ARCA GROUP INVESTMENTS

## *SUBMISSION TO THE CLEAN ENERGY FINANCE CORPORATION*

Dated: 8 December 2011

### About ARCA Group Investments Pty Ltd

The ARCA Group has been established to radically change how innovation in the Cleantech sector is supported and brought to market. ARCA Groups' mission is to significantly add depth and breadth to the public market sector for Cleantech in Australia; and more broadly in Australasia.

### What ARCA Group does

*Imagine a business model that allows Investors to own and build a diverse portfolio of investments, using technologies that assist the process of the achievement of improved resource use whilst also reducing or eliminating toxic emissions. Such a portfolio is expected to bring significant benefits to the economy, the environment and the Investor. These businesses will supply products and services in ways that maintain and prolong the resource base and protect the environment around the world.*

***Welcome to ARCA***

ARCA Group is committed to the support of a special purpose investment Facility designed specifically to assist Pre-IPO commercialisation of Cleantech business opportunities. Each technology and innovation is chosen and introduced to the Investor, through participation in the Facility, on the criteria based on specific parameters.

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## The submission

To supplement the consultation process, the CEFC review panel is seeking written submissions from stakeholders and their experiences on the key themes for the review:

From the request for submissions - *"The objective of the CEFC is to overcome capital market barriers that hinder the financing, commercialisation and deployment of renewable energy, energy efficiency and low emissions technologies.*

*The CEFC will invest in firms and projects utilising these technologies as well as manufacturing businesses that focus on producing the inputs required. It will not invest in carbon capture and storage technologies.*

*The CEFC is not intended to compete directly with the private sector in the provision of financing to these businesses. The CEFC will act as a catalyst to private investment which is currently not available and thereby contribute to reducing carbon emissions and cleaner energy.*

*Capital that is returned from investments will be retained for reinvestment by the CEFC, with the Board to determine the timing and quantum of dividends payable to the Australian Renewable Energy Agency."*

## Our View

For Australia to have any chance of reaching it's emission targets and to move quickly to a low carbon economy it has to reassess the definition of risk as applied to investments and capital needed to support innovation, creativity and technology.

***If …….*** *"The objective of the CEFC is to overcome capital market barriers that hinder the financing, commercialisation and deployment of renewable energy, energy efficiency and low emissions technologies.*

***And If ……*** *The CEFC is going to invest in firms and projects utilizing these technologies as well as manufacturing businesses that focus on producing the inputs required.*

**Then…..** The CEFC has to think of itself as a catalyst for change and not fall into the trap of funding the same old models and existing technologies. The CEFC has the opportunity to be an accelerator of the Cleantech industry in Australia and take the view that it is possible to multiply the amount of money available, the outcomes and the effort tenfold.

The most significant capital market barrier that hinders the financing, commercialisation and deployment of technologies in Australia is the current view of risk held by those who control the deployment of capital. In the main, Australian venture capital organisations and private equity firms have moved up the risk curve whereby they tend to make more assured investments on technology and innovation. There are arguments that both support and decry this approach, each are

valid. However, the challenge we face in transitioning Australia to a low carbon economy requires a step-change in the assessment of risk.

True solutions must lie with approaches that continue to see the Australian economy grow and prosper while at the same time increase the level of environmental protection. Along with all the other mechanisms available, this approach will be greatly assisted with technological breakthroughs. As David Charlton said in his recent Quarterly Essay[1] – *"It is important to remember that innovation is not a simple task. It often arises unpredictably, after hundreds of failures, decades of wasted effort and mountains of lost treasure".*

It is recognized that the majority of the money available to the CEFC will be deployed to support infrastructure projects that support existing technologies, and so it should. Existing technologies will, of course, improve over time, but the bigger challenge is such that that we will need major technological breakthroughs. Existing known technologies in wind, solar, wave, hydro and geothermal will not be sufficient to achieve the targets set.

It is imperative to bring forward the technologies of the future. The point is not that technology is the easiest solution. It is that technology is the only solution. Our efforts to develop technology must be unremitting and ever increasing.

ARCA Group Investments would like to see the CEFC structured in such a way that future technologies, developed in Australia, can be supported in parallel with support given to existing technologies and proven infrastructure projects.

This is why ARCA has been created. A novel way to bring step-change technologies to market quickly so they have the ability to raise the additional capital to be in a position whereby the technologies can be applied on a large scale. It is ARCA's view that with a small allocation from the CEFC great inroads can be made in the commercialisation and deployment of Australian innovation, creativity and technology to the point where it can make a significant contribution to Australia's transition to a low carbon economy and indeed be very well positioned to export these solutions the world.

ARCA is but one approach, albeit we believe a good one. ARCA is of the firm belief that to truly get the most out of the best innovation and creativity Australia can produce, we have to be equally innovative and creative about the way we deploy capital and support new business models.

ARCA moves beyond the "institutional" investment in R&D and looks at the commercialisation of technology that can make a real difference by building new companies, creating new jobs and exporting Australian solutions to the world. It is by no means to only option, however ARCA is a commercial model that exploits

[1] Quarterly Essay – Man-made world – Choosing between progress and plant – essay by Andrew Charlton. Published by Black Inc., an imprint of Schwartz Media Pty Ltd

Australian intellectual resources in the same way as this country continues to exploit its natural resources since the days of Arthur Phillip. The reality is that no one has a mortgage on good ideas and that good ideas are everywhere.

Australia punches way above its weight in innovation. One can only imagine the result if the same amount of effort was put into the commercialization of innovation and creativity as was put into more traditional Australian businesses activities. It is just about redefining risk, reallocation of financial resources and not just leaving it to government policy. Yes there are "schemes and there are incentives and programs", however compared to the amount of capital put to work in other countries supporting and commercialising innovation, Australia pales.

It is a big picture problem requiring big picture thinking that breaks away from convention and incumbencies.

In a commentary on the Copenhagen Climate Summit in 2009 Andrew Charlton[2] commented:

*"Poor countries care about the environment, but poverty is their chief concern. A Chinese official made the point starkly: "You cannot tell people who are struggling to earn enough to eat that they will need to reduce emissions." Developing countries were unwilling to accept any binding constraints on their path out of poverty. "For centuries your countries have prospered by exploiting the world's resources," a Latin American negotiator explained to me. "How can I tell the slum dwellers that must stay poor to help clean up your mess?""*

Britain's Lord Stern, one of the world's top climate economists gave a speech to the National Press Club in Canberra on Wednesday 1 September 2010 and commenced with the following words:

*"I want to talk today about the economics of climate change, and set that in three clear perspectives that really do influence the way in which we see the opportunities and the challenges and the way forward on managing climate change.*

*The first of them is of fundamental importance and that is that the two defining challenges of this century are overcoming world poverty and managing climate change and we succeed or fail on those two things together.*

*If we try to manage climate change by putting obstacles or appearing to be putting obstacles in the way of rising standard of living in the developing world, and not just the developing world, in the next two or three decades… if we try to manage climate change that way, we will not succeed in putting together the coalition which is vital on a global scale to manage climate change.*

[2] Andrew Charlton was a senior economic adviser to the prime minister from 2008 to 2010. During that time he served as Australia's senior official to the G20 summit and the prime minister's representative to the Copenhagen Climate Conference. He previously worked for the London School of Economics, the United Nations and the Boston Consulting Group and received his doctorate in economics from Oxford University, where he studied as a Rhodes Scholar.

