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FUNDING RENEWABLE ENERGY PROJECTS IN THE EU/UK AND AUSTRALIA

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AUGUST 2009

*The design, build, financing and operation (**DBFO**) of Renewable Energy (**RE**) projects is a major key to the mitigation of climate change globally in the developed and developing world. In this paper I provide a comparative analysis of the Australian and European policy and funding mechanisms driving the DBFO of RE projects with a strong focus on what is and has worked as well as what are the keys to financing such projects*[1].

1. INTRODUCTION

The world is at a tipping point in respect of mitigating and adapting to dangerous climate change. In respect to mitigating climate change, RE is one of the key solutions being adopted globally[2]. RE is so critical to mitigating climate change, it is dangerous and unreasonable to solely rely on market forces (i.e. emissions trading) to deliver the required RE development but must be incentivised through subsidies[3].

Real progress will only come through the political will to innovate, cooperate, develop and invest in RE technology with local, regional and international cooperation.[4] Importantly, picking technology winners in advance of commercialisation can only hinder competition and effective

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[2] R.K. Pachauri, 'Renewable Energy: Seeking a Global Commitment' at http://www.renewables2004.de/pdf/pachauri_opening.pdf as well as IPCC scoping report on special report on renewable energy resources and mitigation of climate change.
[3] See http://www.renewables2004.de/pdf/msd_en.pdf.
[4] Ibid.

long-term utilisation of the most common technology for the countries where they are added[5].

Decision makers in government and the private sector must incorporate Ecological Sustainable Development (***ESD***) into their decision-making processes,[6] in order to adopt the policy changes; expand the financing options; and develop the capacity required, to enable the requisite investment in RE[7].

No single policy choice can meet every element of the energy sector: a toolbox approach is required to meet the demands of each individual sector and is particularly true for new market entrants such as RE technologies[8].

Governments must:

- develop an overall energy policy that emphasises RE;

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[5] See http://www.renewables2004.de/pdf/comparative_analysis_working_document.pdf.
[6] Mr. Roger Wilkins AO, 'Strategic Review of Australian Government Climate Change Programmes' (31 July 2008) ("***Wilkin's Report***") at page 122 and also notes that both bureaucrats and the ministers they serve are not best placed to deliver on the needs of developing RE as they are called upon by their constituents to make decisions in pursuit of other objectives which detract from Australia's interest in build in a portfolio of RE.
[7] See http://www.renewables2004.de/pdf/policy_recommendations_final.pdf at page 6.
[8] Ibid. An example in the UK was the Landfill Allowance Trading Scheme (LATs) which places an obligation on the Local Authorities to divert a reducing amount of Biodegradable waste/organic waste from landfill on an annual basis with £150 tonne fine for non performance. This measure is cupped with the split landfill tax (i.e. split between inert and biodegradable waste) to incentivise separation of such waste at source rather than tipping organic/BMW into landfill. This double regulatory driver was a strong price signal for traditional waste contractors (who traditionally picked and dumped waste) to look to new technologies to create energy from waste (EFW) through predominately the thermal technologies (i.e. incineration, gasification and pyrolisis) as well as using MBT/IVC/autoclaving/AD technology. The project delivery structure needed to be adjusted to allow new market entrants effective access to the waste sector and this was achieved, in part, through implementing a Strategic Partnering Organisation (***SPO***) model into the procurement structure allowing larger non-waste sector players to use their supply chain expertise in delivering complex procurements to enter in the market as the main counter party who then contracted out the bespoke contractual arrangements to the parties best able to perform those tasks, such as: collection to a traditional waste contractor, disposal to a group of parties including possibly a separate technology provider for the disposal of waste through new EFW technology, as well as possibly an IVC contractor at the frontend of the waste process.

- formulate clear goals for RE[9];

- establish transparent market conditions that encourage investment (energy prices subject to "full lifecycle accounting"[10]);

- ensure licensing procedures and import regulations are not biased as against RE; and

- Address the high initial cost of RE[11].

Lord Stern released the Stern Review: The Economics of Climate Change in October 2006.[12] His central message is that climate change is a serious threat to human welfare that demands urgent global action now.[13] It warns that climate change has the potential to lead to major economic and social disruption – on a scale similar to the world wars and the great depression – later in this century and beyond.[14]

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[9] Lord Stern was very supportive of RE as a means of mitigating climate change through grants, subsidies, quota based systems and price support mechanisms, such as the RET and suggested that such incentives be increased 2/5 times current levels to US$33 billion per annum. See Rick Baker, Andrew Barker, Alan Johnson and Michael Kohlhaas, Australia Government Productivity Commission, the Stern Review: an assessment of its methodology: staff working paper at page 76.

[10] This means: including the social, health and environmental costs of fossil fuel generation into their off-take prices as well as recognising that RE does not have such harmful consequences/costs. It is what Stern and Garnaut refer to as 'the greatest market failure of all time': that such costs have not been factored into fossil fuel production and consumption.

[11] Id at footnote 7. Through temporary and gradual declining subsidies for RE such as: tax credits, grants, rebates, long-term interim free loans combined with renewable energy quote/pricing systems: with a preference for performance based subsidies as a directly encouraged RE development.

[12] Professor Ross Garnau's preliminary and final report is Australian's version of the Stern Review. For a full list of Professor Ross Garnau's reports see www.garnautreview.org.au.

[13] See: <http://www.hm-treasury.gov.uk/d/Executive_Summary.pdf> accessed 22 August 2009 at pages (i) and (iv). Both China and India have moved to adopt domestic measures to increase the use of RE in their energy supplies at page (xxiv). In particular, the Stern Review notes that there is a significant risk of global temperatures rising about 5°C by the early part of the next century if the world continues on its Business As Usual (BAU) trajectory. Even with strong expansion of RE: hydrocarbons are likely to still contribute to over 50% of the global energy supply by 2050 at page (xiv). The Stern Review has not been without its critics: in particular, Mendelshon (2006) states that the amount of land required for RE development will have secondary environmental impacts; and Tol and Yohe (2006) states that the Review underestimates the costs required to overt catastrophic climate change because of the omission of impacts on economic growth and capital stock turnover. See Rick Baker, Andrew Barker, Alan Johnson and Michael Kohlhaas, Australian Government Productivity Commission, the Stern Review: an assessment of its methodology: staff working paper at page 42.

[14] Id footnote 11 at page IX (summary).

Stern contends, if the world does not act now, the overall costs and risks of climate change will be equivocal to losing[15]:

- 'at least' 5% of global GDP per annum (now and forever); and

- 20% of global GDP each year (now and forever) if a wider range of risks and impacts are taken into account.

In contrast, the costs of reducing Greenhouse Gas (***GHG***) emissions, to avoid the worst climate change impacts, could be limited to 1% of global GPD per annum[16].

Australia is responsible for 1.5% of global GHG emissions: the EU is responsible for 12.6%[17]; and the UK[18] is responsible for 2%[19]. As Professor Ross Garnaut points out: that to focus on Australia's 1.5% contribution to global GHG's as a small percentage misses the point – we are the thirteenth top GHG emitter world wide; and the top 20 global emitters are responsible for 80% of global emissions.[20]

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[15] See <http://www.hm-treasury.gov.uk/d/Summary_of_Conclusions.pdf> at page (vi) accessed on 22 August 2009.
[16] Also see: UK Low Carbon Transition Plan page 22.
[17] See <http://www.garnautreview.org.au/pdf/Garnaut_Chapter3.pdf> at page 65, Table 3.2 accessed on 22 August 2009.
[18] Annual average daily mean temperatures between 1961 and 2006 in the South East of England have risen between 1.4 to 2.1 degrees Celsius. See Carbon Disclosure Report FTSE 350: building business resilience to inevitable climate change (August 2009) at page 3
[19] See <http://www.defra.gov.uk/environment/statistics/globatmos/gagccukem.htm> accessed on 22 August 2009.
[20] See <http://www.garnautreview.org.au/pdf/Garnaut_Chapter3.pdf> at Figure 3.1 page 54, accessed 22 August 2009.

In respect of RE, by way of comparison, in 1987 there was only two Terra Watts annually; equal to about 21% of energy consumed worldwide.[21] Compare these statistics with the AR4 analysis that only 15% of the world's energy supplies were sourced from RE at 2004. This is obviously due to population growth and stalled policy implementation.[22]

This paper aims to provide a comparative analysis between Europe's (with a strong focus on the UK's response) and Australia's 'mitigation' policies as a means of averting 'catastrophic climate change' by incentivising RE.

2. A BRIEF INTERNATIONAL HISTORY OF RENEWABLE ENERGY POLICY

It was not until the 1960s when Rachel Carson wrote a "Silent Spring" in 1962,[23] that the world began waking up to the environment as a resource to be protected rather than exploited in the capitalist drive for profits by any and all means: this myopic focus on short-term profit is bad for business in the long run.[24]

The push for RE generation is not new. Internationally, action on climate change has been gathering pace since the UN Conference of the Human Environment held in Stockholm in 1972, which was the first time

[21] Report on the World Commission on Environment and Development, 20 March 1987, at page 192 paragraph 73 where it states that 15% comes from biomass and 6% from hydropower: both of these technologies has had their own environmental issues, such as: food shortages and land degradation from change land use from food to fuel crops as well as displacement of people, destruction of habitats and water pollution including the release of dangerous gases from rotting vegetation and water born diseases (i.e. snail fever) as well as posing a barrier to fish and land animal migration and the remote risk of the dam wall rupturing and destroying any downstream human settlements in respect of large hydro schemes.
[22] IPCC Fourth Assessment Report at paragraph 4.3.3.
[23] Rachel Carson, *Silent Spring*, Houghton Mifflin Co, Boston, 1962, republished 2002
[24] See http://www.un.org/geninfo/bp/envirp3.html for a commentary on the Rio declaration.

environmental law was placed on the international agenda, and resulted in the Stockholm declaration[25].

2.1. The World Commission on Environment and Development (***WCED***) was established in 1983 and had as one of its core mandates "to propose new forms of international cooperation that will influence policies and events in the direction on needed changes".[26]

The WCED report in 1987 titled "The World Commission on Environment and Development 'Our Common Future'"[27] ("***Brundtland Report***")[28], had as its core remit the proposition of long-term environmental strategies for achieving sustainable development by the year 2000 and beyond. It put the world on notice that the state of the environment is in a very bad shape and declared the need to "face up to the future, and of safeguard of the interest for coming generations".[29]

The Brundtland Report acknowledged, amongst other things, the following:

(a) That a new era of economic growth based on policies that sustain and expand the environmental resource basis is possible but it is conditional on decisive political action to

[25] The United Nations Environment Programme (***UNEP***) was established shortly after the conference.
[26] Report on the World Commission on Environment and Development, 20 March 1987, at page 20, paragraph 9.
[27] See http://www.undemocracy.com/a-42-427.pdf accessed 10th August 2009.
[28] Named after the chair of the WCED, Gro Harlem Brundtland, the then Prime Minister of Norway.
[29] Report on the World Commission on Environment and Development, 20 March 1987, at page 12.

manage environmental resources and development[30]: RE is one such policy;

(b) It raised global climate change as a core risk due to the burning of fossil fuels impacting on temperatures, resources, coastal environments, health, food supplies and economies[31];

(c) Discusses RE as being the untapped potential[32];

(d) Because new technology is a main stay of economic development, RE is a win/win solution[33];

2.2. The Rio Conference of 1992 (***Rio***), which established amongst other things:

(a) The Rio declaration[34] on Environment and Development[35]; and

(b) The United Nations Framework Convention on Climate Change (***UNFCCC***).

