



AUSTRALIAN  
CONSERVATION  
FOUNDATION

# FUNDING THE TRANSITION TO A CLEAN ENERGY ECONOMY

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“ More than 85% of the total investments needed to meet the climate challenge will likely have to come from private capital...Without government actions, however, private-sector investment will not reach the scale required to address climate change effectively. ”

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## ABOUT ACF

The Australian Conservation Foundation (ACF) is a national, community-based environmental organisation that has been a strong voice for the environment for over 40 years, promoting solutions through research, consultation, education and partnerships. We work with the community, business and government to protect, restore and sustain our environment.

As an independent environment focused NGO that does not compete for investment or advisory mandates, ACF believes it can play a constructive role in lifting the profile of climate finance constraints and opportunities, advocating policy and regulatory settings and facilitating cross-sectoral collaboration in order to rapidly catalyse the required transition to a low carbon economy.

ACF has undertaken significant work with the finance community to promote responsible investment and a closer alignment of investment mandates with environmental outcomes.

For more information see: [www.acfonline.org.au](http://www.acfonline.org.au)

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**Cover quote by:** Institutional Investors Group on Climate Change, Investor Network on Climate Risk, Investor Group on Climate Change (Australia/New Zealand) & UNEP Finance Initiative, *2010 Investor Statement from New York Summit*, <http://www.iigcc.org/> Private sector capital requirement as identified in United Nations Framework Convention on Climate Change (2007), *Investment and Financial Flows to Address Climate Change*, <http://unfccc.int>



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## FOREWORD

To play our part in limiting the rise of global temperatures to less than 2°C and seize the opportunities of a low-carbon economy, hundreds of billions of dollars of private investment are required in low-carbon assets in Australia over coming decades. Without significant private sector investment, the current gap in low-carbon investment will not be closed and these objectives will not be achieved.

Investors have a responsibility to beneficiaries that requires them to seek optimal risk-adjusted returns on their investments. In the absence of strong and stable policy frameworks, many low-carbon investment opportunities do not currently pass this test. Private investment will only flow at the scale and pace necessary if supported by clear, credible, and long-term policy frameworks that shift the risk-reward balance in favor of less carbon-intensive investments.

*Funding the transition to a clean energy economy* makes a timely contribution to the low-carbon financing debate. While carbon pricing is the critical centerpiece of the policy response to efficiently reduce emissions in Australia's economy, complementary measures and institutions that catalyse investment and reduce risk are key to getting funds flowing now.

As the low-carbon economic policy framework is resolved, it is also critical that institutional investors seek opportunities to allocate funds to low-carbon assets. Institutions that diligently and thoroughly assess low-carbon investment options now, as well as prepare to increase their allocations to the low-carbon economy, will be best prepared for what is effectively a predictable economic revolution.

Congratulations to the Australian Conservation Foundation on *Funding the transition to a low-carbon economy*. I recommend it to policy makers and investors as a valuable input to their future work.

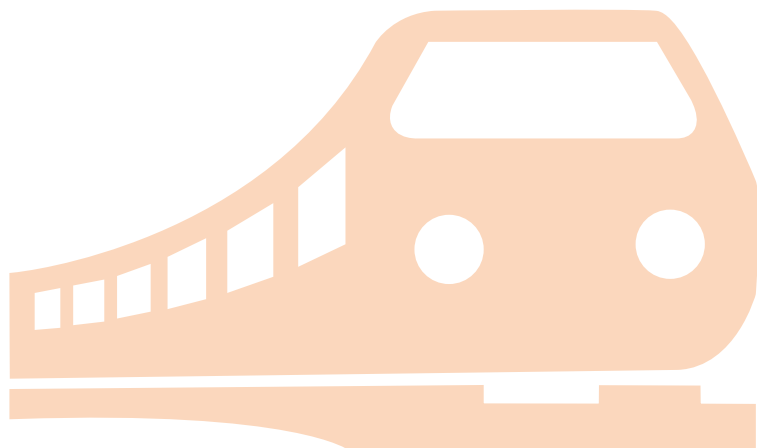


Nathan Fabian  
Chief Executive  
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Investor Group on  
Climate Change

*The IGCC (Australia / New Zealand) represents institutional investors, with total funds under management of approximately \$600 billion, and others in the investment community interested in the impact of climate change on investments. The IGCC aims to encourage government policies and investment practices that address the risks and opportunities of climate change, for the ultimate benefit of superannuants and unit holders.*

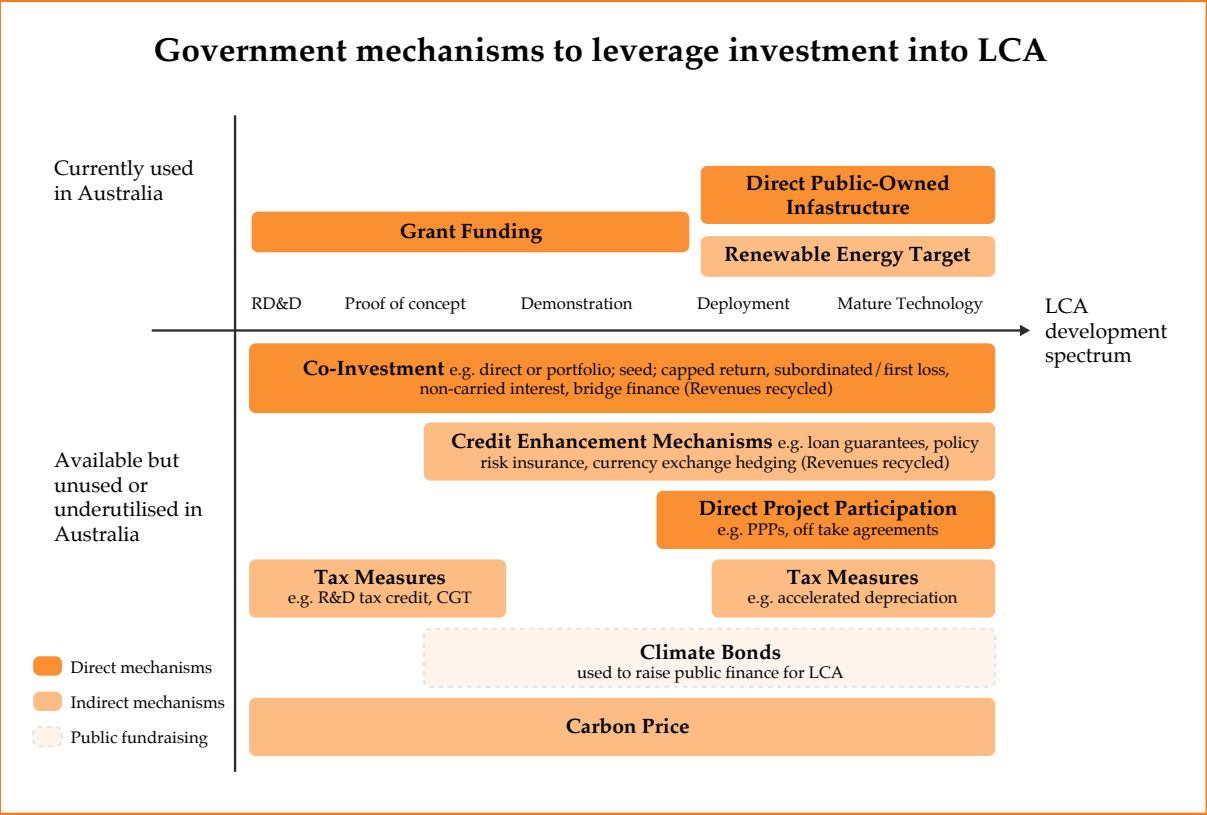


## EXECUTIVE SUMMARY

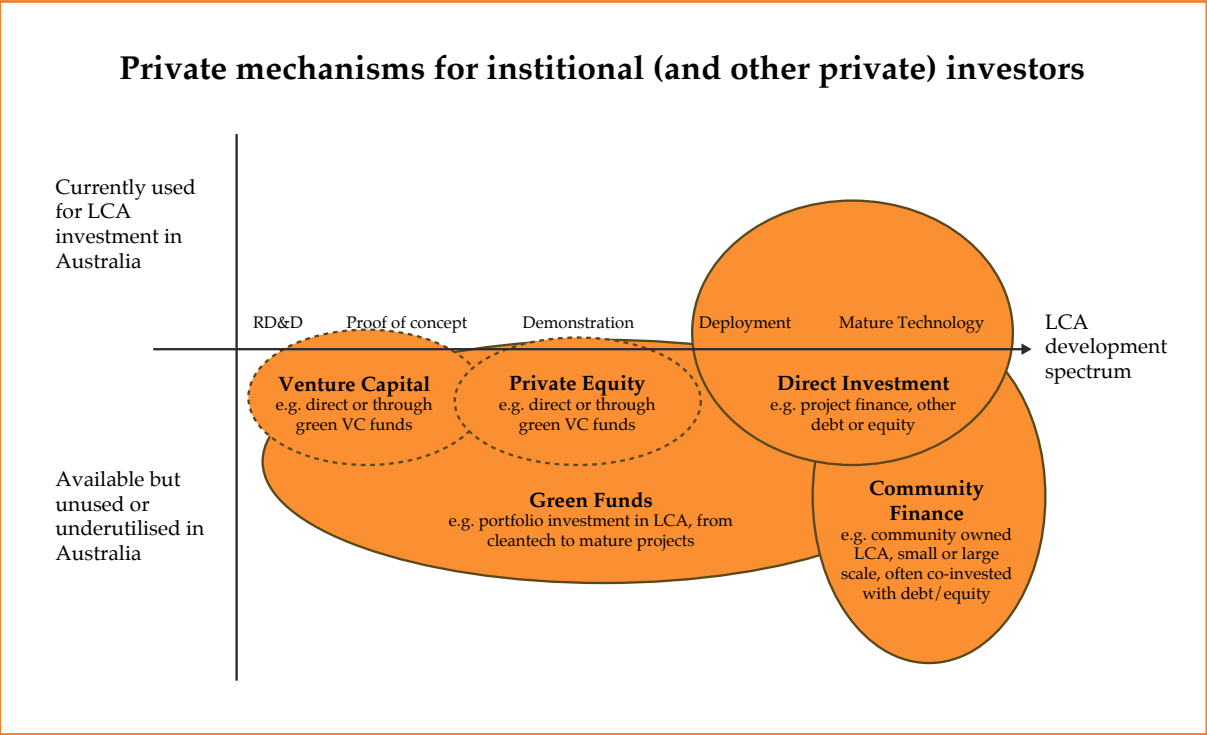
- Achieving the cuts in greenhouse gas emissions to which Australian governments have made in-principle commitments will require the **rapid scaling up of investment in a range of “low carbon assets” (LCA) – clean energy, transport and water infrastructure, both centralised and distributed.**
- **Over the coming decade alone, the investment requirement for these assets in Australia if reduction targets are to be met is likely to exceed \$100 billion.** Although this would represent a step-change in investment directed to the LCA sector, **set against proposed public/private investments in other sectors such as telecommunications and defence, it is both achievable and affordable.**
- However neither the policy settings pursued by current governments nor a business as usual approach from the investment community will drive investment on anything like this scale.
- Informed by emerging and innovative approaches overseas, **this report highlights a range of practical and immediate measures that can be taken to stimulate the investment necessary to rapidly transition to a clean energy economy.** It outlines how a coordinated and collaborative effort by governments and the finance community can address a range of existing investment barriers and market failures.
- These barriers are diverse and differ from investor to investor and from project to project. They range from wholly inadequate and volatile policy and regulatory settings, the peculiarities of some LCA assets themselves to a lack of initiative and leadership from sections of the finance community.
- **We recommend that Australian governments, both state and federal, implement a range of targeted policy and regulatory measures aimed at leveraging private capital into LCA.** These direct and indirect financing approaches go beyond the critical, but alone inadequate, step of pricing carbon emissions to encompass solutions to specific financing barriers arising along the LCA technology and investment spectrum. **Many of these solutions have already been adopted by governments in the course of financing other infrastructure assets. We see no reason in principle why they cannot be adopted to drive the level of investment necessary to avoid the worst impacts of climate change.**

Our key findings for the public and private sectors are contained in the following charts.

