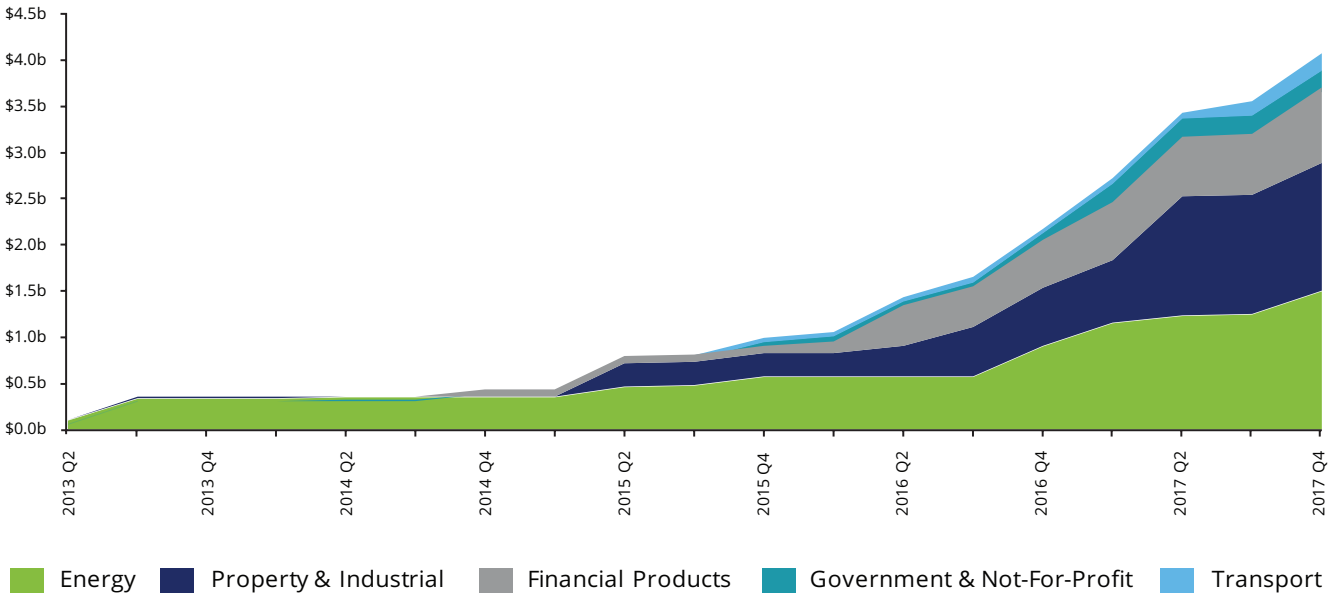


Table 3.3 below provides a summary of the investments that the CEFC has made across the target sectors.

Table 3.3: CEFC investment by sector, markets and products.

Industry sector

Renewables $1,490m 35%	Government, Not-for-profit $303m 7%	Property, Infrastructure, Manufacturing, Agriculture $1,521m 35%	Transport $179m 4%

Market

WIND	LARGE SCALE SOLAR	GRID AND SRORAGE SOLUTIO N	WASTE AND BIOENERGY	LOCAL GOVERMENT AND UNIVERSITIES	COMMUNITY HOUSING	PROPERTY	INFRASTRUCTURE	MANUFACTURING AND INDUSTRY	AGRICULTURE	VEHICLES	BIOFUELS

CEFC amount invested to date (and % of total portfolio)

$720m 17%	$527m 12%	$120m 3%	$123m 3%	$113m 3%	$190m 4%	$763m 18%	$150m 3%	$307m 7%	$301m 7%	$180m 4%

Product

Financial Products: $830m* (19%)		
Debt Markets: **$675m** (16%)	Investment Funds: **$125m** (3%)	Innovation Fund: **$30m***

*Note: Clean Energy Innovation Fund amounts were not yet invested, shown for comparison.

Key findings

The CEFC has been effective at facilitating increased flows of finance into clean energy projects across different sectors of the Australian economy. Most of its investment activity has been targeted at the energy industry, the property and industrial sector and financial products.

Comparison to other Green Investment Banks: Investment focus

The **Green Investment Group (GIG)** in the United Kingdom stated sectors of focus are offshore wind, waste and bioenergy, onshore renewables, and energy efficiency (non-domestic). [58]

New York Green Bank (NYGB) invests in clean energy generation, energy efficiency, clean transportation, clean energy storage, sustainable agriculture and water infrastructure.[59]

The German Development Bank (KfW) has a broader mandate than a green bank, being the country's development bank, however it has low-carbon focus areas including energy efficiency, renewable energy (solar, wind, waste-to-energy & bioenergy) and energy-related innovation projects. [60]

3.2.4 Investment by financial product

The Explanatory Memorandum states that the CEFC "will finance Australia's clean energy sector using financial products and structures to address barriers currently inhibiting investment." While the type and range of products the CEFC uses or invests in is driven in part by the opportunities available to it in each sector, it is also representative of its risk appetite, capability and innovation.

The CEFC provides finance through two broad categories of investment:

- **Direct investments:** $2.7 billion (62% of total investments)

  For the purposes of this analysis, direct investments include project finance, corporate loans (as they are largely allocated to specific projects) and equity.

- **Investments through a financial intermediary** (third party such as a bank): $1.6 billion (38% of total investments)

  Climate bonds and aggregation loans are categorised as finance provided through a financial intermediary. A climate bond (specific type of certified green bond) is *"a fixed-income debt investment and, like any other bond, offers a financial return"* which is *"issued for the specific purpose of funding ... sustainable projects or other uses beneficial to the natural environment."*[61] Aggregation partnership loans are a form of wholesale finance invested through an intermediary such as a bank, which allow the CEFC to invest in smaller scale (i.e. small business) projects.

It is noted that the funds invested in aggregation partnerships programs generate an estimated return of approximately 1.0% over the Australian Government Bond Rate (AGBR), which has the effect of reducing the entire portfolio's return, which is targeted to be 3 to 4% over the AGBR. However, this is also representative of the very low risk exposure the CEFC takes in making these loans, as it is only exposed to the financial institution's credit risk (i.e. the credit risk of loaning funds to the bank, which is very low), and not the end customers individual credit risk.

As outlined in Figure 3.6 and Figure 3.7, the majority of the investments that the CEFC has made are in project finance (31%), aggregation partnerships (29%) and corporate loans (19%).

Figure 3.6: CEFC investments by financial product

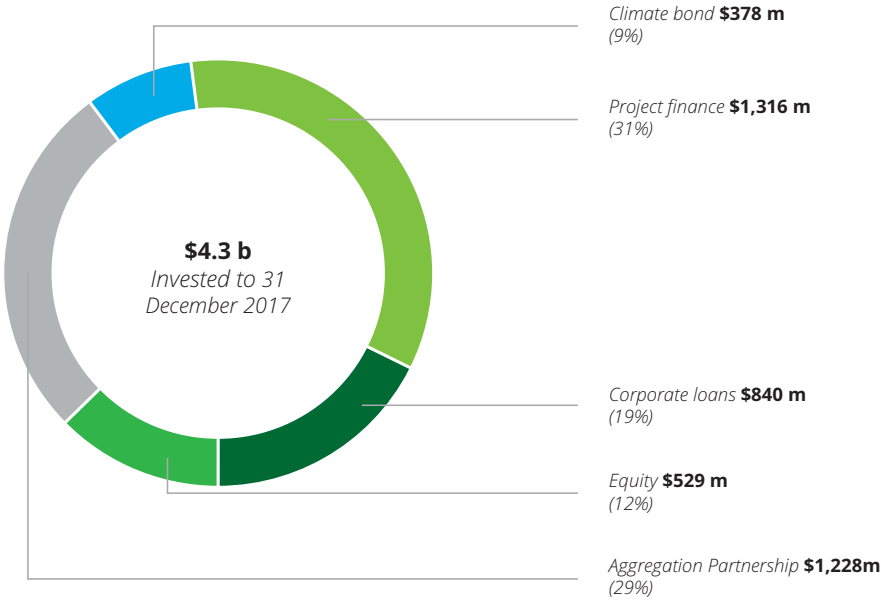
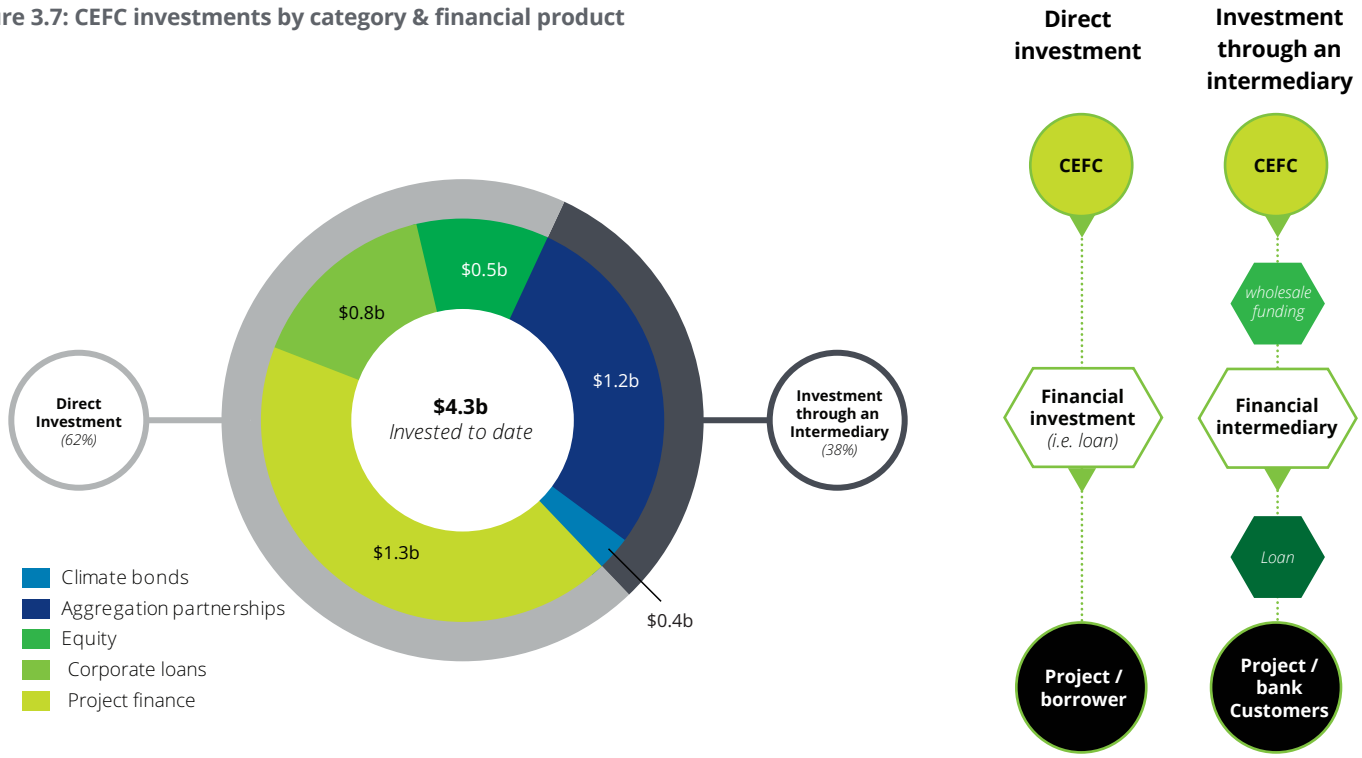


Figure 3.7: CEFC investments by category & financial product



Direct finance

Project finance

Long-term financing of infrastructure and industrial projects (such as a utility-scale generator) which will be repaid from the projected cash flows of the project without recourse to the balance sheets of the sponsors.

Corporate loans

Typically, a loan to a company (rather than a specific project) for its smaller-scale projects, or a bundle of projects, often secured against the assets or operations of the corporate entity.

Equity investments

In finance terms, owned capital (such as shares) in a business or enterprise.

Investments through an intermediary

Aggregation partnership programs

The provision of CEFC finance via co-finance intermediary partners, to aggregate customer demand that would otherwise be too expensive to be serviced directly by the CEFC. The CEFC's finance is indirectly provided to end users via a third party, such as a bank or financial institution. The CEFC develops products with intermediaries (i.e. banks) to leverage their capital and sales networks. These products can be distinguished from a direct CEFC loan where the finance moves directly from the CEFC to the project owner.

Climate bonds

A specific type of green bond issued by the Climate Bond Standards and Certification initiative.

Source: CEFC Annual Report 2016-17 definitions of financial products [62]

The key example of CEFC financial product innovation has been the development of wholesale funding products, including aggregation partnership programs, green bonds and investments in securitisation structures. The CEFC has increased the flows of finance into less developed asset types and increased capital availability, using specialist capabilities to innovate and standardise, creating new de-risking products, contractual structures and procedures in order to help projects become bankable.[63]

In the direct investment channel into large-scale projects, the CEFC has made the vast majority of its investment into senior debt ($3.7 billion, 85%), however it has demonstrated innovation into a limited number of lower security investments, such as providing subordinated debt or equity funding in a selection of projects. One stakeholder commented that the CEFC "has a pretty finite structure of plain vanilla lending with their debt financing. I would prefer some equity or quasi equity products offered too."

A research paper by Geddes et. al. investigated, among other concepts, "the activities and financial instruments offered by SIBs [State Investment Banks] and compare[d] these to the need for such from low-carbon developers when sourcing finance." [64] The paper notes that the CEFC offers a narrower range of financial products compared to peers such as the GIG, which "provides a wider range of financial instruments than the CEFC, including long-term fixed market rate debt, mezzanine and subordinated debt, equity and bridging equity loans." [65]

This narrower range of financial products offered by the CEFC is partly a by-product of the ecosystem in which the CEFC invests, and also of the maturity of the organisation. The Australian banking system is primarily funded by short-term deposits and short-term funding. [66] As a result, local lenders have generally offered short to mid-term loans of around five years that are unsuited to low-carbon projects with longer lifetimes. This has left a significant gap in the market for senior debt finance with appropriate terms to finance clean energy projects. This explains, at least in part, why the CEFC has focused on investments with longer tenor, regardless of a higher weighting toward senior debt, as the domestic appetite for longer dated instruments has taken longer to develop. Nevertheless, this has naturally resulted in less investment into subordinated debt or equity positions.

The CEFC's investment into a broad range of financial instruments is important due to its role in 'educating' or leading the market, by building out its expert internal capability to *"better assess risks, create and standardise innovative de-risking instruments and then diffuse this new knowledge throughout the industry."* Stakeholders indicated that *"many private investors in Australia lack the requisite sector expertise and specialisation in clean energy financing,"* increasing the sector's reliance on the CEFC for leadership in structuring and financing clean energy projects. The future role of the CEFC in this regard is discussed further in Chapter 6.

Another aspect of this range of commercially priced financial products in the clean energy sector is the additional investment options it provides market participants, as well as the deepening of liquidity of the products. One stakeholder pointed out that *"it is important that positions reflect the commercial reality so that the market becomes educated and also so that these positions can be sold on the secondary market."*

Comparison to other Green Investment Banks: Financial instruments

KfW: debt - primarily bonds for construction stage, export and project finance

Caisse des Dépôts (CDC) (France): debt (construction stage) & equity (operational stage) - investments into companies, real estate, private equity and infrastructure

European Investment Bank (EIB) (European Union (EU)): debt & equity - green bonds, small-medium enterprise (SME) and venture capital financing

GIG: debt & equity

Key findings

The CEFC has developed a broad range of debt financial products. The primary focus on debt products may shift as the sector matures similar to other green banks around the world.

3.3 Indirect flows of finance

In addition to directly increasing the flows of finance into the clean energy sector through its investments in various projects, the CEFC also indirectly increases the flow of finance into the sector. There are two different ways in which the actions of the CEFC indirectly facilitate increased flows of finance into clean energy technologies:

01. Leveraging private sector finance to increase the total dollars invested in the sector; and
02. Provision of knowledge and expertise in financing clean energy technology projects.

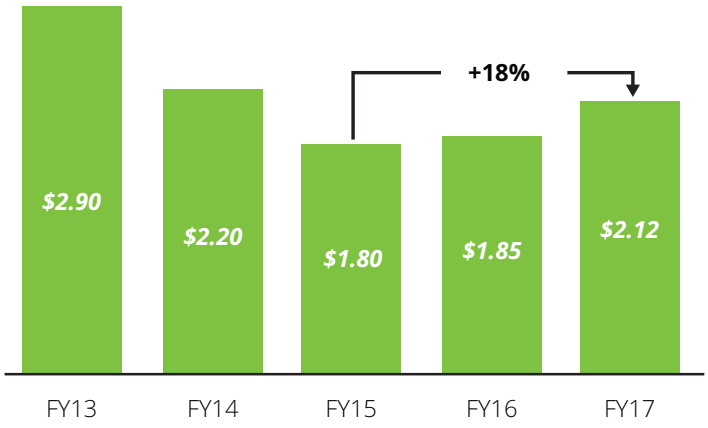
These are discussed in more detail below.

3.3.1 Leverage of private sector finance

The CEFC's investment objectives, as set out in its Investment Policies, are to *"catalyse and leverage an increased flow of funds for the commercialisation of solely or mainly Australian-based renewable energy, energy efficiency and low emissions technologies."* [68] It does this by working with private sector financers, project sponsors and business owners to *"facilitate and leverage increased flows of finance into the clean energy sector."* [69]

The CEFC measures private sector leverage by calculating the ratio of its investment to the size of the private sector investment. That is, if the CEFC made an investment of $20 million in an investment with a total size of $100 million, private sector investment would be $80 million, resulting in leverage of $4 of private investment for every $1 of CEFC finance. This calculation can be used as an indication of the indirect flows of finance into clean energy technologies as a result of the CEFC's investment activity.

Figure 3.8: Portfolio investment leverage, per $1 of CEFC capital



Comparison to other Green Investment Banks: Leverage [67]

GIG reports a mobilisation ratio to assess performance, calculated in the same manner as the CEFC's leverage calculation. Between 2012 and 2016 the GIG achieved a mobilisation ratio of between 2.4 - 3.8 each year (equivalent to leverage of $2.40 and $3.80).

Connecticut Green Bank also reports private leverage, and has achieved leverage of $6.10 per dollar invested since 2012.

GFO achieved a private source leverage ratio of over 10:1 (i.e. $10 per $1 of GFO capital) from 2012-13 to March 2017.

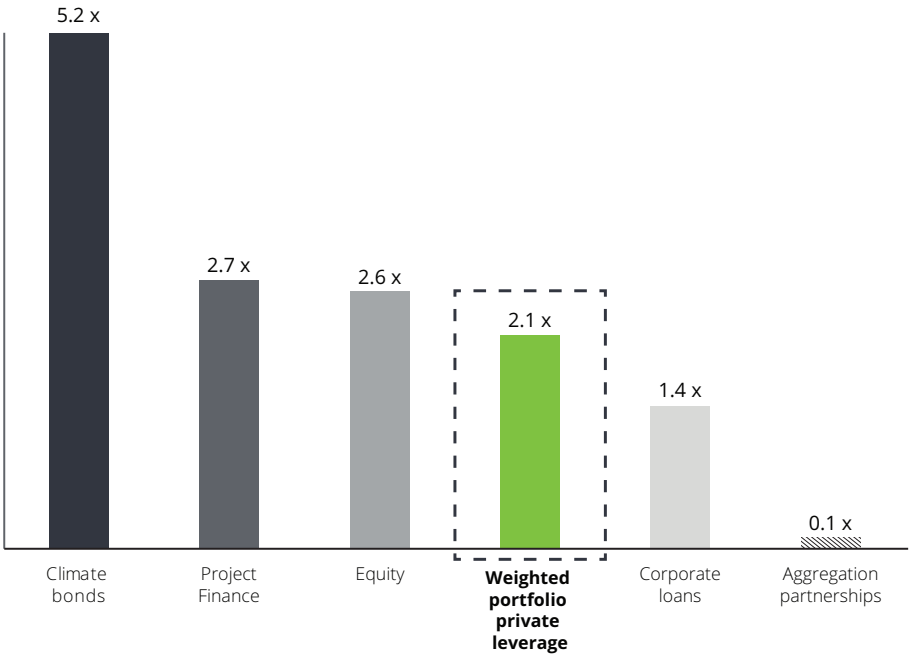
The CEFC reports the amount of private capital it has leveraged each financial year in its annual report. In the financial year ended 30 June 2017 [70], the CEFC reported that for each dollar of CEFC investment, it leveraged $2.12 in private sector investment. [71] The investment that the CEFC has leveraged over the five years of its operation has varied, as shown in Figure 3.8, with the CEFC leveraging a high of $2.90 per each dollar of investment in its first year of operation and a low of $1.80 per dollar of investment during 2014-15, being the period of the RET review, where the clean energy sector was subject to significant uncertainty and private sector investment declined significantly. [72] CEFC leverage has slowly recovered post 2014-15, 18% to 2016-17, but has not recovered to the highs of 2012-13.