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[30] Ibid at page 18 paragraphs 3 and 4.
[31] Ibid at page 19 paragraph 7.
[32] Ibid at paragraphs 73 to 88. RE offers huge primary energy sources, sustainable in perpetuity and available in one form or another to every nation on earth.
[33] Ibid at page 21 paragraph 14. RE creates jobs and economic prosperity as well as mitigating climate change
[34] The Rio declaration also states that "developed counties" recognise their responsibility in pursuing sustainable development resulting from the pressures their societies place on the global environment and of the technologies and financial resources they command. See http://www.un.org/geninfo/bp/envirp2.html.
[35] Which were a series of principles defining the rights and responsibilities of States include the principles of ecological sustainable development in particular the precautionary principle in decision making.

2.3. The Global Environment Facility (***GEF***) was established in 1991;[36]

2.4. The Commission on Sustainable Development was established in 1995[37];

2.5. In 1998 the International Panel on Climate Change (***IPCC***)[38] to provide the world with a clear scientific view on the current state of climate change and its potential environmental and social economic consequences.[39]

Working group III (IPCC Fourth Assessment Report (***AR4***)) had to cover the full range of mitigation options which necessarily limited its treatment of RE. At the time, AR4 identified the economic potential for RE to provide heat, electricity and transport fuels to meet in part the growing energy demand and to reduce GHGs[40].

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[36] At Rio, the GEF became the funding mechanism for activities under the UNFCCC and the convention on biological diversity. The World Bank assists climate countries mobilise the financing needed to combat the causes and consequences of climate change through innovative mechanisms, such as: the Bank Administered Clean Technology Fund as well as direct World Bank lending. See http://beta.worldbank.org/climatechange/financing accessed 10th August 2009.

[37] Which adopted a work programme on the transfer of environmentally sound technology, cooperation and capacity building. The programme places emphasis on three interrelated priority areas, including capacity building for technological change and financial and partnership arrangements. The commission is working collaboratively with the World Trade Organisation (***WTO***), the UN conference on trade and development and UNEP to ensure that trade, and environmental and sustainable development issues are mutually reinforcing: see http://www.un.org/geninfo/bp/envirp4.html accessed 10th August 2009.

[38] The IPCC is a scientific body and an intergovernmental body and it is open to all members of the UN and WTO. There are at present 194 countries that participate within the IPCC. It reviews and assesses the most recent scientific, technical and social economic information produced worldwide relevant to the understanding of climate change. It does not conduct any research nor does it monitor climate related data or parameters. Thousands of scientists from all over the world contribute to the work of the IPCC on a voluntary basis. Review is an essential part of the IPCC process to ensure an objective and complete assessment of current information. Differing viewpoints exist within the scientific community and they are reflected in the IPCC reports.

[39] See http://www.ipcc.ch/organization/organization.htm.

[40] See IPCCWG (iii) scoping paper on special report on renewable energy sources and climate change mitigation at http://www.ipcc-wg3.de/activity/current-activitieswgiii/special-report-renewable-energy-sources/.pix-data/srrns-scoping-paper.pdf accessed 10th August 2009. Since AR4 significant new information and analysis has been reported in the literature on technological development and deployment, regional assessments, environmental and social economic impacts, cost reductions as well as mounting practical experience with implementations. A special report on renewable energy sources and climate change mitigation maybe finalised by the end of 2010 while a fifth assessment report would probably not be available before 2013.

2.6. In 2002 the World Summit on Sustainable Development (***WSSD***) advanced the use of RE for meeting the sustainable development needs of the global energy demand[41].

So, the benefits of RE have been discussed and encouraged at an international level for the past 30 years.

3. COMMERCIALISATION AND PRE-OPERATIONAL INCENTIVES FOR FUNDING RE PROJECTS

The Australian government recognises the need for some time limited, additional support for the development, demonstration[42] and commercialisation[43] of low emissions technologies by consolidating existing programmes into a new investment vehicle namely, the "carbon technology trust"[44]. The main steps in the innovation chain are detailed below and show the life cycle of bringing new technology to the market.

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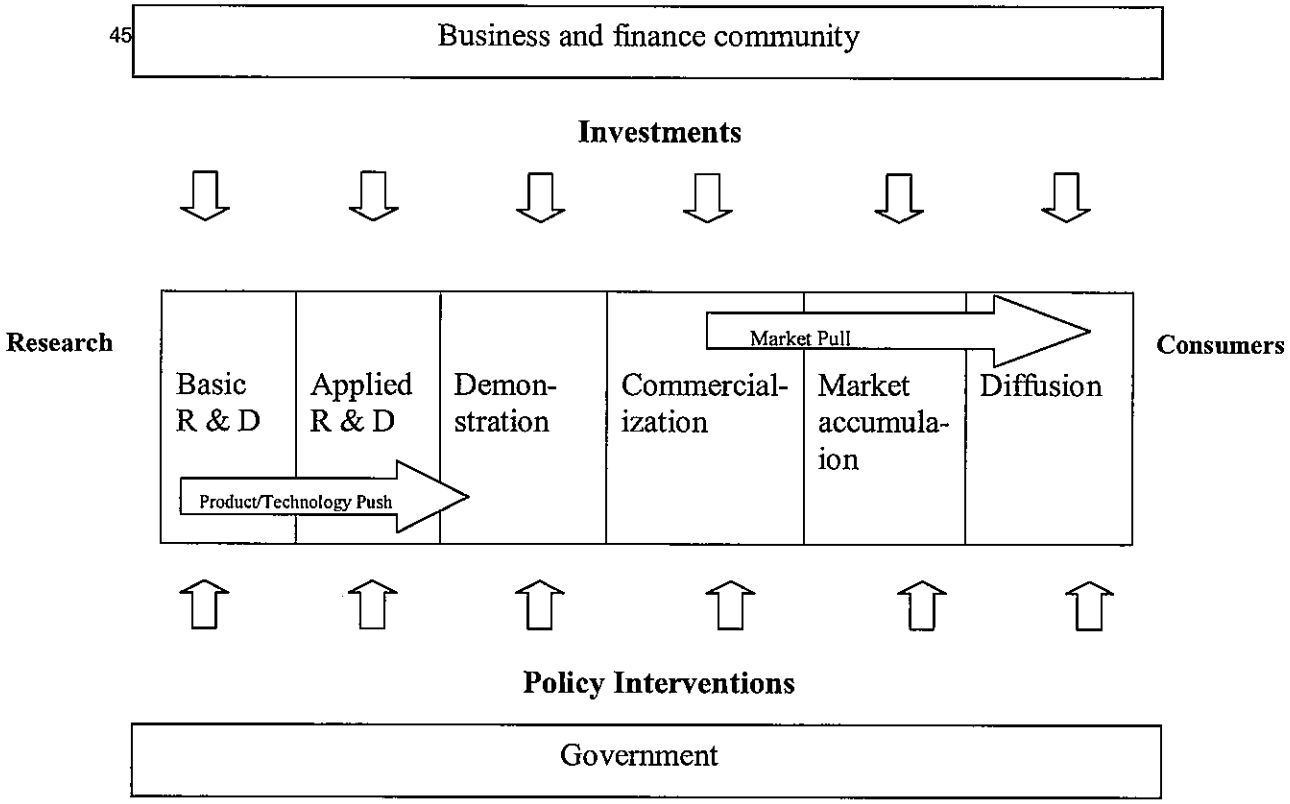
[41] Policy recommendations for renewable energy version 4, June 2004 at page 5. See http://www.renewables2004.de/pdf/policy_recommendations_final.pdf. Accessed 10th August 2009.

[42] The Wilkin's Review at page 119 notes that "public push and pull" (i.e. government support through funding/grants etc.) for early stage R & D are insufficient to bridge the technology "valley of death" – particularly in the energy sector which involves large scale investments in plants and facilities with long operational and low product differentiation. It is acknowledged that there are "first mover" spillovers at the demonstration and commercialisation phases including spillovers in knowledge and regulatory and social acceptance where pioneering firms bear the costs of resolving regulatory legal and acceptance issues around the use of new technology.

[43] Ibid at page 119 noting that the Productivity Commission Report of 2008 acknowledges that market demonstration and commercialisation involve high costs and low returns but noted that programmes at this stage should target innovation and high risk activities that can demonstrate "additionality". The report concludes that there is a case for government intervention to support the development and demonstration of new low emission technologies for a limited, transitional period until the Carbon Pollution Reduction Scheme (***CPRS***) provides a strong signal for future Australian emission units price (***AEU***).

[44] Ibid at page 114.



The carbon technology trust (modelled on the UK carbon trust)[46], will aim to consolidate existing programmes for the development and deployment of low emission technology was well as being used as a vehicle for developing additional support the government may wish to make in this area.[47]

Australia's contribution to international technology is modest based on the size of the Australian economy and in fact it is an importer of technology and most of the low emission technology is likely to be made overseas:

[45] Main steps in the innovation chain

[46] The UK government established the carbon trust in 2001 to drive energy efficiency and the development of low emission technology. Its aim was to accelerate the transition to a low carbon economy by helping organisations reduce their GHG emissions: it is only the technology development role that Australia has adopted. The trust is largely funded by government departments of which DEFRA is the main contributor. The trust had five funding programmes (as at 31st March 2007) to invest in low emissions technology companies, to advise on its investment portfolio and develop low carbon businesses. The trusts funding has increased over time from £2.9 million (2001-2002) to £103 million in 2006-2007. The trusts work appears to have helped overcome many of the barriers that researchers typically face and it has also leveraged private sector investment to develop the commercial potential of new technologies.

[47] The Wilkins Review at page 116.

coupled with the fact that Australia's existing support programmes for R & D of low emission technologies appears unlikely to deliver a sufficient portfolio of technologies that will facilitate Australia's transition to a low carbon economy[48].

It is suggested that Australia become a "fast follower" and concentrate on importing and adapting new technologies pioneered overseas to suit Australian conditions: which the report notes poses a policy problem in Australia as existing programmes do not foster such an approach[49].

The difficulties of Australia's existing programmes, is highlighted by the $410 million Low Technology Emission Demonstration Fund (***LTEDF***). This was announced in June 2004 and having completed its funding round between October 2006 and March 2007: as at 30 June 2008 full contracts for only three projects had been signed from a pool of six projects.

In contrast, the Renewable Energy Efficiency Fund (***REEF***),[50] a venture Capital Fund for RE, appears to have had a degree of success which can be partially attributed to the fact that the delivery of support was at "arms length" from the government; but it has had longer to produce results than LETDF.

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[48] The Wilkins Review at page 120.
[49] The Wilkins Review at page 119.
[50] Ibid at page 122 notes that REEF did not only develop RE but developed the experience of Venture Capital Fund managers of investing in RE. It was announced in November 2007 and CVC REEF investment managers were selected in a competitive tender process and the fund was established in December 2000. The government provided $17.7 million which was matched by $8.9 million from private investors and provided a total of $26.6 million for CVC REEF Limited to make investments and pay management fees. CVC REEF invested in 13 small Australian companies developing or commercialising RE in: wind, geothermal and biomass. The programme is due to close on the 26th October 2010. Advice from DEWHA is that most of the investments by CVC REEF had been successful and returned over 7 million to the government from successful investments.