### Government mechanisms to leverage investment into LCA



### Private mechanisms for institutional (and other private) investors



■ **Our recommendations include:**

- **Establishing a Clean Energy Finance Corporation** armed with the Federal Government's AAA credit rating and a broad and flexible range of financing tools including credit enhancement products, funds for debt and equity co-investment on a concessional basis and tax concessions and credits;
  - **Themed climate bond issues to raise capital for public and public/private LCA investment** and address unmet retail and institutional demand for sustainable investment options;
  - **Participating directly in LCA projects** where needed to make them bankable, **including the use of off-take agreements for renewable energy projects; and**
  - **A range of targeted tax measures** including concessions aimed at scaling up risk capital investment in Australian clean technology (cleantech) and permitting mature phase technologies to access the same level of allowances that are currently available to carbon-intensive investments.
- Alongside public policy and financing measures, **the finance community must play a far more proactive and prominent role in allocating capital to the growing LCA sector.** Achieving this will require a much greater degree of collaboration and cooperation with governments and proponents (from large developers to small community financed projects) and a willingness to adopt innovative approaches emerging internationally.
- Examples such as the willingness of large institutional investors in California and Europe to create funds with explicit LCA mandates and/or to team up with sources of risk capital to fund cleantech development offer insights into opportunities that should be available to fund the Australian transition to a low carbon economy.
- To facilitate the roll-out of decentralised and distributed LCA, governments and the finance community need to be willing to support innovative community financing and ownership structures emerging both internationally and domestically.
- In conclusion, this report makes it clear **that there is a broad suite of policy and financing opportunities available to governments and investors. These are underutilised in Australia and greater pursuit of these opportunities can deliver investment on the scale required and within the timeframes available. We encourage governments and the finance community to recognise the urgency and scale of the investment requirement and to collaborate to realise these opportunities.**



# 1. INTRODUCTION

Globally, governments are acknowledging the need for deep reductions in greenhouse gas emissions to avoid the worst impacts of climate change. Domestically, a path appears set towards the introduction of a price on carbon with both major Australian political parties having committed to 5 per cent emissions reductions by 2020, and the Australian Labor Party committing to a 60 per cent reduction by 2050.

## The scale of investment required:

Meeting these emissions reductions targets will require the transformation of our economy. From power generation and energy efficiency measures to transport infrastructure, massive investment in existing and nascent technologies will be necessary.

The International Energy Agency (IEA) estimates that stabilising the atmospheric concentration of carbon dioxide equivalent (CO<sub>2</sub>-e) at 450 ppm requires incremental investment of ~US\$10 trillion over the period 2010 – 2030 in the energy sector alone.<sup>1</sup> At only 0.1 per cent of the total value of world financial assets and ~0.23 per cent of the total value of debt and equity securities, this level of investment is achievable, would generate substantial monetised and non-monetised returns and is much lower than the cost of inaction (as clearly outlined in many studies including the UK's Stern Review and Australia's Garnaut Reports).<sup>2</sup>

However, existing investment levels are well below the levels necessary. Investment in Australian clean energy was recently estimated at \$975 million in 2009, only 0.8% of the global total of \$122 billion.<sup>3</sup>

In Australia, the scale of investment required across all types of infrastructure in order to meet specific emissions reduction targets has not been systematically quantified. Given the lack of specific medium to long term carbon budgets, this remains a difficult task and is beyond the scope of this report. Nevertheless, a number of estimates applicable to relevant sectors are indicative of the scale of the investment requirement:

- The level of investment in renewable energy generation required by 2020 under the expanded Renewable Energy Target is estimated at \$20 billion, which alone will not be sufficient to deliver even 5% emissions reductions by 2020.<sup>4</sup>
- Under business as usual, the capital required by the energy sector over the next five years alone is \$94.1 billion, of which \$51.2 billion is capital expenditure on new and existing generation and network assets.<sup>5</sup>
- A recent study by the University of Melbourne and Beyond Zero Emissions modelling the cost of achieving 100% renewable energy in Australia by 2020 estimated an annual capital investment requirement of \$37 billion.<sup>6</sup>
- Estimates by ClimateWorks for investment in energy efficiency show 25% emissions reductions are achievable by 2020 at a net social cost of \$1.8 billion per annum, or around \$14 billion discounted to today's dollars.<sup>7</sup>

1 IEA *World Energy Outlook 2009* <http://www.iea.org/>

2 2009 values. IIGCC (2010) op cit. p.3 based upon analysis by the McKinsey Global Institute, *Global Capital Markets: Entering a new era*, September 2009, <http://www.mckinsey.com>

3 Bloomberg New Energy Finance (2010), *Renewable Energy Investment Opportunities and Abatement in Australia*, commissioned by The Climate Institute and Westpac.

4 Bloomberg New Energy Finance (2010) op cit. found that the RET alone would fall short of the -5% target by 170MtCO<sub>2</sub>e

5 Energy Supply Association of Australia, *Capital Markets Survey 2010*, 19 July 2010, accessed at [www.esaa.com.au](http://www.esaa.com.au)

6 Beyond Zero Emissions (2010), *Zero Carbon Australia Stationary Energy Plan*

7 ClimateWorks Australia (2010), *Low Carbon Growth Plan for Australia*



- In terms of transport infrastructure, ACF has estimated that an investment of \$6 billion per annum could deliver Australian cities a world class public and active transport system within 10 years.
- And finally, as an indication of the levels of water infrastructure required, currently state governments are investing an estimated \$10 billion in desalination projects alone.<sup>8</sup>

Without a comprehensive costing of an adequate economy wide response to climate change, the above examples demonstrate that **a targeted investment in LCA (both private and public funds, new and reallocated capital) of >\$100 billion is likely to be the minimum required in Australia over the coming decade.** This is clearly a step-change relative to current allocations to LCA. However, it is achievable and affordable. This is highlighted when set against planned public investments in, for example, a national broadband network, defence spending projections and water desalination projects.<sup>9</sup>

## Barriers to investment

Investment in these sectors to date, however, has suffered from a range of barriers – from wholly inadequate and volatile policy and regulatory settings to peculiarities associated with some of the required assets themselves and the general lack of initiative and leadership from the finance community. Despite these barriers and the urgency and scale of the financing requirement, **precisely how the investment requirement will be met has not been systematically explored in Australia.**

While the financing challenge is at the extremes of the capacity of governments or the private sector acting alone, how these sectors might work more effectively together to meet the challenge has also not been given the attention it deserves.

Recognising that funding the transition to a clean energy economy involves a complex set of investment and policy challenges with no single “silver bullet” solution, there are a number of measures governments can take to stimulate more rapid flow of capital into a range of infrastructure that we refer to generically as “low carbon assets” (LCA).

Some of these reflect innovative financing approaches and solutions emerging internationally while others have their origins in approaches that have already been successfully implemented in other contexts in Australia. **Indeed, examples outlined in this report highlight just how innovative and collaborative Australian governments and the private sector can be when called upon to finance programs and projects considered a high strategic priority.**

<sup>8</sup> The Australian, “Water charges are set to spiral in desalination squeeze”, 23 January 2010

<sup>9</sup> The ALP’s proposed National Broadband Network has been valued at \$43 billion; the Defence White Paper of May 2009 proposes a \$100 billion investment over two decades; and State governments currently have \$10 billion of desalination projects proposed or under development.

There is an urgent need to apply this innovative and collaborative approach to funding the transition to a clean energy economy.

**At the outset it is important to highlight that a price on carbon is a necessary and critical pre-condition to scaling up investment in LCA** (discussed further in section 3.3.2). However, this policy measure alone will not overcome the various market barriers addressed in this report nor create sufficient investment certainty in the near term. It will also fall well short of driving investment on the scale and with the urgency required.<sup>10</sup>

With this issue in mind, this report covers two major areas:

- firstly, it outlines recent approaches to financing LCA – both international and domestic, public and private - that could be applied and/or further scaled up in Australia; and
- secondly, it sets out a range of policy measures that Australian governments could use to leverage private investment into LCA.

While the report focuses on how governments and the private sector can work together to leverage private capital, we note that separately governments can play a central role in funding the transition by investing on their own in LCA and owning them as public assets outright. Indeed, a significant portion of the stock of existing infrastructure critical for enabling a low emissions future is already in public hands. Energy and transportation infrastructure are notable examples.

It is beyond the scope of this report to consider questions of the relative merits of public versus private versus hybrid ownership of particular assets. Rather, informed by the scale of the investment requirement, existing public sector finance constraints and the assumption that there is unlikely to be a departure from the current approach that sees a major role for private capital in the development of new technologies and large-scale infrastructure projects, it aims to highlight how these sectors can better work together to facilitate low emissions outcomes.

It should be noted that even with the right policy mechanisms in place, there remains significant constraints not addressed in this report regarding the ability of institutional investors (notably superannuation funds) to scale up their allocations of capital to LCA. Institutional investor portfolios are currently set with very limited allocations to infrastructure (0-10% for most superannuation funds), of which the majority is allocated to brownfields assets (e.g. roads, airports, fossil fuel-based electricity). This leaves the only potential source of available capital for LCA investment as the very limited private equity allocations. To free up new sources of capital to scale up investment in LCA, a more fundamental assessment of the way in which institutional investor portfolios are constructed is required.

In canvassing these issues, our primary audience is intended to be policy makers and significant sources of private capital (notably, institutional investors). However the report also covers ground of relevance and interest to investors, project proponents and technology developers in the LCA sector.

<sup>10</sup> For further discussion see Chatham House, *Unlocking Finance for Clean Energy: the Need for Investment Grade Policy*, December 2009

## 2. CONTEXT: LOW CARBON ASSETS AND INVESTORS

### 2.1 Low Carbon Assets (LCA)

An Australia that in 2050 emits 60 per cent less greenhouse gas emissions would be markedly different to the Australia that exists in 2010. Alongside measures to reduce demand for emissions intensive goods and services, large sections of the stock of public and private infrastructure will need to be replaced or modified. Over and above the human capital that the response will require, resources will need to be allocated to the technology, physical plant and equipment and infrastructure that will deliver the necessary emissions reduction outcomes.