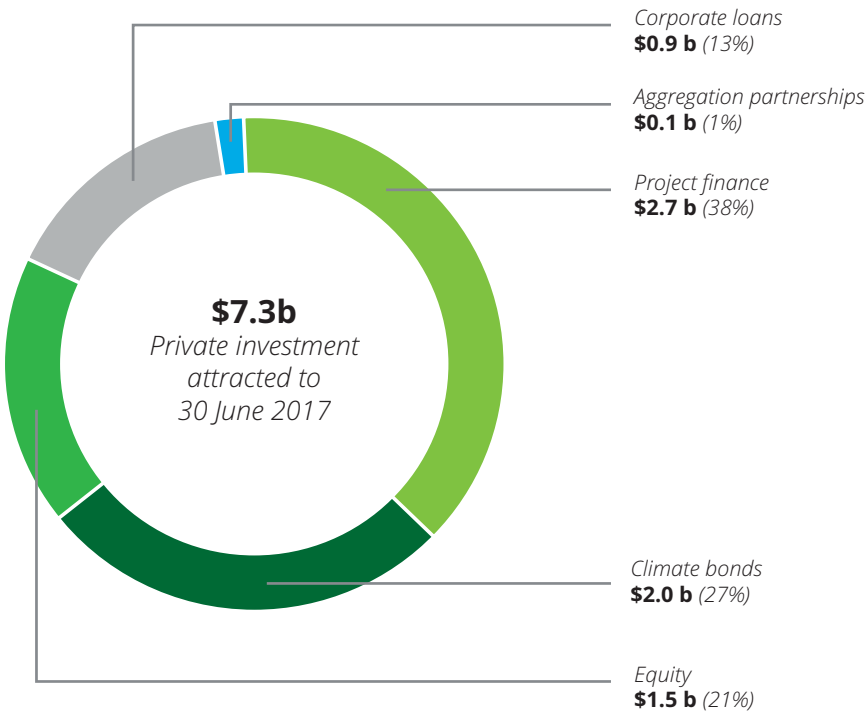
Private sector leverage is partly influenced by the preference of investment method (financial investments) in each project. As shown in Figure 3.9, some financial instruments attracted significantly more private sector capital than others.

Climate bonds delivered the highest private leverage multiple of $5.20 per dollar of CEFC investment at 30 June 2017, and the second highest contribution of private capital, attracting $2 billion of private funds. This high degree of leverage is due to the characteristics of the bond issuances the CEFC has been involved in, and the success of the bond issuances, easily attracting significant amounts of private capital with later issuances being reported as oversubscribed and no longer needing the CEFC's investment.

Project finance private leverage delivered an average of $2.70 for every $1 invested by the CEFC (as reported at 30 June 2017). Due to the number of projects delivered to 30 June 2017, project finance attracted the most private investment, supplying approximately $2.7 billion in private funds. This is a result of the nature of project finance, which typically attracts a greater

Figure 3.9: Portfolio investment leverage by finance type at 30 June 2017 (presents investment per $1 of CEFC finance)[73]



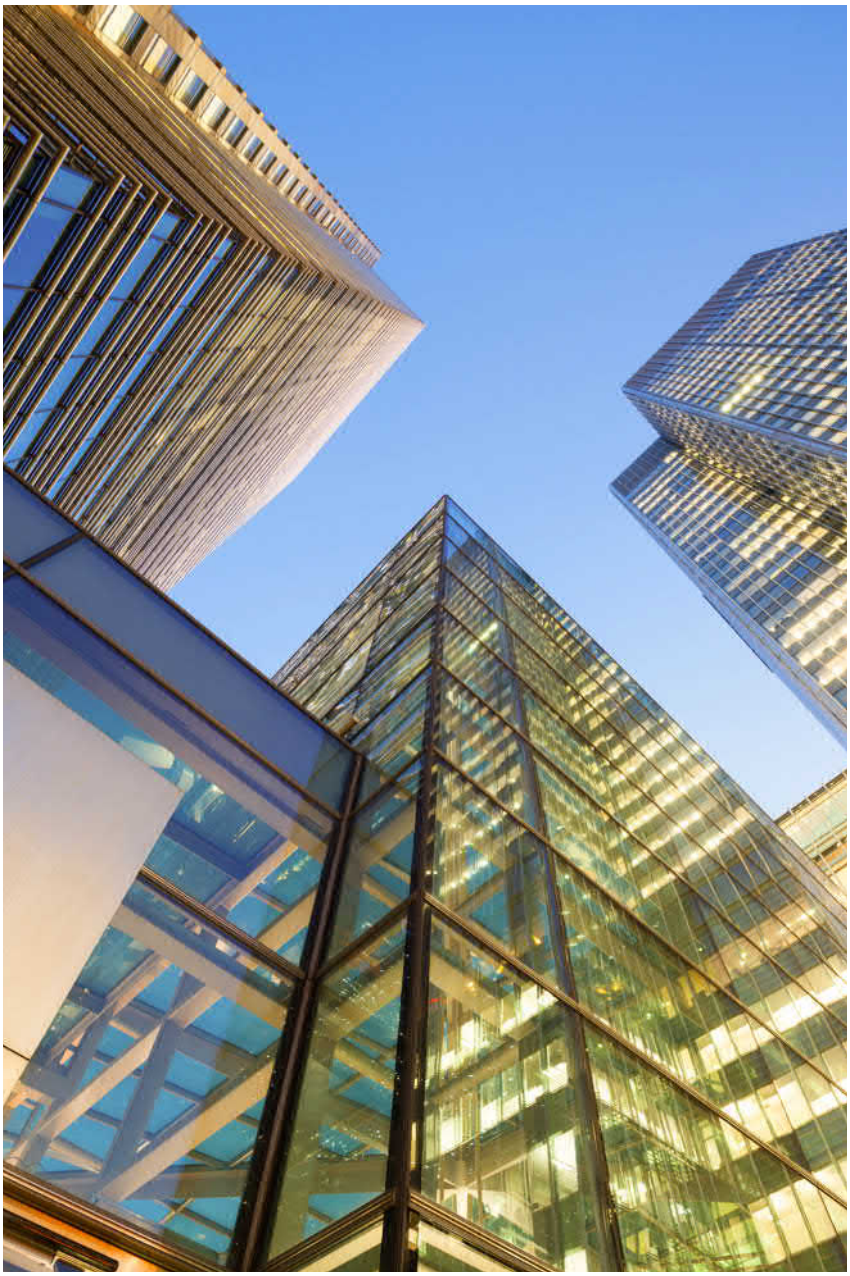


proportion of equity capital to debt capital, and may involve multiple debt financiers such that the CEFC is not the sole debt financier of a project.

Equity investments also delivered substantial private leverage, driving $2.60 per dollar of CEFC capital, and delivering around $1.5 billion of additional private investment. Corporate loans, with debt provided to a company to fund one or more projects, delivered a $1.40 of private investment per CEFC dollar, resulting in almost $1 billion of private capital.

Co-financing (aggregation loans) delivered a low level of leverage (on average less than $0.10 per CEFC dollar). These loans were typically provided as wholesale finance through a bank's network to be passed directly to a customer, and therefore did not typically attract investment of private capital. It is noted that due to the combined size of these loans the weighted average leverage of the CEFC is reduced substantially.

However, while the reported leverage on co-financing loans was typically low, the CEFC's leverage calculation for these types of loans does not capture any equity contribution made by the ultimate beneficiary of the loan. This is because the co-financing partners of the CEFC do not provide it with data on the equity contribution of the ultimate beneficiary of the loan. Therefore, the leverage of co-financing or aggregation loans is likely to be understated.



Key findings

The CEFC has been effective at leveraging private capital, leveraging between $1.80 and $2.90 in private capital for every $1 invested since its inception. This has been primarily driven by project finance investment and climate bonds.

3.3.2 Provision of market knowledge and expertise

As a dedicated clean energy investment bank, the CEFC has developed market knowledge, expertise and experience that is generally not available within other commercial lending organisations. This was identified as one of the key benefits of the CEFC by its stakeholders, both in submissions and in interviews.

The information that the CEFC releases to the public provides only high level information about the investments that the CEFC has entered into, such as the project developer and the technology that is being invested in. This information is valuable as it signals the types of investments that the CEFC is willing to make which as a consequence, could serve to reduce some of the perceived risk in investing in different types of technologies. In contrast, its value is limited in terms of developing market knowledge in relation to the operation of projects in the context of the market. This view was echoed by stakeholders who noted "the market reports and case studies it [the CEFC] generates are useful. But I think that is scratching the surface of what knowledge the organisation holds that could be beneficial to the whole market."

Despite the above, there are a number of instances where the CEFC has required a project proponent to share knowledge as part of the extension of an offer of finance. In particular, as part of the CEFC's equity investment in the Investa Commercial Property Fund, Investa has committed to create an online resource that will outline its approach and the economics behind the development of energy efficiency in buildings. [77] Investa will make this resource publicly available, however we are not aware of the status of its development.

While the CEFC does not generally publicly share detailed information in relation to the investments that it makes, nor require project developers to do so as a condition of finance, we understand that the CEFC does apply the expertise and knowledge that it learns through projects. Further, this knowledge, expertise and experience is applied in projects with various project developers and commercial financiers that it works with, subject to confidentiality requirements. In effect, this enables market capability to be developed in financing clean energy technology projects and is one of the reasons why it is important that the CEFC lead the market in relation to financial product innovation and deal structuring.

The CEFC's focus on building industry knowledge is not as strong as that of ARENA. However, this is appropriate, as the "return" that ARENA seeks from a grant is the development of industry capability and knowledge rather than a financial return. ARENA regularly requires projects that are provided a grant to develop a knowledge sharing plan that outlines how the project developer will provide information to the market in relation to the key findings of their project, particularly where the project is early in the innovation chain.[78]

The CEFC does not have the same statutory requirement for knowledge sharing as ARENA because its focus is on projects that are at the deployment end of the innovation chain combined with a commercial focus. [79] Many of the projects the CEFC invests in operate in competitive markets and it would not be appropriate for detailed information in relation to the structure and terms of the project to be released publicly as the information is commercially sensitive. Requiring the CEFC to have a similar focus on building industry capability as ARENA would likely limit the participation of potential private investors.

Comparison to other Green Investment Banks: Building industry capacity

NYGB reports on external affairs outreach efforts in quarterly and annual reports. [74]

GIG disseminates knowledge through distribution of news and insights. It has also developed a 'Green Investment Handbook' for a consistent and robust means of assessing, monitoring and reporting the green performance of investments. [75]

Connecticut Green Bank releases studies and reports from evaluations of its programs as well as other studies which address specific needs and questions of interest to the clean energy industry. [76]

ARENA and CEFC

ARENA is an independent Australian Government authority, established in 2011 to administer Commonwealth renewable energy grant funding to improve the competitiveness of renewable energy and related technologies and to increase the supply of renewable energy. ARENA has responsibility for:

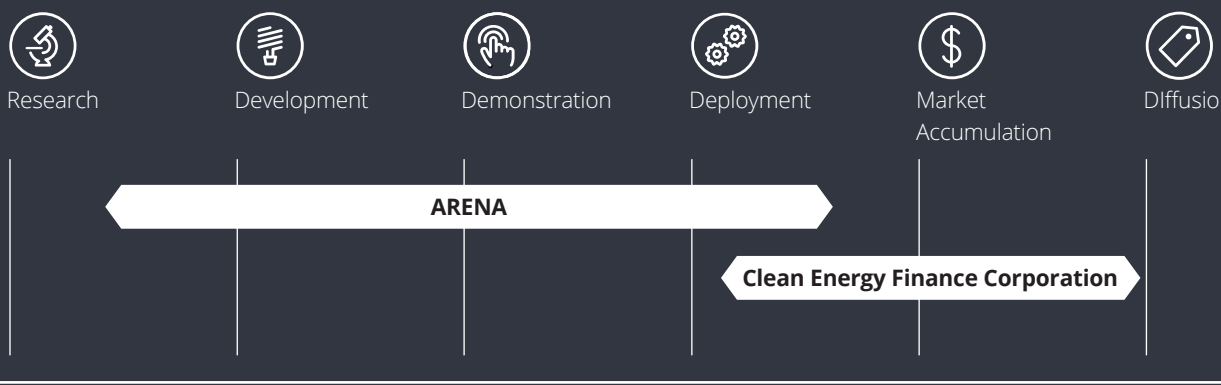
- "Providing financial assistance for the research, development, demonstration and commercialisation of renewable energy and related technologies
- Developing skills in the renewable energy industry
- Sharing of non-confidential knowledge and information from the projects it funds
- Promoting collaboration on renewable energy technology innovation with state and territory governments and other institutions, including international governments and institutions." [80]

The financial assistance that ARENA provides renewable energy is in the form of grants. There is no requirement for ARENA to make a financial return on the assistance it provides to different projects. The return that ARENA seeks from a grant is the development of industry capability rather than a financial return. [81]

In contrast, the CEFC was established as a financier of clean energy sector projects and it provides finance to clean energy sector projects, with the expectation of earning a financial return. The CEFC also supports projects that are further along the innovation chain – those at the deployment end of the chain.

The different stages along the innovation chain in which ARENA and the CEFC focus are outlined in Figure 3.10.

Figure 3.10: Technology innovation chain [82]



Key findings

The knowledge, expertise and experience of the CEFC provides benefit to the market, in that it builds market capability with respect to financing clean energy projects. The application of this knowledge, expertise and experience is not as public as ARENA's knowledge sharing initiatives, but this is appropriate given the function of the CEFC.

3.4 Submissions

In general, stakeholders were positive in relation to the extent to which CEFC facilitated increased flows of finance into the clean energy sector. More than three-quarters of stakeholder submissions agreed that the CEFC had a direct impact in increasing financial flows into the clean energy sector. A common opinion expressed by many stakeholders was that the CEFC was a key facilitator for investment in early stage projects in underdeveloped technologies. The Australian Industry Group (AI Group) estimated that each dollar of CEFC investments were matched by more than $2 from private sector investments in 2016-17.

"A great strength of the first years of the CEFC has been the diversity of financing structures that have managed to provide opportunities for private capital from many different pools to participate in, and co-invest alongside the CEFC. Working across debt and equity, working with infrastructure, venture capital, private equity and property, from banks to VC fund managers, across different assets and asset classes, the projects have been broad and diverse and have often pioneered a new application of financial structures that catalyse new and additional flows of finance into the clean energy sector."

The Responsible Investment Association Australasia (RIAA)

Clean energy sector

In the large-scale market, the CEC, Finncorn Consulting Pty Ltd (Finncorn) and other stakeholders noted that the CEFC has enabled investment into projects with merchant exposure, where there was low interest from commercial investors. The CEC estimated that, since 2014, more than 300 MW (of around 700 MW) of renewable energy projects committed without any PPAs were financed by the CEFC, and that a single company represents half of the remaining capacity that was able to proceed on a fully merchant basis. Moreover, almost all multi-megawatt projects with partial merchant exposure relied in part on CEFC financing, demonstrating that this capability is not common without the CEFC's support. Although increased funding is important, the CEC also remarked that the CEFC has avoided crowding out private sector investors by charging a price premium for projects with merchant risk. This has provided a gap to allow private sector financiers to enter with more cost competitive products as they develop confidence.

The ATSE noted that the CEFC has gained greater capability in assessing clean energy project risk than many of their private counterparts, and therefore is better placed to make investment decisions. Thus, sharing their knowledge via partnership has assisted in developing private sector investor confidence, particularly in early stage projects. Superannuation fund Australian Ethical Investment, highlights its collaboration with CEFC for the Artesian Clean Energy Seed Fund. Through the fund, CEFC has made early stage clean technology accessible for institutional investors, who often lack the specialised resources to evaluate the benefits on a project-by-project basis. ATSE, alongside Australian Ethical Investment, the CEC, the GBCA and the Responsible Investment Association Australasia, also remarked on the CEFC's capability to develop new financial products, which has greatly assisted in their objective. According to The Australian Conservation Foundation, the CEFC has financed more than 4,000 smaller clean energy projects, partnering with over 15 different financial institutions.

Property & industrial sector

Three of the stakeholders noted the importance of the CEFC in the built environment market. The GBCA submitted that the CEFC supported the launch of Australia's first certified property Green Bonds. In 2016-17 the CEFC made its first investment in clean energy transport infrastructure, committing up to $150 million to the Moorebank Logistics Park intermodal terminal in Sydney. According to the GBCA, this will reduce the distance travelled by container trucks by 150,000 kilometres every day, deliver annual net carbon emission savings equivalent to burning 25,000 tonnes of coal and generate 65,000 MWh/year from renewable energy sources installed on site.[83]

Stakeholders also commented on the CEFC's support for clean energy in the commercial segment. The CEC suggested that the provision of CEFC's finance products allowed solar retailers to market systems to businesses as cash flow positive from day one, an important factor in the

growth of the commercial segment, which represents 28% of total solar capacity installed in 2017 compared to 3% in 2012.

The AFIA estimated that energy efficiency funding by the CEFC financed the acquisition of approximately $433 million of assets by small businesses. While there is a growing desire for more energy efficient assets among small businesses, COSBOA also attributed the popularity of the energy efficiency program to the attractiveness of the funding discount provided and its appeal relative to the 'instant asset write-off' tax concession which is limited by a $20,000 ceiling. Despite the positive outcomes, COSBOA also commented that only approximately 30% of CEFC's portfolio was allocated to small business, while the rest of their investments are "to much larger organisations who arguably do not require government assistance and effective subsidies." Both COSBOA and CAFBA advocated for an increase in funding for the Energy Efficiency Program (aggregation partnership programs discussed in 3.2.4) to sustain long-term viability.

The GBCA also acknowledged the financial flows that the CEFC has indirectly facilitated. The CEFC has been effective in growing industry capacity in the property sector and promoting best practice through education and knowledge sharing. The CEFC published Energy in Buildings: 50 Best Practice Initiatives as a practical guide for property owners and managers to improve building energy efficiency. Moreover, the GBCA notes that the CEFC encourages project partners to share learnings from funded projects, by developing case studies and gathering performance data. The GBCA and other stakeholders recognised the CEFC's collaboration with Investa enabled energy efficiency expertise and experience to be shared with the property sector.

Government and not-for-profit

Not-for-profit, World Wildlife Fund (WWF), commended the CEFC's role as an advisor for members of the Renewable Energy Buyers Forum, which focuses on accelerating renewable energy uptake by large energy user organisations. St George Community Housing (SGCH) acknowledged its partnership with CEFC has helped develop, build and upgrade housing with energy efficient features. Since 2015, CEFC has committed up to $170 million to help deliver 500 high-performing homes, the largest financial investment in an Australian community housing provider yet. Through institutional investment SGCH and CEFC were able to future proof an asset class and share the benefits between the landlord and tenant. This overcomes a traditional investment barrier due to misaligned incentives between property owners and tenants.

The Australian Conservation Foundation and The Australia Institute believe that the CEFC plays a key counter-cyclical role in maintaining investments in the clean energy sector. The Australia Institute commented that the CEFC has been a stable presence while the clean energy market has faced ongoing uncertainty, was compounded by the lumpy nature of large-scale renewable energy and infrastructure finance.

4

Was the CEFC's involvement integral to the outcome?

In addition to assessing the effectiveness of the CEFC against the object of the Act, we have also assessed the outcomes of the CEFC against the counterfactual to establish causality. That is, the extent to which the CEFC caused the outcome of increased investment in the clean energy sector. This analysis involved consideration of:

- The extent to which the involvement of the CEFC in an investment was integral to that investment proceeding
- Whether the involvement of the CEFC changed the behaviour of the partner investor or other investors.

This chapter finds that there is evidence that the CEFC was effective relative to the counterfactual in a number of instances, and enabled a number of projects to proceed that may otherwise have not been able to secure finance. However, in relation to whether the involvement of the CEFC changed the behaviour of the partner investor or other investors, it is too early to tell for a number of the CEFC's investments.