The Australian government does not take any interest in any intellectual property (***IP***) developed as part of the technology grant programmes as they are poorly placed to manage ownership of the IP and programme objectives are best met if developers are able to explore any valuable IP but, it may be a barrier to the spill-overs inherent and the project actually being realised[51].

Australia announced as part of the Federal Budget on 13 May 2009, various new clean technology programmes, notably:

3.1 four new programmes for the development of and demonstration of new technologies with low emissions profiles, namely[52]: the $500 million National Clean Coal Fund; the $500 million Renewable Energy Fund; the $150 million Energy Innovation Fund; and Climate Ready (part of the Clean Business Australia initiative)[53]; and

[51] Ivor Frischknecht: Investment Director at Starfish Ventures, notes that when they invest in a technology the technology company will retain the IP. Ivor believes Australia's funding is generous towards low emissions technology, but believes there is a market failure, namely: that there is very little funding and assistance available for early stage developments (i.e. pre-seed investment) through Universities etc. He noted that previously in Australia there was a 'pre-seed' program providing $2 government dollars for every $3 private sector invested – which worked well and would rectify this market failure. He also noted that the CEI did not include certain technologies, including: geothermal, wave and tidal. Because, there is a lack of government 'pre-seed' funding, private sector investment in RE is directed at the commercialised technologies: not possible new technologies, such as base load electrical storage. Also, the fact that the government's response has predominately been 'specific' technology mandates will hinder new developments. In addition, the Renewable Energy Target (RET) will also favour existing technologies and is Australia's only complementary measure: a Feed-in Tariff would assist stimulate new investments.

[52] See <http://minister.ret.gov.au/TheHonMartinFergusonMP/Pages/BUDGETBOOSTSCLEANCOALANDRENEWABLEENERGY.aspx> accessed 22 August 2009.

[53] Ibid at page 121. These four funds have between them $1.225 billion in funding and more than $800 million of which is allocated in the forward estimates to 2011/12. Much of this funding has been committed to specific technologies and specific types of projects.

3.2 the Clean Energy Initiative, which includes, the Solar Flagships program providing funding of $1.6 billion over 6 years[54].

4. AUSTRALIAN RENEWABLE ENERGY POLICY

At the time of writing this paper the Australian Carbon Pollution Reduction Scheme (***CPRS***)[55] is still stalled in the Senate, but the renewable energy target (***RET***) was passed in late August 2009.

Australia has set the following GHG emission reduction targets:

- A 5% reduction of GHG's based on 2000 levels by 2020[56] (if no international agreement can be reached in Copenhagen in December 2009); or

- A 25% reduction based on 2000 levels by 2020[57] if an 'ambitious' global climate change agreement can be reached to stabilise levels of carbon dioxide equivalent to 450 part per million or lower, in Copenhagen in December 2009; and

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[54] See <http://www.environment.gov.au/minister/garrett/2009/pubs/budmr20090512i.pdf> accessed 22 August 2009.

[55] Mr. Roger Wilkins AO, "Strategic Review of Australian Government Climate Change Programmes" (31 July 2008) ("***Wilkins Review***") at page 114 states that the CPRS will increase the cost of established, higher emission technologies and increase the potential returns on investments and new technologies with lower emission profiles. In my view, the current design of the CPRS, notably: large amounts of compensation being paid to liable entities; a low trajectory (depending on whether an international agreement is reached in Copenhagen in 2009); and a fixed Australian emission unit price, will not deliver the technological change required in the initial years. The Acid Rain Abatement Project (***ARAP***) is a casing point: even though its design was better structured on the above points and was viewed as a success, it really did not deliver the innovation sought but resulted in any efficiency measures being implemented such as scrubbers and fuel switching.

[56] Professor Ross Garnaut notes that this is a 25% per capita reduction: a major structural task. See Professor Ross Garnaut, *Garnaut Climate Change Review: Interim Report to the Commonwealth, State and Territory Governments of Australia* at page 45 ("Interim Report").

[57] Professor Ross Garnaut suggested a 10% reduction if a global climate change agreement could be reached. He also notes that this is a 25% per capita reduction: a major structural change see Professor Ross Garnaut, *Garnaut Climate Change Review: Targets and Trajectories: Supplementary Draft Report* September 2008 at page 42 ("***Supplementary Report***").

- A 60% reduction based on 2000 levels by 2050[58].

Australia's strategy to reach the above targets is a three-pillar strategy, namely, with the reduction of GHGs (i.e. mitigation) being Pillar 1.

The CPRS is an emissions trading scheme[59]. It is the primary policy response of the Australian Federal Government to combat climate change[60].

Emissions trading schemes are not new:

(a) the US introduced the Acid Rain Abatement Programme (***ARAP***) in the late 1980s to mitigate the damage caused to the environment from acid rain caused by sulfur dioxide (NOX)[61];

(b) the UK introduced a voluntary emissions trading scheme for carbon dioxide in 2002 to prepare for the First Commitment Period (***FCP***)

[58] The Wilkin's Review at page 114 states that the 60% trajectory is unlikely to be achieved without the deployment of new technologies as fossil fuel provides nearly 95% of Australian primary energy supply and produces nearly 90% of Australia's emissions and that the IEA advises that large emission reductions will require a technological transformation of the energy sector on an unprecedented scale.

[59] Mr. Roger Wilkins AO, *Strategic Review of Australian Government Climate Change Programmes* (31 July 2008) at page 117 and 118 notes that: government funding for early stage research is likely to complement emissions trading; and page 118 notes that uncertainty whether emissions trading will be sufficient to bring a range of low emissions technologies through this middle section of the innovation chain (i.e. the "technological push") based on the perceived ineffectiveness of emissions trading even one with long-term targets, banking of permits and a secondary market assisting the establishment of prizes to drive investment in technologies that are expected to be needed to meet future emissions caps. Even if the target is high enough to deliver sufficient investment, the democratic political cycle, will make such design too risky and that aggressive technology policy is better than emissions trading. In particular, sub-standard economic conditions and regulatory uncertainty all may lead to underinvestment.

[60] Environmental trading schemes have been used in the water industry in Australia previously.

[61] The US also has various regional emissions trading schemes, notably: US Regional Greenhouse Initiative (RGGI); the Midwestern Greenhouse Gas Reduction Accord (aiming to establish a cap and trade by 2012); the Southern US Governors are currently exploring options for a cap and trade scheme. Federally, the American Clean Energy & Security Bill, known as the "Waxman-Markley comprehensive energy bill", which aims to establish a Federal cap and trade scheme, was narrowly passed by the House of Representatives on 26 June 2009.

under the Kyoto Protocol (***KP***) (i.e. 2008-2012) and gain "first mover" advantage; and

(c) Europe introduced (and the UK subsequently joined) the EU emissions trading scheme in 2005 on a voluntary basis for "first mover" advantage and to ensure that the global "carbon" market would be in Europe: not elsewhere.

Emissions trading, notably the CPRS, if designed correctly, will focus liable entities' minds to the material abatement costs (***MAC***) meaning, that they will make a decision to: either purchase Australian Emission Units (***AEUs***); or implement abatement technology such as renewable energy.

Australia is a relatively newcomer on the global stage of emissions trading: mainly due to the former Federal government's slow response and their negotiation of Australia's KP GHG emission reduction target for the FCP. Australia's target in the FCP is a 108% reduction based on 1990 levels by 2012[62]. In essence, the special provisions negotiated under the KP for land clearing will mean that Australia will probably meet its international targets by 2012 with little need for strong policy action at the national level.[63]

I do not intend to focus on the CPRS because, I do not believe that the CPRS will provide the price signal in the initial five years to incentivise RE

[62] This is 13% above the base line target for KP: which is a 5% reduction based on 1990 levels which Annex One countries ratified.
[63] See <http://www.garnautreview.org.au/pdf/Garnaut_Chapter7.pdf> at page 153.

deployment within Australia: primarily because of the large amounts of compensation being paid through one off payments or free AEUs to liable entities (under both the CPRS and RET) including recession buffer assistance; coupled with our low trajectories[64]; the delayed start date being pushed back to 2011; and full market trading commencing on 1 July 2012[65].

Therefore my focus of Australia's RE policy will focus on the RET and possible other complementary measures.

4.1 THE RENEWABLE ENERGY TARGET (RET)

The RET will not incentivise the demonstration of new RE, which will aim to be achieved through the measures discussed in section 3 above.

The RET[66] establishes a legal liability on wholesale buyers of electricity to purchase a certain amount of electricity from approved RE. From 2010 to 2020, wholesale buyers of electricity are required to obtain an additional 45,000 GWh of RE each year: it will be phased out from 2030. The RET will support the RE industry by enabling a higher price for electricity from RE to support the development of RE.

[64] Unless an "ambitious" global climate change agreement is reached in Copenhagen in December 2009
[65] See <http://www.environment.gov.au/minister/wong/2009/pubs/mr20090504.pdf> accessed 23 August 2009.
[66] Wilkins believes that only R & D compliments the CPRS: and that growth subsidies (RET/FiT): subsidy and rebate programmes are not complementary. As in the case of the RET/FiT, it dictates how part of the abatement tasks set by the CPRS is to be achieved and distorts decisions about which abatement opportunities should be utilised and is claimed to increase the cost of abatement. My experience in the UK and coupled with the new UK renewable energy policy and their low carbon transition plan would seem to directly oppose his view.

Each annual target represents the total additional RE based electricity for that year that parties liable under the scheme are collectively obliged to source. Liable parties do not need to implement RE but can meet their compliance obligations through purchasing renewable energy certificates (***RECs***) from accredited RE generators or from REC traders.[67] One REC equals one MWh of eligible RE[68].

The RET is effectively a cross subsidy which has proved effective in the past especially with wind but has proved expensive[69].

The Wilkin's Report notes three major arguments in favour of the RET[70], namely:

(a) Industry development: as the CPRS on itself would not be sufficient to deliver the amount of RE needed the RET will assist this development of RET technology;

(b) Energy security: some argue that without the RET, Australia will switch fuel supply from coal to gas as happened in the UK in the 1980s[71]; and

[67] That is: the secondary market.
[68] COAG Working Group on Climate Change and Water: Consultation Paper on the Expanded RET, page 6 at 2.1.
[69] Ibid at page 140.
[70] Solar energy in Australia benefits largely from rebates for installing PV panels: rebates for solar hot water: FiTs in some states (which provide a guarantee to price for the energy generated from the grid connected panels); the RET; and potential tax offsets for solar energy. See Wilkins at pages 141-142.
[71] It is claimed the RET will incentivise the export of gas and smooth the domestic consumption of gas reserves.

(c) Abatement: the RET will assist to meet our abatement that would not occur under the CPRS if the CPRS target/incentive is below the RET target incentive[72].

The Wilkins review showed that FiTs have been expensive in Europe[73] compared with other forms of abatement and are usually designed as cross subsidies rather than government grants reducing their transparency as energy users are effectively paying for the higher cost coupled with an emissions trading scheme. It notes that the RET will provide significant support with more certainty than the current rebate programme. If the government decides to incentivise the RE industry in the longer term this could be done through budgetary assistance (grants or through the tax system) rather than a gross subsidy[74].