It is stimulating investment in these tangible low carbon assets and “joining the dots” between investors and these assets that is the principal concern of this report.

The solution will involve a broad range of existing and as yet undeveloped technologies across industry sectors and therefore any attempt to comprehensively catalogue this inventory would be misplaced. Suffice to note that when we refer to LCA we use the term in a general sense to refer to technologies, physical plant and equipment, infrastructure or processes that:

- facilitate the **supply** of goods or services with materially less emissions intensity than existing approaches; or
- materially reduce the **demand** for emissions intensive goods or services.<sup>11</sup>

Some examples include:

- utility scale renewable energy – for example: wind, solar photovoltaic (PV), solar thermal, geothermal, ocean/ tidal, biomass;
- distributed small scale renewable energy generation – for example: residential solar PV, solar hot water systems, co-generation, tri-generation, wind;
- energy efficiency measures – particularly in the built environment, commercial, industrial and residential property;
- electricity grid build out and management – extension and improved management of grid systems (transmission networks) to integrate Australia’s renewable energy resources, facilitate distributed energy generation and better manage supply and demand;
- transport infrastructure – public transport/ mass transit systems and other low carbon transport infrastructure; and
- water efficiency technologies.

### 2.2 Sponsors, Developers and Operators

The sponsors, developers and operators of these assets will likely continue to represent a highly diverse group reflective of existing cross-sectoral participation across the LCA technology spectrum.

Participants will range in size from integrated energy companies and governments at all levels to infrastructure specialists and small clean technology developers.

<sup>11</sup> This report does not express a view on the relative merits of different technologies or particular projects.

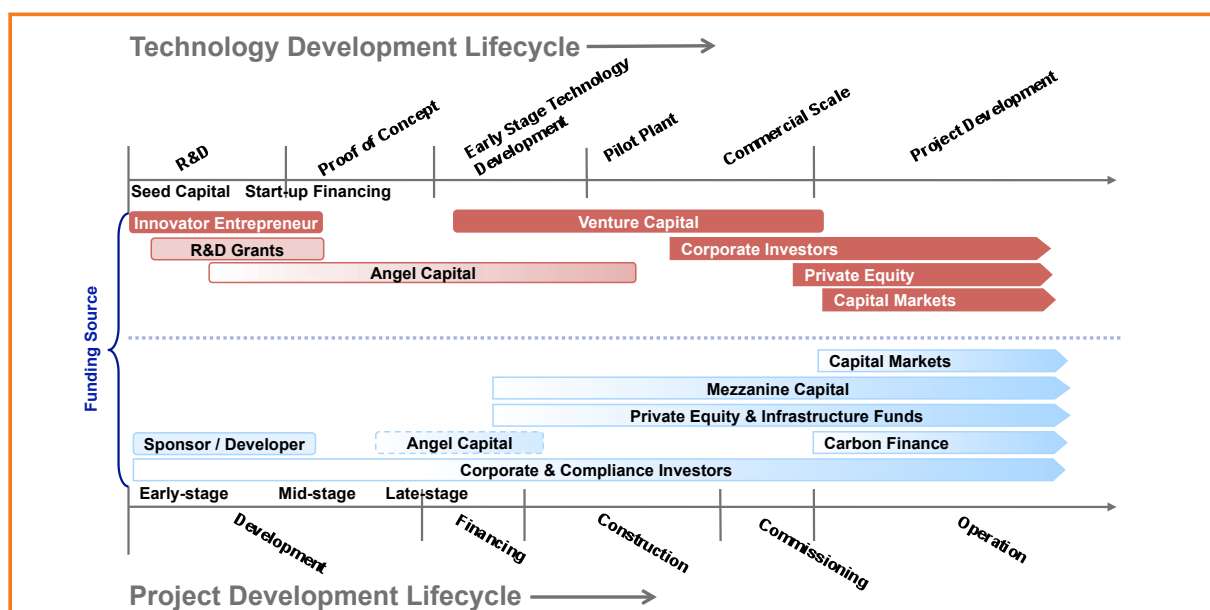
## 2.3 Investors and the Investment Spectrum

Reflecting the spectrum of LCA technologies, the sources of capital for them are as many and varied as the finance sector itself.

BOX 1 SOURCES OF FINANCE	
Type	Example
<b>Institutional Funds</b>	Regulated superannuation and insurance funds and other general managed or "infrastructure" funds
<b>Corporate Direct Investment</b>	Integrated energy company investment in energy generation capacity
<b>Bank Debt</b>	Ranging from basic debt facilities to structured and project finance
<b>Private equity</b>	Medium to large privately held equity investors
<b>Venture, risk and philanthropic capital</b>	Small to medium sized venture, high net worth and 'angel capital' investors. Philanthropic grants.
<b>Retail investors</b>	Households investing directly in listed equity or debt securities (for example: ASX companies and exchange traded bonds)
<b>Community investors</b>	Household and community finance organisation equity investment or debt facilities to local community assets and projects (including co-operative ownership)
<b>Governments</b>	Federal, State and Local Government investments and grants

Clearly different sources of capital are appropriate at different phases of the LCA spectrum. Technology at pre-commercialisation or early R&D phase will struggle to attract both debt and equity finance and may be solely reliant upon grant funding, philanthropy and/or family and friends. On the other hand, project-scale deployment of proven technologies may require (and be able to tap) the resources and depth of large financial institutions and global capital markets. Box 2 contains a diagrammatic representation of funding sources typically available over the technology and project development life cycle.<sup>12</sup>

### BOX 2 TECHNOLOGY AND PROJECT LIFE CYCLE



12 Source: Asian Development Bank (2007) *Investing in Clean Energy and Low Carbon Alternatives in Asia* p.50 and Aequero *Barriers in Clean Energy Projects* (2008) Presentation to ABAC Environmental Finance Symposium, available at <http://www.aequero.com/>

# 3. PUBLIC SECTOR FINANCE: THE KEY ROLE FOR GOVERNMENTS

*“It will be some time – possibly decades – before carbon credits alone provide an economic rationale for the large-scale roll-out of renewable energy, for the deployment of the key enabling technologies for such large-scale roll-out, or for commercial carbon capture and sequestration projects. If these goals are to be achieved, a broader range of policy tools is required.”<sup>13</sup>*

## 3.1 Overview – barriers and market failures

Some may argue that funding the transition to a low emissions economy should be left to the private sector alone. Certainly, the scale of investment required is well above the level that Australian governments have demonstrated an appetite for. However, in the face of a range of significant barriers and market failures, private capital can not rise to the challenge without significant and targeted interventions by governments.

The experience globally is that the barriers are diverse and differ across both the LCA and investor spectrum. In this, Australia is no exception - a large integrated energy company contemplating a utility-scale solar facility faces fundamentally different financing hurdles and constraints to a medium sized cleantech company needing capital to progress new technology to commercialisation phase or a rural community considering a 5 MW wind farm to meet local energy needs.

In the UK, the Green Investment Bank Commission recently summarised key barriers to that country achieving its emissions reductions targets as:

- market investment capacity limits and limited utility balance sheet capacity;
- political and regulatory risks stemming from the fact that government policy determines expected returns and the history of policy changes;
- confidence gaps among investors given technology risks, lack of transparency in government policy and high capital requirements for commercialisation; and
- the challenge of making large numbers of small, low carbon investments attractive to institutional investors (the aggregation challenge).<sup>14</sup>

Although arguably Australia has weathered the Global Financial Crisis better than many of its OECD peers, each of these barriers are directly relevant in Australia.

As we highlight below, investment in Australian LCA has suffered markedly from the absence of flagship regulatory measures including pollution regulation. At the same time, the global contraction in debt markets and the reluctance of institutional investors to move away from investing in traditional infrastructure such as roads, emissions intensive energy generation and airports has also constrained the flow of capital to LCA.

At early stages of the LCA technology spectrum, Australia suffers from a dearth of the risk capital (such as venture capital) that is so critical to supporting new technologies through to proving and commercialisation.<sup>15</sup> We have witnessed as a result the well documented exodus of Australian originated LCA technology to other countries for funding and development.

<sup>13</sup> World Economic Forum (2009), *Green Investing: Towards a Clean Energy Infrastructure*

<sup>14</sup> Green Investment Bank Commission (2010), *Unlocking Investment to Deliver Britain's Low Carbon Future*.

<sup>15</sup> Ernst & Young (2010) *Navigating the valley of death: Exploring mechanisms to finance emerging clean technologies in Australia*, Report prepared for the Clean Energy Council at <http://www.cleanenergycouncil.org.au>

Other barriers are posed by the nature and type of LCAs themselves. Frequently they are capital intensive, long lived, interconnected with other assets and therefore require a high degree of planning and pose inter-project dependency risks.<sup>16</sup> However, this does not imply that the solution lies solely with large scale assets. Indeed numerous but small to medium sized and highly dispersed LCAs (such as decentralised renewable energy generators and retrofitted energy efficiency) will play a key role on both the supply and demand side in cutting emissions. These assets pose an aggregation challenge – how can they be aggregated and packaged in a way that would unlock investment on the scale that is needed? Still further barriers are posed by risks associated with the relatively rapid pace of technological change in the LCA sector and the lack of investor confidence this can create.<sup>17</sup>

In this section of the report we outline a number of immediate and practical steps Australian governments can take to address these barriers and market failures.

Chiefly for convenience's sake, we have divided this section into two parts: Direct Public Finance Mechanisms and Indirect Public Financing Mechanisms. By direct financing mechanisms we refer to mechanisms by which, through the direct provision of grant or investment funding (whether debt or equity or both) governments can leverage private sector investment or raise funds for public and public/private investment in LCA. By indirect financing mechanisms we refer to a broad range of government policies, schemes and initiatives other than the direct provision of grant or investment funding that can help bridge the gap between what investors are willing to finance and the investment requirement for the given asset.

## 3.2 Public Sector “Direct” Financing Mechanisms

*“The great technological revolutions of the past did not occur via regulatory fiat. The US did not invent the Internet or the personal computer by taxing or regulating typewriters. Nor did the transition to the petroleum economy occur because we taxed, regulated or ran out of whale oil. Those revolutions happened because we invested in alternatives that were vastly superior to what they replaced, and, in remarkably short order, a good deal cheaper. The transition to a clean energy economy will be no different and, like previous technological revolutions, will require substantial public investment to occur quickly and completely.”<sup>18</sup>*

### 3.2.1 Grants

To date, grant funding has been a key vehicle for direct government financing of the clean energy sector in Australia. Grants have been administered across a number of different government departments - State and Federal - and generally involve a tendering and selection process.

Grant funding has been directed chiefly at R&D and early demonstration stage technologies however larger utility scale clean energy projects have recently attracted more significant support.