4.1. The counterfactual

Assessing effectiveness with reference to a counterfactual requires consideration of what would have occurred in the absence of the policy or program. In the case of this review, this involves consideration of whether similar levels of investment in clean energy would have occurred in the absence of the CEFC. This includes both the direct investments that the CEFC has made, and the indirect flows of finance resulting from CEFC investment activity.

It is not a straightforward task to determine whether the $4.3 billion directly invested in the clean energy sector would have eventuated in the market in its absence. It is possible that some of the projects that the CEFC supported may have found alternative finance options, albeit with a time delay or pricing differences. To thoroughly test this a detailed review of the availability of finance in the market at the time of each investment would need to be undertaken, and even this might prove inconclusive. Further, much of the information that would be required is generally not publicly available and a review of all CEFC investments was outside the scope of this review.

To assess the effectiveness of the CEFC relative to the counterfactual, we reviewed a sample of the CEFC's investments made to 31 December 2017 using information supplied by the CEFC alongside publicly available information and submissions. This sample was identified based on the two relevant counterfactuals against which the effectiveness of the CEFC can be assessed, noting we were limited by the information available. These are:

01. Whether the project would have been financed in the absence of the CEFC; and
02. Whether the involvement of the CEFC in an investment changed the behaviour of the partner investor or other investors.

For some investments, one of these counterfactuals may apply more readily. For example, in assessing the effectiveness of the CEFC in relation to a specific wind farm investment, the more appropriate relevant counterfactual considers whether there was a reasonable prospect that the project would have proceeded with private finance. In contrast, for an investment that would likely have proceeded even in the absence of the CEFC (i.e. a property fund investment), the more relevant counterfactual is whether the partner investor or other investors changed their behaviour in response to the involvement of the CEFC. For other investments, such as climate bonds, both counterfactuals may be equally relevant.

It is important to note that we considered the counterfactual at the time the investment was made. As the market for clean energy matured over the period and other policy and market settings changed, financial markets may have 'caught up' as the perceived risk around certain investments decreased.

We acknowledge that there may have also been other policy levers that the Government could have utilised to achieve similar outcomes in the market, such as the introduction of building codes to effect increased investment in energy efficiency. These are not relevant to the assessment of the effectiveness of the counterfactual, which considers the outcome if the CEFC was not in place, rather than vis-à-vis other policy measures.

4.2. Would the project have been financed in the absence of the CEFC?

There is evidence that, in the absence of the CEFC, a number of the sample projects would have not proceeded due to the perceived risk of the project or low return requirements. In particular, new renewable energy developments that with revenue completely exposed to market risk, or that had not secured an offtake agreement with a highly rated counterparty, faced high barriers to private sector finance initially, with limited to no domestic interest and limited international interest [84]. While energy efficiency projects similarly faced barriers to finance, these barriers appear to have been more related to the ability for the private sector to provide capital at a rate that makes energy efficiency investment attractive due to the indirect nature of financial returns from energy efficiency investment.

From the information we reviewed, including submissions from stakeholders, the CEFC does appear to have been effective in overcoming barriers to finance and enabling a project to proceed where otherwise it may have fallen away. In one interview, a stakeholder expressed the view that the CEFC was critical to enabling equity partners to proceed with certain projects, noting that existing commercial lenders were not willing to provide terms agreeable to equity partners. Similar views were expressed in other interviews as well as submissions to the consultation paper.

The analysis in this section focused on whether projects would have been able to proceed in the absence of the CEFC, to assess the effectiveness of the CEFC relative to the counterfactual. It is noted, however, that there is also evidence suggesting that in cases where the CEFC was aware that sufficient finance was commercially available, it did not proceed with an investment. This implies that the CEFC focused its efforts on projects experiencing barriers to finance, limiting the extent to which it displaced private sector capital. All else being equal, this would have facilitated increased flows of finance into the clean energy sector as a greater number of projects proceeded.

The remainder of this section provides an overview of a subset of the sample investments that we reviewed against the counterfactual. The projects outlined suggest that the CEFC was effective relative to the counterfactual and that in its absence the projects are unlikely to have proceeded. We have relied on information provided by the CEFC to conduct this review. Our conclusions are limited by the uncertainty which exists with respect to the counterfactual as well as by the availability of information that demonstrates that project proponents thoroughly tested finance markets to establish no alternative capital was available to the project.

It is important to note that while the projects the CEFC supported were generally subject to a greater degree of risk than projects in the market that attracted commercial investment, this does not imply that the merits of the projects supported by the CEFC were lower than the merits of projects supported by commercial finance. It also does not imply that there is no need or demand for the project in the market. Indeed, the role of the CEFC is to take on projects in exactly these circumstances. The market for offtake agreements is driven by a range of different factors, and a project's ability to attract an agreement is affected by expectations in relation to price and policy as well as established relationships with potential customers.

Case Study 1: Portland Wind Energy Project, Victoria | 2013 | 47MW financed, 179MW refinanced

In September 2013, the CEFC provided $70 million in debt financing to Pacific Hydro for the construction of stage four of the project and refinancing of stage two and three of the Portland Wind Energy Project, taking a mezzanine equity position.[85]

The Portland Wind Energy Project did not have a PPA at the time that finance was being sought and was perceived to have high revenue risk. Consequently, the project had difficulty attracting sufficient private capital to proceed. By taking a mezzanine debt position, it appears that the CEFC was able to address the concerns of commercial lenders in relation to gearing, unlocking an additional $158 million of private finance from a consortium of domestic and international banks toward the $361 million project. [86]

While technically the refinancing portion of the project does not necessarily increase the flows of finance into the clean energy sector, the ability for project developers to refinance a project is important to demonstrating that should a developer need to offload some of its assets, it is able to do so. This improves liquidity in the market, which all else being equal, would be expected to increase the attractiveness of investment in that market. The CEFC's involvement in this project provided a signal to the market that projects can be exited and refinanced where required.

This case study indicates that the CEFC was effective in enabling the Portland Wind Energy Project to proceed. In its absence, and noting that we have not tested or reviewed the state of the market at the time the project was seeking finance, it is possible that the project would not have successfully completed at that time This investment is also a good example of where the CEFC has utilised different finance structures and security position to address a specific barrier to finance for a project.

Case study 2: 2016 Large-Scale Solar program (ARENA & CEFC) | 2016 | $350 million (combined)

The CEFC provided debt finance to eight of the 12 projects that were successful in the 2016 ARENA large-scale solar $100 million grant funding round, and supported a further two projects that did not receive a grant but were able to proceed regardless. In total, the CEFC committed $350 million in primarily senior debt to these projects and acted as either the sole financier or as a co-financier. [87] The remaining four projects were financed through a combination of domestic and global banks. All equity was provided by foreign investors.

As four other projects in the program were able to secure finance without the CEFC, this could imply that finance may have been available to the projects that the CEFC supported, in the absence of the CEFC. However, this does not take into account the differences between the projects that were able to be financed commercially and the projects supported by the CEFC. In particular, where the CEFC was the sole financier or a co-financier, the project typically did not have an offtake agreement with a tier one counterparty or was exposed to market risk (i.e. no PPA). In these instances, there was no market for debt, beyond the CEFC. Projects that were financed commercially were not subject to these same risks, generally having an offtake agreement with a tier one counterparty, or being entirely equity financed.

This case study is an example of the CEFC being effective in enabling projects to overcome barriers to finance, particularly where projects were subject to higher degrees of risk. This facilitated increased flows of finance into solar projects, taking into account the additional private finance that was invested as a result of the CEFC's $350 million investment. This case study also provides an example of where the CEFC has played a first or early mover role for new projects, acting to support both the technology type and scale as well as the project business model. [88]

In addition to facilitating increased flows of finance into solar projects, the CEFC's involvement with projects competing for an ARENA grant also assisted in de-risking investments in solar through signalling that solar projects are 'bankable' and commercial ready in Australia by providing instruments and capital at commercial terms. [89] These additional benefits may not have eventuated in the CEFC's absence.

Case study 3: National Australia Bank (NAB) Aggregation Partnership Program | 2015 | $120 million

CEFC committed $120 million through NAB for an energy efficiency loan program. The program provided concessional loans to NAB business customers for energy efficiency upgrades. The program was designed to incentivise businesses, in particular agriculture and industrial businesses, to invest in technologies and vehicles that could reduce their energy costs. [90] Equipment and technologies targeted in this program included variable speed pumps in the irrigation sector and upgrades to industrial and commercial refrigeration as well as investments in biogas, bio-digesters, micro turbines, fuel switching equipment and processes and solar PV. [91]

The CEFC's aggregation partnership program with NAB enabled the CEFC to reach agriculture and industrial businesses with energy efficiency investment needs below its internal investment threshold, to facilitate increased flows of finance into clean energy technologies. [92] By leveraging NAB's credit teams to access its customer network, the CEFC was able to pass on the benefit of its ability to provide finance at a lower rate through to agricultural and industrial customers. NAB received no direct financial benefit from the CEFC's subsidised loan. However, it may have benefited indirectly through the expansion of its customer base.

While NAB could have offered a similar program in the absence of the CEFC, it is unlikely that it would have offered the same concessionality without CEFC finance. As a result, the finance that flowed into the sector would likely have been lower.

The program has been an effective way for the CEFC to increase flows of finance into the clean energy sector. The success of this program has led to further increases in flows of finance from the CEFC through similar channels with the CEFC partnering with the following organisations: Westpac ($200 million), Commonwealth Bank of Australia (CBA) ($200 million), Australia and New Zealand Banking Group (ANZ) ($150 million), Macquarie Group ($100 million), Eclipx ($50 million) and RateSetter Australia Pty Limited (RateSetter) ($20 million).

Case study 4: St. George Community Housing | 2015 & 2017 | $170 million (combined)

The CEFC committed $170 million to community housing provider SGCH for the construction of new energy efficient community housing and upgrades to existing housing stock. This commitment was made in two blocks: the CEFC provided an initial debt facility of $40 million (plus $20 million uncommitted) in 2015 with a further $130 million committed in 2017. Under the investment, up to 500 new dwellings will be constructed to an average 7-Star Nationwide House Energy Rating Scheme (NatHERS) rating. The investment also supports energy efficiency upgrades (e.g. LED lighting, energy efficient appliances, smart meters and/or solar) on its existing portfolio, to achieve a weighted average 7-Star NatHERS rating. [93]

In making the investment, the CEFC intended to bridge a funding gap in the community housing sector where private sector finance tends to be provided on a short term basis, which is misaligned with long life of housing assets.[94] By filling this commercial gap, the CEFC allowed SGCH to implement these clean energy initiatives and overcome one of the key barriers to investment in energy efficiency for rented dwellings, being that the direct benefit of the investment accrues to the tenant. The investment also provided additional public benefit through reducing energy bill pressure on low-income households.

The value of the energy efficiency upgrades was a relatively small component of the intended uses for the CEFC loan facility. The CEFC's investment also supported the construction costs of the project more generally. The rationale for this was that in order to enable increased investment in energy efficiency in this social housing project, broader support was needed to overcome barriers to financing the project more broadly. This suggests that the CEFC was likely critical to the project proceeding and, given the combination of barriers facing both investments in social housing and energy efficiency, it is unlikely that the project would have proceeded in the CEFC's absence.

Case study 5: Sundrop Farms Greenhouse Development | 2013 | $40 million (not drawn down)

CEFC provided a cornerstone finance commitment of $40 million to Sundrop Farms for a $140 million greenhouse development near Port Augusta, South Australia. This project sought to install a state-of-the-art solar tower to produce fresh water and energy to power the plant-growing systems and to heat and cool the greenhouse, allowing for tomatoes to be grown on degraded land in arid areas previously considered too barren for agriculture.

Commercial financiers were reluctant to finance the Sundrop Farm project as the technology has not been proven and the risk involved in the investment was difficult to quantify. Further, as the project was both an agricultural project and an energy project, commercial financiers did not necessarily have the expertise to be able to understand the merits and risks of the investment.

The CEFC's early involvement in the project and its commitment to underwrite up to $40 million in senior debt finance enabled Sundrop to progress plans to build its 20-hectare facility in 2013 and start construction. Subsequently, Sundrop was able to secure private sector growth capital from global investment firm Kohlberg Kravis Roberts (KKR) in 2014, replacing the need for the CEFC's finance. [95]

This case study provides an example of where the CEFC was integral to the outcome, sentiment which was echoed at the time by Sundrop Farms in relation to securing KKR's involvement, utilising its investment function to crowd-in private finance by de-risking and signalling the viability of an investment to the point that its investment is no longer needed.

Key findings

Case studies suggest that in the absence of the CEFC, a number of the projects that it supported would not have proceeded due to the perceived risk of the project or low return expectations. The CEFC does appear to have been effective in overcoming barriers to finance and enabling a project to proceed where otherwise it may have not successfully completed.

4.3. Did the involvement of the CEFC change the behaviour of the partner investor or other investors?

There is evidence that the involvement of the CEFC in different projects has had an impact on the behaviour of the partner investor or other investors. In particular, from the information we reviewed, it appears that the CEFC has been able to effect greater clean energy commitments from project proponents than would have otherwise been the case in its absence.

The case studies provide data that suggests the CEFC has utilised its investment function to work with other parties to create new clean energy financial products. The CEFC was the cornerstone investor in both the first Australian climate bond and the first Australian renewable energy fund designed to facilitate greater Australian equity investment in renewable energy projects. While corporate bonds and equity funds were broadly available in the market and were attracting investment in clean energy, the CEFC's investment led to the establishment of green versions of these products which specifically targeted clean energy projects. Without the CEFC, it is possible that these products would have emerged with time, but the CEFC's involvement appears to have catalysed the development of a market for these products.

In relation to investments in property funds, it is more difficult to ascertain whether the involvement of the CEFC materially changed the profile of the fund's investments. There are a range of different reasons why commercial office real estate developers may seek to invest in higher energy efficiency rated buildings, including that high quality tenants tend to demand more energy efficient and sustainable office space and these buildings tend to attract higher rents. While it appears that the CEFC has been able to support greater energy efficiency outcomes through its investment in premium commercial office real estate funds, it is difficult to conclude that this would not have happened in the absence of the CEFC given the trend towards increased sustainability in the commercial office real estate sector more broadly.

However, one of the broader outcomes sought through the CEFC's investment in property funds is a lifting of the entire portfolio of assets managed by the fund. That is, while the CEFC's investment may be related to a capital raise for a particular project, as a result of the investment the fund manager is expected to undertake broader energy efficiency upgrades across its property portfolio. We understand that the CEFC seeks this commitment from the fund manager as a condition of its investment in the fund. While this is an effective way to effect greater investment in clean energy, and could provide an example of where the CEFC has changed the profile of a fund, due to the immaturity of these investments it is too early to tell if this approach has been effective. Further, for similar reasons as above, namely increased demand for greater sustainability in buildings, it is difficult to be confident that this would not occur in the CEFC's absence.

The remainder of this section provides an overview of a subset of CEFC investments that provide an example of where the CEFC has sought to change the behaviour of the partner investor or other investors through its investment.

Case study 6: Investa Commercial Property Fund | 2016 | $110 million

The Investa Commercial Property Fund (ICPF) investment was a $110 million equity investment provided by the CEFC as part of a $600 million capital raising for the $4.1 billion fund. The investment is being used to support the development of a $900 million, 5.8-Star NABERS rated building at 60 Martin Place in Sydney's CBD, which will be a landmark smart building in Australia through digital engineering and energy efficiencies.

This type of equity investment is not entirely comparable to traditional common equity, as the investment is being made into a lowly geared (debt funded) property fund, with strong, relatively less risky underlying assets, being premium commercial office space, held by top tier managers with high quality tenants. [96] Nevertheless, this type of investment still generates substantial returns, boosted by expected projected capital gains on forecast asset values at the time of the investment decision. This unrealised gain in the return calculation will only be realised at the time of investment exit, exposing the return to some risk if projected capital gains are not realised.

The $110 million investment also established a landmark co-operation agreement between the CEFC and Investa to promote the increased uptake of energy efficiency design principles and technologies. The broader aim of this investment is to drive energy efficiency across the broader ICPF, targeting net zero emissions across its portfolio by 2040. [97]

Due to the immaturity of the investment and lack of available data, it is difficult to ascertain whether the investment has been catalytic to driving energy efficiency across the property fund. However, the agreement between the CEFC and Investa is an indicator of the intention to change the energy efficiency characteristics of the fund's assets. It is also difficult to conclude on effectiveness as the commercial benefits, including possible higher rental yields, may have driven this investment in energy efficiency, and the fund did not have a barrier to accessing finance being a top-tier, highly rated commercial property fund.[98]

It is noted however that this investment has driven subsequent similar investments by the CEFC into AMP ($100 million, 2016), QIC (Queensland Investment Corporation) ($200 million, 2017) and Lendlease ($100 million, 2018). However, in terms of whether the CEFC's investment in Investa Commercial Property Fund resulted in increased flows of finance that would otherwise not have occurred, it is not known what additional commitments the Investa agreed to, nor how the CEFC will track performance against these commitments. This is due to the immaturity of the investment and the nature of the outcome targeted (i.e. increased energy efficiency investment). It also remains to be seen whether this investment is instrumental in driving energy efficiency across this market.

Case study 7: NAB Climate Bond | 2014 | $75 million

In 2014, the CEFC provided a cornerstone investment of $75 million in the inaugural issue of the NAB Climate Bond. [99] The NAB Climate Bond was the first Australian dollar denominated and Australian domestic asset-linked certified bond of its kind in the market. The underlying portfolio of assets in this bond contained 17 Australian utility-scale renewable energy projects (in operation or under construction).

This cornerstone investment was made to support NAB in achieving full subscription of $300 million in the bond issuance, being an effective method for the CEFC to attract additional capital to its investment. More broadly this investment was made to support the establishment and growth of the climate bond market locally, demonstrating the potential in the Australian market for mobilising capital in renewable energy. The CEFC was effective in this regard, with the project catalysing additional green bond issuances in the Australian market including by ANZ, Westpac, CBA and FlexiGroup.

In this case study, the involvement of the CEFC enabled the packaging of debt related to renewable energy projects into a specific climate bond issuance. The CEFC's investment allowed for the creation of a specific climate bond, which facilitated the development of demand and a market for climate bond products, improving liquidity for investors in clean energy and directly facilitating increased flows of finance into clean energy.[100]

The CEFC has indicated that subsequent green bond issuances in Australia were oversubscribed, leading to the CEFC's displacement from ANZ's 2015 climate bond issuance, crowding-in private capital.[101]

Comparison to other Green Investment Banks: Green bonds

Green banks have been first movers in the climate bond market globally – in 2008 the European Investment Bank supported the first Climate Bond in 2008, and the World Bank issued the first Green Bond.

Case study 8: Palisade Renewable Energy Fund | 2016 | $75 million

In 2016, the CEFC made a $75 million cornerstone commitment to a new specialist Palisade Renewable Energy Fund managed by Palisade Investment Partners. This fund aims to inject as much as $500 million in new investment to accelerate the development of utility scale renewable energy projects which are being delayed due to a lack of equity at the late development/greenfield stage.

The CEFC's investment in this fund is targeting the equity market for clean energy in Australia, which is relatively immature compared with markets in Europe and the US, with institutional equity constrained by a lack of institutional grade investment product. [102] The CEFC has had initial success to date in partnering with HESTA, Vic Super and Palisade as equity co-investors into a separate but related project, being the Ross River Solar Farm (135MW), which was one of the first Australian institutional equity (i.e. superfunds) investments in Australian solar.

In this case study, the CEFC's investment in the fund did not change the nature of the fund, but sought to encourage the participation of local institutional equity (i.e. superfunds) in an equity market for renewable energy. The fund also creates a vehicle that enables these institutions to more easily invest equity in renewable energy without directly taking on full project level risk. This project is an early indication of the potential for significant increase in flows of finance to the clean energy sector, however its effectiveness will take time to be fully assessed due to the longer term nature outcome being pursued.

Case study 9: Moorebank Logistics Park | 2017 | $150 million

In 2017 the CEFC committed to providing $150 million in senior debt financing to Qube Holdings as the developer of Moorebank Logistics Park, a major intermodal terminal in south-western Sydney. Qube Holdings is developing the Park which will take trucks off the road by switching to rail to distribute freight to and from Port Botany. The project will also incorporate renewable energy and energy efficient equipment onsite. The investment was part of the CEFC's Sustainable Cities Investment Program and was the CEFC's first infrastructure transaction.