It is estimated that the REC price will start around $63.00/MWh and then decrease over time as it will be capped at the shortfall price (i.e. $65.00 MWh) as detailed in the Electricity Charge Amendment Bill (Cth) (2009) at sub-section 6(1).[75] The prices in each year reflect the long-term contract

[72] The Wilkin's report at page 142. Wilkin's notes that: solar is best supported by: R & D; access to the grid; solar cities is useful (connecting urban areas around Australia); rebates (but expensive: as few people take them up as they require initial access to capital resulting in wealthier households taking up such technology: and has resulted in 16,000 PV panels around Australia but, they have not transformed the PV industry into a stand alone business without continued subject to budget decisions and often a boom or bust outcome for the industry. The price of solar is high compared to other sources of RE: however, many believe it will fall rapidly but it is not expected that the CPRS price will "pull" it into the market by itself and some estimate that it would require a price of $300.00 per tonne of carbon.government support). Ongoing use of rebates brings uncertainty in that they are transitory.

[73] Although, FITs have been the most widely used and provide the greatest RE penetration in the EU. See COM(2008) 19 Final at page 8.

[74] Wilkins review page 144.

[75] See <http://www.climatechange.gov.au/renewabletarget/publications/pubs/renewable_energy_electricity_charge_amendment_bill_2009.pdf> accessed 23 August 2009.

price for certificates that are required to support the RE generators that enter the market in each year[76].

The decreasing price path is explained as follows:

(a) Firstly, electricity prices have been expected to increase slowly over time so that the revenue required under the RET to recover investment costs decreases over time[77];

(b) As many RE generators continue to operate after the end of the RET, they could earn additional revenue from the electricity market as prices continue to rise after the expiry of the RET[78];

(c) RE more than doubles under the expanded RET with all technologies likely to have higher levels of deployment, however, about two thirds comprise additional wind generation and new geothermal (hot rocks) generation[79];

(d) Impacts on electricity markets: McLennan, Magasanik Associates (***MMA***) anticipates the expanded RET will have a modest impact on electricity prices. Wholesale electricity prices for 2010 to 2020

[76] McLennan, Magasanik Associates, *Report to the Department of Climate Change: benefits of the expanded renewable energy target* (January 2009) page 4 (***"MMA report"***).
[77] Although, this is offset by the increasing cost of RE as the target increases, but such increase is more slow than rising electricity costs
[78] MMA report page 4.
[79] MMA report page 6. The MMA report estimates RE generation reaches 54,300 GWh in 2020 or 20% the total generation of electricity (on a sent out basis) projected for that year. Without the RET, the same level of investment would not occur until 2035

average $65.09/MWh (without the RET) or $66.20/MWh (CPRS plus RET)[80];

(e) Retail prices for electricity in Australia are expected to rise by around 3% until 2020 and 3.6% from 2021 to 2030 due to the added cost of purchasing certificates[81]; and

(f) Wider economic impacts: GNP is reduced by around 0.2 billion per annum due to the expanded RET, representing a reduction in GNP of around 0.01% equalling a present value change in GNP estimated at 2.4 billion for the period to 2030.

REC prices, although capped at the "shortfall charge", are affected by a number of factors namely:

(a) The nature, cost and available resource of RE;

(b) Prices received for RE generation in wholesale electricity prices;

(c) Revenue earned from other potential services provided by RE[82];

(d) Short-term factors such as variation in climate from year to year;

[80] The difference being less than 1% over the entire period
[81] MMA report page 6. Adding up to $4.00/MWh to retail prices up to 2020 and around $6.00/MWh on average after 2020
[82] Such as ancillary services, avoidance of network costs, avoidance of waste disposal costs and green premiums

(e) Capital/operating costs as well as other factors will impact on the choice of RE[83].

The value of output for the RE generators will be equal to the prices received in the pool market minus a lost factor covering losing in transmitting the electricity from the generator to the market: in some cases RE generators will offer an advantage to customers in lowering the network losses.

Due to the operation of the national electricity market (***NEM***), the electricity prices vary significantly during the day: with the highest prices in periods of high demand (morning/evening peaks) with lower prices during the day or later in the evening. This diurnal cycle has a large impact on the sales revenue by a RE generator and the REC price required to support the project. Some RE generators will generate more during the day at a higher average price while others may not as they may merely replace off-peak electric systems and thus lowering prices[84].

Future REC prices are dependent on wholesale electricity market prices and the cost of RE: and the entry of more RE into the market will impact on wholesale electricity prices. Price may vary due to local supply/demand and transmission capability.

[83] These are likely to include: constraints on fuel resource availability (i.e. cost of biomass options which may need long-term guarantees of supply); changes over time of the capital cost of RE; lag times in developing RE projects (including the planning delay); community concerns over the visual amenity or other pollution issues associated with RE.
[84] MMA report at page 15.

The value of the REC may be determined by the difference between:

- The levelised cost of generation of the marginal renewable generation unit; and

- Electricity obtained in the market for the thermal generation it displaces.

Thus the basis for projecting the REC price is that the certificate price will relate directly to the cost of RE generation: it will equate to the difference between the cost of the lowest cost RE required to meet the mandatory target and the price for the electricity that can be obtained in the wholesale market[85].

Under the expanded REC, there is no limit on banking: so more RECs can be created in a year than required to meet the target to be banked and surrendered at a later date. This makes economic sense if the cost of creating the REC is lower than projected costs of purchasing an REC at a later date[86]. Banking means that the demand for RE can be higher than the interim targets in the early years and lower than the target in the later years and its impact on REC prices will depend on the level of banking and the costs avoided for creating surplus RECs[87].

[85] MMA report at page 16. It is predicted that most RECs will be traded under bilateral contracts with up to 20% sold on the spot market
[86] Will this be the case if RE generation will be more costly at the beginning?
[87] MMA report page 18.

It is expected that under the CPRS, new gas fired CCGTs may be adopted. In the longer term, new fossil fuel technology with low/no emissions are likely to be adopted such as IGCC using coal as a fuel and more efficient natural gas fired combined cycle plant[88].

MMA predict that based on fixed operating costs ($/kw): natural gas options will be the cheapest, followed by wind and hydro (the other RE technology has been the highest cost technologies, black coal (ultra-supercritical coal and USC with post-combustion capture)[89]. Although, it is unclear from the assumptions what price was placed on carbon and of course it does not include the regulatory risk of additional complementary measures and higher emission reduction targets: which have and continue to be brought into Europe.

MMA predict the bulk of new RE generation resulting from the expanded RET will be in New South Wales and Victoria as South Australia only experiences a modest increase due to the new RET: as higher levels of RE generation in that state are likely to cause wholesale market prices to fall[90].

MMA predict that the RE investment will be at least 70% from wind and new geothermal[91] and that without the expanded RET, the same level investment will not occur until 2035[92].

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[88] MMA report at page 25.
[89] MMA report page 25-27.
[90] MMA report at page 32.
[91] MMA report at page 34.
[92] MMA report page 35.

Following a review of some of the main consultee's responses to the consultation on the expanded RET the following issues were raised:

(a) **Liability and annual targets**: sustaining the 2030 target beyond 2020 as a potential long-term policy instrument[93];

(b) **Shortfall charge**: Roaring40's suggest setting the shortfall charge at a rate that will continue to encourage additional RE[94]. In addition Ausra believes that solar thermal costs more than wind to develop and therefore will be disadvantaged.[95] Both Sulzon and Energy Australia state that the shortfall charge should be linked to CPI and above the projected peak price of the REC to incentivise RE development[96]. Vestas notes that the short fall charge should remain until 2035[97] and that no phase out of the RET is needed as the CPRS will drive down prices of the REC until it reflects the true price of carbon. It will also assist RE technologies that are not yet commercially viable[98];

[93] Roaring 40's response to the Renewable Energy Subgroup Secretariat Renewables, Offsets and COAG Branch, Department of Climate Change RE Design Options for the Expanded National Renewable Energy Trading scheme (1st August 2008) (***"Roaring 40's"***) at pages 2 and 3.
[94] Ibid page 2.
[95] Ausra Pty Ltd Consulte response to the Renewable Energy Subgroup Secretariat Renewables, Offsets and COAG Branch Department of Climate Change (25th February 2009) Renewable Energy (electricity) Amendment Bill 2008 exposure draft (***"Ausra"***) at page 5.
[96] See Sulzon Energy Australia Pty Ltd Submission to COAG Working Group on Climate Change and Water Design Options for the Expanded Renewable Energy Target (***"Suzlon"***) at pages 3 and 4 and Vestas Australian Wind Technology Pty Ltd (***"Vestas"***) submission at page 3.
[97] The UK has extended their period until 2035 and may look to continue it in perpetuity. See below.
[98] Vestas page 3.

(c) **Eligible sources**: many consultees criticise the inclusion of solar hot water heaters under the RET[99] as this is "double counting" as they are already incentivised under other measures and will reduce the available capacity of base load RE. Ausra believes that by including solar hot water, the micro generation "multiplier" will both distort the RE market and take away incentives for base load RE development[100];

(d) **Banking RECs**: banking can create strong early mover incentive for investors and reduce the overall cost of the RET as the excess supply of RECs for less from earlier years will lower the cost of RECs on the market.

However, in my view, excessive banking may impact the level of RE capacity brought on line as liable parties in later years could partially meet RET targets by surrendering RECs procured by earlier generations. Suzlon[101] and Vestas[102] both support unlimited banking of RECs. However Ausra[103] believes banking will benefit wind over solar as investors seek to stockpile wind RECs in preference to other sources of RE[104];

[99] This was also the feedback from my consultation with the market in Australia.
[100] Ausra at page 2.
[101] Suzlon at page 4.
[102] Vestas at page 4.
[103] Ausra at page 2.
[104] Following my consultation with various market players it is the generally accepted view that wind will be the winner under the expanded RET and that it will not incentivise technologies that are not as mature as wind even if they are close to or operating on a commercial scale. This in my view is a design flaw.

(e) **Project eligibility periods**: means the number of years which the RE generator that is accredited under the scheme is entitled to create RECs. The eligibility period will impact on the level and profile of investment for the overall cost of the scheme as a short period may limit the amount of generators coming online or limit it to market ready technologies impacting on the energy mix. Roaring 40's notes that most RE technologies have an economic life greater than 15 years: so, by restricting the eligibility period to 15 years, RE may favour short-term projects as well as incentivise early replacement of RE generation[105];

(f) **Treatment of existing generators**: this will impact on the supply of RECs in the market after 2020 and the cost of the scheme: as investors could worry that pre-existing RECs could crowd out the market and impact on REC price/volumes, leading to insufficient investment in RE. It could also impact on the credibility of the scheme;

(g) **Duration and phase out**: the duration will impact on the cost of the scheme as well as the period of incentivisation for RE development, as RE schemes need 10-15 years (at least) of REC revenue stream to secure investment (i.e. term of debt funding). It is intended that the scheme be phased out between 2020 and 2030 as electricity prices under the CPRS allowing RE to compete with traditional

[105] Roaring 40's at page 5. This will link directly into the Power Purchase Agreement (***PPA***) discussed later in this paper.

generation on an equal footing supposedly without the REC. Phase out can be achieved through: ramping down the targets, restricting accreditation, reducing their non-compliance penalty or a combination of the above.

Sulzon, Vestas and Ausra have all requested a national solar FiT as solar costs more than wind[106].