Grant funding is often critical for the support of technology development at the pre-commercialisation phase, when little or no capital is available from the private sector. However, an inevitable result of the assessment and award process is that they require governments to pick winners from among funding applicants. Moreover, without any possibility to recoup and recycle the capital, they represent a once and for all outlay of public funds. Herein arguably lies grant funding's key limitation. Unless it is accompanied by a range of additional policy measures and significant and longer-term budgetary allocations, it can make only a marginal contribution to investment on the scale required.

Nonetheless, there is likely to be a continuing case for grant funding support for nascent technologies and projects for which other forms of support are not suitable.

16 Aequero Barriers in Clean Energy Projects (2008) Presentation to ABAC Environmental Finance Symposium, available at <http://www.aequero.com/>

17 See Waite A., (2009) *Second-mover advantage*, presentation given to Clean Energy Council Investment Forum available at <http://www.cleanenergycouncil.org.au>

18 Shellenberger, M, Nordaus, T, Navin, J, Norris, T, & Van Noppen, A, *Fast, Clean & Cheap: Cutting Global Warming's Gordian Knot*, Harvard Law and Policy Review Vol.2, 2008

## BOX 3 RECENT CLEAN ENERGY GRANT PROGRAMS: AUSTRALIA

- **Low Emissions Technology Demonstration Fund (2006)** – the LETDF was a single round of funding that invested \$240 million in five low emissions projects aimed at helping Australian firms commercialise world leading low emissions technologies. Of the five projects, four were “clean coal”, with one solar project. Funding is closed with no plans for further funding.
- **Renewable Energy Demonstration Program (2009)** – provided grants totalling \$435 million to commercial scale renewable energy projects.
- **Geothermal Drilling Program (2009)** – a \$50 million program of grants to support proof of concept stage geothermal developments. The money supported seven projects.
- **Solar Flagships (2010)** - \$1.5 billion in grants to support four commercial scale grid connected solar power stations using solar thermal and solar photovoltaic (PV).
- **Solar Homes and Communities Plan (2007-10)** - \$700 million committed to financially support the installation of residential solar PV systems across Australia. The program has resulted in over 100,000 solar PV systems installed.
- **Renewable Remote Power Generation Program (2001-09)** - \$300 million was committed to this program in 2009 to install small and medium scale renewable energy generation in remote and regional Australia, targeting areas not grid connected. Program resulted in over 9000 installations.
- **Victorian Government Renewable Energy Support Fund (2006-)** – provided \$8.45 million in grants to support innovative application of medium scale proven renewable technologies in Victoria.
- **Victorian Government Energy Technology Innovation Strategy (2008)** – two rounds of funding over the last 5 years have delivered approximately \$360million to demonstration projects to advance low emissions technologies towards a commercialisation phase.

### 3.2.2 Co-investment

Co-investment can take many forms. In short it involves a commitment by government to invest directly in LCA projects or funds in combination with one or more additional private financiers.

A co-investment approach can be applied across the LCA technology and investment spectrum (from seed funding of early stage technology to co-investing in large LCA infrastructure funds or projects) to bridge financing gaps and leverage private capital. Numerous co-investment approaches can be adopted depending upon the LCA financing requirements, the co-investors involved and the government’s desired risk profile.

Indeed one of the key attractions of co-investment is the sheer scale of its flexibility. For example, funds can be provided on a debt or equity basis or both and in each case, the government’s risk profile can be tailored to reflect both the nature of the financing gap and any parameters set for the government’s participation in co-investment programs.

Other advantages include the fact that investment funds can be recouped and recycled. Moreover, by only co-investing in funds or projects that have also attracted private capital, the government can partly mitigate due diligence risks and transaction costs that might be higher where grant funding or sole government investment is the primary source of capital.

Examples of co-investment approaches to bridging the financing gap include:

- **capped return:** returns of income and/or capital to the government are capped, allowing other co-investors access to higher up-side on their investment;
- **first loss position:** the government's investment is first loss in the sense that it ranks behind other investors upon insolvency or winding-up;
- **non-carried interest:** in the case of government co-investment in an LCA fund, the government's interest is not entitled to profit over and above return of capital and/or a pre-agreed rate of return; and
- **mezzanine or subordinated debt:** government lending to LCA projects on a basis that is subordinated to senior lenders.

As Box 4 highlights, internationally, public/private co-investment is increasingly being utilised in an LCA context.

BOX 4 RECENT PUBLIC CO-INVESTMENT IN LCA FUNDS – INTERNATIONAL				
Fund/Project Name	Size	Owner/ Manager	Sources of Funding	Further detail
UK Innovation Investment Fund (UK)	£325 mn	Hermes Private Equity/ European Investment Fund	UK Government and private financiers	Government to co-invest in two Fund of Funds covering low carbon/ clean tech, and digital, ICT, life sciences and advanced manufacturing
Green Wave – CalPERS <sup>19</sup> (USA)	US\$1bn (approx)	California Public Employees Retirement System (CalPERS)	CalPERS seed funding attracted large scale co-investment by private sources	Started as an allocation by CalPERS of \$200m to clean energy and cleantech funds having since catalysed ~\$4b in cleantech venture investments
Solar Europe Industry Initiative <sup>20</sup> (EU)	€1.2 bn	EU Solar Industry Associations	60% Private/40% EU member states over 3 years	A strategy to enhance the generation of solar power in Europe to 5% of total output by 2020, including co-investment in R&D of solar technologies
Wind Power Development Project (Egypt) <sup>21</sup>	US\$796mn	Government of Egypt	IBRD (World Bank), European Investment Bank, German and French Development funding, and private contractor under Build-Own-Operate contract	Project includes enhancement of electricity grid, technical assistance to support expansion of wind power, and 250MW wind farm in Gulf of Suez by a private sector operator under a Build-Own-Operate contract

Particularly interesting proposals for co-investment approaches to LCAs have recently emerged from inter-governmental and finance sector organisations and forums. These include the Finance Initiative of the United Nations Environment Program, the multilateral development banks and the Institutional Investor Group on Climate Change (IIGCC).

While some of these proposals have a developing country context, others are clearly capable of application in OECD countries. For example, there are no barriers in-principle to why an Australian government could not participate in seeding a large LCA infrastructure fund as a subordinated investor alongside superannuation and/or other large institutional funds.<sup>22</sup>

<sup>19</sup> Various sources including [http://www.treasurer.ca.gov/greenwave/green\\_facts.pdf](http://www.treasurer.ca.gov/greenwave/green_facts.pdf)

<sup>20</sup> European Photovoltaic Industry Association, [www.epia.org](http://www.epia.org)

<sup>21</sup> See World Bank projects page, <http://web.worldbank.org/external/projects/main?Projectid=P113416&theSitePK=40941&piPK=64290415&pagePK=64283627&menuPK=64282134&Type=Overview#>

<sup>22</sup> United Nations Environment Programme and Partners (2009) Catalysing low-carbon growth in developing economies available at <http://www.unepfi.org/>



Other proposals including cornerstone and challenge fund models involve packages of concessional public finance and/or publicly provided credit enhancement mechanisms being made available to institutional and other investors to overcome risk and other barriers.<sup>23</sup> For example, a syndicate of fund managers and/or project proponents could bid for packages of government concessional finance and/or guarantee and/or insurance products that would reduce investment risk to a magnitude that is acceptable for superannuation and other institutional investors.

Despite these innovative developments internationally and although co-financing has been used in other contexts in Australia,<sup>24</sup> it is under-explored as a mechanism for leveraging private capital into LCA in Australia. In section 3.3.4 below we have recommended the establishment of a Clean Energy Finance Corporation (CEFC) armed with a broad and versatile set of financing tools to leverage private capital into LCA. These tools would include the ability to pursue a broad range of co-financing strategies and to administer packages of support along the lines discussed above.

### 3.2.3 Climate Bonds: Financing Public LCA Investment

*“[Climate Bonds offer] investors the opportunity to participate in the financing of ‘green’ projects that help mitigate climate change and help countries adapt to the effects of climate change.”<sup>25</sup>*

As noted in the introduction, governments have played, and will continue to play, a critical role in financing and owning infrastructure that is essential to meet emissions reduction targets. The Australian government raises billions of dollars annually to fund public sector spending from a variety of sources, an important one of which is the market for sovereign bonds.

Globally, governments have a long history of tapping the bond market to raise funds for projects of national significance – whether that be public infrastructure such as sewerage systems, exploration voyages in search of ‘new lands’ or to finance war efforts. Being government-backed and generally lower risk, bonds have historically been attractive to both institutional and retail investors.

In recent years climate (or green) themed bond issues have been increasingly utilised by governments, inter-governmental organisations and multilateral development banks to tap the increasing demand for sustainable investment options. Moreover, international networks such as the Climate Bonds Initiative have undertaken significant work highlighting the utility of climate themed bond issues and financing structures.<sup>26</sup>

BOX 5 RECENT CLIMATE BOND ISSUANCES – INTERNATIONAL				
Bond Name	Size	Owner/ Manager	Sources of Funding	Further detail
Environmental Support Bond (Finland)	150m (in South African Rand and NZ Dollar)	Nordic Investment Bank, managed by Nomura Securities	Japanese retail customers	To finance climate change, energy efficiency and renewable energy lending
World Bank Green Bonds	>US\$1.5bn	IBRD <sup>27</sup> with various private managers (designed by Scandinavian bank SEB <sup>28</sup> )	Primarily pension funds	Projects that address climate change mitigation or adaptation and promote low carbon development
Climate Awareness Bond (Scandinavia and Japan)	Swedish Krona 2.25 bill (1 <sup>st</sup> issue) AU\$ and South African Rand (2 <sup>nd</sup> issue)	European Investment Bank (2 <sup>nd</sup> issue with Daiwa)	Scandinavian investors (1 <sup>st</sup> issue) Japanese institutional and retail investors (2 <sup>nd</sup> issue)	Proceeds to finance projects in renewable energy and energy efficiency
PACE Bonds (US)	Undefined	US Municipalities	Standard bond investors, institutional investors	Residential energy efficiency retrofits (see Box 6)

23 Institutional Investors Group on Climate Change (2009) Non-Carbon Market Financing Mechanisms for Climate Adaptation and Mitigation in Developing Countries: Statement by the Institutional Investors Group on Climate Change, available at <http://www.iigcc.org>

24 For example Screen Australia’s debt and equity co-investment program.

25 The EuroMoney Environmental Finance Handbook 2010, *Green Bonds: a model to mobilise private capital to fund climate change mitigation and adaptation projects*, accessed at <http://treasury.worldbank.org/cmd/htm/WorldBankGreenBonds.html>

26 <http://climatebonds.net/>.

27 International Bank for Reconstruction and Development

28 Skandinaviska Enskilda Banken

## BOX 6: CASE STUDY – CLIMATE BONDS FOR LOCAL GOVERNMENT PROPERTY ASSESSED CLEAN ENERGY (PACE) BONDS

### Background

Property Assessed Clean Energy (PACE) Bonds are a US local government finance initiative to fund residential energy efficiency retrofits. These local government issued bonds provide property owners with low-interest finance for energy efficiency and renewable energy improvements.