*If of course on the other hand we fail to manage climate change, then the environment will become so hostile over the course of this century and into the next that we will reverse, set back the whole story of development. So, we succeed or fail… If you take a view of this century, we succeed or fail on those two issues together and we have to keep that firmly in mind*[3]*".*

And this thought is mirrored in Andrew Charlton's recent essay which gives us insight into the reasons for the failure to reach any agreement in the Copenhagen Climate Summit held in 2009 in the following thoughts:

*"... The deal broke down because Copenhagen exposed the central dilemma of our century: the choice between progress and planet*[4]*."*

*This was the conundrum in Copenhagen. A fraction of the world's people had become rich by plundering our planet to the point of exhaustion; now the still-poor majority wanted to do the same. ..... The world is split between those who want to save the planet and those who want to save themselves.*[5]*"*

The message from these commentators and others is clear. Renewable technology as we currently know it is not the answer: there needs to be a cost effective solution available to the developing economies; this means a "step-change" in technology development and not a case of incremental improvements in what we already have, as this path is just too slow to achieve the changes needed or promised.

ARCA believes that there is a real need to understand that neither investment for investment sake nor technology for technology for technology's sake is the answer. We need to provide solutions that reduce the cost of energy, food and resources today, if not, then the climate will be swamped by the need of the developing nations to develop in the cheapest and fastest possible way, they need food, clothing and shelter first.

Andrew Charlton correctly, in our view, suggests that we flip the thoughts we have about renewable energy and Cleantech developments. He suggests that the examples from developing nations are that: *"Climate change cannot be solved by reducing energy use or making fossil-fuel power more expensive. In developing countries – where most of the world's population live – there is an urgent need for the opposite: more, and cheaper energy. This conclusion, as we will see, has fundamental implications for global climate policy*[6]*."*

This cannot be achieved without the "step-change" noted above in the technologies we have available. This cannot be achieved with continuing the current path of

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[3] http://www.climatespectator.com.au/commentary/shaping-future - *This is an extract of a speech delivered by Britain's Lord Stern – one of the world's top climate economists – to the National Press Club in Canberra on Wednesday 1 September 2010.*

[4] Quarterly Essay – by Andrew Charlton At page 4

[5] Quarterly Essay – by Andrew Charlton At page 5

[6] Quarterly Essay – by Andrew Charlton At page 36

development; we need new ways of funding, new ways of supporting innovation and new ways to foster the emerging ideas into real businesses.

The value ARCA Group brings to the market is the combined understanding of the reality that global resources are limited, the licence to pollute is being constrained and will become increasingly so in the near future and the current thinking on investment and support to new and emerging technologies cannot rely on the current market to support its required growth.

Conventional economic growth models are based on the assumption of infinite resources and relatively unlimited pollution caps and the risks associated with the reverse of this assumption has not been factored into the risk analysis of major investors.

ARCA Group understands that:

- resources must be managed and their use maximised as some resources such as fossil fuels, minerals and forest timbers are finite;
- pollution, including carbon and other toxic emissions, must be either eliminated or converted to a new resource base; and
- pollution "sinks" like the atmosphere and oceans cannot be used indefinitely without social, environmental and economic consequences such as global warming and ocean acidification.

Where are those ideas and businesses that will be key players in the new dynamic? They have to be found, supported and nurtured to the point where they are ready to play an active role in the new economy. We see that Australia:

- has an abundance of innovative ideas and skill; and
- has an abundance of capital looking for ways to be deployed to take advantage of the Cleantech revolution; and
- properly structured and funded can quickly become a net exporter of Clean Technologies to the world.

Traditionally the risks for investors in unlisted investments (Pre-IPO) are high. There are very few Cleantech businesses with a five year track record and established commercial networks. Likewise, liquidity and exits are difficult propositions for Pre-IPO ventures. It is believed that ARCA Group, through this Facility, provides a solution whereby it is able to give Pre-IPO support with the view to listing on a suitable securities exchange, which through the ARCA investment approach and the structured ability to provide spread will reduce the traditional Pre-IPO investor risk.

## The structure

The structure we propose for the development of the CEFC, combined with the new thinking in the investment management model devised by ARCA will positively

impact the ability to advance the innovation that is required for the step-change to give us the new technologies urgently required.

Whilst there is pressure from various parties to ensure that the CEFC do not have investment failures, inherent in the development of a system that can provide a real "step-change' required for success in this new and rapidly developing market there needs to be an acceptance that there will be failures – it is inevitable. Vinod Koshler of Koshler Ventures, based in California, adequately describes the position in his and his firm's investment process in that he has an expectation that not all investments will be successful, but at the same time more will succeed that fail and this is the real measure of the investment success.

## The market gap in financing low emission technologies

The current market space for financing of technologies is well reported in various publications[7].

Excluding the CEFC, there are several levels of investors that have or should have an interest in diversifying their portfolio with low carbon asset (LCA) investments. These include:

- Retail investors;
- High net worth and professional investors;
- Private superannuation funds;
- Retail investment funds; and
- Public and industry superannuation funds.

Each of these has specific investment requirements and levels of available investment funds. The overall consideration for each is the analysis of the risk associated with any investment decision. The introduction of the CEFC can significantly alter the risk analysis to assist with the unlocking of available funds for investment and development.

The current experience in the market suggests that there is little appetite for investments into "new" technologies that are not supported by a strong underlying business. Unfortunately the Cleantech and LCA class does not have the history of development to have reached the level of stability required. There is an overriding need for government support in the development of the sector as a whole.

History has continually shown that where large infrastructure projects and new technologies are beginning their journey to commercialisation that government support and appropriate legislation is required to create an economic environment where capital can take risks in a more controlled manner.

[7] Quarterly Essay – by Andrew Charlton At page 36

Given the premise that LCA are as equally beneficial to the community as a whole, then it follows, that there is a great incentive for regulatory and government support for the sector that will facilitate the unlocking of private investment funds. The wider area or regulatory and government support is however not the focus of this report.

It is assumed that the CEFC is a step in providing the appropriate government backing to develop the opportunities that exist in the Cleantech and LCA rollout. However the CEFC is a facilitator and multiplier, not the panacea.