The REC price has been fairly volatile due mainly to regulatory uncertainty: fluctuating from highs of $40.00 in September 2004 to a low of just above $10.00 in September 2008 (due to over supply from regulation supporting solar hot water heaters and the former Liberal government's election win in 2004). However since 6 September 2008, the REC price has risen (up until March 2008) with the previous Federal government announcing an increase in the RET and later the election of the Labor government[107].

In Australia around 40-60% of RE project's revenue comes from electricity they produce with the remainder largely delivered through RECs. Given that electricity prices can vary by as much as 25% between states, this is a significant barrier to investment in some states with low electricity costs[108]

[106] Sulzon at pages 3-4, Vestas at page 3 and Ausra at page 10. however in my view this anomaly could be rectified if Australia followed the UK example by banding the REC on a base load structure: so that, demonstrator and less mature technologies receive greater RECs than their more mature counterparts.
[107] Ernest & Young 20-20 Vision: Investment Challenges and Opportunities Arising from Australia's 20% Renewable Energy Target (***E & Y Report***") at page 4.
[108] Ibid at page 6.

5. FUNDING RENEWABLE ENERGY PROJECTS IN AUSTRALIA AND EUROPE

Government support primarily through correctly structured policy that provides incentives to polluters to reduce their GHG emissions is crucial to the development of RE[109].

With the exception of biomass: RE has zero fuel costs coupled with lower operating costs but it does have high upfront capital costs[110], so procuring initial finance is difficult for proven technologies and extremely difficult for early stage RE technologies[111]. This is why assistance is needed for RE technologies to operate on a level playing field[112].

Full cost accounting on a lifecycle basis[113] of various technology options should all be included in the market price for energy, which would make RE very commercially attractive.

The cost differential is exacerbated by the fact that mature fossil fuel technologies have benefited from not only long-term hidden subsidies, but years of learning, technology advancements and economies of scale.[114]

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[109] The Global Financial Crisis and its Impacts on Renewable Energy Finance, April 2009, Commissioned by UNEP's Division of Technology, Industry and Economics (DTIE) under its sustainable energy finance initiative and produced in collaboration with Frankfurt School of Finance and Management and New Energy Finance Limited at page 52, question 4D. In addition, the full economics of renewable energy verses fossil fuel will need to be understood by regulators to include both domestic and international benefits of climate change with the possible inclusion of a security premium providing RE with a cost advantage against imported oil. See http://www.renewables2004.de/pdf/pachauri_opening.pdf.

[110] See http://www.renewables2004.de/pdf/policy_recommendations_final.pdf at page 7 accessed 11th August 2009.

[111] Which will require "angel" investment; venture capital; private wealth; and/or government grants to reach commercialisation.

[112] Especially in times of economic uncertainty and short supplies of bank capital.

[113] Including costs for: climate change; fuel imports; fuel price; volatility; environmental; social; economic; and social impacts of fossil fuel.

High transactional costs and restricted access to finance are also barriers to RE development.

5.2 Innovative Financing Mechanisms (IFMs)

In respect of IFMs, if costs can be distributed throughout the supply chain the end cost to the consumer may be reduced[115]. In addition to national policy measures, direct foreign investment as well as the GEF may assist in funding RE projects.

The clean development mechanism (***CDM***)[116] has been widely used in funding investment in the "developing" world[117] and since trading began of Emission Reduction Units (***ERUs***) for Joint Implementation (***JI***) projects[118]; in early 2008[119], it is expected that ERUs will enable further investment in developed countries to assist to meet their national target[120].

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[114] See http://www.renewables2004.de/pdf/policy_recommendations_final.pdf page 7.
[115] Examples of such measures include: feed-in tariff (***FiT***) and Renewable Portfolio Standards as are used in Denmark, Spain, Sweden and the UK.
[116] A diagram showing how the CDM operates and is structured is attached at Schedule 2.
[117] Id note 108 at page 8.
[118] See project implementing steam boiler and steam turbo generator (CHP plant) to an existing Horlivka Coke Plant in the Ukraine at http://ji.unfccc.int/usermanagement/filestorage/mef827w6htdnyx0941bokvcil3spur accessed 1st August 2009. It may also be used to reduce fugitive emissions from leakages to pipelines.
[119] For an update of the joint implementation mechanism see http://unfccc2.meta-fusion.com/kongresse/090601_sb30_bonn/templ/ply_page.php?id_kongressession=1844&player_mode=isdn_real accessed 1st August 2009.
[120] See scoping document for the determination and verification manual (DVM) at http://ji.unfccc.int/Sup_Committee/Meetings/015/Reports/Annex4.pdf which was recently open for public consultation. The JISC's aim is to finalise this documentation at JISC18 (September 2009) before Copenhagen (December 2009). Australia is not currently registered for JI projects: although New Zealand is. Accessed 1st August 2009.

The UNEP Sustainable Energy Finance Initiative (***SEFI***)[121] provides current and targeted information to financiers and facilitates new economic tools combined in social and environmental factors as integral measures of economic performance. [122].

In August 2007, the secretariat of the UNFCCC estimated[123] that $US200-210 billion in an additional investment will be required annually by 2030 to meet global GHG emission reduction targets.[124]

Funding of smaller scale RE projects has benefitted from using dedicated funds; bundling of investment services; and customer based investments. This is often linked to "micro finance" (it has been especially successful with women in developing countries), which often meets the energy needs as well as assisting in the reduction of poverty.

By implementing RE incentives in rural areas and non energy sectors such as housing,[125] commercial buildings[126] and health, (with Tri-Generation[127]

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[121] The UNEP SEFI mission is to pave the way for global scale-up of investment in energy efficiency and renewable energy. SEFI's goal is to foster investment in sustainable energy projects by providing up to date investor information, facilitating deal origination, developing partnerships, and creating the momentum needed to shift sustainable energy from the margins of energy supplied to the mainstream.

[122] SEFI aims to provide modest amounts of capital and bring together financiers to work together and form public private partnerships (***PPPs***) sharing costs and lowering the barriers to sustainable development. The Global Financial Crisis and its Impacts on Renewable Energy Finance, April 2009 at page 64.

[123] See technical paper titled "Investment and Financial Flows to Address Climate Change".

[124] Public Finance Mechanisms to Mobilise Investment in Climate Change Mitigation: an overview of the mechanisms being used today to help scale up the climate mitigation markets with a particular focus on the clean energy sector at page 5.

[125] See Green Star: multi unit residential rating tool at http://www.gbca.org.au/green-star/rating-tools/green-star-multi-unit-residential-v1/1930.htm accessed on 1st August 2009.

[126] See Green Star: office design and as built rating tool at http://www.gbca.org.au/green-star/rating-tools/green-star-office-design-v3-green-star-office-as-built-v3/1710.htm and Green Star Office Interiors at http://www.gbca.org.au/green-star/rating-tools/green-star-office-interiors-v1/1530.htm both accessed on 1st August 2009.

[127] Generation that simultaneously produces: electricity, heat and converts heat energy to chilled water for cooling. As a guide: Tri-Generation plants cost around $AU3.5 million to $AU4.5 million per megawatt hour including all associated plant, heat exchanges, chillers, building costs, projects costs etc. This is an extra cost of around $AU1.5 million to $AU2.5 million per megawatt above the use of conventional generation the typical payback periods of eight years or more. However, GHG reductions are likely to be around 7,000 to 8,000 tonnes per megawatt per annum which is likely to enable trading revenues under the New South Wales energy

now being the preferred option for efficiently producing heat and power in hospitals fed by natural gas)[128], retail developments[129] and communication sectors can all lead to greater access to users of RE.[130]

5.3 Funding Renewable Energy Projects In Developed Countries And Economies In Transition.

Some of the policy measures suggested by the UN include:-

(a) Increased funding for renewable energy R & D[131]; focused bilateral and multilateral development agencies on catalytic funding of RE programmes in conjunction with a creation and extension of microfinance schemes that target consumers and small-scale businesses. PPPs are a successful means for developing such markets and should be further expanded[132];

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efficiency trading scheme or a national scheme when introduced as well as possible offset through REC's under the Renewable Energy Target when passed through the senate which has currently being split from the Carbon Pollution Reduction Bill. Currently these trading benefits are not included in the capital/lifecycle costs of development due to the regulatory uncertainty. Improved energy efficiency can reduce operating costs, for example, Opex may be reduced by 0.2% if energy and water costs are reduced by approximately 20% further reducing the payback period. In addition by improving staff retention through improving the working environment staff costs which are typically around 70% (in an acute hospital) of all operational expenditures may be reduced. See http://www.davislangdon.com/upload/StaticFiles/ausnz%20publications/technical%20reports/the%20cost%20of%20green%20star%20hospitals%20davis%20langdon%20research%20report%20final.pdf at pages 5 and 7 accessed on 1st August 2009.

[128] See Green Star: Education at http://www.gbca.org.au/green-star-rating-tools/green-star-education-v1/1762.htm accessed on 1st August 2009.

[129] See Green Star: Retail Development http://www.gbca.org.au/green-star/rating-tools/green-star-retail-centre-v1/1757.htm accessed on 1st August 2009.

[130] See http://www.renewables2004.de/pdf/policy_recommendations_final.pdf at page 8 accessed on 25th July 2009.

[131] It is noted that the IEA member governments (at 2004) allocated only 8% of their energy R & D to renewable energy. Governments have an opportunity to strengthen their RE by reverting the ration of funds allocated for RE verses those provided for conventional energy R & D. Demonstration projects with the private sector should be encouraged as well. See http://www.renewables2004.de/pdf/policy_recommendations_final.pdf at page 12 accessed on 1st August 2009.

[132] Ibid at page 13 accessed 1st August 2009.

(b) Promote RE through export credit agencies (***ECAs***) through the provision of credits or guarantees by ECAs to help mobilise private financing in RE projects[133]; and

(c) Utilise the power of procurement[134].

5.4 Funding Renewable Energy Projects In Developing Nations.

The UN suggests that governments should consider the following policy options and drivers when developing a strategy for such projects, namely:-

(a) Provide access to cleaner cooking fuels especially improved biomass for women to use in domestic cooking/heating;

(b) Provide access to electricity[135];

(c) Make use of new financing tools[136];

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[133] ECAs can help with developing a standardisation and simplify procedures for small scale RE projects so as to reduce transactional costs. They can also foster long-term contract terms (i.e. at least 15 years) and more flexible modalities (i.e. flexibility in repayment terms, liberal treatment of local costs, noting a higher share than currently allowed under the OECD arrangement, to adjust to the variety of RE projects).

[134] Governments can direct from top to bottom of the supply chain the guarantee demand for RE and technologies over a period of time which will attract investors and create market certainty. This happens successfully in the UK with the introduction of the Merton rule by Merton Borough Council which dictated that for developments over 1000 square feet 10% of all electricity was to be derived from onsite from renewable energy sources. This lead to the Carbon Reduction Commitment (***CRC***) in July 2009.

[135] The industrialised world provided electricity to rural areas through government support and cross subsidies among electricity customers. PPPs involving decentralised RE projects would be ideal. Other services include: training, education, feasibility studies, business planning, financing and linking to banks and community organisations.