Property owners opt in to receive long term financing (up to 20 years) for these improvements, which is repaid through additions to their property rates. This arrangement spreads the cost of the retrofit over the expected life of the investment, minimises the upfront cost (a major impediment to retrofitting residential and commercial properties) and allows for the repayment obligation to automatically transfer to the next property owner if the property is sold.

Household loan repayments are set lower than the energy cost savings resulting from the retrofit investment thereby mitigating the cash flow impact upon households.

In the US model, the repayment liability rests with the property owner. Partly as a result of lower energy bills the loans have experienced a very low default rate as the loans are paid with resident cash flows through lower energy bills. Risk to municipalities is further mitigated because the PACE loan liens are treated as senior security over the property.

Currently in the US, over 20 states have initiated legislation to enable PACE bonds. A similar model is to be tested in the UK under the name of 'Pay As You Save' (PAYS).

### PACE Bonds in Australia?

To take advantage of increasing demand for improved energy efficiency and renewable energy installations, the use of innovative financing mechanisms in a local government context is worthy of further exploration in Australia.

However, there are difficulties in applying the PACE model directly in Australia given local councils do not have the ability to issue bonds (as US municipalities do). In most states, local governments are required to seek approval from the relevant state government Minister prior to undertaking any borrowing. Often, borrowing occurs via the state government Treasury Corporation. Despite these limitations, it might be possible for:

- Local governments to borrow through state governments to fund a residential energy efficiency retrofit program, potentially using a state government climate-themed bond issuance on behalf of local councils; or
- Local councils to work directly with banks to raise debt through a secured loan (subject to Ministerial approval).

Repayments of such borrowings could be applied as a rates surcharge, that stays tied to the property even where ownership changes. As tax liabilities are prioritised, the risk of default is reduced which may in turn reduce the cost of borrowing.

The second option is currently being implemented by the Melbourne City Council, with amendments proposed to the City of Melbourne Act 2001 to introduce low cost financing to support green retrofits for the Council's 1200 Buildings Project (The project aims to retrofit 1200 commercial city buildings over 10 years). These amendments to the Act allow for low cost loans for green building retrofits under an *environmental upgrade agreement*. The Council then recoups the cost of the investment and repays the loan through an additional levy on the building rates.

**\*Sources:** PACE Bonds, [www.pacenow.org](http://www.pacenow.org) ; 1200 Buildings, [www.melbourne.vic.gov.au/1200buildings](http://www.melbourne.vic.gov.au/1200buildings) ; UK Department of Energy and Climate Change, Warm Homes, Greener Homes: A strategy for household energy management ; and Productivity Commission (2008), Assessing Local Government Revenue Raising Capacity Research Report

In Australia, governments and their agencies at Federal and State levels are familiar and comfortable with bond issues. Treasury bond issuances for 2010-2011 are expected to total around \$56 billion with weekly bond issuances recently running at \$500 million to \$1.2 billion.<sup>29</sup>

Themed government bonds have recently been proposed by both sides of Federal politics. One proposal was as a financing option for the National Broadband Network, to issue Aussie Infrastructure Bonds aimed at retail and institutional investors. Another more recent proposal by the Coalition was to set up an Infrastructure Partnership Bonds Scheme as a “new form of infrastructure financing product that will attract household savings through generous tax arrangements to lower the costs of financing infrastructure”.<sup>30</sup>

There is no reason why the Australian government could not undertake specific bond programs targeted at institutional and retail investors with the explicit theme of financing the transition to a low emissions future. These Climate Bond programs could be tied directly to financing some of the initiatives this report has recommended and would help satisfy increasing and unmet demand for quality domestic sustainable investment options.

## 3.3 Public Sector “Indirect” Financing Mechanisms

### 3.3.1 Introduction

In addition to directly funding LCA, governments can play a key role in catalysing private sector investment through a broad range of indirect mechanisms and policy settings. There are numerous measures, from pollution regulation to tax incentives that governments can deploy to steer investment towards LCA. Policy settings and mechanisms can achieve this through measures that either make LCA relatively more attractive or make alternative carbon-intensive assets relatively less attractive.

This section examines some key policy measures and settings governments can adopt with these aims in mind.

#### BOX 7 CHATHAM HOUSE – INVESTMENT GRADE POLICY

According to the UK’s Chatham House, “investment grade” regulatory and policy settings are critical requirements for moving capital into clean energy in order to meet government emissions reductions targets. “Investment grade” policy and regulatory settings require:

- Clear, unambiguous policy objectives, with clear enforcement provisions;
- Policy and regulation streamlined across all factors within the boundary of the deal: from planning approval to delivery;
- Carefully designed incentive or support mechanisms to achieve set objectives;
- Policy stability across a project-relevant duration;
- Simplicity, to reduce complexity and variables that might add risk;
- Near-term attention to infrastructure: the planning, integration and regulatory requirements, to ensure the overall system is optimized for significant uptake of renewable energy, and demand-side options; and
- A clear, longer-term ‘story’ is required on the scale of ambition and the practical ability to deliver.”

\*Source: Chatham House (2009), *Unlocking Finance for Clean Energy: the Need for Investment Grade Policy*

<sup>29</sup> Australian Office of Financial Management, Issuance Program, updated May 2010, accessed at [www.aofm.gov.au](http://www.aofm.gov.au)

<sup>30</sup> The Honourable Senator Stephen Conroy, Minister for Broadband, Communications and the Digital Economy, Media Release, *New National Broadband Network*, 7 April 2009 and Joint Press Release by the Hon. Tony Abbott MHR Leader of the Opposition & Senator Barnaby Joyce, Regional Development, Infrastructure and Water, *Real Action on Infrastructure*, 17 August 2010.

### 3.3.2 A Carbon Price and Regulatory Certainty

*“The single most significant driver of private sector investment in renewable energy and other low-carbon technology is strong, stable, transparent and credible national policy.”<sup>31</sup>*

Although the barriers to accelerating investment in low carbon assets are many and varied and differ among investors, there are two fundamental policy settings that investors of all stripes and colours view as necessary (but not necessarily sufficient) prerequisites to scaling-up investment.

The first is a clear price signal through effective regulation of carbon pollution - whether implemented via an emissions trading scheme (ETS) or otherwise. The second is certainty on key regulatory and policy measures.

Alone, a price on carbon will not overcome the various specific market barriers addressed in this report nor create sufficient investment certainty in the near term. Thus, it will fall well short of driving investment on the scale and with the urgency required.

Unfortunately, to date, Australian governments have been unable to deliver investment grade policy. An effective carbon price remains as elusive as ever and key aspects of flagship policy measures, such as the Renewable Energy Target, have been subject to frequent change and prolonged periods of uncertainty.

The combination of the lack of both an overarching price signal and certainty on medium to longer term policy settings has had a significant impact on investment supply and demand across the spectrum – from large integrated energy companies considering deployment of utility-scale renewable generation capacity to cleantech focused risk investors.

In the words of AGL Energy CEO, Michael Fraser, “... stability and certainty are not the first words that come to mind in relation to investors viewing the Australian power generation sector...”<sup>32</sup> At the other end of the investment spectrum, a recent report by Ernst & Young on the cleantech sector in Australia concluded that “... the major challenge facing cleantechs over the next 12 to 18 months... is government policy not delivering certainty for investment decisions.”<sup>33</sup>

It is not the purpose of this report to discuss in detail approaches to carbon pollution regulation. Suffice to note that a strong price signal is urgently required and that governments at all levels must work harder to ensure that regulatory measures (including those proposed in this report) are better tailored to reflect specific investment barriers and are designed with the need for longer term certainty as a key objective.

<sup>31</sup> IIGCC (2009) *Non-Carbon Market Financing Mechanisms for Climate Change Mitigation and Adaptation in Developing Countries*

<sup>32</sup> Address to Clean Energy Council National Conference, 3 May 2010, *The Importance of Reforming the Renewable Energy Target*

<sup>33</sup> Ernst & Young (2010) *Navigating the valley of death: Exploring mechanisms to finance emerging clean technologies in Australia*, Report prepared for the Clean Energy Council at <http://www.cleanenergycouncil.org.au> pp.2, 17

## 3.3.3 Tax Measures

### Overview

One of the key advantages tax concessions have over other forms of public support for investment in low carbon assets is that (as a market based mechanism) they avoid difficult decisions that might otherwise arise for governments seeking to pick winners through direct financing (for example: grant funding and, to a lesser extent, co-financing).

While concessions must be subject to well-defined eligibility requirements, they can leave investment decisions to those best placed to make them. Moreover, being available to all qualifying taxpayers and generally being subject to less continuing conditions, tax concessions can be a more equitable and efficient mechanism than grants.

Despite in-principle rejection of environmental tax concessions by the recent Henry Review,<sup>34</sup> we believe the urgency and scale of the investment required warrants concessional tax measures. These measures must be targeted at, and tailored for, both:

- the different phases of the LCA investment spectrum – from risk capital through to secured debt; and
- the diverse tax profiles of investors in LCA – from loss making start-up ventures to established businesses with positive cash flow.

In this section of the report, we briefly outline tax measures that could play a significant role in stimulating LCA investment.

### Making pollution-intensive investments less attractive

Before discussing policy approaches to making LCA a more attractive investment proposition, it is worth highlighting the low-hanging fruit in terms of Australian tax policy's response to the climate challenge.

Over and above the investment incentives and disincentives created by an effective ETS, abolishing the numerous tax concessions that currently play a significant role in stimulating carbon intensive activities would play a significant role in transforming the Australian economy. Examples of some of these include:

- accelerated depreciation and capped effective life provisions that benefit extractive industries and other carbon intensive sectors;
- diesel fuel tax credits for road transportation and certain off-road activities including mining; and
- concessional fringe benefits tax arrangements for company cars.

The continuation of these measures clearly undermines competing regulatory measures intended to accelerate the transition to a low carbon economy.<sup>35</sup>

<sup>34</sup> *Review of Australia's Future Tax System* (2010), available at <http://taxreview.treasury.gov.au>

<sup>35</sup> For more detail see Australian Conservation Foundation (2008) Submission to the review of Australia's future tax system, available at <http://www.acfonline.org.au/> and Berger C. Towards an ecologically sound tax system, (2009:2) National Environmental Law Review National Environmental Law Association of Australia p.24

## Cleantech/R&D Phase

*“...the Federal Government should consider providing targeted tax support for the development of cleantech in order to stimulate private investment in cleantech businesses.”<sup>36</sup>*

At the cleantech/R&D phase of the investment spectrum, tax measures can be a particularly effective mechanism of support because they do not require government agencies to make difficult assessments of the relative merits of alternative unproven technologies. Moreover, tax policy can be targeted at the broad range of different entities that sponsor R&D. These range from start-up organisations lacking the balance sheet and/or proven technology necessary to obtain debt and other finance (and therefore reliant upon risk capital to take projects through to commercialisation) to established companies with reliable cash-flows.