The benefits of supporting the Cleantech and LCA sector in Australia are clear and include:

- Development of alternative industries for employment and investment diversifying away from the mining industry dependence currently dominating Australia;
- Development of high technology exports for local innovation in a rapidly expanding marketplace;
- Providing the community with stable and reliable LCA development providing both economic stability and environmental protection; and
- Given the need for step-change in the technology, a real opportunity to introduce local innovation to the international market place.

There is a significant market gap in the funding of the emerging Cleantech sector and ARCA welcomes the support the CEFC will provide to stimulate and release the ample investment funds currently locked behind the risk based investment mandates of the local capital and superannuation markets.

## Funding Models

Funding models that incorporate a public funding component have proven effective in leveraging significant additional private investment in development in innovation in various industries. Public financing mechanisms in the climate change mitigation sector are also able to increase private financing available by factors of between three and fifteen[8].

In the renewable energy sectors, the following models have been used to deploy public finance as a means of attracting increased private finance for both research and development and early commercialisation:

- Grants: public grant funding programs, which along with the founders capital (including family and friends and angel investors) are major sources of finance for research and development activities globally, can drive private

[8] Sustainable Energy Finance Initiative, Public Finance Mechanisms to Mobilise Investment in Climate Change Mitigation, SEFI 2008.

investment in research and development both by providing capital for the activities, and creating an incentive that can be made subject to particular private investment requirements (such as matched funding requirements). This is however not the subject of discussion for the CEFC as this is not appropriate for the desired and nominated purpose of the CEFC.

- Funds: fund structures, although demonstrating significant variation, can attract increased private finance for activities targeted for investment, by mitigating investment risks and allowing exposure to a wider range of investment opportunities. Whilst a multiple fund strategy (fund to fund investment models) provides current investment groups, such as retail and industry super funds, the diversity in the investment strategy by allowing the various fund managers to each demonstrate different management styles, it is not the way the gain maximum leverage through a co-ordinated investment approach to the emerging Cleantech sector. There needs to be a focus on the sector in a very co-ordinated way and the depth of capital available to the CEFC is not sufficient to have multiple managers in this still small but rapidly developing market. Co-ordinated effort and focus is required.
- Loans: loans for development and expansion activities may also take a wide range of forms, all of which may be adapted to help attract increased private finance and equity, for example through application of concessional terms or provision of commercial finance to high risk enterprises which would not otherwise be able to secure funding.
- Guarantees: a range of guarantee structures have been used to encourage private financing of renewable energy development activities, the following have been commonly and effectively used.
    - Loan guarantees: where a public guarantor guarantees (part of) the debt finance provided by a private lender.
    - Equity guarantees: where a public guarantor guarantees (part of) the equity finance provided by an equity investor.
    - Performance guarantees: where a public guarantor provides a guarantee that may be called upon if a technology fails to perform as expected.

*Refer Appendix 2 for further details on each of these methods.*

Each of these funding methods is designed to enable the investee company to establish a profitable operation. Ultimately, it is envisaged, that these companies will be in a position to enter the publically listed capital market. Here the levels of capital available in increased significantly.

### Staged specific risks and requirements

It is important to recognise that the path to commercialisation is comprised of distinct project cycle phases – research, proof of concept, commercial demonstration, technology commercialisation and finally market expansion. The needs of each phase vary significantly and require different forms of financing, attract different types of investors and through the market reluctance to invest necessitate different CEFC style funding and incentive structures.

For example the milestone development levels are:

- Research requires upfront capital financing, which is usually provided by the founder and their close networks. This stage has a relatively long technology time to market and therefore poses a high investment risk profile. These projects in addition to the founder's capital and financial resources are commonly the recipients of grant funding from government.
- Technology projects at the demonstration stage have a comparatively shorter technology time to market. However the projects at this stage still face difficulties in attracting sufficient funding for the development of demonstration facilities.
- Then, even where the initial demonstration models are secured, sustained capital injections are required to carry a project through the "cash flow valley of death" (see Appendix 1). Even here there is a difficulty in obtaining sufficient financial resources to ensure success.
- Commercial prototype development and proof of market acceptance, where the project is now ready for the final commercialisation roll-out.

Even following the demonstration level and even the achievement of the commercial prototype, experience has shown that in this emerging technology area, government sector funding is still applicable and under the CEFC will still account for assistance in the financing of a substantial proportion of project costs, though it may impose higher matched private funding requirements and may be given in various forms from equity to various guarantees. Also at this development stage, early seed investors, venture capitalists and private equity funds may also offer financing, though usually in conjunction with public financing mechanisms and almost always as a consortium with other private investors.

## The scope for the operations of the CEFC

*"The objective of the CEFC is to overcome capital market barriers that hinder the financing, commercialisation and deployment of renewable energy, energy efficiency and low emissions technologies."*

We recommend that there should be four distinct investment portfolios for the CEFC, with each targeting the various stages of development of "emerging"

technologies, each having different capital market barriers with unique management and funding requirements. The investment portfolios are:

- Stage 1 – defined as technologies that have developed beyond concept stage but have not achieved prototype stage.
- Stage 2 - defined as technologies that have developed beyond the prototype stage and are in the process of or have recently developed a commercial demonstration plant.
- Stage 3 - defined as technologies that have developed a commercial demonstration plant and are commencing the entry into the commercial market for deployment.
- Stage 4 - defined as technologies that have entered into the commercial market deployment and have requirement for project or other funding for expansion.

This staged approach is designed to give a funding path to emerging technologies based on the achievement of milestones in development. This is the approach of many overseas venture capital firms and is not a new concept. The depth of capital to follow in initial investments is the important factor and something that is very much lacking in the Australian markets.

This staged approach does not limit the investment strategy to new technologies alone, but provides for a clear path for these, whilst allowing for the rollout of Stage 4 technologies and projects at the same time. This is not proposed as an investment funnel model, opportunities exist at each level simultaneously.

We suggest that a suitable portfolio mix for the CEFC would be:

- Stage 1 - $500 million
- Stage 2 - $2 billion
- Stage 3 – $2.5 billion
- Stage 4 – $5 billion

This recognises the capital and other financial support needs of each level and provides for a suitable risk profile spread.

### The Stages in further detail

### Stage 1

- defined as technologies that have developed beyond concept stage but have not achieved prototype stage.

It is considered that innovation is best incubated by dedicated and motivated individuals and like minded groups. Institutions such as universities and the CSIRO are uniquely suited to research and development, which are currently subject to

other funding sources. Talented individuals through the use of their own resources (including family and friends) are better suited to the pre Stage 1 development of the ideas and concepts. This is deemed the highest risk sector in the development of new technologies and traditionally not well suited to a larger corporate environment.