Concessionality was provided via additional tenor and reduced margin, in exchange for extensive sustainability initiative commitments. CEFC rationale for investment is to use its role as financier to influence decisions relating to the project's engineering, construction, and design (including 60MW of rooftop solar PV), targeting lifetime carbon abatement of 4.9MtCO2.[103]

This case study provides an example of where the CEFC has been effective in changing the behaviour of the partner investor, specifically in terms of its commitment to clean energy investment. Qube had difficulty sourcing debt finance with a tenor beyond five years for the clean energy investments that it was seeking to make as part of the project, which is misaligned with the payback period of these investments, typically being greater than five years.[104] In providing longer tenor debt to the project, the CEFC was able to overcome this barrier as well as gain additional sustainability commitments from Qube as part of the project. The investment appears to have been effective in increasing the flow of finance into clean energy technology for the project, which would likely not have occurred without the CEFC's involvement.

As this investment represents the CEFC's first commitment to clean energy in the infrastructure market, it is premature to make a finding on the broader effectiveness of the investment in catalysing a change in the transport market. However, based on the forecast clean energy outcomes built into the program this appears to be a positive development and an effective way to demonstrate the use of clean energy technologies in an infrastructure investment.

Key findings

There is evidence that the involvement of the CEFC in different projects has had an impact on the profile of those projects. The CEFC appears to have been able to effect greater clean energy commitments for project proponents than would have otherwise been the case in its absence. However, in relation to investments in property funds, while it appears that the CEFC has been able to support greater energy efficiency outcomes through its investment in property funds, it is difficult to conclude that this would not have happened to a greater or lesser extent in the absence of the CEFC given the trend towards increased sustainability in the commercial property sector more broadly and the immaturity of the investments. In addition, the evidence base is limited by the immaturity of the investments and the long-term nature of the desired outcome (i.e. over 10 years).

4.4 Submissions

More than half of stakeholder submissions highlighted that the CEFC was integral to the progression of clean energy and energy efficient projects in Australia. A number of these submissions, particularly those representing the investment and think tank segments, agreed that there are many clean energy and energy efficiency projects that would not have gone ahead without the financial support of the CEFC.

Clean energy sector

The CEFC was recognised by various stakeholders as having provided a cornerstone investment in a number of clean energy investments. The Australian Conservation Foundation observed that the CEFC has been a cornerstone investor in nine of the 15 climate bonds issued in Australia since 2013. ATSE notes that it may have taken longer for climate bonds to become available if the CEFC had not been involved. The GBCA, the IGCC and other stakeholders, emphasised that the CEFC provided a cornerstone investment in two of Investa's certified Green Bonds issued in 2017. Pilbara Minerals acknowledged the CEFC as a cornerstone investor with a US$15 million investment in a US$100 million bond to fund the Pilgangoora Project (to mine lithium for battery storage). The mineral company commented that the remainder of funds came primarily from international institutional investors who "viewed CEFC's interest as a positive feature of the investment."

One stakeholder noted that the CEFC has been able to take on risks that commercial lenders could not, enabling many projects under the ARENA large scale solar program (which was perceived to be a new technology from the domestic lenders' perspective at the time), and assisting projects that are fully or partly merchant to be financed. The CEC commented that the CEFC's investment in merchant exposed projects has been vital to the supply of LGCs that are key to ensuring the LRET is fulfilled. ARENA emphasised that the Clean Energy Innovation Fund has catalysed the ability for Australian technologies to access funding that was not previously available from the private sector.

IGCC observed that 90% of institutional investors they surveyed recognised a lack of opportunities with an appropriate risk level as a perceived barrier to making green investments. Given this, IGCC suggested that there remains a critical role for the CEFC to play in de-risking emerging technologies and accelerating the uptake of innovative technologies and clean energy solutions in the market.

Property and Industrial sector

RateSetter stated that the CEFC was crucial to the launch of its green loan marketplace in 2017. The marketplace would not have been commercially viable without CEFC's $20 million commitment, due to uncertain availability of funding. So far, this has allowed 200 other investors (mostly retail) to purchase energy efficient and renewable energy products.

CAFBA's members, made up of commercial equipment finance brokers primarily focused on small to medium sized businesses, commented that the CEFC's Energy Efficiency Funding program helped their SME customers finance new energy efficient equipment that they otherwise may not have proceeded with.

SGCH stated that their partnership with CEFC has been a game changer, providing a new pathway for SGCH to improve energy efficiency across their property, particularly because "there has not been a market to finance social and affordable housing in Australia on longer tenor."

5

Factors that enable or constrain the CEFC's ability to facilitate increased flows of finance

The previous two chapters assessed the effectiveness of the CEFC in facilitating increased flows of finance into the clean energy sector. This chapter considers the factors that have influenced the CEFC's ability to effectively facilitate flows of finance into the clean energy sector. These factors include:

- Incentives and uncertainty in the policy ecosystem
- The requirements of the Act
- Directions provided under the Investment Mandate
- The availability of capital
- Investor appetite and private capital.

5.1 Incentives and uncertainty in the policy ecosystem

It is important to recognise that the CEFC is one component of a broader policy ecosystem that exists to drive reductions in the emissions intensity of the Australian economy by supporting the development of the clean energy sector. [105]

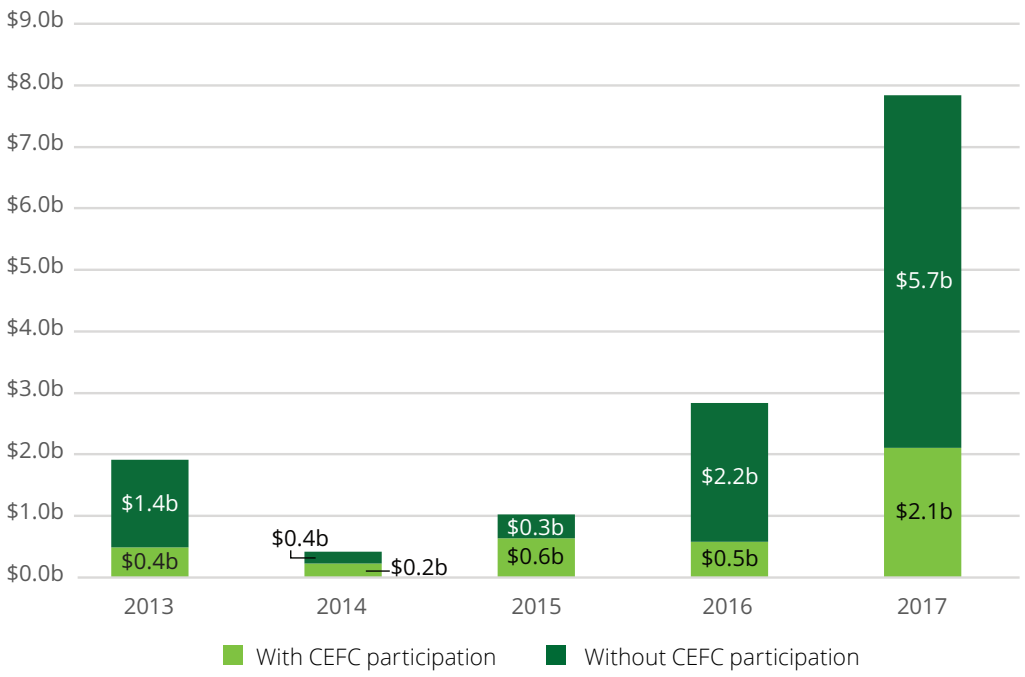
The ability of the CEFC to facilitate the flow of finance into clean energy technology projects is therefore, at least in part, defined by what is occurring in the broader policy ecosystem. While the CEFC seeks opportunities for investment, the broader attractiveness of the sector will influence the nature of new projects that may seek finance from the CEFC.

If the broader policy ecosystem creates an environment that is not attractive to investment in the clean energy sector, investors and developers will not invest in the sector. The uncertainty in the policy ecosystem and lack of investor appetite during the RET review is demonstrated by the decline in value of large-scale clean energy financing in 2014-2015 shown in Figure 5.1.[106] This figure also highlights the increased reliance on CEFC investment in projects during this period. Private capital flows have subsequently increased post-2015, with clean energy investment experiencing a boom in 2017 as a result of a more stable policy ecosystem.

Apart from the RET, the policy ecosystem has supported the development of the clean energy sector through a number of different initiatives, including but not limited to:

- Funding grants provided by the Australian Renewable Energy Agency (ARENA)
- The National Energy Productivity Plan and associated work program
- The Commercial Building Disclosure Program
- The Emissions Reduction Fund
- Emissions and energy reporting under the National Greenhouse and Energy

Figure 5.1: CEFC involvement in renewable energy investment relative to market



Note: Only includes investment data on large-scale asset financings.

Reporting Act 2007

- Various state and territory government renewable energy targets and energy efficiency schemes.

These initiatives have contributed to a policy ecosystem that has supported greater investment in clean energy technology. However, while growth in the clean energy sector was strong over the period of the CEFC's operation, it may have been stronger if not subject to ongoing policy uncertainty in relation to emissions reduction policy. In particular, there was limited federal policy support for renewable energy generation investment more generally, with uncertainty compounded by a lack of bipartisan support, ongoing federal debate and ongoing policy change. [107] This would likely have had some effect on the investment opportunities available to the CEFC.

Comparison to other Green Investment Banks: Policy ecosystem

The UK Government legislated the Climate Change Act in 2008 to decrease the UK's carbon footprint to 80% lower than the 1990 baseline emissions. This supportive policy environment assisted in reducing risk of investments and also encouraging private sector finance and collaboration in the renewable energy space. As a result, the GIG was able to deploy £1.8 billion (equivalent of approximately AU$3 billion) in the first two years of its operation.

Key findings

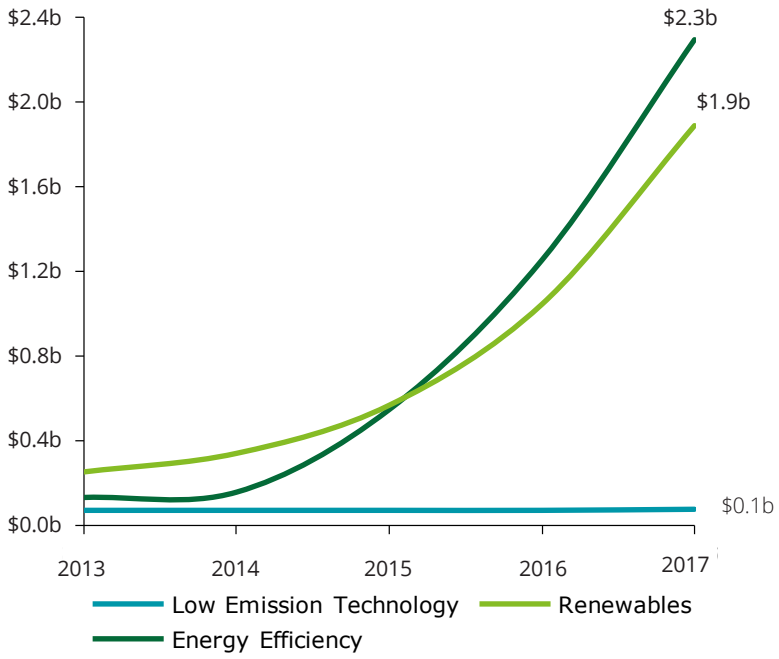
Uncertainty in the broader policy ecosystem likely had an impact on the opportunities available to the CEFC to invest in the clean energy sector. This uncertainty created a clear role and need for the CEFC to provide confidence to the sector, but did affect the number of projects being considered and developed in the Australian market, which limited opportunity for investment.

5.2 The requirements of the Act

As outlined in Chapter 3, the Act allows the CEFC to invest in renewable energy, energy efficiency and enabling technologies and low emissions technologies. Under the Act, at least half of the funds invested for the purposes of the CEFC investment function must be invested in renewable energy technologies from 1 July 2018 onward.[108] The extent to which the CEFC was on track to meet this target at 31 December 2017 is covered in Chapter 3.

The requirement that at least half of the deployed capital is invested in renewable energy technologies from 1 July 2018 onward could, in combination with increased renewable energy investment opportunities as a result of certainty over the RET target, explain the sharp increase in investment in renewable energy technologies over 2016 and continuing into 2017 as shown in Figure 5.2. While we note that the CEFC was not required to have at least half of its funds invested in renewable energy technologies until 1 July 2018, in practice it is likely that this requirement encouraged the CEFC to ensure that

Figure 5.2: Cumulative investment by clean energy technology type to 31 December 2017



close to half of its funds were invested in renewable energy technologies across the period of its operations. This would be an effective way to manage the risk of not meeting the requirement under the Act at 1 July 2018.

As outlined earlier, the CEFC started to increase investment in energy efficiency technologies in 2015. To maintain a portfolio with at least half of the funds invested in renewable energy technology, the CEFC needed to increase the amount of funds invested in renewable energy to remain within a comfortable margin of the requirement. Noting that we have not undertaken a detailed review of the CEFC's investments, nor the rationale behind why certain investments were made, we consider that it is likely that the requirement under section 58(3) of the Act has influenced the CEFC's investments in different technologies, and in particular, in renewable energy technologies.

The Act specifies that the CEFC invest in businesses or projects that are solely or mainly Australian-based. While it is feasible that this may have constrained or limited some opportunities available to the CEFC, no evidence has been obtained to indicate that this restriction materially affected the CEFC's ability to facilitate flows of finance into clean energy technologies over the first five years of operation.

The Act also prohibits CEFC investment in carbon capture and storage (CCS) and nuclear technology and power. We note that an amendment to the Act to enable the CEFC to invest in CCS is currently before Parliament. The Clean Energy Finance Corporation Amendment (Carbon Capture and Storage) Bill 2017 was put forward in May 2017 and aims to remove a restriction on the financing of CCS technologies. If passed by Parliament, this change would enable, but not require, the CEFC to support CCS technology investments.[109] While this prohibition restricts the CEFC from investing in these technologies, we have not found evidence that has indicated that the prohibition has limited the CEFC's ability to facilitate flows of finance into clean energy technologies.

There was some support for a technology neutral approach in stakeholder submissions. While we have not found evidence that a technology neutral approach would have made a material impact on the investments that the CEFC has made, a broader technology neutral approach may better enable the CEFC to make investments that support the role of clean energy technology in the wider energy markets.

Key findings

The requirement that half of the CEFC's funds invested at 1 July 2018 be invested in renewable energy appears to have driven steady investment by the CEFC in renewable energy generation over the period, and increased investment closer to 1 July 2018.

A broader technology neutral approach may better enable the CEFC to make investments that support the role of clean energy technology in the wider energy markets.

5.3 Directions provided under the Investment Mandate

The directions provided to the CEFC through the various Investment Mandates it has been issued have also had an effect on its portfolio. The responsible Ministers can provide direction to the CEFC in relation to the performance of its investment function including, for example, the terms on which it can make an investment and the types of technology and instruments in which it can invest. As such the impact of the directions can be seen in the composition of the CEFC's portfolio.

The CEFC has been issued with five Investment Mandates since it was established:

- Clean Energy Finance Corporation Investment Mandate Direction 2013 (2013 Mandate)
- Clean Energy Finance Corporation Investment Mandate Direction 2015 (2015 Mandate)
- Clean Energy Finance Corporation Investment Mandate Direction 2015 No. 2 (2015 Mandate No.2)
- Clean Energy Finance Corporation Investment Mandate Direction 2016 (2016 Mandate)
- Clean Energy Finance Corporation Investment Mandate Direction 2016 No. 2 (2016 Mandate No.2)

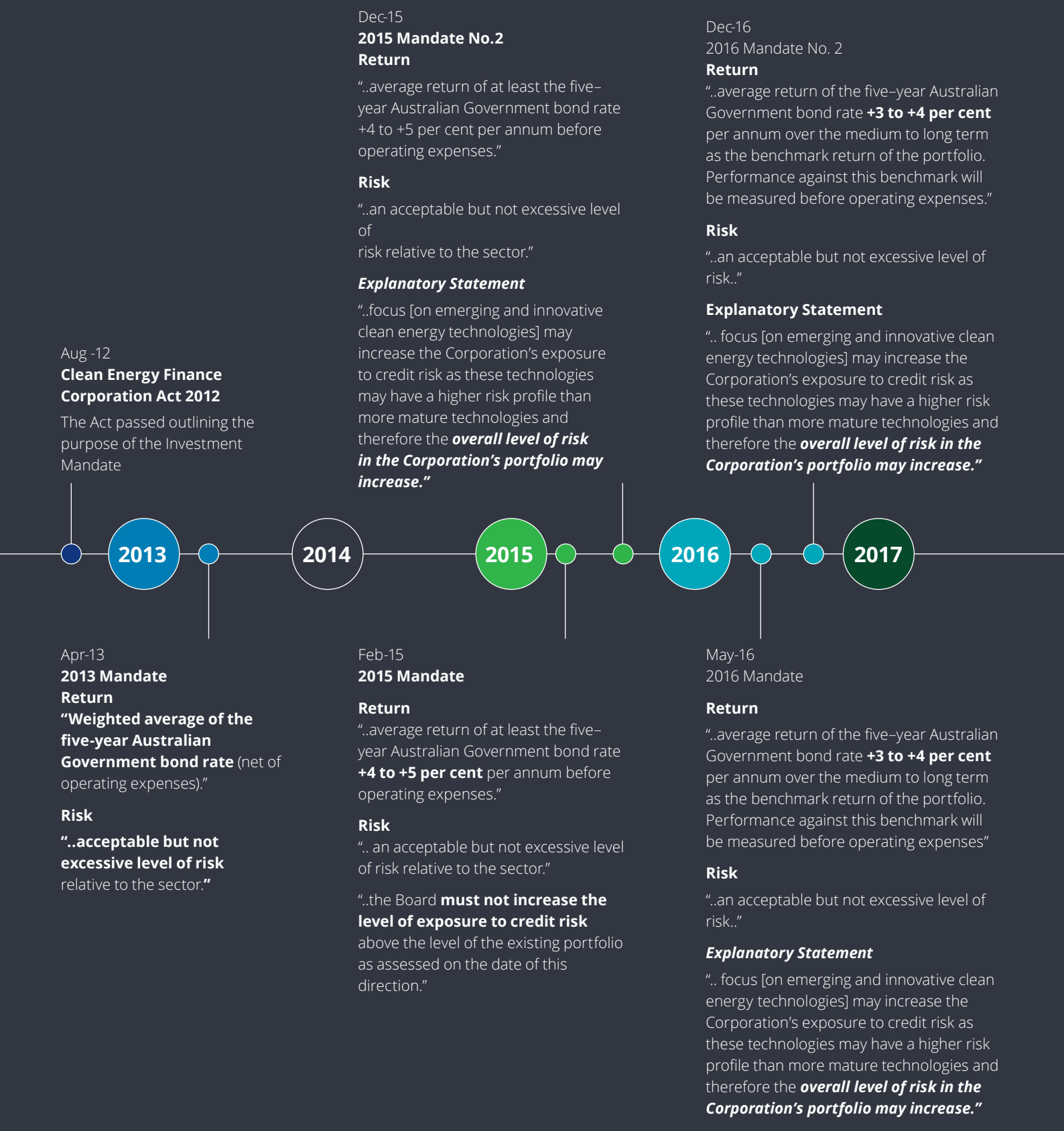
The changes under each Investment Mandate are highlighted in Figure 5.3.

While the Investment Mandates issued to the CEFC have contained a range of different directions, instructions that have had the most impact on the CEFC's ability to facilitate flows of finance into clean energy include:

- Portfolio benchmark return settings
- Level of risk
- Focus areas (including the Innovation Fund, Sustainable Cities Investment Program and Reef Funding Program).

These are discussed in more detail in the following section.

Figure 5.3: Timeline of Investment Mandates and key risk and return direction



5.3.1 Portfolio benchmark return

The initial mandate, the 2013 Mandate, required the CEFC to target a portfolio return based on the weighted average of the five-year Australian Government bond rate, measured net of operating expenses.[110] This was increased in the 2015 Mandate to *"at least the Australian Government bond rate plus 4 to 5% per annum, measured before operating expenses"*. Subsequently, in the Investment Mandate 2016 (issued 5 May 2016) reduced the portfolio return target to *"at least the Australian Government bond rate plus 3 to 4% per annum, measured before operating expenses,"* which remains the current setting. [111]

The CEFC Board has repeatedly submitted that the portfolio benchmark return specified in the Investment Mandates issued post 2015 is too high. [112] In its submission on the Draft Investment Mandate 2016, the CEFC submitted that:

"...the Board remains of the view that the current Portfolio Benchmark Return for the CEFC's core ... of 3% to 4% over the 5-year Australian Government bond rate remains an unrealistically high return target for this market. It does not reflect the CEFC's considered approach to risk and the composition of the current investment portfolio."