Approaches to tax incentives must recognise the different tax profiles of different sponsors through a tailored approach. For example, tax loss measures such as enhanced deductions may only be valuable to investors if there is likely to be positive cash flow and hence a tax liability. For cleantech investors in vehicles with minimal revenues, other approaches such as capital gains tax relief or measures such as those adopted in the United States which allow taxpayers to elect to receive a cash payment in lieu of tax credits may be more appropriate.<sup>37</sup>

Although Australia has tax measures aimed at stimulating R&D and venture capital finance generally,<sup>38</sup> with minor exceptions,<sup>39</sup> these measures are limited in scope and there are currently no incentives specifically targeted at the cleantech sector. Recent reports prepared by Ernst & Young for the Clean Energy Council highlight how little support the Australian cleantech sector receives from risk capital and outline a number of tax measures that would help stimulate investment from this source<sup>40</sup> (see Box 8).

Recognising the difficulty that early stage developers of new technology face in raising capital, overseas governments have also adopted specific tax incentives aimed at stimulating risk capital. In the UK, the Enterprise Investment Scheme (EIS) has enabled financial intermediaries to offer tax concessional investment products to high net worth/sophisticated investors. This has enabled the intermediaries to aggregate risk capital for the purposes of direct equity investment in early stage cleantech ventures early stage cleantech ventures (see Box 9).

<sup>36</sup> Ernst & Young (2009) *Accelerating cleantech: Future tax measures to accelerate the delivery of clean technologies in Australia*, Report prepared for the Clean Energy Council, available at <http://www.cleanenergycouncil.org.au> and (2010) *Navigating the valley of death: Exploring mechanisms to finance emerging clean technologies in Australia* op cit. p.2

<sup>37</sup> With the aim of stimulating investment in renewable energy, measures implemented under The American Recovery and Reinvestment Act 2009 allow taxpayers with minimal taxable income to elect to receive cash payments in lieu of tax credits.

<sup>38</sup> Existing measures include the Early Stage Venture Capital Limited Partnership Scheme and the proposed new Research and Development Tax Credit Scheme – see Box 8

<sup>39</sup> A notable example is the recently introduced measures for geothermal energy exploration

<sup>40</sup> Ernst & Young (2009) Op cit.

## BOX 8 ACCELERATING CLEANTECH INVESTMENT IN AUSTRALIA ERNST & YOUNG RECOMMENDATIONS

A 2009 Report commissioned by the Clean Energy Council from Ernst & Young identified key tax measures that could stimulate investment in **cleantech equipment and businesses** including:

- **accelerated depreciation allowances** for eligible cleantech assets such as loading allowances and/or reduced or capped effective lives. Such measures might be particularly appropriate (eg. for the retro-fitting of existing building stock with energy efficiency plant);
- **deduction allowances for specific capital costs** where warranted. One example would be to extend provisions recently adopted for geothermal exploration costs to other prospecting type costs associated cleantech projects (e.g. wave energy);
- capital investment “**bonus**” **allowances** (similar to the 2009 Small Business and General Business Tax Break) targeted at specific cleantech assets;
- revisions to the proposed new **research & development tax credit scheme** to provide targeted support to the cleantech sector including, for example, setting more appropriate eligibility criteria given the urgent need to move to a low carbon economy.\*

The report also identified measures that could be targeted specifically at **cleantech investors and investment structures**:

- review **existing venture capital stimulus measures** (including the Early Stage Venture Capital Limited Partnership (ESVCLP) regime) from a cleantech perspective with a particular focus upon attracting and leveraging superannuation funds that can be allocated to risk capital. Objectives would include concessional treatment of capital gains and/or dividends/distributions and broadening the scope of application of the existing regime;\*\*
- alternative measures that would allow **flow through of tax losses** from investment vehicle to investor.

**ACF comments:** \* *The Tax Laws Amendment (Research and Development) Bill 2010 (Cth) has been particularly controversial - attracting broad criticism for its restrictive eligibility criteria and complexity. See: <http://www.treasury.gov.au/contentitem.asp?ContentID=1740&NavID=037>*

\*\* *The current \$10 million minimum committed capital eligibility requirement for ESVCLP scheme implies that this regime may assist technology that is at a more mature stage of the development /funding cycle only.*

## BOX 9 CLEANTECH TAX INCENTIVES: UK ENTERPRISE INVESTMENT SCHEME

### UK Enterprise Investment Scheme

In a bid to stimulate investment in higher risk innovation focussed companies, the UK introduced the Enterprise Investment Scheme (EIS).

Under the Scheme, an investor making a minimum £500 equity investment in an EIS qualifying company is eligible for tax concessions including:

- **Income tax relief:** a tax offset equivalent to 20% of the invested amount (offset capped at £100,000) in the investment year. For investments in Green Fund II made during FY2009/10, investors can “carry back” the offset to the previous financial year (subject to caps);
- **CGT exemption:** complete exemption upon disposal of EIS shares held for at least 3 years;
- **CGT deferral:** for capital gains on any other assets, by reinvesting all or part of the gain into an EIS company within one year before, or three years after, the gain accrued; and

**Inheritance tax exemption:** exemption for shares held for at least 2 years.

### Triodos EIS Green Funds I & II

In 2009 Triodos Bank launched two EIS Green Funds to undertake direct venture capital equity investments in UK Enterprise Investment Scheme qualified sustainable companies with strong growth prospects. The Fund has a particular focus on renewable energy generation and technology, energy efficiency, sustainable living and low carbon products and waste recycling and reduction.

The Funds of up to £5 million each are aimed at high net worth investors. They have a minimum investment of £5,000 and aim to generate superior capital returns over 6 to 7 year periods. Investors in the funds benefit from the EIS tax benefits outlined above.

## Mature Technology Phase

In addition to attracting risk capital to the cleantech end of the technology spectrum, tax measures can also play a role in stimulating investment in more mature phase technologies.

Although usually based on proven technology, large-scale renewable energy projects often have high early stage capital expenditure requirements and are not entirely immune from technology risk. One example is wind farm turbines which, while generally considered a mature technology, have been subject to rapid technological change. Similarly, once developed, initial utility scale solar technology is likely to be both capital intensive for project owners and subject to the same types of technology risks.

For these projects, measures such as accelerated depreciation entitlements that recognise both the high up-front capital costs and potential for rapid technological redundancy could play an important complementary role alongside other regulatory stimulus such as the RET.<sup>41</sup> As we have outlined in the section above there is ample precedent for measures of this type in the form of existing concessions to extractive and other industries.

<sup>41</sup> See generally, The Australia Institute (2008) The tax treatment of capital investments in renewable energy, available at <https://www.tai.org.au/>



## 3.3.4 Credit Enhancement Mechanisms

### Overview

Internationally, significant work has recently been undertaken aimed at identifying innovative methods by which private funds can be leveraged into LCA via the credit ratings strength of governments and multilateral development banks (MDBs). By offering various credit enhancement mechanisms and products, these bodies can leverage their balance sheet strength to help financiers close the financing gap by mitigating particular risks.<sup>42</sup>

Examples include:

- **Loan Guarantees:** full or partial guarantees by governments or MDBs of a borrower's debt repayment obligations in connection with an LCA infrastructure project;
- **Political and policy risk guarantees/insurance:** sovereign risk type products including interesting adaptations for the climate context, for example products aimed at insuring against the reversal of low carbon government policy settings<sup>43</sup>; and
- **Currency risk funds:** enabling fund and/or project participants to hedge currency risk.

While some of this work has a developing country context, there is no reason in-principle why these approaches cannot be applied in an OECD context. Indeed, as part of a package of measures implemented under The American Recovery and Reinvestment Act 2009, the United States government has recently introduced a US\$30 billion government guarantee program for investments into LCA. As outlined below, through its Green Investment Bank proposal the UK government is also exploring the use of credit enhancement mechanisms to scale up LCA investment.

<sup>42</sup> See Asian Development Bank (2007) Investing in Clean Energy and Low Carbon Alternatives in Asia; United Nations Environment Programme and Partners (2009) Catalysing low-carbon growth in developing economies available at <http://www.unepfi.org/> and United Nations Global Compact (2008) Investor Leadership on Climate Change: An analysis of the investment community's role on climate change and snapshot of recent investor activity, available at <http://www.unglobalcompact.org>

<sup>43</sup> UNEP (2009) Ibid p.2

## BOX 10 CASE STUDY: UK GREEN INVESTMENT BANK

The recent elections in the UK saw both major parties committing to the establishment of a Green Investment Bank (GIB). Less a single financing mechanism, the GIB is more an umbrella agency of government aimed at increasing the availability of capital to LCAs in order to fund the investments required for meeting UK's emissions reductions budgets.

The GIB is planned as a government agency seeded by public funds with a suite of financing mechanisms (and non-financial mechanisms) available to it in order to accelerate investment in LCAs, aiming to leverage significant private capital with a mix of targeted direct and indirect financial mechanisms.

Its two main functions are:

- *"To consolidate within a single institution the existing disparate sources of public investment in the low carbon economy, such as the Carbon Trust and the Marine Renewables Deployment Fund. This will provide a clearer focus for prospective investors as to where to go for investment help, will leverage in external investment and will ensure that public funds deployed are focused and efficiently managed;*
- To act as an intermediary to help attract and package investment opportunities in forms acceptable to investors."(UK Conservatives)

A recent report by the Green Investment Bank Commission for the UK Government outlined the justification for a GIB, the functions of the bank, as well as the core focus:

*"The Commission has proposed that the primary focus of the GIB should be on lowering risk for investors, rather than simply providing capital. It suggests the GIB could help catalyse low carbon investment by:*

- Unlocking project finance through equity co-investment, first loss debt and insurance products for low carbon technologies and infrastructure.
- Creating green bonds to access to the very large pools of capital held by institutional investors. Such products would fit with the long-term investment horizons of pension funds and life insurance companies and would provide the scale of capital needed to fund the low carbon transformation.
- Selling green ISAs [tax free Individual Savings Accounts], which would be an important and visible way for retail investors to make a contribution to the funding of green infrastructure.
- And, in light of the recent National Audit Office report entitled Government funding for developing renewable energy technologies, the GIB should use the potential rationalisation of quangos [quasi-autonomous non-government organisation, or government agency] and their funds to radically improve Government support for low carbon innovation and commercialisation."

### Developments in the USA

The UK is not the only country to look at dedicated government agencies at stimulating investment in LCAs. The US has also proposed an infrastructure bank, backed by Obama and a number of governors and mayors to promote a targeted program of investment in infrastructure focused on environmental sustainability, reducing emissions and energy security. (Building America's Future)

**\*Sources:** UK Conservatives, *Rebuilding Security: Conservative Energy Policy for an Uncertain World*, 18 February 2010; Green Investment Bank Commission (2010), *Unlocking investment to deliver Britain's low carbon future*; Building America's Future <http://afuture.org>

## 3.3.5 Government Involvement at Project Level

*“In renewables projects, the offtake risk more than anything else frustrates project financings.”<sup>45</sup>*

### Overview and Australian context

Over and above the potential to directly participate in LCA projects by co-investing or providing credit enhancement products, the government can, as it has done in the past, play a broad range of directly participatory roles in large-scale projects considered public interest priorities. Frequently these projects are financed and implemented as Public Private Partnerships (PPP) under Build Own Operate Transfer (BOOT) or similar structures. The roles that governments (and statutory corporations) play in these projects range from the grant of regulatory concessions to the off-taker under long term purchase contracts that guarantee a secure revenue stream for the project's owners.