### The market barriers

Once the idea or concept has reached Stage 1, where it can demonstrate a commercial application that potentially solves a current market failure, normally the founder funds are almost exhausted. This is a critical point in their funding needs. Current grant funds are not sufficient and loan funds from commercial sources are not available as there is no available cash flow, balance sheet or proof of profitability to support loan repayments. At the same time, current capital markets view the risk as too high. These risks include:

- Small scale of investment;
- Technology;
- Management depth;
- Lack of liquidity and long time frame to any foreseen liquidity event;
- Commercialisation, including:
- Manufacturing;
- Distribution; and
- Marketing and sales.

Unless there is continued support the idea or concept fails at this point.

### The role of the CEFC

The CEFC's role at this Stage 1 is to support the innovation develop the concept to the bench top prototype stage. The effective method is for either:

- Direct capital investment; or
- Capital guarantees.

The investee company is not in a position to service loans, or loan guarantees and requires the capital to take the concept to the bench top proof of concept stage. This is venture capital which is currently not available in the Australian capital markets.

The level of commitment to equity in any one venture would be no more than $500,000. The capital requirements at this stage are not significant and small amounts of funding can be effectively utilised to bridge the gap between ideas and bench top proof of concept.

### Stage 2

- defined as technologies that have developed beyond the prototype stage and are in the process of or have recently developed a commercial demonstration plant.

There are numerous companies and technologies in this category. They are still to develop a full management team and complete the final step in the proof of concept – the building of the commercial small scale demonstration plant.

At this point there are potential investment opportunities coming from private groups and inventors as well as institutions such as universities and the CSIRO. Each group lacks the depth of capital and access to additional funding resources to further develop their technologies. Although this stage is does not have the same risk level as Stage 1, it is still deemed higher risk and not well suited to a larger corporate, family companies and superfund fund investment mandates.

#### The market barriers

Whilst the risk has been diminished, the major funding institutions are not disposed to readily invest in the venture capital style of opportunities within the local market. There is support for venture capital firms located overseas, but the local venture capital firms have vacated the local scene due to limited fund availability and the need to move up the risk curve. There is some evidence of international venture capital firms such as Koshler Ventures, Emerald Technology Partners, The Founders Fund and Sequoia Capital are moving into the local market to "poach" technologies and entrepreneurs for transfer overseas. This poses a risk to the local capital market as it limits the development of potential significant investment opportunities.

Again, loan funds from commercial sources are still not available due to the same reasons as Stage 1 innovation as there is no available cash flow, balance sheet or proof of profitability to support loan repayments. At the same time, current capital markets (superannuation funds, high net worth groups, family offices) view the risk as too high. These risks include:

- Management depth, the building of the management team needs to be completed;
- Lack of liquidity, although there is a clearer path to a liquidity event in a shorter period of time;
- Commercialisation, including:
- Distribution; and
- Marketing and sales.

At this milestone the investee company has achieved some level of development and the following perceived risks have been reduced to such a level as to be not material to the investment decision:

- Technology – now proven and ready for market deployment;
- Management depth – in place and recruitment plans for additional skills identified;
- Commercialisation,
- Manufacturing - for the manufacturing process and partners have been identified and suitable contracts in place for including;
- Distribution – still a risk but depending on the business plans initial distribution channels may already be in place.

Again, unless there is continued support the idea or concept fails at this point.

### The role of the CEFC

The CEFC's role at this Stage 2 is to support the innovation development to the initial commercial scale plant or unit for the rollout to the first revenue producing opportunities. The effective method is for either:

- Direct capital investment;
- Capital guarantees;
- Development loans; and or
- Loan guarantees.

Direct investment is the preferred method as the investee company is still not in a position to quickly service loans, or loan guarantees and requires the capital to achieve the effective commercialisation of the technology. This commercialisation capital is currently not available in the Australian capital markets as the risk is still deemed to be outside the investment mandates of most investment houses.

The level of commitment to any one venture for either equity, loans or guarantees would be between $5,000,000 and up to $50,000,000. The capital requirements at this stage are higher and depend on the cost and size of the needed commercialisation plant and the working capital required to effectively take the technology to the market.

### Stage 3

- defined as technologies that have developed a commercial demonstration plant and are commencing the entry into the commercial market for deployment.

This is the logical next step in the funding and development cycle for the emerging Cleantech company. They are still to develop a full management team and complete the final step in the move to full commercialisation with the development of the customer base.

Although this stage is does not have the same risk levels as previously, it is still deemed higher risk and not well suited to a larger corporate, family companies and superfund fund investment mandates.

### The market barriers

Whilst the risk has been significantly diminished, it will still not fit within the general funding mandates of the local funding institutions. The examples from overseas still place this follow-on investment in the venture capital market and as such are still deemed too risky in Australia as there is no venture capital group, or even groups, with the depth of capital to truly support follow-on funding.

Again, loan funds from commercial sources are still not available due to the same reasons as stated above in the earlier development stages. At the same time, current capital markets (superannuation funds, high net worth groups, family offices) view the risk as too high. These risks include:

- Management depth, the building of the management team whilst significantly improved needs to be completed;
- Lack of liquidity, although there is a clearer path to a liquidity event in a shorter period of time;
- Commercialisation, including:
    - Distribution – whilst still a risk the development plans show a clearer path to the market; and
    - Marketing and sales.

At this milestone, the following risks have been further reduced for incoming investors:

- Technology – now proven and operating in a limited market environment;
- Management depth – in place and recruitment plans for additional skills identified;
- Commercialisation,
- Manufacturing - for the manufacturing process and partners have been identified and suitable contracts in place for including;
- Distribution – still a risk but depending on the business plans initial distribution channels may already be in place.

Again, unless there is continued support the idea or concept fails at this point.

### The role of the CEFC

The CEFC's role at this Stage 3 is to support the further development of the technology to a commercial scale plant or unit for the rollout to the first revenue producing opportunities. The effective method is for either:

- Direct capital investment;
- Capital guarantees;
- Development loans; and / or
- Loan guarantees.

Direct investment is still the preferred method as the investee company is still not in a position to quickly service loans, or loan guarantees and requires the capital to achieve the effective commercialisation of the technology.

The level of commitment to equity, loans or guarantees would be between $5,000,000 and up to $100,000,000. The capital requirements at this stage are higher and depend on the cost and size of the needed commercialisation plant and the working capital required to effectively take the technology to the market.

### Stage 4

- defined as technologies that have entered into the commercial market deployment and have requirement for project or other funding for expansion.

This is the area where there is a need for significant project finance to roll out the infrastructure. These projects are on the back of proven technology and business operations.

#### The market barriers

There is still reluctance in the Australian market to invest in such large scale Cleantech investments due to several structural problems. These barriers include counterproductive local legislation, resistance by market incumbents with legacy systems to protect and a general resistance to new developments without a long history of success.

Some of these barriers can be overcome by changes to government regulations over time, acceptance by incumbents that change is inevitable and constructive support from the CEFC.