This view appears to be supported by stakeholder views, with one stakeholder noting:

The balance between risk and return (to the Commonwealth) has, I believe, tipped too far into the return side. The CEFC can still manage a good return to The Treasury, and at the same time invest in projects that are a little riskier, but have high potential to broaden the sources and supply of clean energy."

While the CEFC is self-sustaining, its actual investment return and forecast lifetime investment return in financial year 2016-17 were 4.5% and 5.4% respectively, below the bottom end of the target range of 5.8% to 6.8% as set by the 2016 Mandate No.2. [113] That the CEFC has not been able to meet the portfolio benchmark return indicates that the return expectation may either not be consistent with the actual returns available in the market or is too high given the additional public benefit return the CEFC is expected to deliver. The prior years of operation similarly yielded lifetime forecast and actual returns below the relevant targets in each year.

The CEFC's portfolio benchmark return appears high in comparison to the portfolio benchmark return of other funds. In particular comparison, we note that the Investment Mandate of the Future Fund sets out a portfolio benchmark return expectation of an "average return of at least the Consumer Price Index (CPI) + 4 to + 5% per annum over the long term."[114] Over the five years since inception, the Future Fund's target return rate has been in the range of 5.5 to 7.5%. However, the CEFC's 2016-17 target, based on only the FY17 revised target per the Investment Mandate 2016 (No. 2), was 5.8 to 6.8%.

This means that the Future Fund was expected to make a portfolio return only 0.7% greater than the CEFC at the top of its targeted return range. This is despite the Future Fund having none of the public benefit objectives that the CEFC has, as the Future Fund is purely focused on maximising investment return.

Per the CEFC Investment Policies June 2017, the CEFC "seeks to make targeted commercial investments, to counter market failures and financing impediments and to generate positive public policy outcomes".[115]

Additionally, in comparison to the CEFC, the Future Fund has a large investment universe to generate financial returns (being essentially unrestricted), with a primary purpose of maximising investment returns. The CEFC on the other hand is a public purpose institution, restricted to investing in limited circumstances, in order to drive technological change in the energy sector and more efficient energy use. [116]

The Northern Australia Infrastructure Facility's (NAIF) objective is to provide support to the construction of economic infrastructure that provides a basis for the longer term expansion of industry and population in northern Australia. It has a similar investment function to that of the CEFC, being to operate in partnership with commercial lenders and to catalyse further private sector investment in northern Australia (among other strategic objectives). Under the NAIF's Investment Mandate, it must target a return to cover at least the administrative costs of running the facility, and the Commonwealth's cost of borrowing (i.e. the Australian Government bond rate). The NAIF does not have to make an additional return.

The portfolio benchmark return settings could have prevented the CEFC from pursuing opportunities that have the potential to provide a 'public benefit return' if those opportunities were expected to materially affect its ability to meet the portfolio benchmark return. Likewise, it is possible that the CEFC may have prioritised opportunities based on their potential to contribute to meeting the portfolio benchmark return over the public return that may have been delivered. However, we have not found evidence that either has been the case to date, noting that we have not taken an in-depth review of the particular opportunities that the CEFC has pursued.

Key findings

In 2016-17, the CEFC's actual investment return and forecast lifetime investment return were 4.5% and 5.4% respectively, both below the bottom end of the target range of 5.8% to 6.8%. That the CEFC did not meet the targeted portfolio benchmark return may indicate that the return expectation is not consistent with the current mandate, the returns available in the market or may not reflect the public benefit of the CEFC. It is possible that the portfolio benchmark return has impacted the investment decisions of the CEFC, but no evidence was found to support this.

5.3.2 Risk

In addition to setting out a portfolio benchmark return expectation, the Investment Mandates issued to the CEFC since 2013 have provided directions to the CEFC on the level of risk that it should assume in the performance of its investment function (see Figure 5.3 above).

The initial mandate, the 2013 Mandate, directed that in targeting the portfolio benchmark return the CEFC was to *"develop a portfolio across the spectrum of clean energy technologies that in aggregate must have an acceptable but not excessive level of risk relative to the sector."*[117] On increasing the portfolio benchmark return in the 2015 Mandate, the CEFC was directed to not increase the risk profile of its portfolio.[118] That is, while the CEFC was directed to target a higher return, under that mandate it was not able to target riskier investments that might achieve these return expectations.

This restriction on risk was lifted in the 2016 Mandate which specified that:

"in targeting the portfolio benchmark return and operating with a commercial approach, the Corporation must, for all investments other than those made under subsection 14(1) [the Clean Energy Innovation Fund], seek to develop a portfolio across the spectrum of clean energy technologies that in aggregate has an acceptable but not excessive level of risk, having regard to the terms of the Act and the focus on particular areas identified." [119]

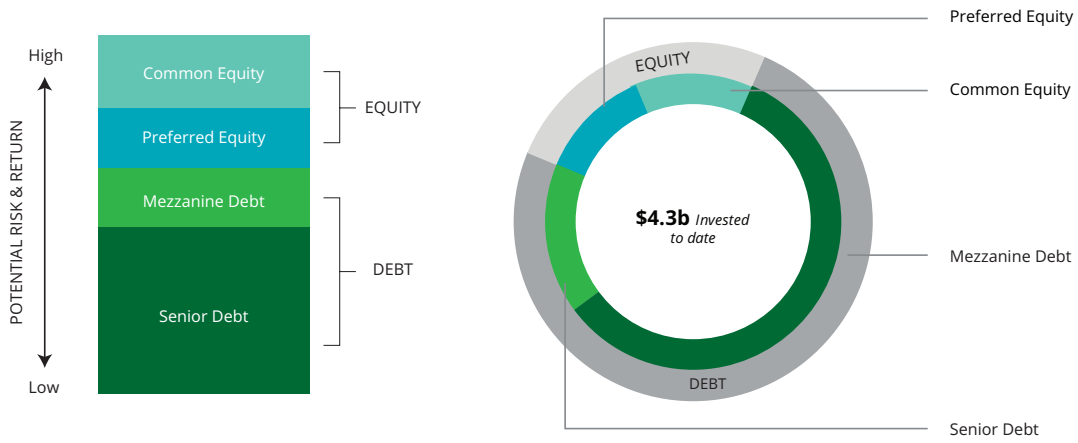
The Explanatory Statement to the 2015 Mandate No. 2 made clear that the CEFC could assume more risk in undertaking its investment function, stating:

"The Government has directed the Corporation to include, as part of its investment activities, a focus on emerging and innovative clean energy technologies. This focus may increase the Corporation's exposure to credit risk as these technologies may have a higher risk profile than more mature technologies and therefore the overall level of risk in the Corporation's portfolio may increase." [120]

The CEFC has taken a conservative approach to risk in response to the directions issued to it under the various Investment Mandates, evident through both the financial instruments that the CEFC has invested in to 31 December 2017 and the counterparty risk that the CEFC has assumed. However, while the CEFC has taken a conservative approach to risk through financial instruments and counterparties, the particular projects it has invested in may have had a higher level of risk, including for example, merchant market exposed renewable energy developments. What this means is that the CEFC has taken less risky positions in riskier projects.

In reviewing evidence relating to the CEFC's risk appetite, we acknowledge that there will be a lag between instructions being issued in an Investment Mandate and a notable change in the level of risk across the CEFC's portfolio. New investments also generally require a relatively long lead time, which would likely be exacerbated if the investment is considered to be higher risk, particularly for an organisation that has limited experience in assessing these risks. As such, it is possible that the risk profile of the CEFC's portfolio will change in the future as opportunities that may be in the pipeline reach financial close.

Figure 5.4: Risk and return relationship of the capital stack



Financial instrument risk

The financial instruments that the CEFC has invested in, and the degree of risk it has been exposed to in investing in these financial instruments, is evidence of the CEFC's lower risk appetite. The CEFC has generally favoured financial instruments with the lowest amount of risk in the capital stack when making an investment.

To 31 December 2017, almost $3.7 billion (85%) of the CEFC's investments were made into higher security senior debt. As shown in Figure 5.4, this is the most secure position in the capital stack, with the lowest potential risk and return relative to other instruments in the capital stack.

The balance of the portfolio, being subordinated (or mezzanine) debt, preferred equity (or convertible debt) and common equity positions have a combined value of $650 million (15%). This is consistent with the CEFC's risk policy in the CEFC Investment Policies June 2017, which states that the *"CEFC typically seeks the lowest possible risk position in the capital structure as a protection of the CEFC investment against underperformance."* [121]

It is possible that this low appetite to risk was a result of directions provided to the CEFC in the various Investment Mandates, but it is also possible that as a corporation, the CEFC is not comfortable assuming a higher level risk.

However, it is equally possible that to effectively facilitate flows of finance into clean energy, the CEFC did not have to assume a higher level of risk, targeting lower risk opportunities position in projects may have enabled the CEFC to more easily deploy capital into a commercial gap, while maintaining acceptable risk and return as set by the Government. Evidence of this exists in the debt metrics that the CEFC has provided in loans such as those provided for large-scale solar, as although many were senior secured debt investments, the terms provided were not on offer from commercial banks (particularly regarding tenor). [122] As debt financiers begin to increase their appetite for similar loan terms, such as the Commonwealth Bank's provision of a long-term loan in 2017 alongside the CEFC (and NORD/LB) to finance 165MW of large-scale solar, [123] it is expected that the ongoing need for senior debt from the CEFC as the sole financier will reduce in this particular market.

If it is the case that the CEFC could effectively facilitate flows of finance into the clean energy sector by targeting less riskier positions within investments, the risk profile of the portfolio would be expected to shift toward relatively riskier investments in the future as the number of comparable opportunities contracts. As the availability of opportunities to deploy capital into low risk instruments without displacing private capital diminishes, the CEFC would naturally shift towards higher risk instruments. This shift toward higher risk instruments can only operate if consistent with the direction set by the Investment Mandate.

There is evidence that the CEFC is starting to have a greater appetite for riskier instruments such as equity, specifically into renewable energy technologies. As discussed in Chapter 4 (Case Study 8), the CEFC made an equity investment into the Ross River Solar Farm in December 2016. More recently, the CEFC has assisted the commercialisation of the Granville Harbour wind farm in Tasmania, in 2018, by providing equity to this wind farm.

Counterparty risk

The CEFC's risk appetite is also evident from the shadow credit ratings of the investments (for debt instruments), which is based on the default risks of the counterparties to each investment. At 30 June 2017,[124] the CEFC had made $1.9 billion of rated and unrated investments.[125] Of the $1.9 billion, 63% of funds were invested into investments with highly rated 'investment-grade' counterparties. The remaining rated investments were classed as 'non-investment-grade', which are assessed to have higher risk, or were unrated investments. This is shown in Figure 5.5.

The investments at 30 June 2017 that have been shadow credit rated exhibit a weighting toward higher credit rated, investment grade counterparty exposure (see Figure 5.6 and Appendix C). The CEFC has also provided significant amounts of capital to lower credit risk counterparties, targeting premium, highly rated corporates for many of its investments, such as large retail banks and other highly rated commercial property fund managers. However, it is noted that this preference toward premium corporates in part reflects the use of financial intermediaries, specifically in the case of aggregation loans, which directed funds through highly rated banks to end customers. Another contributor to the preference toward stronger credit rated counterparties is the 'first-mover' strategy employed by the CEFC, which aims to invest with the most highly rated corporates to change the industry standard in each sector, eventually changing the behaviour of the wider sector to drive an increase in the flows of finance into clean energy technologies.

Figure 5.5: Shadow credit ratings of investment counterparties

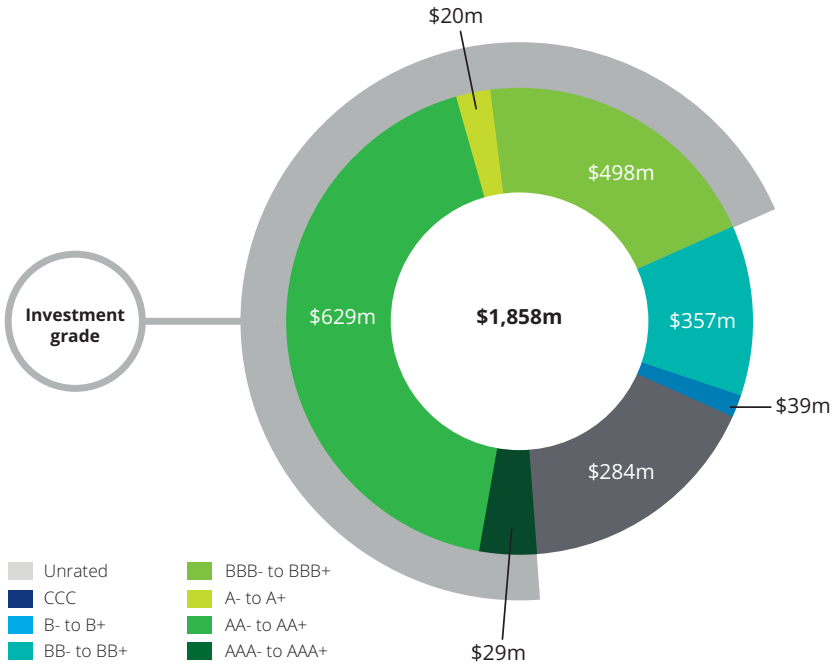
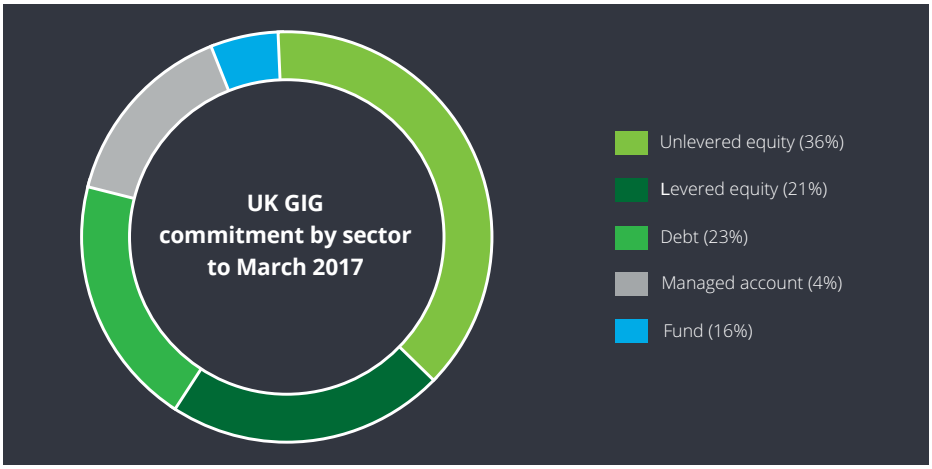


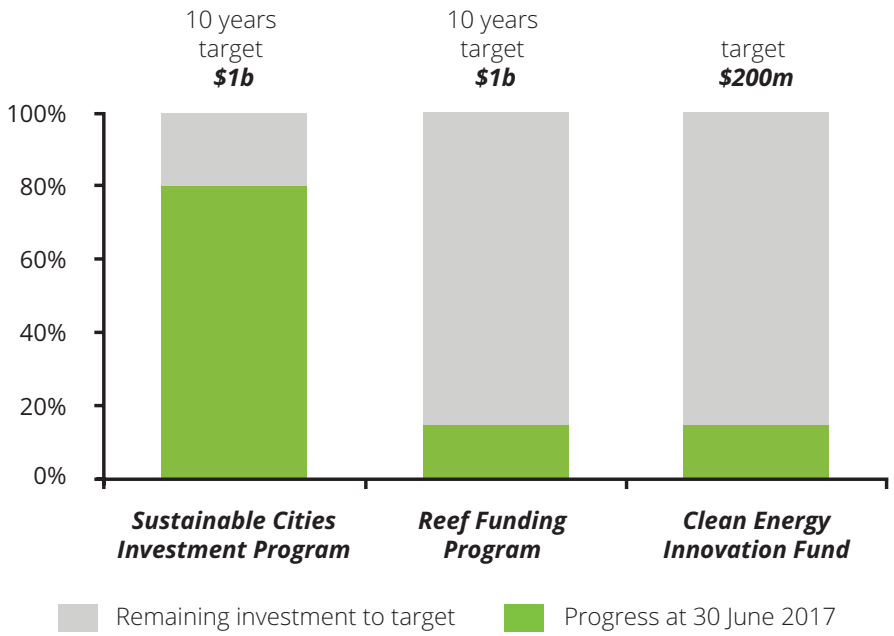
Figure 5.6: Comparison to UK Green Investment Group commitments by security type



Key findings

The CEFC maintained a conservative approach to risk to 31 December 2017, focusing on investing primarily in senior debt and a preference toward lower risk counterparties. The risk setting in the 2015 Mandate was likely one of the factors that drove this conservative approach. However, since the 2016 Mandate and under current settings, the CEFC is able to assume a higher level of risk, and evidence suggests it is beginning to do so.

Figure 5.7: CEFC commitments under each focus area program



The 'unrated' investments at 30 June 2017 are mostly equity investments, which are largely attributed to the equity investments in commercial property funds. While this type of equity has generated stable returns to 31 December 2017, as it is based on premium grade office space, and increases portfolio return via capital gains, these investments are exposed to potential downside risk in the local commercial property market.

5.3.3 Focus areas

The CEFC has been directed to make available capital for three specific focus areas:

- The Clean Energy Innovation Fund
- The Sustainable Cities Investment Program
- The Reef Funding Program

The investment commitments the CEFC has made under each of these specific focus areas is shown in Figure 5.7.

Clean Energy Innovation Fund: up to $200 million

The CEFC Investment Mandate Direction 2016 introduced the Clean Energy Innovation Fund (the Innovation Fund). Initially, the Innovation Fund was set up as a program to make available up to $1 billion to support the growth of innovative clean energy technologies and businesses, in consultation with ARENA. The fund was subsequently scaled down to $200 million in the Clean Energy Finance Corporation Investment Mandate Direction 2016 (No.2).

The Innovation Fund makes debt and equity investments into businesses that have passed the research and development stage, and which can benefit from early stage seed or growth capital to help them progress to the next stage of their development. This program has committed $30 million to four projects at 30 June 2017.[126] Submissions on this particular initiative were positive, being a vehicle for investment into projects at a scale which is beyond ARENA's capacity to fund and at the higher-risk end of the CEFC portfolio. Additionally, the projects financed through the Innovation Fund since its inception have generally attracted around 50% private capital, with the CEFC investment thereby facilitating the flow of private finance into each project.

Stakeholder submissions also highlighted the broader positive outcomes of this program being the "non-financial role in strengthening the local venture capital and investment community" particularly through involvement in hosting industry events such as the 2017 'Innovators Demo Day.' The program has an estimated lifetime carbon abatement of 14,000tCO2-e, based on reaching the current $200 million investment target. [127]

The Sustainable Cities Investment Program: up to $1 billion over 10 years

This program extends the CEFC's work in bringing clean energy solutions to the built environment, leveraging private sector capital to accelerate the deployment of "cutting edge clean energy projects in Australia's cities" (i.e. renewable energy plants, transport management systems, 'green' buildings etc.). At 30 June 2017, this program had deployed $800 million toward its 10-year target of up to $1 billion, largely in the property market. Rapid deployment of funds under this program have been aided by the broad range of investments available to the CEFC that qualify, as well as the larger average size of investments. The program has an estimated lifetime carbon abatement of 17mtCO2-e.

The Reef Funding Program: up to $1 billion over 10 years

The Reef Funding Program targets clean energy projects in the Great Barrier Reef catchment area to support the delivery of the Australian Government's Reef 2050 plan. Investments include projects that have a positive co-benefit for the health of the reef (either directly by improving water quality, or indirectly by reducing emissions). The program has five priority industry areas for investment: agribusiness, tourism, renewables, property and infrastructure, with an estimated lifetime carbon abatement of 11mtCO2-e. As of 30 June 2017, $150 million had been committed to projects under this program.