[136] PPPs should be used to attract private sector capital for RE projects. The waste sector in the UK is the only environmental sector currently using developed standardised project finance documentation, which could be used as the model going forward for RE projects. Microcredit schemes should be adopted as well as third parties/customer financing for off grid RE projects plus support insurance schemes for all RE projects. Carbon financing could strengthen the leverage for further funding opportunities.

(d) International organisations play an important role in delivering RE projects. The World Trade Organisation (***WTO***) rules could be adapted to develop an international trade in RE as instruments for sustainable development, such as: trade in RE technologies and carbon certificates amongst those electricity markets that have significant targets to expand the use of RE[137];

(e) Include funding for RE in development cooperation programmes to alleviate poverty, rural development, education, healthcare, agriculture, water supply, sanitation, transport and construction;

(f) Increase base load RE through International Finance Institutions (***IFI***) lending, that is: the World Bank[138] and the regional development banks should encourage RE investments in developing countries and in economies in transition[139];

(g) Increase transparency in reporting on RE activities[140];

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[137] A key driver to RE development in the industrialised world, is the reduction of import dependence on external sources for their energy supply (i.e. security supply) so the removal of barriers to RE needs to be complemented by concrete measures for rapid technology transfer so as to reduce dependence on foreign technology.

[138] See http://web.worldbank.org/wbsite/external/topics/extenergy2/0..contentMDK:21456405-menuPK:4140682-pagePK:210058-piPK:210062-theSitePK:4114200.00.html for analysis of the World Bank's renewable energy policy, its carbon finance unit (which does not fund projects but purchases the CERs/ERUs from projects in "developing" nations or nations in "transition"; and bespoke funds such as the Carbon partnership facility, forest carbon partnership facility and the GEF).

[139] IFIs should: establish clear objectives for RE given the huge investment needed and assign RE a more prominent role in their strategies and portfolios sending a strong signal to the private sector; leverage grants and loans through IFI investments would attract private sector financing (e.g. PPP schemes); provide dedicated funds to increase investment in RE schemes; and apply full cost accounting for IFI lending see http://www.renewables2004.de/pdf/policy_reccommendations_final.pdf at page 14 accessed on 1st August 2009.

[140] IFIs and ECAs should fully disclose the information regarding their financing, lending, insurance and other relevant policies and contributions for RE as well as the role of PPP schemes.

(h) Because project implementation often occurs at the local authority/regional level, measures should be implemented to include:

- The establishment of local authority building codes to speed up RE investments;

- Strengthening stakeholder involvement in licensing and prioritising siting by fostering community and stakeholder involvement in RE projects, therefore reducing conflicts and difficulties surrounding permission procedures as well as application timeframes[141];

- Utilise the power of public procurement to create a market demand for RE investment;

- Establish public/private investment funds on a local level directly benefiting the local residence possibly coupled with PPP schemes;

- Develop an integrated suite of policy measures for other sectors: such as local utilities, transport, waste, water and sanitation.

[141] Local RE and siting plans should be developed as they would provide a greater certainty for potential investors and guide developers to areas where projects are more likely to be permitted.

5.5 Private Sector Preference for Policy Choice and Certainty.

Investors in RE projects view policy choices critical with a strong preference for FiTs, renewable portfolio standards (i.e. RETs' RO), efficiency regulations and standards, cap and trade, a long-term carbon price, stable subsidies, higher targets and tax breaks.

Most investors would like to see all or most of the above policy incentives implemented and that they are designed effectively[142].

It is widely anticipated that government funding of RE projects will increase as private equity, venture capital, project finance and capital markets decrease during the short-term. However, there are alternative funding mechanisms being used in Europe that are currently funding RE projects.

An example is the Private Finance Initiative (***PFI***) in the waste sector in the UK. Although the total GHG from the waste sector in the UK is 3%[143] billions of pounds is being invested by the UK HM Government on implementing the abatement technology primarily through capital grants to eligible projects that meet required and suggested risk profiles to assist with the capital cost.

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[142] The Global Financial Crisis and its impacts on Renewable Energy Finance, April 2009 at page 60, question 4m. An example of design flaws in regulation is the CPRS where innovation will be restricted due to large amounts of compensation being paid to polluters under both the CPRS legislation and the RET legislation, a low trajectory and a low fixed price of carbon for the first two to five years.

[143] See the executive summary of the Stern Report 2006.

The EU is looking at PPPs for RE projects[144] although, there are problems with the PPP structure in the UK namely: a lack of strong governance structure and ineffective partnership arrangements between the public/private sector through lack of representation on the board of the SPV resulting in projects specific decisions being made predominantly by the SPV and its stakeholder/supply chain to the detriment of the public sector and the public asset once it traditionally reverts back to the government on expiry is adversely affected[145].

Other financial mechanisms to incentivise the private sector include public finance mechanisms (***PFMs***),[146] which can be successfully implemented, bringing down barriers to investment as well as spread the risk between the public/private sectors.

However they must complement the domestic national policy framework: this is because funders must operate within the legislative framework of the domestic nation as well as facilitate investment that the private sector is unwilling to fund on its own. It is generally thought that while providing $1 of public money investing in a project; private sector funding between $3-$15 can be leveraged to assist with the funding of RE projects through

[144] There is a strong growing awareness that unless public money is used (as well as the public sector sharing risk with the private sector) to incentivise private sector involvement: RE technologies will not develop fast enough. See http://www.renewables2004.de/pdf/msd_en.pdf accessed 1st August 2009.
[145] Report by the Comptroller and Auditor General: Department of Transport – Failure of Metronet (London Underground PPP) at page 6.
[146] In the area of PMFs: UNEP SEFI have recently established the SEFI public finance alliance (SEF alliance) a partnership of public finance agencies focused on clean energy and climate sector development.

PFMs[147] which is strongly influenced by government policy, regulation and legislation.

An overview of PFMs is shown in the below table[148].

Mechanism		Description	Barriers	Financial Markets	Sectors
Debt	**Credit line for Senior Debt**	Credit line provided to CFIs for on-lending to projects or corporations in the form of senior debt	CFIs lack funds and have high interest rates	Undeveloped financial markets where there is lack of liquidity, particularly for long term lending, and borrowing costs are high	Large-scale RE and EE; wholesale loans for energy access markets
	Credit Line for Subordinated Debt	Credit line for CFIs for on-lending to projects with subordinated repayment obligations	Debt-Equity gap, whereby project sponsors lack sufficient equity to secure senior debt	Lack of liquidity in both equity and debt markets	Medium and small-scale
	Guarantee	Shares project credit (i.e. loan) risks with CFIs	High credit risks particularly perceived risks	Existence of guarantee institutions & experience with credit enhancements	Large-scale RE and EE and energy access markets
	Project Loan Facility	Debit providing by DFIs directly to projects	CFIs unable to address the sector	Strong political environment to enforce contracts and enabling laws for special purpose entity	Large and Medium scale EE and RE

[147] PFMs also have an indirect benefit in that they "roll over" and continue to stimulate secondary markets and multiple investments that both continue to grow after the initial funding has been expended. However, as with all investments the amount invested will only meet demand and that means either projects or technology need to be available to fund. See Public Finance Mechanisms to Mobilise Investment in Climate Change Mitigation: an Overview of the Mechanisms being used today to help scale up the Climate Change Mitigation Markets, with a particular focus on the Clean Energy Sector at page 6.

[148] UNEP & SEFI *Public Finance Mechanisms to Mobilise Investment in Climate Change Mitigation: An Overview of mechanisms being used today to help scale up the climate mitigation markets, with a particular focus on the clean energy sector: Advance Draft* (2008) at page 8.

	Mechanism	Description	Barriers	Financial Markets	Sectors
Carbon	**Carbon Finance**	Monetisation of future cash flows from the advanced sale of Carbon Credits to finance project investment costs	Lack of project development capital; lack of cash flow for additional security; uncertain delivery of carbon credits	Availability of underlying financing for projects. Adequate institutional capacity to host CDM/JI project and to enforce contracts	Large-scale RE and EE; programme of activities such as in energy access markets
	Carbon Transactions in post-2012 credits	Contracting for the purchase of Carbon Credits to be delivered after 2012	Lack of regulatory framework and short-term compliance driven buyers	Availability of underlying financing. Adequate institutional capacity to host CDM/JI project and to enforce contracts	Any GHG emissions reduction project
Innovative Grants*	**Project Development Grants**	Grants "loaned" without interest or repayment until projects are financially viable	Poorly capitalised developers; costly and time consuming development process	Can be needed in any financial market context	Any sector
	Loan softening programmes	Grants to help CFIs begin lending their own capital to end-users initially on concessional terms	Lack of FI interest in lending to new sectors; limited knowledge of market demand	Competitive local lending markets	Medium and small scale EE and RE

Mechanism	Description	Barriers	Financial Markets	Sectors
Inducement Prizes	"Ex-ante prizes" to stimulate technology development. Unproven in climate sector	High and risky technology development costs and spill-over effects	Sufficient financing availability to deploy winning technologies	Any technology sector
** Although all PFMs are concessional in some way, and therefore include some grant component, these grant based mechanisms do not include an underlying financing component, as this capital is expected to be mobilized commercially by the target CFIs.*				

5.6 Corporate finance[149].

Corporate finance uses a company's internal reserves or means it procures funds from private investors. This generally is unlikely to leverage the amount of capital required for large base load RE projects: but my experience shows that some core market players do use their balance sheet in the EU to fund expensive projects. However if it is used the company would first approach its normal lender.

For a new developer, retail banks are not accustomed to assessing RE projects and may decline the project unless the developer's business plan is extremely good and it may be more appropriate to approach the specialist energy or project finance department at the bank's head office[150].

[149] Financing RE Projects at page 6.

[150] Finance could be sourced from an equity placement; upon the issue; the bank finance in the name of the sponsor; internal cash flows; or a specific bank financing in the name of the project company supported by a parent company guarantee from credit worthy sources. In addition, grant aid may be available for a project deploying specific technology.

5.7 Debt finance[151].

Debt finance may be used in various structures such as joint ventures[152] and/or limited recourse funding[153].

Project finance is typically viable for projects with a capital cost over $10-20 million subject to tight contracts being implemented for all major project participants such as: fuel supplier, equipment supplier, construction contractor, project owner and power purchaser. Project finance is often chosen in order to dilute a developer's risk exposure or to increase the debt funding in the project or where there are multi sponsor projects or it is a non-core business.

The principal parties likely to be involved in a project finance transaction are: Shareholders; Lenders; Contracting parties (turnkey construction contractors; subcontractors; equipment suppliers; power purchasers; fuel/waste feed stock supplier; and network operator); and the Operator.

Because the project itself is expected to generate a stable and predictable cash flow necessary to repay the loans, lenders do not rely on the balance sheet of the sponsors for security. In order to guarantee the cash flow for the repayment off their debt, they will take security over the project assets

[151] Financing RE Projects at page 7.
[152] That is: a joint venture between the developer and a strong joint venture partner who is more readily able to raise capital.
[153] That is: whereby bank loans are secured against future cash flows rather than just physical assets and involve a series of contractual arrangements. This type of funding is one of the most likely financing routes for RE and is termed "limited recalls" to the developer in the instance of default because parties seeking compensation are limited to the project company (i.e. SPV) and not permitted to look beyond the corporate veil to a parent company. Therefore, it is not tradition for limited recourse funding to be backed up by a parent company guarantee.

and contracts giving the lenders the ability to control the project and even "step-in" and operate the project in adverse situations.