The breadth of the role that governments can play in the interests of ensuring that projects considered high priority are successful is illustrated by the Victorian Government's Desalination Project (see box 11).

### BOX 11: DIRECT GOVERNMENT PARTICIPATION IN MAJOR PROJECTS. VICTORIAN DESALINATION PROJECT

#### Background

In July 2009 the Victorian Government selected a winning consortium for the construction and operation of a 150 GL per annum Desalination Plant at Wonthaggi. The Project, due for completion by the end of 2011, includes 85 kilometres of water pipeline. Carbon emissions associated with the Plant's substantial energy requirements are proposed to be fully offset through the purchase of Renewable Energy Certificates (under the RET).

With construction costs of ~A\$3.5 billion and a total project cost over 30 years of ~A\$5.7 billion (2009 A\$ terms) the Project was the largest PPP announced globally during 2009.

#### PPP Features

Typically for a PPP structure, the Project involves:

- a **project company** responsible for the financing, design, construction and operation of the Plant;
- **key supplier arrangements** including design, construction, operation and maintenance as well as long term power supply arrangements;
- **project finance** in the form of senior and junior debt and sponsor and third party equity;
- the grant of **leases and licences** from the Government to the project company necessary for construction and operation;
- a **long term off-take agreement**, providing long term revenue certainty for the project. In this case, Melbourne Water, an entity wholly owned by the Victorian Government, will purchase all water produced by the plant under a two tiered security (availability) and usage payment structure.

#### Additional State Support – Gap Underwriting

Despite substantial Government support in the form of leases and licenses and a long-term State -backed off-take arrangement, the project sponsor had been unable to raise a significant part of the financing required (A\$1.7 billion) required by the time the winning consortium was announced.

In response the Victorian Government provided a “Treasurers Guarantee of Syndication” by which the State Government agreed to lend the funding shortfall at commercial rates if it was unable to raise the amount by financial close. Although the debt shortfall was ultimately met by lending banks, this additional support of underwriting for 46% of the project's capital costs over and above the substantial support already provided illustrates the range of measures potentially available to Governments to ensure that high priority infrastructure projects succeed.

\***Sources:** State Government of Victoria (2009) Partnerships Victoria – Project Summary Victorian Desalination Project, available at <http://www.partnerships.vic.gov.au>; “Australia's Biggest Desalination Plant to Secure Water and Jobs”, Media Statement, Victorian Premier John Brumby 30 July 2009, available at <http://www.premier.vic.gov.au>; “Aquasure said to get A\$1.7 Billion Loan for Desalination Plant”, 3 November 2009, Bloomberg, <http://preview.bloomberg.com>

<sup>45</sup> Sievers E.W. and Gerig S. A View of “Project Finance” For Renewables Policymakers in Parker L., Wilder M. and Cameron J. (Eds) ‘From Debate to Design: Issues in Clean Energy and Climate Change Law and Policy’ A report on the work of the REIL Network 2007-2008 (2008) Yale School of Forestry and Environmental Studies, p.17, available at <http://environment.yale.edu>

## Implications for LCA in Australia

As this and many other examples highlight, governments can play a range of direct roles at project level to leverage private capital and ensure the successful implementation of infrastructure projects. There is no reason why governments cannot play a similar role in LCA projects at varying ends of the investment and technology spectrum.

In a renewable energy context, the most significant barriers to accessing project (and smaller scale) finance are often the absence of a long term revenue stream (or power purchase agreement - PPA) and/or the related issue of current approaches to energy pricing which sees the market price too low for many technologies. In the same manner in which they have acted as the primary purchaser or off-taker in other PPP contexts, governments should be willing to enter PPAs where the circumstances warrant. Examples might include utility-scale solar plants that are not otherwise bankable and demonstration or pilot technology projects.

### Recommendation: Clean Energy Finance Corporation

As this report has highlighted, the barriers to scaling up investment in LCA across the investment and technology spectrum are many and varied. They also differ from participant to participant and from project to project.

Consequently, we believe there is a strong case for the establishment of a new statutory body – a Clean Energy Finance Corporation (CEFC) – armed with a broad and versatile set of financing tools that can be deployed on a case by case basis to bridge the financing gap and leverage private capital into LCA projects. Domestically there is already solid precedent for this type of approach in the form of Australia’s Export Finance Insurance Corporation (EFIC) and Screen Australia’s film financing work. Internationally, as outlined in Box 10, similar bodies are in the process of being established overseas.

The CEFC would also be charged with responsibility for managing and administering a number of the direct and indirect public financing mechanisms we have outlined in this report, including co-investment and tax measures. Some of these, for example packages of concessional finance and credit enhancement products, could be awarded in response to competitive bids lodged by syndicates of fund managers and/or project proponents.

The CEFC would be staffed by professionals with deep finance, infrastructure and sectoral expertise and also play a key role in the planning and development of cross-portfolio climate change policies and programs. While it would require initial seed funding, it would be increasingly self-sustaining as a result of revenues generated from investment returns and administration and commitment fees charged for its credit enhancement products.<sup>44</sup> Further details are set out in Box 12.

<sup>44</sup> A tiered approach to setting fees could be adopted in-line with priorities for concessional support. The United States DoE 1703 and 1705 guarantee schemes for LCA projects adopt this approach.

## BOX 12 CLEAN ENERGY FINANCE CORPORATION (CEFC)

### Overview

- A statutory body charged with the administration of a broad suite of Federal Government direct and indirect financing tools to support rapid scale-up of low carbon technology, assets and infrastructure (LCA) investment
- Advisory and collaborative role on cross-portfolio measures related to meeting Australia’s emissions reduction targets, including the extent to which the nation’s current stock of LCA will meet emissions reductions targets over time
- Increasingly self-funding through fee for service credit enhancement products and returns on investments
- Staffed by professionals with deep finance, technology development, infrastructure and sectoral expertise

Financing Tool/Role	Comment/Example
<b>LCA Investment Manager</b>	
<b>+ Equity</b>	Management of Government’s direct and portfolio investment in LCA funds and projects  Usually on a co-investment basis – see below
<b>+ Debt</b>	Issuance of Government debt to LCA projects or proponents  For example where appropriate: mezzanine/subordinated debt or contingent “cost overrun” facility to bridge financing gap  Aggregator of small loans for on-sale to financial institutions
<b>+ Co-investment</b>	Management of Government co-investments – both direct and portfolio  Capped return, subordinated/first-loss, non-carried interest where appropriate to bridge financing gap
<b>Credit Enhancement Products</b>	
<b>+ Loan Guarantees</b>	Full, partial or conditional Government guarantee of LCA proponent obligations to lending bank(s).  Similar to guarantee mechanisms offered by the Export Finance Insurance Corporation and the United States Department of Energy under the DoE 1703 and 1705 loan guarantee programs. Backed by a dedicated contingent liability fund scaled up in size alongside growth in guarantee portfolio
<b>+ Insurance and other risk products</b>	Risk cover not offered by the commercial insurance market  Examples include “political” risks associated with future changes to key regulatory/policy settings on which investors/proponents have relied in committing to projects and risks excluded from constructor’s cover  Products to facilitate foreign exchange risk hedging where relevant and appropriate (eg. exchange rate risk associated with the importation of LCA plant and equipment)
<b>Grant Funding</b>	
<b>+ Manage consolidated/integrated grant program</b>	Administration of all continuing LCA grant programs to ensure that approach is coordinated and integrated with other CEFC and other cross-portfolio activities and overarching emissions reductions targets  Limited seed funding on grant basis only where other stimulus measures are demonstrably inadequate
<b>Administration of Tax Concessions</b>	
<b>+ Administration of tax concessions/support to Australian Taxation Office</b>	Provide support to the ATO by administering specific LCA stimulus concessions eg. tax credits. Apply specialist LCA sector knowledge to determine eligibility requirements for particular concessions, including entitlement to deductions
<b>Advisory and Key Relationships</b>	
<b>+ Cross portfolio advice and engagement</b>	Whole of Government advice and engagement on LCA requirements and stimulus measures  For example detailed engagement with Treasury, Finance, Energy and Resources and Climate Change portfolios on matters ranging from LCA requirements to meet prevailing emissions reductions targets to ‘climate bond’ issues for publicly funded/owned LCA works and advice on project level involvement (eg. feed in tariff support to utility scale generation facilities and/or off take agreements)

# 4. PRIVATE FINANCE

*“Provision of private investment and finance will be fundamental to the creation of a climate resilient infrastructure that addresses concerns at the heart of the challenges associated with adaptation to global warming [...] estimates suggest that at least 80% to 85% of the finance and capital required in our collective response to the mitigation and adaptation needs of climate change will come from private investment sources and capital markets”<sup>46</sup>*

## 4.1. Overview

Although in this report we have focussed in particular upon the role that governments can play in leveraging private capital, there is much that the private sector can and should do both as part of that collaborative effort and under its own steam.

In particular, despite broad community support for action on climate change and the broad commitment the institutional investment sector has made to the adoption of the UN Principles for Responsible Investment,<sup>47</sup> there is considerable scope for that sector (including superannuation fund managers) to play a far more proactive and prominent role in allocating capital to the growing LCA sector and creating financing solutions in conjunction with governments and other financiers.

This section highlights the increasing prominence of LCA investment approaches and structures internationally and provides examples of opportunities and approaches which could be applied in the domestic finance sector.

## 4.2. Green Funds (Portfolio Investment)

### International context

Across Europe and the USA a number of green funds (otherwise called clean energy funds, climate funds, or low carbon funds) are emerging. The purpose of the funds is to aggregate capital into large diversified infrastructure-style funds allowing LCA to be re-packaged in a manner that is attractive to large institutional investors such as pension funds. The funds have unlocked investment capital on an impressive scale.<sup>48</sup>

<sup>46</sup> UN Principles for Responsible Investment (PRI) Open Letter to Leaders at COP15 in Copenhagen (December 2009)

<sup>47</sup> Approximately 32 Australian super funds (asset owners) have signed on to the UN PRI (as at August 2010) and many additional fund managers and other investment managers.

<sup>48</sup> These funds are not to be confused with “ethical” or “socially responsible” funds that predominantly invest in listed equities targeting companies with best or better environmental or ethical performance. These funds are a much less direct way of moving capital into LCA and so are not considered in detail here.