The strong growth in property investments over the last two years occurred after the introduction of the Sustainable Cities Investment Program, along with other changes including an increased portfolio benchmark return. We note similar progress has not been made toward the Reef Funding and Innovation Fund programs. This is may be due to the availability of opportunities under each program. We understand that the CEFC has had particular difficulties in identifying projects that involve the clean energy technologies that it is able to invest in under the Act that can also provide some direct benefit to the reef.

The use of the Investment Mandate enables the Government to quickly and efficiently direct the CEFC to focus on specific aspects of the clean energy sector as issues arise. This ability to direct the CEFC through changes to the Investment Mandate enables the Government to target specific policy outcomes in a timely manner. However, the ability of the Government to direct the CEFC to focus on specific issues must be balanced with the flexibility that the CEFC's Board requires to be responsive to the market, with one stakeholder noting *"too much prescription from the Government also undermines the accountability of the Board and management of the CEFC for results"*.

Key findings

The Sustainable Cities Investment Program has driven significant investment in property. The CEFC has invested less in projects under the Reef Funding and Innovation Fund programs, largely due to the limited availability of opportunities under each program.

5.4 The availability of capital

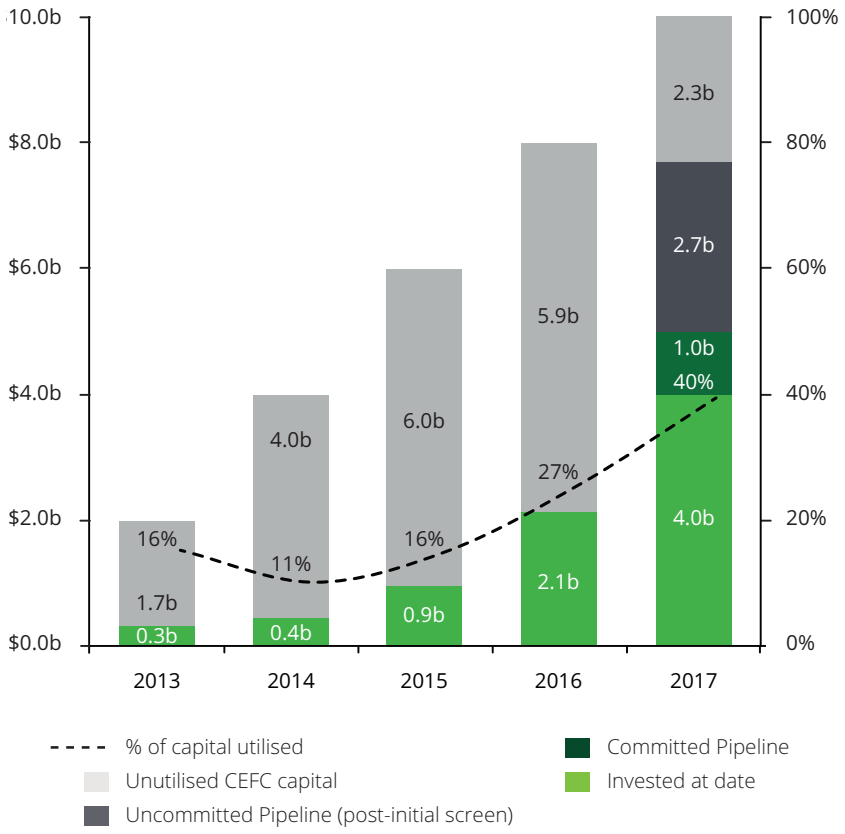
The appropriation of a total $10 billion of capital to the CEFC between 2013 and 2017 has resulted in the CEFC being highly capitalised, with no capital constraint impacting the portfolio investments to date.

The CEFC is unlikely to become capital constrained in the short term. In the longer term given the pipeline of projects that the CEFC has not yet committed to (shown in Figure 5.8), it appears that the CEFC is gaining momentum in its deployment of capital and may move toward its $10 billion at a faster rate than its historical deployment. This may mean it becomes capital constrained at some future point. However, it is difficult to pinpoint when this will occur due to natural capital recycling and project attrition both which may free up capital for redeployment by the CEFC.

The lack of a capital constraint to date is another factor that has afforded the CEFC with the flexibility to be responsive to the opportunities that manifest rather than needing to make decisions on competing investments that may provide different benefits to the clean energy sector. This has been a key factor in the breadth of markets that it has invested in, particularly in the last 18-24 months, which the CEFC will build out as each sector evolves and the CEFC's strategy evolves with it.

We note that the CEFC has begun to focus on building out its capital management capability (see Section 6.3 for further information).

Figure 5.8: CEFC investment to capital availability



Key findings

The lack of a capital constraint to date has afforded the CEFC with the flexibility to be responsive to the opportunities that manifest rather than needing to make decisions on competing investments that may provide different benefits to the clean energy sector. This has been a key factor in the breadth of markets that it has invested in.

5.5 Investor appetite and private capital

Lack of adequate capital to finance projects has empirically been one of the key barriers to developing the sector in Australia. This is particularly evident in renewable energy, as although innovation in this space has reduced the cost of relevant technology (e.g. wind turbines and solar), the initial capital outlay is still significant, and with the perceived risk due to revenue and market uncertainty, investment has been beyond the appetite of local investors. [128] This risk, coupled with uncertain policy conditions (such as the RET review), has resulted in a shortage of long-term buyers of renewable energy. [129] As one stakeholder pointed out "anticipated or actual modifications to policy settings, risk appetite of investors and international economic conditions are all proven to have material impacts on annual levels of private sector investment". This environment together with the immaturity of deployment of clean energy technologies in Australia provides context to the lack of debt and equity capital available to finance clean energy projects.[130]

Debt

In Australia the source of local debt finance is primarily sourced through large, local retail banks, typically offering short to mid-term loans, unsuited to low-carbon projects with longer lifetimes. This has driven developers to source foreign capital, from financiers that display more comfort with these types of projects, and are therefore willing to offer longer-term finance. [131]

Of the 18 large-scale solar projects the CEFC has committed debt finance to so far, only six secured debt co-financiers. [132] All six projects were funded with foreign debt (five foreign banks in total), with only two securing additional local debt in the respective syndicates. No other local banks or other financial institutions provided debt in these projects.

Institutional equity

Due to the immaturity of the sector, Australia's investors are less experienced in renewable energy investments compared to some other countries. [133] Projects displaying new technologies, new business or income models and new entrants, such as first-time developers or equipment suppliers, have often been unable to source finance in Australia due to the lack of a track record that most investors require to understand the risk of the investment.

The CEFC has repeatedly taken the first or early mover role for new project settings to combat this, as investment by the CEFC generates trust and increases legitimacy for these new settings. [134] Its cornerstone investment in the Palisade Renewable Energy Fund (discussed in Chapter 4) was designed to attract Australian based institutional equity to renewable energy projects, by demonstrating that the risk and return profile is acceptable to Australian equity investors of that class, while also providing an effective route to market for funds to invest. [135] By financing these projects and ensuring they are successfully developed, the CEFC is educating investors and helping them to become familiar with risks so they are more likely to fund projects in the future. [136]

The price signal to build new solar and wind projects around the world is now strong and driving a surge in investment, with renewable energy assets globally representing the fastest-growing infrastructure sub-sector. [137] Recent investment and project development trends demonstrate increasing momentum in renewables in Australia, which has returned to the top ten most attractive countries to invest in new renewable projects, signalling rising confidence in the sector.[138]

Key findings

For most of the CEFC's operational life, both debt and equity markets in Australia for clean energy investments have been relatively immature, which has been one of the key barriers to the development of the sector in Australia. As such the CEFC has played a leading role in developing these markets.

5.6 Submissions

Stakeholder submissions primarily focused on barriers, rather than opportunities, to financial flows in the clean energy sector. The three main barriers identified by stakeholders included:

- Policy uncertainty and shortfall in government support
- Deficiency in financial opportunities and appropriate risk
- General lack of awareness or experience in the Australian market.

Policy and government support

Uncertainty with respect to Australia's emissions reduction policy was one of the most widely recognised impediments to growth in the clean energy sector. Numerous stakeholders, including the CEC, ATSE, RIAA, The Australia Institute, and QFF acknowledged that Australia's emissions policy uncertainty has hindered growth in the energy sector over the past decade.

The CEC stated that the policy instability had damaged investor confidence. The CEC believes there was little the CEFC could have done that would have made a material difference to investment levels between 2013 and 2015, given that a major source of revenue (LGCs under the RET) was threatened by the possible roll-back or abolition of the RET. The RIAA submitted that mixed policy signals risked efficient allocation of capital, which would result in higher costs.

One stakeholder commented that during an 18-month process of securing a PPA, the Government was exploring implementing various policies including extending the RET, an Emissions Intensity Scheme, a Clean Energy Target and the National Energy Guarantee. This stakeholder noted that policy uncertainty undermined its faith in LGCs and the strength of the future energy market such that a 10-to-15-year contract became unviable.

Although more recent commitment to the LRET has alleviated this policy uncertainty and encouraged new investment in clean energy, one stakeholder suggested that ambiguity of the National Energy Guarantee (the Guarantee) at the time of submission continued to be a factor influencing investors.

The AFPA submitted that the emphasis on renewable electricity in the RET has constrained bioenergy investment in renewable heat and cogeneration opportunities. According to the AFPA, renewable heat is actively promoted as an effective means for reducing fossil fuel reliance in other nations, including Scandinavia. The association believes that the lack of incentives for employing biomass in energy generation misses some of the lowest cost opportunities for carbon emissions abatement.

Other government initiatives were also thought to be lagging in support of clean energy. The GBCA suggested that the Emissions Reduction Fund (ERF) had failed to incentivise take-up in the property sector as it only considers a limited range of activities. The CEC considered that investment in low carbon energy storage has been constrained due to lack of specific government support in this area. The CEC submitted that demand management is a particular area where profitable opportunities currently exist, however, regulatory reform of the energy market is required to deliver the economic potential of demand management.

Financial opportunities and risk

The CEC considered that incumbent fossil fuel competitors and the structure of the market act as a significant barrier to clean energy investors. In particular, the CEC submitted that existing market players with low operating costs and mostly sunk capital cost can offer electricity at a price that reflects these low operating costs, which does not enable a wholesale market price which facilitates capital cost recovery. The CEC also noted that the lack of significant and profitable market opportunities for dispatchable technologies act as a barrier to the CEFC's capability to assist as these technologies are unlikely to generate a commercial return on funds.

On a similar note, stakeholders observed that the availability of offtake contracts has been a barrier to clean energy sector projects. It was observed that due to the difficulty experienced by clean energy developers in sourcing PPAs of sufficient price and tenor, large retailers continue to exercise significant market power. One stakeholder submitted that the uncertainty and risk surrounding battery storage does not support the investment level required of this technology. It was considered that these barriers apply to all new projects to a degree, as most projects now envisage some storage capacity at some future point.

Finncorn stated that the availability of reasonably priced capital was no longer a barrier to large-scale renewable energy in Australia, but rather the availability of commercial structures that allow projects a reasonably stable revenue return profile. According to Finncorn, this is driven by various factors:

01. There is a lack of traditional PPAs with large creditworthy retailers. These retailers have generally contracted for their long-term expected residential and business customer load, and are not prepared to risk contracting long-term against commercial and industrial customers (who are typically on one to three year contracts and may churn rapidly);

02. Although small retailers may be willing to enter PPAs, they have weaker credit to support medium to long-term exposure;

03. Energy products traded on the Australian Securities Exchange (ASX) are limited in tenor and inappropriate in design. Offers generally do not extend beyond the short term and are not suitable for renewable projects as they are designed around baseload and peak profiles;

04. Limited over-the-counter structures are available in the electricity market. In other commodity markets, over-the-counter providers help stabilise project revenues through derivative products, however there is a deficiency of these institutions in the electricity market; and

05. Corporate PPAs remain underdeveloped, primarily because corporate buyers perceive the long tenor of credit exposure against project risk as a barrier.

Awareness

Limited awareness and experience of clean energy technologies are also recognised as key barriers to certain clean energy investments. According to the CEC, there continues to be a deficiency in experience and understanding of the dispatchable technologies required to complement wind and solar. The CEC believes that technologies such as battery storage, pumped hydro and bioenergy remain relatively unfamiliar to Australian financial institutions.

The AFPA, Bioenergy Australia and QFF also agreed that energy market participants are not completely aware of the potential of bioenergy. AFPA suggested that the underdeveloped domestic capability and investment structures were barriers to growth in this technology. Bioenergy Australia stated that, while some processes are now more familiar and commercially mature, other methods (such as gasification) are still relatively young and require specific equipment and operational knowledge. Bioenergy Australia believed that the energy benefits of biomass are not fully understood by market players, including industry, developers, government and overall community, which has constrained opportunities for both investors and agricultural businesses.

Inexperience with clean energy and energy efficiency is also quite industry specific. For example, BRIG submitted that the implementation of clean energy in irrigated farming systems is relatively new due to the unique characteristics of pumping, which is quite different to residential solar. BRIG suggests that systems may not have fulfilled their expectations because solar retailers did not fully understand the farmer's practical needs of irrigation processes. The QTIC also submitted that a lack of awareness of the CEFC was a barrier to engagement in the tourism industry.

6

Enabling future flows of finance

There are a range of different ways that the clean energy industry within which the CEFC makes its investments may change, as different factors start to influence how decarbonisation and decentralisation trends evolve over time. Some of these factors are known, but many may emerge as policies, technologies, business models and public sentiments change.

Given these uncertainties, it is not clear what environment the CEFC will be operating in and the barriers to finance that may emerge in that environment. As a result, it is important that the CEFC retain flexibility to make investments that reflect the challenges and opportunities in the market at a given point in time.

There is a significant amount of investment that will be needed in the Australian economy to transition it to a lower carbon future. Modelling undertaken by ENA and CSIRO showed that under one scenario, investment needed for transition totals over $800 billion by 2050. This is shown by component of the supply chain Figure 6.1.

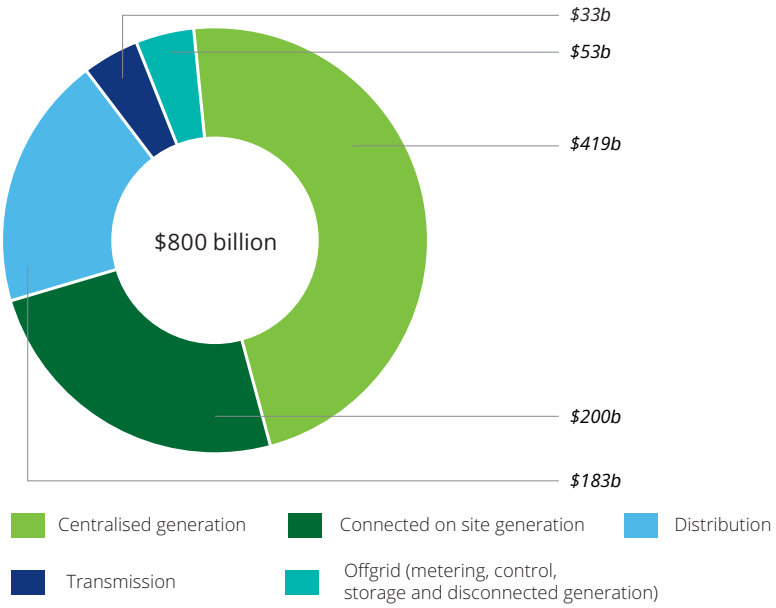
With this level of investment needed to transition the market, we consider that there will likely be a role for the CEFC in the future, both in terms of directly investing in the sector and in leading the market to de-risk investments and foster innovative new financial products.

This chapter considers how the CEFC could effectively facilitate future increased flows of finance into the clean energy sector, and the changes that will be needed to enable the CEFC to do this.

6.1.The Investment Mandate

The Investment Mandate is a key determinant of the CEFC's ability to remain flexible and agile to evolve with the rapidly changing clean energy sector. If the Investment Mandate is prescriptive, this will restrict the ability of the CEFC to respond to a changing investment environment. However, we recognise that counter to this, if the Investment Mandate provides significant discretion to the CEFC, there is a risk that the outcomes sought by the Government will not eventuate. As such, a delicate balance needs to be found between prescription and discretion to enable the CEFC the flexibility to respond to the changing market while ensuring that desired outcomes are targeted.

Figure 6.1: Total forecast expenditure in the electricity system to 2050



As it stands, the Investment Mandate is prescriptive on the financial outcomes expected from the CEFC, but provides significant discretion in relation to any specific public benefit outcomes, on which the Investment Mandate is silent. Whether this is appropriate into the future depends on the outcomes sought from the CEFC's investment function This is a matter for policy. However, assuming that the outcomes sought from the CEFC continue to be to foster the development of the clean energy sector, the balance between prescription and discretion may need to be adjusted as the market continues to evolve.

Specifying the public benefits sought from the exercise of the CEFC's investment function, and providing the CEFC with the discretion to determine how it pursues these public benefits would remove the need for focus programs and directions about which technologies to target. Given the rate of change in the market, and the CEFC's unique position, this might enable the CEFC to be more flexible and dynamic in its response to investment opportunities

Providing the CEFC with more prescription on the public benefits to target and more discretion on how to target these benefits may also reduce the need to adjust to the Investment Mandate. This could have a positive impact on the understanding of the CEFC's role in the market, which all else being equal, could support the CEFC's ability to attract investment opportunities consistent with its purpose. Frequent and significant changes to the Investment Mandate undermine the market's confidence in and understanding of the role of the CEFC and the opportunities in which it may be willing to invest.

Further to this, the risk and return settings outlined in the Investment Mandate should provide the CEFC with the discretion to structure its portfolio consistent with a

commercial entity while pursuing its unique public purpose. In the future, as the market continues to mature, we consider it likely that the CEFC will need to take on higher risk projects, potentially with lower than commercial returns, in order to not crowd out private sector finance and pursue public benefits. As outlined in Chapter 5, the existing Investment Mandate, the 2016 Mandate No.2, sets a portfolio benchmark return that the CEFC considers to be high, given the additional public benefit returns it makes. Further, while the CEFC now has a degree of discretion to determine an appropriate level of risk to assume, there have been times when this has not always been the case.

If it is accepted that portfolio return and risk profile move in a consistent direction (i.e. to achieve a higher return more risk must be assumed) it follows that it may not be necessary to specify both a portfolio benchmark return and a portfolio risk profile in the Investment Mandate. This could provide the CEFC with more discretion to structure its portfolio in a way that allows it to pursue the public benefits sought by the Government.

We consider that, going forward, there may be merit in the Government and the CEFC reviewing the settings in the existing Investment Mandate, including the risk and portfolio benchmark return settings and the purpose and role of existing focus areas. This review should focus on specifying the public benefits that may be sought from the CEFC into the future and establish settings that allow the CEFC to pursue these public benefits in a rapidly changing market. This could provide long term certainty to the market and to the CEFC in relation to its unique role in the market.

Key findings

The directions set out in the Investment Mandate should be reflective of the role that the Government considers appropriate for the CEFC into the future and should provide a balance between discretion and prescription. Depending on the role envisioned for the CEFC in the future, the directions in the existing Investment Mandate may need to be adjusted to provide more guidance to the CEFC on expected public benefits and more flexibility to structure its portfolio to respond to rapid changes in the market. We consider there is merit in a review of the Investment Mandate, focused on establishing the public benefits that may be sought from the CEFC into the future and the settings that may allow the CEFC to pursue these public benefits. This could limit the need for further future changes to the Investment Mandate.

6.1.1 Crowding in private finance in renewable energy technologies

As outlined earlier in this report, under the Act at least half of the CEFC funds invested at, and at any time after, 1 July 2018 must be invested in renewable energy technologies. Currently, 54% of CEFC funds are invested in renewable energy technologies. However, if the CEFC continues the current trend of investing heavily in energy efficiency technologies or seeks to expand low-emissions technology investment, it will need to balance this investment with further investment in renewable energy technologies to maintain its statutory portfolio obligations.