The major funding institutions do have significant funding available for "suitable" projects that provide long term returns. The assistance of the CEFC can significantly reduce the risk associated with these "new" technologies and markets without a significant increase on the risk to the CEFC.

Like all investments there are still risks associated with this stage hindering the financial support for the emerging Cleantech sector. These risks include:

- Lack of a profit history;
- Incumbents resistance to market change;
- Government, local, state and federal policies that are at odds with the deployment of the technologies;

- Management depth and history of achievement in a new marketplace.

We have seen developments over the last few years where the financial support was supplied by foreign sources, with the foreign manufactures and overseas banks providing the required funding for such projects as wind farm development. This was due to the lack of interest by local institutions for funding and the inability of the local energy groups to provide off-take agreements for the electricity. The foreign groups effectively have taken the risk on their own balance sheets. Whilst this has meant that the projects were completed it does not provide for the wide spread development of the Cleantech operations in this country.

### The role of the CEFC

The CEFC's role at this stage is to support the innovation develop the concept to the bench top prototype stage. The effective method is for either:

- Direct loan funds;
- Loan guarantees; and / or
- Performance guarantees.

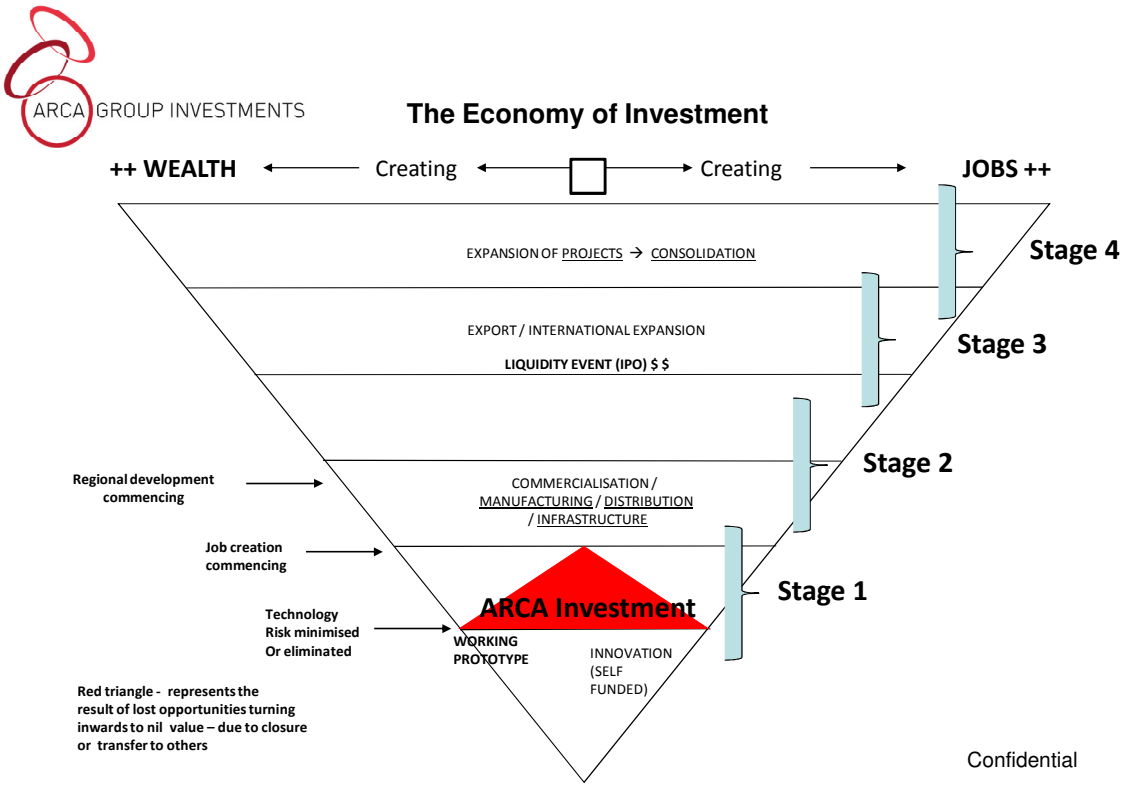
The investee company is now in a position to service loans, or loan guarantees from the project cash flows and business models. The CEFC support at this stage can be leveraged to assist the investee company gain further support from the wider investment community. This is seen as the final stage of the rollout of the investee company technology and allows the development of businesses with the potential for both a strong local as well as an international operation.

The level of commitment to guarantees would be between $50,000,000 and up to $250,000,000 for any one project. The ability to utilise the loan guarantee and or performance guarantee options can effectively leverage the funds significantly. Overseas experiences indicate that this leverage could be as great as 10 times the guarantee amount.

## The process

Whilst we have given four areas for investment by the CEFC, we see that ideally the process is a stepped one. Suitable investments are introduced at the Stage 1 and progress with increased funding as the milestones are reached. The CEFC facilitates the development of the sector through the creation of truly innovative and new technologies. The technologies that will create the step-change required to enable Australia to develop a viable Cleantech renewable energy sector that can not only provide solutions to the local market but can export to the global market.

Diagrammatically, we see the following represent these stages that show the benefits of the investment process in terms of wealth and jobs growth.




## Proof of concept

We believe that ARCA Group Investments is a model that is able to work in conjunction with the CEFC to rapidly develop and bring to market the technologies needed to ensure that the CEFC is able to overachieve its stated objectives. It is in no way suggested that the CEFC funds ARCA to the tune of $1 Billion at this stage. What is needed is a proof of concept model to demonstrate that it is possible to support and finance Australian innovation, creativity and technology and bring them to the public finance markets through the initial public listing. This is the possible exit strategy for the CEFC to enable it to both realise its profit and create resources for further funding, not unlike the venture capital models, which have shown success in the United States.

ARCA is currently in the market raising $100m for ARCA Stage 1 and currently has up to 15 'step-change" technologies ready to be funded. All have a demonstrable prototype with proven technology, are scalable and address market failure. Their main obstacle now is commercialisation and market development capital.

It is not suggested here that the CEFC fund the full $100m ARCA is looking for, but to consider participating in ARCA to the tune of $25m - $50m. The ARCA documentation is attached to this submission.

## Why ARCA's focus is on innovation, creativity and 'step-change' technologies

We believe that the real task for the CEFC is to assist the government and Australia achieve its stated environmental targets and effectively participate in the economic benefits offered by the development of step-change technologies in the LCA market. The challenge for the CEFC is that there is not enough time nor money to reach the 5% cut in emissions target set by the government by funding and providing incentives for existing and even near term renewable technologies. There needs to be a focus on the new emerging ideas that will provided the needed step-change.