The most common means of taken security are:

- Assignment of priority rights to the project cash flow;
- Mortgage[154];
- Assignment of the project contracts;
- Contractual undertakings;
- Shareholder undertakings;
- Insurance; and
- Bonds.

The project contracts form the basis of the security structure creating the cash flow and underpins the project financing. For RE projects, the typical contracts are:

- Engineering, procurement and construction agreement (***EPC***)[155];

[154] Fixed and floating charge over the physical assets

- Fuel/waste supply contracts[156];

- Operating agreement[157];

- Power purchase agreement (***PPA***)[158]; and

- Shareholders agreement[159].

In a full "non-recourse" structure, the shareholders will not provide any undertaking to the lenders save an undertaking to subscribe the agreed equity.

However, where lenders are not comfortable with the risk profile, they will request "limited recourse" through some of the following measures:

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[155] The EPC (generally a "turnkey" construction contract: i.e. all the owner needs to do is "turn" the key following construction to operate the facility) will require a credit worthy contractor to design, engineer, procure and contract on a fixed price turnkey basis. The contractor will generally guarantee the performance of subcontractors and equipment suppliers and assume "single point" responsibility for overall construction of the project. The contract will include: completion testing and liquidated damages which will be payable if the tests are not met by an agreed date. The lenders will place significant reliance on the turnkey contractor chosen as their revenues depend on the facility operating and they may also require bond and guarantees from the turnkey contractor to guarantee performance in addition to liquidated damages.

[156] The fuel/waste supply contract's term will need to exceed the term of the debt facility by two to three years. The contract will specify: the price, amount and characteristics of the fuel to be delivered on a daily, monthly and annual basis. The supplies will need to be credit worthy entities with access to assured sources of fuel/waste over the tern of the contract. In waste projects in the UK, this is achieved through "exclusivity provision" or "guaranteed" minimum and maximum quantities (i.e. take or pay) provisions.

[157] The operating agreement: lenders will expect to see the operation of the plant being carried out by a company with an appropriate track record on successful operation and is crucial for technologies where the operational aspects are more complex than others. Operating agreements will often provide for the reimbursement of costs plus an incentive rate and performance fee and termination for no/poor performance.

[158] PPA: this is the corner stone of most RE projects. The off-taker must be credit worthy and the contract will need to extend beyond the term of the loan plus the ability to rectify/step-in if necessary prior to termination.

[159] Shareholders agreement: the shareholders agreement governs the relationship between the shareholders/joint venturers/partners and the lenders who will want to ensure the JV management mechanisms are appropriate.

Limited Recourse Requirements[160]	
Completion guarantees	In the case of significant risk of capital cost over runs, delays or of completion not being achieved completion guarantees will be required[161].
Specific funding obligations	Shareholders may be required to commit funds on a contingent basis for the future[162].
Insurance	Lenders will insist on approving the proposed insurance arrangements prior to committing funds and/or take an assignment over or joint interest in the insurances that are actually taken out[163].
Bonds	Lenders will often require the construction contractor to issue a performance bond, typically an "on demand" bond or subject to "agreed conditions" to cover payment obligations[164].

[160] DTI, *Financing Renewable Energy Projects: A Guide for Developers* (February 2000) ("***Financing RE Projects***") at Page 11.
[161] The guarantee may require the shareholders to guarantee the debt until the completion tests are met and this is often the case in RE project where there is a risk of technology failure for new/emerging technologies
[162] If a "change of law" would entail capital expenditure, which would not necessarily be funded by the project company, lenders may require the shareholder to commit to provide the necessary funds. However, in the waste market in the UK, this has been reduced due to mature "change in law" mechanisms whereby such risk is generally a shared risk between private/public parties.
[163] If the facility is destroyed or damaged the lenders will require to be paid the insurance proceeds who will have the right to commit such funds to the repair/replacement of the facility or repayment of loans: if the lender thought the project was no longer economical.
[164] The lenders will take an assignment or a bond to ensure that any call on the bond results in payment to a bank account that they control. A guarantee or standby letter of credit may achieve the same result.

5.8 Risk Transfer for RE Projects.

The key to structuring an RE project is to assign the risk to the party who is best able to manage that risk. That does not mean becoming completely risk averse, because if all risk is transferred to a third party, your project will most likely be too expensive and parties need to be comfortable with absorbing some risk, especially if it is a remote risk with low/medium level consequences.

Some of the key risk apportionment structures can be identified as follows:

Risk Transfer for RE Projects[165]	
Pre-Completion Risk	**Party best able to bear the risk**
Technology risk	Contractor/Equipment Supplier.[166]
Delay	Contractor.[167]
Capital cost overrun	Contractor.[168]
Post-Completion Risk	**Party best able to bear the risk**
Operating risk.	Operator.[169]

[165] Financing RE Projects at Page 11.
[166] Risk: structured through monetary damages for performance shortfall.
[167] Risk: covered by monetary damages as well as insurance.
[168] Risk: covered with a fixed priced turnkey contract coupled with completion cost guarantees for new technology.

Risk Transfer for RE Projects[165]	
Market risk.	Off-taker.[170]
Finance risk.	The financial markets can be used to hedge interest rate or currency risks.
Raw material/fuel/waste supply risk.	The supplier may offer long-term raw materials by contract. [171]

5.9 Typical Financial Terms for RE projects.

In today's market, small projects are difficult to fund, so it is difficult to indicate typical terms for an on balance sheet funding because they will be specific to the business in question.

However, on a typical project finance deal the below terms are common:

[169] Risk: covered through guaranteed minimum performance levels and insurance.
[170] Risk: covered through a minimum floor price in a long-term contract and the price and terms should be clearly defined with no "market out" clauses allowing for contract cancellation due to market conditions.
[171] In some instances, they may take a portion of "market risk" by providing raw materials at a price linked to the project output ("netback" arrangement). Alternatively any price escalator in the fuel could dovetail with that in the PPA.

Funding Terms for RE Projects[172]	
Level of Debt	The "gearing" in a project financing is typically market driven, based on the level of risk retained by the developer, and the type of project being financed[173].
Debt service cover ratios	Are the ratios of cash flow available for debt service divided by debt service (principle and interest) and is usually on an annual basis although it can be quarterly.[174]
Repayment term	Lenders will require full repayment of debt within the period of the major contracts, notably: the PPA or the waste supply contract for an EFW project.[175]
Covenants	Lenders will normally insist on a full range of covenants (i.e. undertakings from the project company).[176]
Conditions precedent	Lenders will require certain conditions to be met prior to the project company drawing

[172] Financing RE Projects page 14-15.

[173] The general rule is 60-80% of the funding will be debt funded. As RE projects are considered medium to high risks, debts/equity ratios vary and in general, low risk projects can procure between 85-90% debt: medium risk projects between 75-85%: and high risk projects between 60-75% debt.

[174] The gearing will impact on the coverage ratio and the two are closely related. Lenders typically require an annual coverage ratio in the range of 1.35 to 1.60, depending upon the risk profile and the time in the project life. Lenders will anticipate lower debt service cover ratios in early years but expect them to escalate over the life of the project. Because the lender's return is a fixed margin over base lending rates, with no scope for an improved return if the project is very successful, lenders look especially closely at coverage ratios which indicate the cash available to repay debt and are less concerned about the project internal rate of return (IRR).

[175] Typical repayment terms are between 10-15 years from operation depending on the term of the major contracts.

[176] In particular, they all seek to restrict distributions of dividends to shareholders in the event of poor project performance (i.e. if the annual debt service cover ration falls below a trigger level of around 1.3 to 1.4) even though their debt service is still being met. In addition a reserve of cash is often maintained in the project company for unseen events (debt service reserve account) and is often equal to three to six months estimated debt service and maybe as high as 18 months debt service. Occasionally they may require specific guarantees from the shareholders if the lenders are not comfortable with certain risks. This will be used in the future for carbon liability.

Funding Terms for RE Projects[172]	
	down on their funds.[177]
Interest rates – fixed or floating	Floating rated debt is typically placed over LIBOR (the London Inter Bank Offer Rate) in the UK.[178]

[177] Such as: all project contracts have been executed and are in full force and effect; a satisfactory report from an independent technical consultant (the bank's technical advisor); all permits, consents, etc. are in place; A report from an insurance consultant and all insurances are in place; and execution of the loan and security documentation and registration perfecting such securities.

[178] Where projects are linked to RPI, floating rates may be acceptable as interest rates and inflation are linked. Floating rates may be fixed through purchasing financial instruments such as: interest rate swaps and caps etc. from banks and it may indeed be insisted upon by the lenders

5.10 Sources of Funding

A typical "limited recourse" project is funded through: equity; senior debt; and subordinated debt, as detailed below:

Sources of Funding for RE Projects[179]	
Equity	This is the capital "at risk" from equity investors who expect an attractive return if the project is successful but must accept a lower return initially in order for the project to succeed.[180]
Senior Debt	This is debt provided by major international banks. In the UK there are about 40 banks that provide project finance with ten (10) to five banks leading the market.[181]
Subordinated Debt (Mezzanine Debt)	Is a layer of financing that comes in priority of payment after senior debt and for equity. Subordinated debt is not always available for RE projects.[182]

[179] Financing RE Projects at page 18-20.
[180] It is generally provided by the project sponsors but other institutions/investors may provide equity, namely: equipment suppliers and contractors; waste disposal companies who are seeking to diverse via inter energy related business; electricity supply companies who are also off-takers looking for unregulated income or other utilities (i.e. trade investors); institutional investors (i.e. pension funds, life insurance companies).
[181] Syndication of the risk to other banks is common and now during the recession of 2008/2009 banks are "banding" together to provide a percentage each of the debt funding: which is keeping project finance RE projects alive in the UK. Some banks have expertise in certain types of technologies: so, it is important that technology providers seek advice on this topic.
[182] It retains the essence of debt whist incorporating the attributes of equity and is a hybrid instrument and bridges the gap between how much senior debt is available and the equity available for the RE project. It would usually be provided by equipment supplies and/or contractors and financial investors.

5.11 Barriers to Investment in Renewable Energy.

Following are some of the main issues that prohibit investment in renewable energy both in Australia and Europe, namely:

Barriers to Investment in RE Projects	
Grid infrastructure and connection issues[183]	States like South Australia, where the RE capacity is large, the available capacity on the grid is small and cannot support much more RE capacity.[184]
Size of electricity market[185]	The larger the market, the more RE generators it can support without depressing electricity prices[186].
Electricity market regulation[187]	Some state's electricity market design discriminates against new market entrants and has a profound effect on the attractiveness of states developing RE projects[188].

[183] Ernest & Young Report at page 6.

[184] Ibid. In Australia, generators do not generally have to pay Transmission Use of System Charges even though it is a service with value: they only pay for the connection work/services to the grid – with all cost associated with the existing infrastructure paid for by electricity consumers. However, this general rule does not apply where a generator wishes to establish away from the existing transmission infrastructure and such costs for additional infrastructure makes their project uncompetitive against other existing generators. In New South Wales, due to considerable excess base load capacity, electricity prices have been low in the past few years however rising coal prices coupled with the introduction of the CPRS and increasing construction costs for new fossil fuel plants means this will be less of an impediment in the future. The Wilkin's Review at page 135 notes that integrating RE into the NEM will create challenges in relation to transmission infrastructure and load management.