The renewable energy sub-markets in which the CEFC invests, primarily large scale solar and wind, are becoming more mature with greater private finance available to projects in these markets. For example, in March 2018, Infrastructure Capital Group secured a landmark funding package for the refinancing of the $124 million loan to Mumbida Wind Farm. The Commonwealth Bank of Australia and BNP Paribas provided a syndicated bank debt facility on reportedly attractive terms and attractive pricing. Notably, the CBA and BNP Paribas provided the debt facility with 12 years tenor, longer than the tenor traditionally offered by the Australian banks.[139]

The implication of increased availability of private finance is that to continue to make investments in renewable energy, the CEFC's approach to risk may need to be revised. As outlined in Chapter 5, the 2016 Mandate No.2 enables the CEFC to assume "an acceptable but not excessive level of risk," with the Explanatory Memorandum making clear that the CEFC can increase the risk profile of its portfolio. While the Investment Mandate does not appear to excessively limit the CEFC's ability to assume risk, in practice, the CEFC appears to have interpreted that it is appropriate that it maintain a low risk appetite over the period of its operation. The CEFC may need further clarity in relation to the level of risk it can assume in the future, if it is required to continue to meet the requirement that at least half of its funds be invested in renewable energy technologies without crowding out private sector finance. This may be addressed if the settings in the Investment Mandate were reviewed with the view of providing the CEFC with the flexibility to respond to changing market conditions

The Government could also consider whether the 50% renewable target remains appropriate given the advancements of renewable energy technology. We consider this to be primarily a policy question about the benefits that the Government is targeting through the CEFC's investment function. We consider that the target could remain if the risk appetite of the CEFC were addressed. However, the challenges associated with managing a diverse and dynamic investment portfolio against a static target for renewable investment will remain a challenge for CEFC. The CEFC currently aims to have slightly more than half of its funds in renewable energy technology to buffer unforeseen changes in its portfolio that may compromise its ability to meet the statutory requirement. If the current requirement were to be reconsidered, a floating target (for example where investment in renewable energy must be with a range centred on 50%), could provide CEFC with additional flexibility to respond to shifts in the market and its portfolio, while retaining the public benefit associated with investment in renewable energy.

One potential mitigating factor to the constraints caused by the inconsistency between the risk appetite of the CEFC, the statutory requirement for half of the funds to be invested in renewable energy technology and the objective that the CEFC crowd in private finance is the possibility that the CEFC will invest in a large-scale public infrastructure projects to support renewable energy technology. The effect of such an investment would be a significant increase in the portfolio weighting toward renewable energy, due to large capital requirement of such projects. This would alleviate the pressure to meet the renewable energy investment target if other appropriate opportunities do not eventuate.

Key findings

The CEFC's current risk appetite may become incompatible with the requirement that it invest half its funds in renewable energy technology at, and at any time after, 1 July 2018 without crowding out private finance. The CEFC may need further clarity in relation to the level of risk it can assume if it is required to invest half its funds in renewable energy technology without crowding out private finance in the future. This could form part of a broader review of the Investment Mandate settings.

6.2 Build offering and experience in a wider range of financial products

The CEFC may need to expand its offering of financial products beyond senior debt to continue to be effective in facilitating increased flows of finance into the clean energy sector. In part, this is because the CEFC has been successful in de-risking the products that it has used to facilitate increased flows of finance into the sector and may need to enter into riskier products in the future in order to crowd in private finance.

Observations of other green banks suggest that there is a maturity lifecycle that these organisations progress through as the market adapts and responds to their presence. The Australian market is relatively immature compared with other international markets, including markets in Europe and North America. Relative to the green banks that operate in these markets, including the United Kingdom GIG, the CEFC tends to invest using less risky financial products. This could be expected as the CEFC does not have to make riskier investments to impact the market in the same way that the GIG would need to.

The importance of the CEFCs investment in lower security investments, (specifically in the energy generation sector) is highlighted in a recent research document on Green banks. This document notes:

"For large-scale solar PV and onshore wind the CEFC has addressed barriers to financing projects well by providing long-term debt financing to projects displaying revenue uncertainty, counterparty risk (solar PV) and risks involved with introducing novelty to projects. But developers agree that provision of equity or higher risk debt by the CEFC would better assist in addressing revenue uncertainty, something the CEFC does not (yet) supply."[140]

While the CEFC takes a conservative approach to risk management, it will be critical to ensure the CEFC does not adopt an investment strategy that is too risk-averse in the future, as this may prevent it from fulfilling its public policy purpose.[141] The CEFC typically seeks the lowest possible risk position in the capital structure as a protection of the CEFC investment against underperformance and to comply with its direction under the Investment Mandate. [142] In the future this approach may not be sustainable with its role of filling the commercial gap as each sub-market matures, with one stakeholder noting that "recently it appears the gap between CEFC and commercial lenders is narrowing". This is likely to require a portfolio comprised of an increased amount of junior or subordinated debt investment (higher risk, higher return), which the CEFC would likely need to build on its experience in delivering as it has done in a minor selection of projects.

To encourage the CEFC to utilise different products to facilitate increased flows of finance into the clean energy sector, the Government may need to consider both its risk and return settings as well as the financial instruments supported under the Act and the Investment Mandate. Feedback from stakeholders and the market suggests that there are a number of alternative methods of supporting finance currently not offered by the CEFC. These include, but are not limited to, the following:

- Offering appropriate derivative products for renewables, supporting projects through lines of credit based on potential derivative exposures, not just debt or equity
- Supporting aggregate procurement models to enable several energy buyers or end users to combine their energy procurement into one transaction
- CEFC financial support of Tier 2 and below revenue off-takers for projects to alleviate counterparty risk and secure investments by private capital providers
- Supporting development of corporate and synthetic PPA structures
- Continued exploration of funding models that attract institutional investors.

Some of these methods likely require a revision of current policy settings if it is considered appropriate that the CEFC use them to increase the flow of funds into the clean energy sector.

Key findings

The CEFC will need to continue to build a wider range of financial products, particularly in subordinated debt and equity investments, which will need to be considered in tandem with the risk appetite of the organisation.

6.3 Capital management

Assuming the CEFC's funding envelope remains constant, at the current rate of investment and market activity, it is likely that the CEFC will become capital constrained in the longer term as discussed in section 5.4. If all potential investments in the CEFC's pipeline at 31 December 2017 (per its database) are converted the CEFC will be capital constrained in the shorter term, although it should be noted that the likelihood of all investment opportunities being converted is low.

The CEFC has extensive commercial experience, and has the capital management capability, to address capital constraints should they arise. We note that the utility of debt finance as a capital raising strategy is limited as the CEFC currently has specific restrictions in place regarding borrowing under the Act, although this may not be a viable option given the nature of the CEFC, its investments and its targeted returns. Other options to address a capital constraint could include structuring investments in a way that they can be exited more easily, syndicating loans, and/or further capital raising. Although not prohibited under the Act, CEFC will need to consider its broader regulatory obligations when pursuing some of these strategies. While specific analysis of the most appropriate capital management strategy for the CEFC is outside the scope of this review, there is merit in the CEFC developing and assessing a suite of future strategies that could be utilised if required. We understand that the CEFC is already considering its future capital management strategy.

Key findings

The CEFC will need to consider options for capital management before its allocated funding is fully utilised, which may involve capital recycling or raising.

6.4 Submissions

In general, the stakeholders that made comments about the potential future role of the CEFC and barriers to the performance of this role focused on diversity of technology and the development of financial products, although some stakeholders also put forward that the CEFC should be directed to increase its support of particular projects. The RIAA describes CEFC's role as critical, "in ensuring capital is crowded-in most efficiently and early enough, that a broad range of technologies are invested in for a diverse resilient energy system, and energy efficiency investments are maximised to ease pressure on the ageing grid. The CEFC's role goes well beyond just energy generation, so the need for such support will be broad and deep."

Technology neutrality

A number of stakeholders pointed to limitations in the Act and the underdevelopment of more niche technologies as barriers to the CEFC's ability to affect future flows of finance into the clean energy sector. The Australia Institute, ATSE, and IGCC all proposed amendments to the restriction on technology and project type in which the CEFC is permitted to invest in.

ATSE considered that the CEFC should not be limited to particular technologies or industries in their ability to finance projects and performance measures as all industries will be impacted and transformed by the confluence of digitisation, disintermediation, artificial intelligence and internet of things. Instead, ATSE suggested that the CEFC should target increased energy productivity and emissions reductions. ATSE believed that the Act and Investment Mandate should be updated to reflect a focus on outcomes and technology neutrality.

ATSE believed a technology neutral policy is essential to support the development of diverse and innovative solutions required to reduce the emissions intensity of the Australian economy. This included CCS and nuclear power and nuclear technology, which the CEFC is currently prohibited from investing in. ATSE submitted that CCS will be essential for the decarbonisation of many industries and may be a cost effective option for emissions reduction in some cases for the energy sector. ATSE considered that next generation nuclear technologies could play a role in the decarbonisation of Australian energy production. However, it recognised that facilitating finance for nuclear power would require more than amending the CEFC's Act.

ATSE also submitted that the CEFC could expand its scope to facilitate unconventional areas of finance, such as where agricultural soil is used as a carbon 'sink' (carbon dioxide is removed from the atmosphere and stored in soil).

IGCC agreed that the existing restrictions on the projects and technologies that CEFC can invest in limits their ability to support projects with supplementary benefits and suitable returns. In the property sector, it considers that there is potential for a commercial return to be achieved through long-term investments in adaption measures and the incorporation of climate resilient designs in property and infrastructure assets. IGCC suggested that the CEFC could leverage private capital to facilitate this investment, while investors and infrastructure managers work to navigate future risks of climate change in this industry.

The CEC submitted that the CEFC has a valuable role in developing Australia's capability in dispatchable energy technologies. However, the CEC recognised that ultimately there is a need for support beyond the CEFC to accelerate Australia's experience with these technologies. This includes financial support from ARENA through grants, feed-in tariff top-up payments and the provision of equity or debt finance.

QFF submitted that significant opportunities remain to develop biofuel and biomass in the agricultural sector, primarily based on renewable or sustainable biofuels, such as liquid fuels from waste feedstock. QFF considered that a new agricultural or land-sector program could be introduced to specifically address opportunities in the primary agricultural sector and to support increased agriculture energy productivity, efficiency and demand management. The Australian Farmers Products Association and Bioenergy Australia both considered that the CEFC's current focus on bioenergy should continue, given its potential for growth in the energy market.

Financial products

A number of stakeholders commented on the untapped potential of diverse financial products and the need to update investment criteria.

One stakeholder recommended that the CEFC help overcome financial barriers by taking increased risk and providing finance solutions that align with corporate PPAs currently available in the market and the uncertain cash flows inherent in battery storage. It was also considered that the limitations on the provision of bank guarantees prevents the CEFC from addressing market gaps.

Finncorn considered that the CEFC should expand its product scope to provide revenue-stabilisation products to large-scale energy projects. Finncorn's view was that in a number of cases medium to long-term revenue certainty acts as a barrier to investment in new renewable energy projects. To address this, Finncorn made five recommendations:

01. The CEFC take on medium-term offtake agreements, balanced by re-contracted corporate, government or retailer demand, which may be executed in partnership with an existing or new specialised retailer.
02. The CEFC should also credit-wrap medium-term arrangements between projects and offtakers, a more traditional financial intermediary role where credit quality is a key factor facilitating financial flows.
03. The CEFC offer a credit-wrapped aggregation product to combine smaller commercial and industrial loads to renewable project size.
04. The CEFC explore options to support the development of renewables-targeted derivative products by the ASX.
05. The CEFC balance sheet is utilised to offer over-the-counter derivative products for renewables. This supports project funding through line of credit based on potential derivative exposures, rather than just debt or equity.

Finncorn suggested that these products could be offered by CEFC alone or in partnership with existing participants (retailers, investment banks or the ASX), allowing CEFC to focus on addressing the risks currently limiting these parties from offering products unaided.

The Australia Institute proposed that funding towards the CEFC Special Account be increased to $30 billion. It also considered that the return hurdle should be adjusted to the original expectation of cost recovery, rather than the cost of funding plus 3-4%. Further it advocated for greater concessionality for innovative and emerging technologies.

AFIA, COSBOA and CAFBA all made recommendations in relation to the CEFC's Energy Efficiency Fund (EEF) Program. AFIA suggested the Minister set a separate specific EEF portfolio benchmark return and permit the CEFC to allow concessional expense as incurred on a draw-down basis rather than up-front. The AFIA noted that other issues in the Act include the 50:50 investment ceiling on energy efficiency assets, compared to renewable assets, as well as the mismatch between booking discount amounts and the life of EEF programs and the relative low leverage of EEF Program investments (compared to other portfolio classes).

Other recommendations

The CEC commented on Board appointments and the setting of the Investment Mandate. The CEC believes that the current process, in which members are selected at the discretion of the responsible Minister, may open a large risk of political interference in the CEFC in the future. It considered that the Board should be appointed by a panel composed of representatives from key CEFC stakeholder groups. The CEC also expressed concern that the Act provided scope for political interference, causing investment objectives to become too specific and which would be better addressed by separate government programs. It proposed that the Investment Mandate be set by the panel of stakeholder groups and approved by the Minister, with investment returns set to reflect appropriate market benchmarks.

Despite the intention of the CEFC's Reef Funding Program to provide co-benefits, the WWF noted that the level to which this has been achieved is unclear. WWF recommended that the reporting on Reef Fund investments include mandatory criteria to measure the outcome for water quality and other co-benefits. Moreover, it considered that a quarter of the Reef Funds available should be allocated specifically to projects which bring significant co-benefits.

Appendix A
Overview of the Act and the CEFC

This Appendix provides an overview of the Clean Energy Finance Corporation Act 2012, the Investment Mandate and the Clean Energy Finance Corporation. The purpose of this Appendix is to provide context to the findings outlined in this report, and focuses on areas of the Act, Investment Mandate and CEFC that are relevant background to these findings. We acknowledge that there are other aspects to the Act, Investment Mandate and CEFC not covered in this Appendix.

The Clean Energy Finance Corporation Act 2012

The Clean Energy Finance Corporation Act (the Act) was passed by the Australian Parliament on 22 July 2012. The object of the Act is to "establish the CEFC to increase flows of finance into the clean energy sector." The Act sets out powers, functions and governance of the CEFC.

A.1.1. The CEFC's functions

Under the Act, the CEFC has the following functions:

- Its investment function
- To liaise with relevant persons and bodies, including ARENA, the Clean Energy Regulator, other Commonwealth agencies and State and Territory governments, for the purposes of facilitating its investment function
- Any other functions conferred on the CEFC by the Act or any other Commonwealth law
- To do anything incidental or conducive to the performance of the above functions.[143]

In performing its functions, the Act specifies that the CEFC must act in a proper, efficient and effective manner. [144]

The Investment Function

The CEFC's investment function as set out in the Act is to invest, directly and indirectly, in clean energy technologies.[145] These investments could include any or all of the following:

- Investing in businesses or projects for the development or commercialisation of, or in relation to the use of, clean energy technologies
- Investing in businesses that supply goods or services needed to develop or commercialise, or needed for use in, clean energy technologies
- Giving guarantees in accordance with the Act.

In performing its investment function, the CEFC may make investments itself (including as a participant in partnerships, trust, joint ventures or similar arrangements), or through subsidiaries or other investment vehicles or by any combination of these means. [146] Under the Act, the CEFC is only able to make investments that are solely or mainly Australian-based. [147]

In investing in these clean energy technologies, the Act requires that the CEFC ensure at any time on or after 1 July 2018, at least half of the funds for the purpose of its investment function are invested in renewable energy technologies.[148]

Technology classifications

Clean energy technologies are technologies that can be classified as one or more of the following: energy efficiency technologies, low emission technologies and renewable energy technologies. [149] Each of these technologies is further defined under the Act as follows.

- Energy efficiency technologies includes technologies (including enabling technologies) that are related to energy conservation technologies or demand management technologies.
- Renewable energy technologies including hybrid technologies that integrate renewable energy technologies and technologies (including enabling technologies) that are related to renewable energy technologies.
- A technology is a low emission technology if the CEFC Board is satisfied that the technology is a low emission technology, in accordance with a guideline that it will set for itself setting out the matters to which it will have regard in determining that a technology is a low emissions technology. [150]

The Act states that carbon capture and storage, nuclear technology and nuclear power are prohibited technologies for the purposes of the CEFC investment function.[151]

An amendment to the Act is currently before parliament. The Clean Energy Finance Corporation Amendment (Carbon Capture and Storage) Bill 2017 was put forward in May 2017 and aims to remove a restriction on the financing of CCS technologies. If passed by Parliament, this change would enable, but not require, the CEFC to support CCS technology investments. [152]

The Special Account

The Act establishes a $10 billion fund for the CEFC to invest in clean energy sector technologies (the Clean Energy Finance Corporation Special Account). Under the Act, the Special Account is credited as followed:

- $2 billion, to be credited on 1 July 2013
- $2 billion, to be credited on 1 July 2014
- $2 billion, to be credited on 1 July 2015
- $2 billion, to be credited on 1 July 2016
- $2 billion, to be credited on 1 July 2017. [153]

A.2. The Investment Mandate

Under the Act, the responsible Ministers may, by legislative instrument, give the Board directions about the performance of the CEFC's investment function, and must give at least one such direction.[154] The directions constitute the Investment Mandate and may set out the policies to be pursued by the CEFC in relation to any or all of the following:

- Matters of risk and return
- Technologies, projects and businesses that are eligible for investment
- The allocation of investments between the various classes of clean energy technologies
- Making investments on concessional terms
- The types of financial instruments in which the CEFC may invest
- The types of derivatives which the CEFC may acquire
- The nature of the guarantees the CEFC may give and the circumstances in which they may be given
- Broad operational matters
- Other matters the responsible Ministers consider appropriate to deal with in a direction. [155]

Before giving the Board an Investment Mandate, the responsible Ministers must send a draft of the Investment Mandate to the Board and invite the Board to make a submission on the draft. Any submissions should be tabled in the House of Parliament.[156] Once the final Investment Mandate has been issued, the Board must take all reasonable steps to ensure that the CEFC and its subsidiaries comply with the Investment Mandate.[157]

A.2.1. Directions provided to the CEFC through the Investment Mandate

Since the introduction of the Act in 2012, the Government has issued five Investment Mandates to the CEFC including:

- Clean Energy Finance Corporation Investment Mandate Direction 2013, effective 16 April 2013 (2013 Mandate).
- Clean Energy Finance Corporation Investment Mandate Direction 2015, effective 17 February 2015 (2015 Mandate)
- Clean Energy Finance Corporation Investment Mandate Direction 2015 (No. 2), effective 3 December 2015 (2015 Mandate No.2)
- Clean Energy Finance Corporation Investment Mandate Direction 2016, effective 5 May 2016 (2016 Mandate)
- Clean Energy Finance Corporation Investment Mandate Direction 2016 (No. 2), effective 13 December 2016 (the Mandate).

The five Mandates have issued a range of different directions to the CEFC, including in relation to the projects that are to be prioritised by the CEFC and the conditions on which loans are to be made.

The Clean Energy Finance Corporation Investment Mandate 2016 (No. 2)

The Clean Energy Finance Corporation Investment Mandate Direction 2016 (No.2) (the 2016 Mandate No.2) is currently in effect. This mandate replaced the Clean Energy Finance Corporation Investment Mandate 2016 in December 2016.

A summary of the directions provided to the CEFC in the 2016 Mandate No.2 is outlined below.

Table A.1 2016 Mandate No.2

Component	Direction
Introduction	The CEFC will invest at the demonstration, commercialisation and deployment stages of innovation. The CEFC should apply commercial rigour when making its investment decisions. The CEFC will have regard to its potential effect on other market participants when considering investment proposals. In line with its policy intent, the CEFC should have regard to positive externalities and public policy when making investment decisions and when determining the extent of any concessionality for an investment.
Portfolio Benchmark Return	All investments other than those made under the Clean Energy Innovation Fund must target an average return of the five–year Australian Government bond rate +3 to +4% per annum, before operating expenses, over the medium to long term.
Portfolio risk	The CEFC must, for all investments other than those made under the Clean Energy Innovation Fund, seek to develop a portfolio across the spectrum of clean energy technologies that in aggregate has an acceptable but not excessive level of risk, having regard to the terms of the Act and the focus areas.
Limits on guarantees	The CEFC should avoid the use of guarantees where possible. The CEFC must ensure that all guarantees are limited and quantifiable. At no time may the total potential liability under outstanding guarantees exceed the amount of the uncommitted balance of the CEFC Special Account.[158] The CEFC must also ensure the total value of guarantees at any time does not exceed 5% of the total amount that has been credited to the Clean Energy Finance Corporation Special Account.
Application of Australian Industry Participation Plans	Australian Industry Participation (AIP) Plans must apply to projects that the CEFC invests in, in accordance with the Government's AIP Plan policy.