The real step-change has to come from creating a viable sector that enjoys a reassessment of risk when deploying capital and the acceptance that some things will not always work. While the capital markets in Australia continue to believe that innovation creativity and technology is too risky and best left to others there will be very little new technologies coming to market in the time frame needed to reach the government's emissions target.

*"By combining all known technologies Australia will not be able to reach it's 2020 target of reducing emissions. In fact trying to roll out large-scale renewable energy with existing would be a terrible waste of money. We can spend billions of dollars installing expensive and inefficient renewable power with technology that will be soon be outdated."*[9]

Let's look at the known options currently available:

## Solar

The Moree solar farm will take over 4 years to complete, deliver 0.4TWH of energy to the grid and the subsidised cost to the government of $300. If Australia was to focus on solar to reach its renewable target of 100TWH of renewable energy, it would require rolling out a similar sized project every week until 2020 – a total of 250 solar farms.

Andrew Charlton provides the following examples"

## Wind

Currently wind produces 5TWH power. To reach the 100TWH target using only wind Australia will have to install 20 times the current total wind capacity over the next ten years. Meaning building 5 wind turbines every day from today to 2020

Currently, neither wind or solar are predictable base load power and need additional "add-on" technologies enabling power storage to achieve the next level of energy generation bringing it closer to a reliable 24 hour production level.

[9] Quarterly Essay – by Andrew Charlton

### Nuclear

100TWH can be delivered by Nuclear power, however the plants are expensive, require deep technical expertise that Australia doesn't have, take a long time to build and politically very few governments government support it's' expansion.

And Andrew Charlton concludes that these considerations illustrate the magnitude of the challenge; and need to ensure that we engage multiple solutions; and the need to look for the "step Change" technologies required to lift the production capacity quickly and economically.

The CEFC can be the catalyst for the biggest technical revolution in Australia's history in a very short space of time if it prepared to re-evaluate and redefine risk. Supporting innovation, creativity and technology in a way never undertaken before in Australia is less risky than supporting incumbency.

## How the CEFC could work with other government and market organisations.

### Other incumbents

There are a number of organisations currently funded through government sources providing grants and other direct funding that sometimes have conflicting objectives and prove counterproductive. We do not see that the CEFC can provide an effective solution to this failure; it can however ensure that the structure it chooses does not set up a similar dilemma in that there are duplications and contradictions developed that waste valuable resources.

Properly structured the CEFC can provide a place for the consolidation of expert advice on the development and commercialisation of the step change technologies required to advance Australia in its stated environmental goals.

### Indirect policy measures

In Australia, a number of regulatory and policy frameworks have the potential to provide added incentive for public and private investment in technology development.

Relevant policy measures include the various renewable energy policies available at both the federal and State level, fiscal measures, planning and development concessions in relation to projects and tertiary education programs funded by the Government.

A number of these measures, such as renewable energy policies and planning and development concessions, are by their nature directed towards the latter stages of the solar project innovation and development cycle (i.e. once a solar technology is ready to be deployed for commercial application). For example, benefits derived from policies such as the National Renewable Energy Target and solar feed-in tariffs are captured once a technology has been deployed as a part of a project (whether

small- or large scale) to generate electricity for private consumption. Similarly, planning and development concessions are designed to alleviate the potentially drawn-out and expensive development approval process associated with demonstration, deployment and commercialisation.

By contrast, tax concessions may be designed specifically to benefit eligible parties undertaking solar R&D, or demonstration.

As a centre of excellence, the CEFC can be a significant contributor to the development of the policies adopted by all levels of government. The role could effectively "cut the red tape" involved with the commercialisation and project development of the new technologies.

It is through such means that the CEFC can further facilitate the unlocking of the private investment funds. Giving more certainty to the project outcome, reducing costs and ensuring stability of policy are all desired features of the private investment market.

## Conclusions

To effectively leverage private finance for the full spectrum of the emerging renewable Cleantech technology sector there needs to be a multi-layered funding strategy. The various funding methods need to be aligned with the stage of development and the prevailing market need. The indirect opinion influence that the CEFC can exert as a "centre of excellence" should not be overlooked as a powerful tool in the development and deployment of the new technologies needs to provide the step-change required to achieve the stated and required targets.

The different funding risks and requirements arising from the different characteristics at each stage of the development and commercialisation path mean that each funding model may be relatively well-suited to a particular stage in the innovation cycle, but not so suitable for other stages. The solutions must fit the circumstances accordingly.

Realising the advantages and disadvantages of the various funding models, if the CEFC is to promote private financing, it will be necessary to offer a portfolio of financing instruments targeting different commercialisation stages. At times it will be necessary for the CEFC to be the majority funder, and this should be anticipated in the Stage 1 and Stage 2 types of investee opportunities.

The objective of the CEFC should be that to reduce the following three types of risk which are potentially incompatible with most capital business models:

Technology risk: the risk that the technology being developed by an investee company will fail to perform as expected..

Market risk: the risk that even where a technology performs as intended, it will not have a competitive advantage with which to capture a market share and achieve commercial success.

Regulatory risk: the risk that the regulatory frameworks and settings on which technologies currently depend for competitiveness will be terminated or modified, such that technologies can no longer compete successfully with other energy options.

### ARCA Invitation to the CEFC

Mr Anthony Bertini of ARCA Group Investments welcomes the opportunity to meet with the CEFC to:

- Share its experience in raising capital to support working, demonstrable, scalable, Australian step change innovation and capital;
- Give firsthand opinion of the investment community's view of risk is with regard to innovation. "Reality Vs Rhetoric";
- Explain the ARCA model in detail, and showcase step change technologies that would greatly assist Australia in its transition to a low Carbon Economy.