## BOX 13 PRIVATE 'GREEN' FUNDS – INTERNATIONAL & DOMESTIC

Fund Name	Size	Manager	Sources of Funding	Further detail
Green Power Partners (Denmark)	100 mn	AP Pension	AP Pension, Pension-Danmark and PBU	Renewable energy projects
Clean Energy Fund (Belgium)	Target 400 mn	Fortis Investments	Institutional investors, with seed investment from PGGM and BNP Parabis Fortis	Project level financing of clean energy infrastructure globally.
Climate Change Capital Carbon Funds (UK)	750 mn	Climate Change Capital	Large institutional investors including pension funds	Includes equity and debt investment, and carbon purchase agreements, incl. CDM
PCG Clean Energy & Technology Fund (US)	Undisclosed	PCG Asset Management	CalPERS uses PCG as the core advisory and fund for their USD600m environmental technology program <sup>48</sup>	Global clean energy and technology.
Ampère Equity Fund (Netherlands)	Target 0.5 bn	Triodos Bank	Two cornerstone investors, ABP and Pensioenfond's Zorg en Welzijn	Equity investment in development, construction and operation of clean energy projects
Vanguard Investments Carbon Fund (Australia)	AU\$ 150mn	Vanguard	Super funds, seeded by VicSuper	Low carbon listed companies across all industries based on carbon out-performance within an industry
Clean Energy Fund (Australia)	AU\$ 1bn	Industry Funds Management	Super funds	Predominantly established to hold assets of Pacific Hydro

From an investor perspective, the key benefits associated with these structures include the diffusion of risk across a large number of projects, greater liquidity than direct infrastructure investments and the ability to avoid a time consuming and expensive due diligence process that would be required for direct project investment. As a result, LCA packaged in a green fund can be a more investible structure for a pension fund. Moreover, investors are increasingly viewing investment in this growing asset as an important hedge of carbon risk in their portfolios.

Green funds internationally have typically invested in one or a combination of the following modes or asset classes in developed and/or developing countries:

- direct equity or debt in LCA (most commonly renewable energy projects);
- clean technology venture capital;
- green commercial property;
- listed companies in an environment-related industry;
- carbon finance products such as Clean Development Mechanism (CDM) or EU Allowance credits.

Most projects into which green funds have invested tend to be in countries with relatively strong regulatory support for emissions reductions such as Europe and developing nations that qualify for CDM credits (most commonly in Asia and South America). In some cases, pension funds have actually driven the establishment of green funds by commissioning a fund manager to establish a vehicle through which they can gain exposure to LCA (e.g. Green Power Partners, PCG Clean Energy and Ampère Equity Fund).

<sup>49</sup> This forms part of the CalPERS Green Wave program of investment that includes venture capital cleantech funds.

## Australian context

There are very few domestic green fund options for large institutional investors. In large part this is due to insufficient deal flow of domestic LCA project opportunities. This in turn reflects a number of the barriers identified in this report. Unless serious efforts are devoted to addressing these, LCA can not progress to the development phase in large enough numbers that would enable them to be packaged into attractive investment vehicles for institutional investors.

The general lack of aggregation opportunities generates a difficult chicken and egg scenario:

- Australian superannuation funds predominantly look offshore for exposure to the LCA sector (for example Industry Fund Management's Clean Energy Fund which was established largely to carry the assets of Pacific Hydro, a renewable energy company with a majority of its investments outside of Australia); and
- as a consequence domestic developers are missing an important pool of capital to fund their projects.

Although, as this report has highlighted, governments have a critical enabling role to play in ensuring the appropriate regulatory settings and incentives are in place, international examples such as CalPERS and AP Pension demonstrate that the superannuation industry must also play a leadership role in driving demand for LCA by clearly demonstrating that they will allocate capital to quality projects. This will require a more proactive role in collaborating with proponents, governments and other financial sector participants alike.

## 4.3. Direct Investment

### Project Finance, Other Debt Finance & Equity Investment

Partly due to the attractions of project finance generally and partly because of the low allocation to LCA (and infrastructure generally) from institutional investors, project finance has been a major source of finance for LCA in Australia.<sup>50</sup>

Typical of approaches to structuring adopted in other sectors, LCA project finance generally involves a combination of debt and equity with the project structured to minimise risks to low levels for the debt component. Indeed, it is this feature of project finance that has been particularly prone to many of the investment barriers identified in this report. The combination of current energy pricing arrangements and the absence of guaranteed offtake arrangements for renewable energy projects frequently act as an insurmountable barrier to project "bankability".<sup>51</sup> The net result is that the pool of investors and proponents able to invest in LCA infrastructure is limited to companies with larger balance sheets, such as integrated energy companies. As we have recommended in section 3.3.5 above, particularly in the absence of a carbon price, governments should be ready and willing to enter into or underwrite off-take arrangements where that is warranted given the scale and importance of the project.

However, institutional investors and banks can also do a lot more in collaborating with governments to develop approaches and structures that will satisfy risk/return requirements. On average, Australian superannuation funds have only a limited allocation of their portfolios to direct infrastructure investment and, partly because LCA are unfamiliar to many superannuation fund managers, these often tend to be directed towards more familiar (particularly brownfield) infrastructure assets such as roads, airports and emissions-intensive energy generation assets. Very few superannuation funds in Australia have taken direct equity positions in renewable energy projects.

Internationally, the story is similar, with few pension funds preferring a portfolio approach to taking direct stakes in LCA. However Dutch/UK bank Triodos, is a notable example of a lending institution willing to invest directly in renewable energy projects and to raise capital explicitly for that purpose.<sup>52</sup>

50 Bloomberg New Energy Finance (2010) estimates well over 90% of recent Australian investment in renewable energy as 'asset financed'. A recent example of project financing in Australia is the Roaring 40s Pty Ltd's Waterloo Wind Farm in South Australia

51 Sievers E.W. and Gerig S (2008) op cit. Ernst & Young (2009) How to drive investment in emerging clean technologies: Project Finance, Superannuation and Tax Incentives, presentation given to Clean Energy Council Investment Forum available at <http://www.cleanenergycouncil.org.au>

52 Triodos has undertaken retail "Climate Bond" issues specifically for this purpose.



## Venture Capital and Private Equity

Risk capital in the form of venture, private equity and angel capital is critical at the early stages of clean technology development and commercialisation when other forms of finance are not available. New technologies are critical to enabling the transition to a low emissions economy at least cost.

Globally the cleantech sector has been attracting support from venture (VC) and private equity (PE) funds of varying sizes and increasingly these funds are attracting co-investment from larger pools of institutional capital.<sup>53</sup> VC and PE funds have played a very large part in the rapid development of the cleantech sector internationally.

However, despite Australia having dedicated cleantech VC and PE funds, the amount of aggregate capital invested domestically is very small. The Australian Venture Capital Association estimates that in 2009 just \$25 million was invested domestically in cleantech venture companies. By way of contrast, during the first quarter of 2010 US\$1.9 billion was invested in North America, Europe, China and India.<sup>54</sup> Clearly, there is a significant gap in funding for early stage technology development in Australia. As a consequence a number of technologies have departed for offshore destinations at commercialisation phase (for example: SunTech Power, Ceramic Fuel Cells, Ausra, and Global Renewables).<sup>55</sup>

As we have outlined in section 3.3.3 above, governments can play a significant role in stimulating investment through these channels and enabling a thriving domestic cleantech sector through a range of tax measures, a number of which have been adopted overseas.

## 4.4. Community Finance

Internationally, community based finance is a growing source of private finance, in particular in the renewable energy space. Early investments in renewable energy in parts of Europe (and to a lesser extent the US) have been heavily supported by community financing, often through co-operative structures.

For example, Denmark's wind industry was initially funded predominantly from local ownership of turbines, and today 15 per cent of wind turbines are locally owned, many under co-operative models.<sup>56</sup> Indeed, recent changes to legislation governing wind farm construction in Denmark ensures that at least 20 per cent of every wind farm is offered to local ownership.<sup>57</sup>

Where large scale clean energy development is to occur, many local communities are likely to be impacted directly through amenity impacts. Denmark has found that when a community owns the assets, there is better community support and development approval processes are smoother. This has enabled Denmark to produce 20 per cent of its power from renewable energy. In this context, Denmark is managing to achieve a significant scale of wind penetration, along with a significant source of capital coming directly from the communities within which these assets are located.

<sup>53</sup> See for example the CalPERS Green Wave fund cited in section 4.2.

<sup>54</sup> The Australian, "Australia missing out on clean-tech revolution", 12 April 2010

<sup>55</sup> SunTech Power is one of the largest solar panel manufacturers in the world, based in China, with a CEO and technology that both came out of the University of NSW; Ceramic Fuel Cells is a dual listed (Australia and UK) company based on a CSIRO-developed fuel cell technology. CFC have recently opened their main manufacturing plant in Germany, with most of their sales in Europe and Asia; Ausra is a company specialising in solar thermal energy with a technology developed in Australia. The company relocated to the US to a more favourable investment climate and was bought out by the French energy company Areva in early 2010; Global Renewables is a leading waste management company who has relocated the majority of its business to the UK where a more favourable environment supported major contracts for its main technology and services.

<sup>56</sup> Danish Wind Turbine Owners' Association, [www.dkvind.dk/eng/index.htm](http://www.dkvind.dk/eng/index.htm), accessed July 2010

<sup>57</sup> *ibid.*

Internationally, companies are being established specifically to aid in the development of community owned clean energy assets, particularly in the US and UK.<sup>58</sup>

**BOX 14 COMMUNITY FINANCING OF LCA – INTERNATIONAL & DOMESTIC**

Project Name	Size	Owner	Sources of Funding	Further detail
Middelgrundens Vindmøllelaug (Denmark)	40 MW (20 turbines)	Middelgrunden Wind Turbine Cooperative (owns 10 turbines) and utility company (owns 10 turbines)	Community and utility	An offshore wind farm in Copenhagen Harbour <a href="http://www.middelgrunden.dk/">www.middelgrunden.dk/</a>
Baywind Energy (UK)	3 MW (6 turbines)	Baywind Energy Co-operative	Community	<a href="http://www.baywind.co.uk">www.baywind.co.uk</a>
Hull Wind (US)	2.5 MW	Hull Town	Local utility and community	<a href="http://www.hullwind.org">www.hullwind.org</a>
Hepburn Wind (Australia)	4 MW	Hepburn community	Community and government grants	<a href="http://www.hepburnwind.com.au">www.hepburnwind.com.au</a>

In Australia, there are only a few community owned LCAs. A prominent example is the Hepburn Wind project in Victoria, where two 2 MW wind turbines are being developed and funded by the local community. This project will generate sufficient electricity to power the local towns of Hepburn Springs and Daylesford.<sup>59</sup>

Given the need for much LCA to be distributed and decentralised, the benefits associated with community consent and buy-in associated with a community finance approach suggest governments and financial institutions should be ready and willing to support these projects.

<sup>58</sup> See for example: National Wind (US) [www.nationalwind.com/](http://www.nationalwind.com/); Wind Share (Canada) [www.windshare.ca/](http://www.windshare.ca/); and Energy4All (UK) [www.energy4all.co.uk](http://www.energy4all.co.uk).  
<sup>59</sup> For more information, see [www.hepburnwind.com.au](http://www.hepburnwind.com.au)

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