Component	Direction
Corporation must consider impacts from its investment strategy	In undertaking its investment activities, the CEFC must consider the potential effect on other market participants and the efficient operation of the Australian financial and energy markets. The CEFC must not act in a way that is likely to cause damage to the Australian Government's reputation.
Focus areas for the Corporation's activities	The CEFC must include amongst its investment activities a focus on supporting emerging and innovative renewable energy technologies and energy efficiency technologies, such as large scale solar, storage associated with large and small-scale solar, offshore wind technologies, and energy efficiency technologies for the built environment.
Other directions	• Clean Energy Innovation Fund—Up to $200 million for debt and equity investment in emerging clean energy technology projects and businesses that involve technologies that have passed beyond the research and development stages but are not yet established or of sufficient maturity, size or otherwise commercially ready to attract sufficient private sector investment. • Sustainable Cities Investment Program—Up to $1 billion over 10 years. This investment program focusses on clean energy projects and businesses that provide productivity, accessibility and liveability benefits for cities. • Reef Funding Program—Up to $1 billion over 10 years for clean energy businesses and projects which support the Australian Government's Reef 2050 plan, to extend the benefits of clean energy to the long-term health of the Great Barrier Reef.
Reporting outcomes	The CEFC shall, as part of its annual report, report on the non-financial outcomes of all its investments.
Corporate Governance	In performing its investment function, the CEFC must have regard to Australian best practice in determining its approach to corporate governance principles. The CEFC must develop policies with regard to environmental, social and governance issues.

A.3. The Clean Energy Finance Corporation

The CEFC is a Commonwealth statutory authority, set up to be a specialist clean energy financier. The CEFC was formally established on 3 August 2012, was 'stood up' and commenced operations in April 2013, and commenced investment commitment activity on 28 June 2013.

The CEFC seeks to make targeted commercial investments, to counter market failures and financing impediments and to generate positive public policy outcomes. To help develop financing capacity and investment appetite in the clean energy sector, the CEFC invests in clean energy technologies and projects, leverages CEFC investment to attract additional private sector investment, and shares experiences, insights and expertise with project sponsors, public sector agencies, the energy sector and other industry bodies. [159] The CEFC performs this function by making investments directly, or through subsidiaries or other investment vehicles, or by any combination of these means. The CEFC invests in businesses or projects that are solely or mainly Australian-based and that develop, commercialise or are used in clean energy technologies. [160]

The CEFC complements other Government clean energy initiatives, such as the RET, ARENA, and the Emissions Reduction Fund (ERF).

The Board has interpreted the mission of the CEFC as: [161]

To accelerate Australia's transformation towards a more competitive economy in a carbon constrained world, by acting as a catalyst to increase investment in emissions reduction.

A.3.1. Strategic framework

The CEFC strategic framework (Figure A.1 below) focuses on areas of the economy where CEFC investments can assist in driving emissions reduction in Australia. The framework signals to the markets the types of projects that the CEFC will support and the investments that it will make. As part of its strategic approach, CEFC has identified three main sources of emissions in Australia:

- **Carbon intensive electricity:** The current electricity system is emissions intensive and makes up one third of all emissions in Australia. Australia's electricity system produces 75% more carbon emissions than the average produced in OECD member countries.[162]
- **Inefficient energy use:** The property sector is one of Australia's biggest carbon emitters, with buildings contributing more than 20% of greenhouse gas emissions.[163]
- **Large emissions from transport:** Liquid fuel combustion is an emission intensive process that is used as a major energy source for transportation. Transport, including road, rail, domestic and shipping aviation, accounts for around 17% of Australia's emissions.[164]

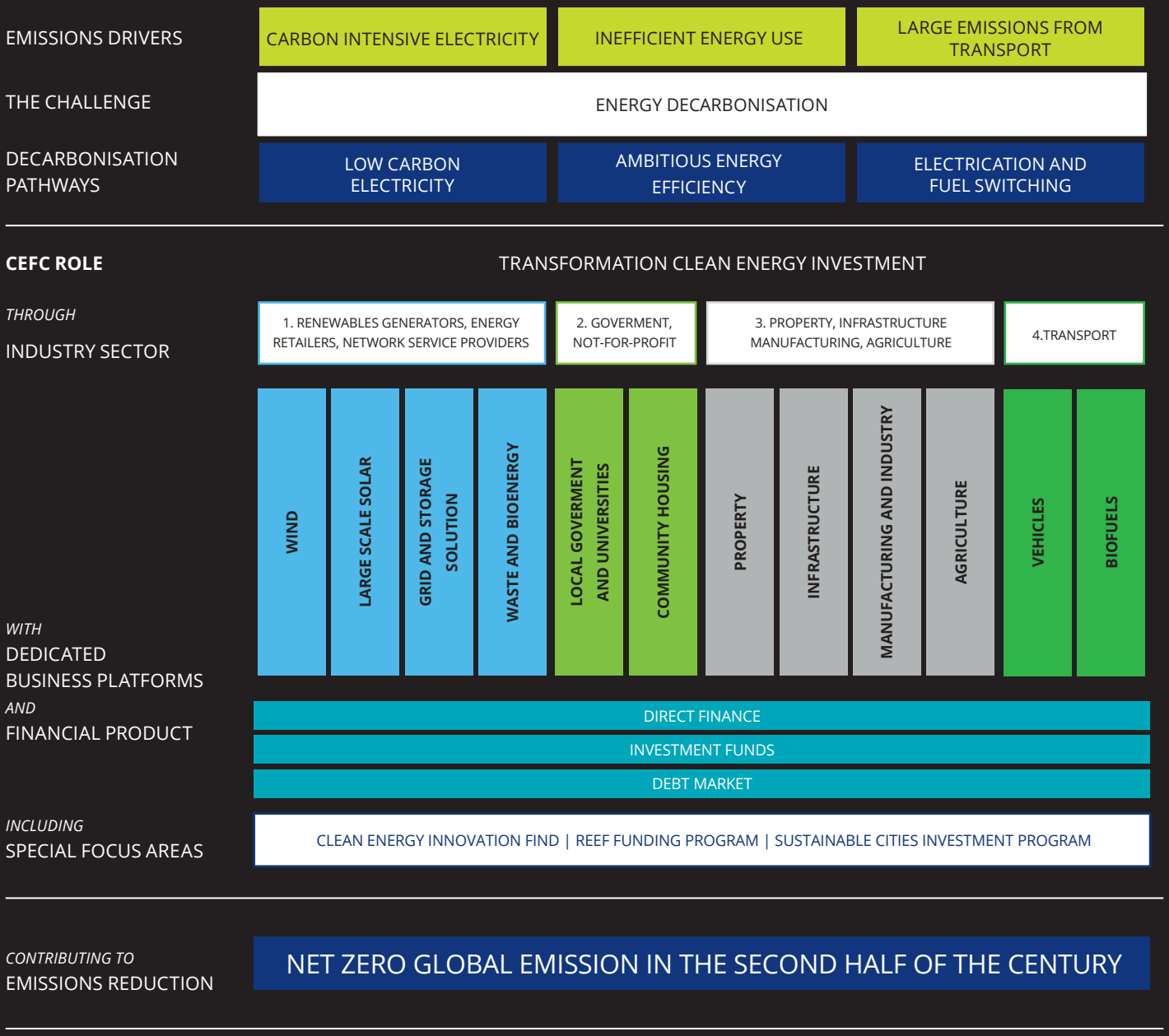
Based on the key drivers of emissions, CEFC has aligned its activities to the following pathways in order to support the decarbonisation of the Australian economy:

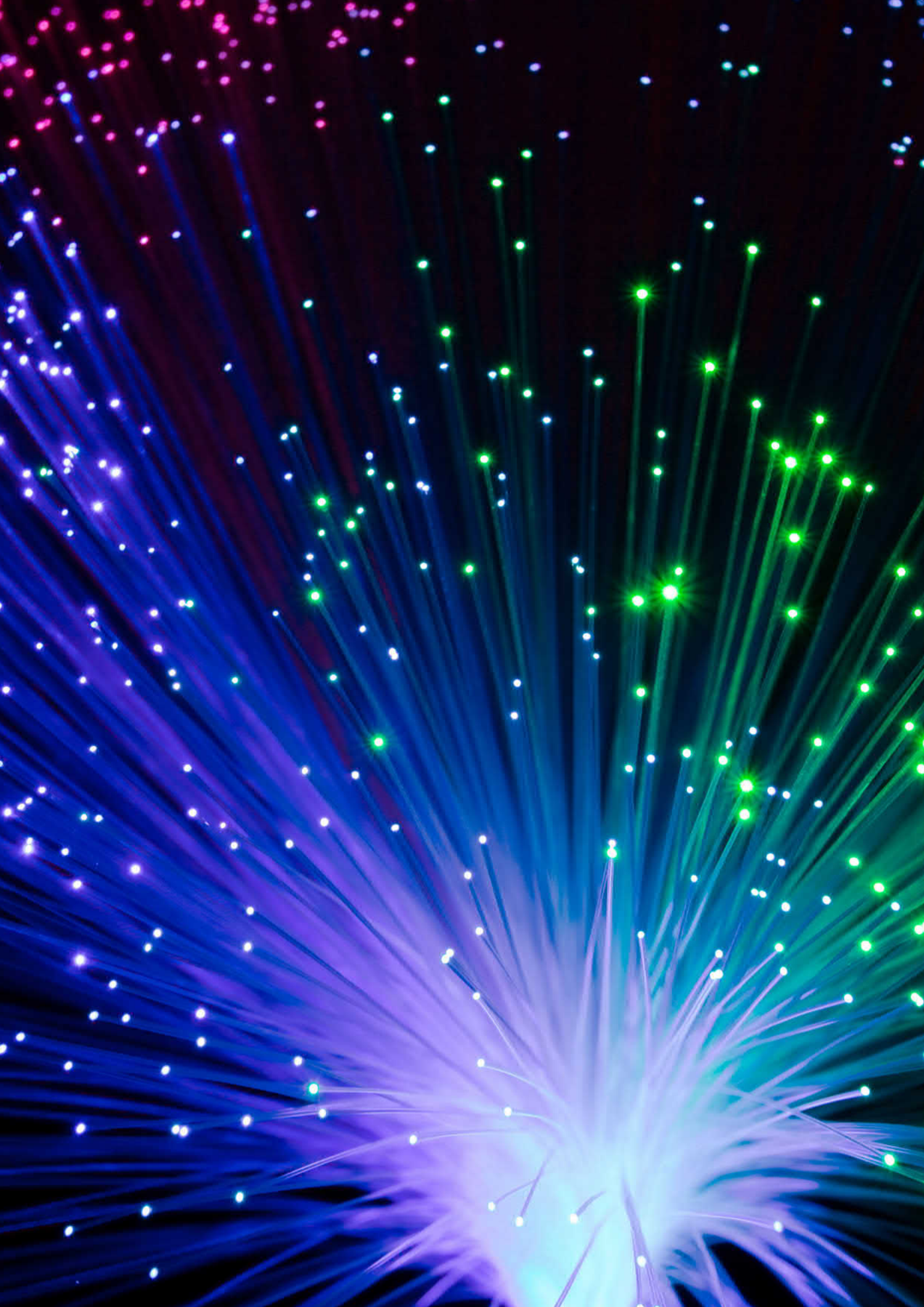
- **Low carbon electricity:** Deployment of clean energy technologies could assist in lowering the emission intensity of electricity generation. This could be facilitated through strengthened transmission and demand management systems, and increased storage capacity, which will contribute to improved system reliability, energy affordability and environmental sustainability with higher levels of variable renewable generation.
- **Ambitious energy efficiency:** Improving energy efficiency in homes, offices and plants will help limit the amount of investment required in the new electricity assets, while helping to reduce users' energy consumption.
- **Electrification and fuel switching:** Decarbonisation can be achieved through switching from vehicles that use carbon intensive fossil fuels to electric vehicles that use low emission electricity or renewable self-generation. In cases where electrification is not appropriate, Bioenergy can be used to further emission reduction. Investments in supply chain contributors such as lithium-ion for batteries or bio fuel production capability or infrastructure such as electric charging stations can assist in promoting electrification in Australia.

The CEFC has established four groups of industry sectors that have the highest potential for emissions reduction based on the pathways above. The CEFC uses a range of financial products to invest within these industry sectors as they transition towards a lower emission environment.

The strategic framework also takes into account the specific focus areas outlined in the 2016 Mandate No.2.

CEFC strategic frameworks





Appendix B

List of public submissions received

Australian Renewable Energy Agency (ARENA)

The Australia Institute

Australian Academy of Technology and Engineering (ATSE)

Australian Conservation Foundation

Australian Ethical Investment

Australian Financial Industry Association (AFIA)

Australian Forest Products Association (AFPA)

Australian Industry Group (AI Group)

Bioenergy Australia

Bundaberg Regional Irrigators Group (BRIG)

Clean Energy Council (CEC)

Clean Energy Finance Corporation (CEFC)

ClimateWorks Australia

Commercial and Asset Finance Brokers Association (CAFBA)

Council of Small Business of Australia (COSBOA)

Finncorn Consulting Pty Ltd (Finncorn)

Green Building Council of Australia (GBCA)

Investor Group on Climate Change (IGCC)

New England Greens

Pilbara Minerals

Queensland Farmers Federation (QFF)

Queensland Tourism Industry Council (QTIC)

RateSetter Australia Pty Limited (RateSetter)

Regulatory Institute—Portugal

Responsible Investment Association Australasia (RIAA)

St. George Community Housing (SGCH)

World Wildlife Fund (WWF)

Appendix C

Shadow credit rating	$ of CEFC investments	% of total investment	Margin range	Project type	Example projects/borrowers
AAA	29,236	1.6%	0.7-1.4%	Securitisation	FlexiGroup
AA- to AA+	629,434	33.9%	1.0-2.5%	Aggregation (partnership) concessional loans Climate Bonds	'Big Four' banks, universities
A- to A+	20,159	1.1%	0.7-2.2%	Property corporate loans, Local government loans	QIC Fund, CBA, Local government
BBB- to BBB+	498,013	26.8%	1.3-8.1%	Large scale generation, energy efficiency upgrades, property funds	Canadian Solar, Origin, Mirvac, Quintessential, AMP Capital
BB- to BB+	356,584	19.2%	0.9-6.5%	Large scale generation, waste-to-energy, CHPs	RATCH-Australia, Infigen, Neoen, Pacific Hydro
B- to B+	39,277	2.1%	7.9-10.5%	Higher risk large scale generation, the Innovation Fund	Pilbara Minerals, Innovation Fund investments
CCC	797	<1%	Unknown	-	-
Unrated	284,075	15.3%	n/a	Unlisted equity funds (renewables & property)	Palisade, EG Funds Management, Investa
Total	1,857,575				

End Notes

1 Under section 4 of the Clean Energy Finance Corporation Act 2012, the CEFC has two responsible Ministers, the Treasurer and the Finance Minister. Under section 76 of the Clean Energy Finance Corporation Act 2012, the responsible Ministers are required to determine which Minister will be the nominated Minister for the purposes of the Act. Currently, the Finance Minister and the Environment and Energy Minister are the responsible Ministers, with the Environment and Energy Minister acting as the nominated Minister.

2 Section 81 of the Clean Energy Finance Corporation Act 2012.

3 Note: the number of projects we have identified is 78, which excludes 72 smaller loans made through a legacy program.

4 Clean Energy Finance Corporation, Annual Report 2016-17, 21 September 2017. Available: https://www.cefc.com.au.

5 ESAA, Study shows policy uncertainty has stalled investment in electricity generation; Media Release, 10 December 2014.

6 Section 3 of the Clean Energy Finance Corporation Act 2012.

7 Commonwealth of Australia, Parliamentary Debates, House of Representatives, 23 May 2012, (the Honourable Greg Combet AM, MP), p. 5213.

8 This does not include investments related to LCAL programs, totalling 72 smaller value projects.

9 Under section 4 of the Clean Energy Finance Corporation Act 2012, the CEFC has two responsible Ministers, the Treasurer and the Finance Minister. Under section 76 of the Clean Energy Finance Corporation Act 2012, the responsible Ministers are required to determine which Minister will be the nominated Minister for the purposes of the Act. Currently, the Finance Minister and the Environment and Energy Minister are the responsible Ministers, with the Environment and Energy Minister acting as the nominated Minister.

10 Section 81 of the Clean Energy Finance Corporation Act 2012.

11 Deloitte analysis of CEFC iMart data.

12 Note under Section 59(3) of the Clean Energy Finance Corporation Act 2012, the Board is required to notify the responsible Ministers if an investment for the purposes of the CEFC's investment function has ceased to be, or never was, a complying investment. We are not aware of any such notifications.

13 Productivity Commission, On efficiency and effectiveness: some definitions, Staff Research Note, 9 May 2013, p.1. Available: www.pc.gov.au.

14 Ibid., p.6.

15 Ibid., p.7.

16 Section 3 of the Clean Energy Finance Corporation Act 2012.

17 Department of the Environment and Energy website.

18 AFIA submission

19 Section 81(5) of the Clean Energy Finance Corporation Act 2012. The Environment and Energy Minister is the nominated Minister.

20 Section 58(1) and Section 60 of the Clean Energy Finance Corporation Act 2012.

21 Section 58(2)(a) of the Clean Energy Finance Corporation Act 2012.

22 Section 58(2)(b) of the Clean Energy Finance Corporation Act 2012.

23 Section 59(b) of the Clean Energy Finance Corporation Act 2012.

24 Deloitte analysis of AEMO data.

25 Ibid.

26 Committed projects presented are those listed by AEMO as 'committed' - these projects are well developed, have the relevant approvals needed to commence construction and have reached financial close. Note, the proposed extension of Snowy Hydro is not classified by AEMO as a committed project.

27 See section 3.3.2 for more detail in relation to ARENA's role.

28 Commonwealth of Australia, Renewable Energy Target Scheme: Report of the Expert Panel, August 2014, p.1. Available: http://www.environment.gov.au

29 Deloitte analysis of Bloomberg New Energy Finance data.

30 U.S. Energy Information Administration, Levelized Cost and Levelized Avoided Cost of New Generation Resources, March 2018.

31 The levelised cost of energy represents the per-megawatt hour cost (in discounted real dollars) of building and operating a generating plant over an assumed financial life. Key inputs to calculating LCOE include capital costs, fuel costs, fixed and variable operations and maintenance (O&M) costs, financing costs, and an assumed utilization rate for each plant type. See U.S. Energy Information Administration, Levelized Cost and Levelized Avoided Cost of New Generation Resources, March 2018.

32 U.S. Energy Information Administration, Levelized Cost and Levelized Avoided Cost of New Generation Resources, March 2018.

33 U.S. Energy Information Administration, Levelized Cost and Levelized Avoided Cost of New Generation Resources, March 2018.

34 Bloomberg New Energy Finance analysis cited in Clean Energy Council, Clean Energy Australia Report 2016, May 2017, p.19. Available: https://www.cleanenergycouncil.org.au.

35 Ibid.

36 Deloitte analysis of AEMO data

37 Deloitte analysis of Clean Energy Regulator data. Clean Energy Regulator, Postcode data for small-scale installations, June 2018. Available: http://www.cleanenergyregulator.gov.au

38 Deloitte analysis of Clean Energy Regulator data.

39 Deloitte analysis of AER data.

40 From 1 July 2017, the mandatory disclosure threshold on commercial office space was lowered from 2000 square metres to 1000 square metres.

41 NABERS, Annual Report 2016/17, 30 September 2017. Available: NABERS Annual Report 2016/17.

42 Ibid.

43 Deloitte analysis of NABERS data.

44 Australian Property Institute, Building Better Returns Research Report, 22 May 2011. Available: https://www.api.org.au.

45 Section 3 and section 60 of the Clean Energy Finance Corporation Act 2012.

46 Section 58(3) of the Clean Energy Finance Corporation Act 2012.

47 Commonwealth of Australia, Clean Energy Finance Corporation Expert Review, Report to Government, March 2012.

48 Productivity Commission, On efficiency and effectiveness: some definitions, Staff Research Note, 9 May 2013, p.6. Available: www.pc.gov.au.

49 A stakeholder suggested that the $10 billion the CEFC was allocated under the Act could imply that the Government considered that $10 billion investment by 1 July 2018 (i.e. one year after the last instalment) would be effective. However, that the capital continues to be available to the CEFC in perpetuity implies that this was not the intention at the time.

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