Email: abertini@arcagroupinvestments.com

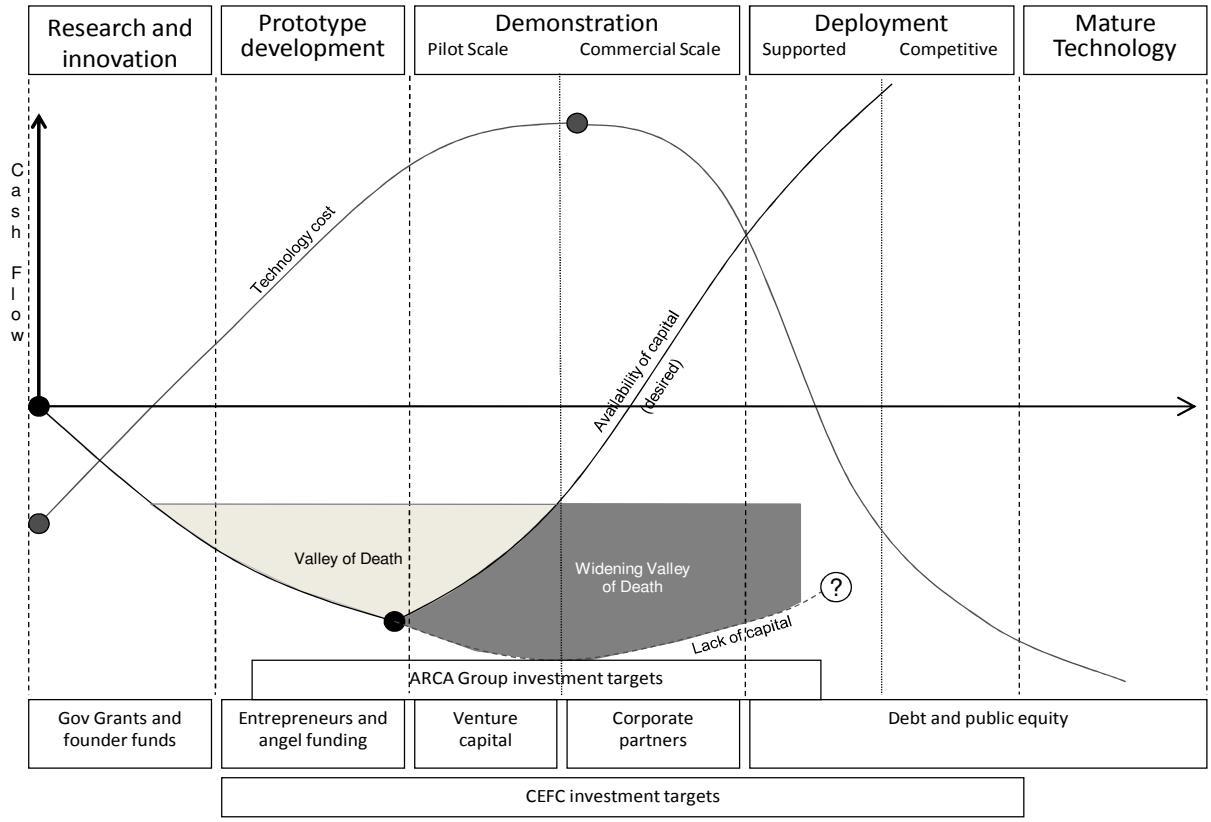
Phone: +612 9261 0883

## Appendix 1 - The valley of death

Extract and adaption from the report prepared by Ernst & Young – "Navigating the valley of death Exploring mechanisms to finance emerging clean technologies in Australia" produced in response to questions raised by the Clean Energy Council (CEC) to explore mechanisms to finance emerging Cleantech in Australia. (March 2010)

The valley of death is not unique to Cleantech or Australia. It has been used to describe the challenges in rolling out any new technology or business opportunity where the characteristics are slow commercialisation with little or no revenues in the early stage, high capital and or operating costs and little or no external funding sources.

- Figure 1: Defining the valley of death22




*Adapted from Going global from New Zealand; Rod Drury; 16 March 2007; www.drury.net .nz*

For Cleantech, the valley of death is widening and technologies get stuck where later stage investments are considered too capital intensive for a venture capitalist, but the technological or execution risk is too high for project finance investors.

The challenge is that Cleantech requires billions of private and public investment, and therefore government policies need to facilitate innovation, appropriate risk taking and ultimately the deployment of existing and new Cleantech.

# Appendix 2 – Possible funding models

## Introduction

The funding needed for the transition from fossil fuel-fired power to renewable energy generation is beyond the capability of the public sector.

However public funding forms an important component of renewable energy financing, through the funding methods used the value of public funds can enhance and effectively leverage and open the financial resources of the private market.

Funding models that facilitate the attraction of private finance through public funding support will help address the current gap in early funding by mitigating investment risks and maximising the effectiveness of public expenditure.

The effectiveness of such models in new and innovative sectors is proven, with public financing mechanisms in the climate change mitigation sector able to increase private financing in the sector by factors of between three and 15[10].

Whilst each model is presented in isolation for illustration purposes, in practice different funding models are often combined with one another (whether formally or informally), or applied with particular variations or additions. A public funding grant, for example, may be conditional upon the grantee securing a matched private equity investment, which private investment may then be protected by a publicly-backed equity guarantee.

Public funding initiatives are most successful when they involve cooperation between government and private sector participants. Public initiatives are not a replacement for the established financial markets, but simply a better way of enhancing the ability to unlock funding for a the new and emerging renewable and LCA sector.

The various funding models include:

## Grants

Grants are not specifically covered in this submission as they do not form part of the CEFC structure and strategy. This remains the direct domain of the various Government bodies.

## Funds

### Typical structure

A fund can in its simplest form be described as a special purpose vehicle into which investors (including other funds in the fund to fund models) pool their capital for a

[10] UNEP Sustainable Energy Finance Initiative, Public Finance Mechanisms to Mobilise Investment in Climate Change Mitigation, SEFI 2008.

common the purpose. This provides investors with a spread of risk at a more cost effective level that as individual investors they would be unable to achieve.

Investments are generally made over a certain term as in a closed end fund (or managed investment scheme), after which the fund will exit or liquidate its investments and, divest the proceeds to the investors. This return may or may not include a profit on the investment.

Funds are a commonly-used funding model for investment providing investors with inherent risk mitigation characteristics:

- by drawing investments from multiple parties or sources, funds inherently distribute the risk attached to an investment amongst several investors (who may otherwise be reluctant to make any investment in the relevant target or targets); and
- by pooling the funds made available for investment, funds are able to:
- distribute these pooled funds across a broader range of investments, giving exposure to a more diverse portfolio of investments, and therefore diversifying the risk exposure; and
- provide a greater total investment to a target business or project than might otherwise occur.

The CEFC can be viewed as a fund, in its own right (albeit a single investor), designed to take direct investments in Australian renewable energy and LCA companies.

In addition to the direct investment made, this CEFC fund could then employ the following fund to fund features to enhance private sector investment beyond the initial capital investment:

- automatic reinvestment into the fund of fund dividends, in order to maximise the capital invested by fund participants during the fund term, with a view to in turn maximising the divided realised at the term's expiry.
- invest in a fund which receives both public and private investments. Where, the fund may be structured to pay a preferential dividend to private investors, with the CEFC participating on a partial non-profit basis, designed so that it received returns adequate to cover its operating costs and a small dividend but did not take a commercial dividend.

Funds receiving public funding through the CEFC may also include quantitative funding commitments or constraints designed to further leverage private investment where the term sheet providing CEFC funding may mandate a certain percentage of its capital is drawn from private sources.

## Loans

Loans are a versatile funding model and, whilst they have a long history of use in financial markets, continue to be adapted for new and specific financing applications.

Loans provided by public bodies may generally be structured in one of three ways:

Loans on commercial terms: in some circumstances, a company may be able to service a commercial loan, but may be perceived to present too high a risk for private commercial lenders (for example due to perceived performance risks associated with innovative technologies), such that the borrower is simply unable to secure private debt finance. Through the CEFC facility, this gap left by private lenders, can be filled by accepting the borrower's credit risk (and technical risk to the extent this impacts a borrower's solvency) and providing a loan on commercial terms (i.e. at interest rates reflecting the borrower's high risk profile).

Concessional or "soft" loans: concessional loans are characterised by terms relatively favourable to the borrower, most frequently low or zero interest rates (reducing the cost of capital) and longer tenors (reducing the level of ongoing repayments), that are designed to make debt finance more available and affordable for:

- pre-commercial companies (businesses yet to commercialise their technologies) that lack the cash flow required to service a commercial loan, provided at commercial interest rates; and
- companies (such as renewable and advanced clean technology businesses) engaged in activities entailing, or perceived to entail, particularly high or novel risks, that face particularly high interest rates given the risks they are perceived to present.

Subordinated debt: where the CEFC provides a loan to a private borrower where the lender (the CEFC) may accept a lower priority ranking than private lenders in the event of a default. In this case, private lenders, who will be repaid before the subordinated public lender, are more likely to recover a greater proportion of their respective loans. This:

- improves the borrower's credit rating in respect of this prioritised private debt; and
- reduces the interest on the debt and associated cost of capital.

As a result:

- private debt finance becomes more affordable for a borrower;
- It may potentially also make commercial debt finance easier to obtain (in that lenders may be more willing to grant the loan), although considered risks will still be a factor.

Loans do not always represent an appropriate funding structure for the commercialisation activities due to the time taken to become cash positive.

The applicability of loans may therefore be limited to the later stages of the innovation and commercialisation cycle

Loan agreements may utilise a combination of both fixed and variable rate interest, and related variable return provisions.

Other considerations which may be made by a lender include:

- the seniority of the debt being offered by the lender in light of other debt provided to the project; and
- the manner in which loan repayments are structured.

The borrower similarly must weigh up the benefits and risks of taking on loan commitments before it has the ability to commence repayments.

Rather than offering stand-alone loans, some public bodies have instead chosen to employ a revolving loan fund structure. These structures may be established with an initial capital injection by government and are set up with the intention of utilising loan repayments from existing borrowers to create additional loans.

Effective revolving loan funds can become a source of sustained debt financing. Interest and other fees paid by borrowers may be used to cover the cost of administration and operations so that the fund also has the ability to preserve its original capital base and potentially return a profit.

### Loan guarantees

Loan guarantees play an important role in channelling investment into pre-commercial Cleantech companies. They play a particularly significant role in leveraging private debt finance, by reducing the credit risk exposure of private lenders.

Loan guarantees can and do vary depending on the loans to which they relate, other than standard loan facilities they generally have the following key features:

- conditions and pre-conditions to the guarantee;
- loan components to be covered;
- the term of the loan guarantee;
- the type of loan guarantee offered; and
- the special provisions required by the guarantor.

In order to adequately mitigate the guarantor's risks, conditions or pre-conditions are commonly found in loan guarantee agreements.

It would not be proposed that any loan guarantees provided under the CEFC structure would not take on 100% of the exposure to a particular risk, as the issue of

"moral hazard" associated with any form of guarantee arises from re-allocation of the entire risk to the guarantor. Under a full guarantee the CEFC would take on an unduly high risk as the borrower in essence has nothing to lose and therefore may be in the position to accept greater risk levels than it would otherwise be prepared to accept.

In order to avert any "moral hazard", loan guarantees would therefore only cover an agreed percentage of the subject loan, rather than its full value.

Loan guarantees may be divided into two main types, by reference to their triggering of the indemnity clauses:

- guarantees of payment, which require a guarantor to pay the lender upon a borrower defaulting on a loan repayment; and
- guarantees of collection, where the lender must first seek to collect payment from the borrower following default and, in the event that this fails, may then require the guarantor to pay on the loan guarantee.

A number of innovative loan guarantee facilities have been developed internationally which, whilst incorporating many of the listed typical features, have also included non-generic terms in the hope of greater leverage of private investment.

### Equity guarantees

Publicly-backed equity guarantees may be provided by the CEFC to venture capitalists, angel investors and other equity investors making seed/early investments in pre-commercialisation companies, to mitigate the risk that the equity investment (or, more commonly, a part thereof) will be lost should the investee company fail. In this context, equity guarantees may be best used to promote equity investments in technology companies following completion of earlier stage technology development, at the point when venture capitalists and angel investors move to invest equity with which the company can proceed to the next stages of technology development, prior to demonstration.

An equity guarantee is typically structured as a partial guarantee (e.g. 50%-70%) covering part of a party's equity investment in an early-stage venture.

If the company fails, the investor can enforce the guarantee to recover an appropriate part of the covered equity investment. Triggers for enforcement generally include insolvency of the investee company, or its loss of a pre-determined equity percentage.

As for loan and other guarantees, guarantors providing equity guarantees will charge a fee, often calculated as a percentage of the guaranteed funds. These fees are to help cover the guarantor's ongoing operational costs, or to finance further investment measures and initiatives. The fee should be high enough to justify the

CEFC's assumption of risk as guarantor, without becoming prohibitive for prospective investors.

### Performance guarantees and efficacy insurance

Performance guarantees and efficacy insurance have not been used extensively in relation to renewable energy technology commercialisation but are seen as possible adjunct to the power purchase agreements, which are currently difficult to obtain from the incumbent market participants. Most instances where performance guarantees have been applied to the solar industry relate to deployment of solar technology as opposed to earlier-stage commercialisation. However, performance guarantees may have the potential to act as an effective public funding model, capable of leveraging significant private investment, in the demonstration context.

A performance guarantee operates in much the same way as a loan guarantee, except that where the latter provides a guarantee for a borrower's repayment of a loan, the former provides an investor with a guarantee for the performance of the technology, by reference to specific performance indicators. "Efficacy insurance" functions in a similar way, usually in a situation where a technology owner/user takes out an insurance policy in respect of the good performance of the technology, with a payment claimable from the insurer in the event that the technology does not perform as expected.

As mentioned above, performance guarantees are more commonly used later in the project cycle, most particularly at the deployment and commercialisation stages. Nonetheless, there are potential for performance guarantees to be suitably adapted to the earlier stages of a project cycle. This is especially the case at the demonstration stage, during which technology performance becomes more readily measurable and the lack of performance data is less pronounced.

Performance guarantees and efficacy insurance may be able to provide the incentives required to sustain private sector investment after initial funding and into the longer-term.

The Energy Performance Guarantee is a good example (in the building energy efficiency sector) of how an energy performance guarantee may be provided. In this case, the primary performance indicator is reductions in energy consumption and carbon emissions. Self Energy provides funding for the set up of energy-saving equipment and provides a guarantee in relation to the energy savings to be achieved.