[185] Ernest & Young Report at page 7.

[186] Ernest & Young Report at page 11. To ensure power quality and reliability, electricity output needs to precisely match electricity demand at all times: as you cannot store electricity (yet). New South Wales has the biggest electricity market in Australia with an annual electricity consumption of approximately 75,000 GWh. This indicates that there is room for several thousand MW of RE before curtailment might be necessary. Tasmania on the other hand has a very small electricity market, which is its greatest barrier to RE investment as well as the fact that there is a dominant state owed Generator. New South Wales' wind resource, although not as strong as some states, is still comparable to many EU countries that lead the world with their wind power capacity and it is expected many new developments would become commercially attractive under the RET. The NSW government is very supportive of RE and was an early mover in respect of the MRET and GGAS.

Barriers to Investment in RE Projects	
Planning process/community support	Planning processes can differ substantially between the states including: who handles the approval; application costs; documentation required; avenues for appeal; and standing for objection to projects.[189]

[187] Ernest & Young Report page 12 although there have been concerted efforts to reform electricity markets, some states continue to have barriers to new investment restricting access. Access for new entrants is possibly Tasmania's biggest issue as to date only the government owned generator has developed any RE in Tasmania.
[188] The E & Y Report notes at page 5 that although Western Australia has some of the best RE resources and high electricity prices (two important drivers for RE investment) the previous electricity market regulatory environment prevented a wind farm from being established unless the operator could exactly balance the wind farm's output with a customer's demand: however, regulatory reforms implemented in 2006 should see RE investment grow in Western Australia.
[189] In addition, different communities have different views on RE development. In New South Wales, the planning scheme could be improved as application costs are high compared with other states.

6. FUNDING RE PROJECTS IN THE UK/EU.

Currently in the UK, there is a shortage of project finance for RE projects leading to serious delays in the development of projects which in turn is leading to further economic difficulties for "developed" countries meeting their 20/20 RE targets[190]. Falls in carbon and energy prices, tight finance conditions and exchange rate fluctuations create risks for RE and other infrastructure development[191].

The funding structures and issues discussed above in paragraph five are applicable and used in the EU and the UK.

6.1 Finance Incentive Through Liability Under the EU ETS

Although the EU implemented the EU ETS in 2005, it was merely on a voluntary basis in order to prepare for the FCP. The EU ETS was the first multilateral carbon trading scheme of its scale in the world and is expected to deliver over 65% of emissions savings in Europe by 2020 (i.e. around 500 million tonnes in 2020)[192]. The EU ETS is the cornerstone of the EU's climate change policy[193] as well as the UK's: it covers around half the UK's carbon dioxide emissions[194].

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[190] BWEA: Powering a Green Economy: Wind, Wave and Tidal's Contribution to Brittan's Industrial Future at page 3.
[191] UK RE Strategy at page 53.
[192] UK RE Strategy at page 56.
[193] EU Package at page 17. In addition, it is the critical policy instrument to create additional incentives that stimulate changes in how the EU generates or uses its energy and has recently been expanded to include aviation (COM(2006) 818).
[194] UK RE Strategy at page 57.

The EU ETS covers emissions from large sources such as electricity generation industry[195]. It also allows liable entities to trade the right to emit TO each other: creating a carbon price and enabling emission cuts to be made where they are cheapest[196].

In addition, given the restrictive nature of the covered sectors; coupled with the fact that huge amounts of free permits were granted to the liable entities (based on their own assumptions of carbon dioxide emissions): little "real" incentive has flowed through to the liable parties to really invest in RE[197].

However, with the introduction of the new Renewable Energy Directive and more stringent targets under the EU ETS plus other Complementary Measures, I anticipate larger development of RE in order to meet EU emission reduction targets[198].

[195] From 2012 aviation emissions will also be included in the EU ETS.
[196] UK RE Strategy at page 57: that is, the Material Abatement Cost (***MAC***).
[197] The current financial crisis has also not assisted in RE development not only because the lack of finance to project finance and/or corporately finance RE deals but the secondary market in respect of European Union Allowances under the EU ETS have not been trading at real value due to an over supply resulting from the granting of free permits to polluters as well as liable parties cash flow restrictions which has resulted in trades on the secondary market of excess EUAs rather than developing RE.
[198] In particular, one of the EU's climate change aims is, in line with the Lisbon Treaty, to make the EU the most competitive economy in the world, especially with respect to new energy technologies such as low carbon energy technologies. See EU Package at page 19.

6.2 Renewable Energy Support Schemes In the EU

As far back as 1997, the Commission published a White Paper on renewable energy,[199] which announced a target to double the EU's renewable energy rate to 12% by 2010 communicated the need in part to address climate change and develop the EU's competitiveness and industrial and technological innovation[200].

Two key pieces of legislation[201] set indicative targets for all Member States and required action to improve the growth, deployment and access to RE. A biomass action plan was adopted in 2005[202] as part of the EU's monitoring of its progress towards its 2010 RE target. It published in 2007 the renewable energy roadmap[203] which highlighted the slow progress Member States were making and the likelihood that the EU, as a whole, would fail to reach its 2010 target: based in part on the indicative nature of the target and the uncertain investment environment provided by the legal framework. This has now resulted in legally binding targets for 2020 out of the EU RE directive.

The 2006 EU RE report showed that good progress had been made but the EU was expected to generate 19% of RE by 2010 rather than 21%[204].

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[199] COM (1997) 599 "Energy for the Future: Renewal Sources of Energy".
[200] Communication from The Commission to The Council and the European Parliament: The Renewable Energy Progress Report 24/4/09.
[201] Directive 2001/77/EC and 2003/300/EC.
[202] COM (2005) 628 "Biomass Action Plan".
[203] COM (2006) 848 "Renewable Energy Roadmap".
[204] This is a 21% target of electricity for RE in 2010: not to be confused with the 2020 target established under the EU RE directive which is for a 20% share of "all" energy (not just electricity): of which it is estimated that 33% of the 20% target for 2020 will need to be met by RE.

Significant additional effort will be required for the EU to meet its 2010 target[205].

Each Member State has different support schemes and stability of schemes is critically important to facilitate investment with constant "stopping and going" regimes that run out of budget as well as policy rule changes harming the development of RE. The development of a "premium FiT"[206] and more detailed technology "banding" has delivered improvements[207].

Due to the EU's understanding that a single support instrument is seldom sufficient to develop a full spectrum of RE sources available in one country, the EU uses a wide range of RE support schemes across its Member States[208]. It believes that, in terms of operating support, support per MWh for RE is far more important than investment support.[209] Such support is ideally through: quantity[210] or price[211] support instruments.

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[205] See: UK Low Carbon Transition Plan at page 4. Hungry and Germany have already reached their target whilst the UK is around 5% and countries such as: Portugal, Latvia, France (although: France has huge Nuclear Energy capacity, it is still required to meet its RE Target), and Slovenia which all need to make their progress in the next two years. It is clear that most growth has occurred through the use of solar biomass and wind energy.

[206] Historic observations in the EU suggest that FiTs achieve greater RE penetration at a lower cost to consumers than quota obligations (i.e. the RET in Australia). See Com(2008) 19 Final at page 8.

[207] Ibid.

[208] Commission Working Document, The Support of Electricity from Renewable Energy Sources, Accompanying document to the Proposal for a Directive of the European Parliament and of the Council on the promotion of the use of energy from Renewable Sources (23/1/08) at page 6 (***"COM(2008) 19 Final"***).

[209] Com(2008) 19 Final at page 4.

[210] Quantity-based market instruments: were at the time used in seven Member States. Government's impose an obligation on consumers, suppliers or producers to source a certain percentage of their electricity from RE. The obligation is facilitated by tradable green certificates (***TGC***) and RE generators can sell the electricity at the market price as well as sell the TGC with suppliers meeting their RE obligation through the purchase of TGCs. Tendering is another form of quantity based system where a tender is announced for the provision of a certain amount of electricity from a certain technology source and the bidding should ensure the cheapest offer is accepted. Denmark recently used tendering for the development of off-shore wind projects. See COM(2008) 19 Final at page 5.

[211] Price support mechanisms typically include: FiTs, premiums and fiscal incentives. FiTs are used in 18 Member States. FiTs and premiums are granted to operators of eligible domestic RE plants for the electricity they 'feed' into the grid. The preferential, technology specific FiTs and premiums paid to producers are regulated by the Government. FiTs take the form of a total price per unit of electricity paid to the producers, whereas the premiums (bonuses) are paid to the producer on top of the electricity price. An important difference is: the premium introduces competition between producers in the electricity market. Fiscal incentives (i.e. tax exemptions or reductions) are used as the main support scheme in two Member States. Producers of RE

The EU Package also notes that if it is to meet its aim of limiting global average temperatures rising to no more than 2 degrees Celsius above pre-industrial levels, it will require global GHG emissions to peak before 2025 and then reduce by up to 50% compared to 1990 levels by 2050: meaning, a lot of RE development is required in the next 16 years[212].

On the 23rd January 2008[213], the European Climate Change Programme Package of Implementation Measures for the EU's Objectives on Climate Change and Renewable Energy by 2020 ("***EU Package***") setting the targets for reducing emission to 2020 as well as targets for renewable energy development in Member States. The package also included a proposal to revise the EU ETS.[214]

The EU Package's specific objectives are[215]:

(a) to reduce the EU's GHG emissions by at least 20% below 1990 levels by 2020, which should be increased to 30% in the context of a "global and comprehensive international agreement"; and

(b) to achieve a share of 20% of RE, and 10% of biofuels by 2020.

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electricity are exempted from certain taxes (e.g. carbon taxes) in order to compensate for unfair competition they face due to external costs in the conventional energy sector (see the Climate Change Levy in the UK). In Nordic countries, coupled with high energy taxes, these tax exemptions can be sufficient to stimulate the use of RE. See COM(2008) 19 Final at page 5.

[212] EU Package at page 12.

[213] On the same date, the Commission adopted a Communication on the Renewables Roadmap proposing a binding target for 20% for the RE share of EU energy consumption and a 10% minimum target for biofuels share of transport fuel consumption. See EU Package at page 9.

[214] The European Climate Change Programme Package of Implementation Measures for the EU's objectives on Climate Change and Renewable Energy by 2020 ("***EU Package***")

[215] EU Package at page 19.

The main purpose of mandatory RE targets[216] is to provide certainly for investors and to encourage continuous development of technologies, which generate energy from all types of RE sources[217]. Each Member State is assigned a percentage of the 20% RE target based on their existing RE generation and their required energy mix by weighing the requirement against each Member States GDP[218].

Since its launch in 2005, the EU ETS has been amended and more changes will be introduced from 2013 in order to respond to some of the failings of the scheme[219]. One recent change is from 2008 the system goes beyond the borders of the EU to cover other members of the European Economic Area (EEA)[220].

[216] There is wide support for a stronger RE target by 2050: with some suggesting an EU Target of 50% by 2050. See EU Package at page 9.
[217] EU RE directive at L140/17.
[218] EU RE directive at L140/18. However, the 10% RE transport target is set at the same level for each Member State in order to ensure consistency in transport fuel specifications and availability.
[219] That is: over allocation of permits and windfall profits.
[220] Arnaud Brohé, Nick Eyre and Nicholas Howarth: with a forward by Nicholas Stern, *Carbon Markets: An International Business Guide* (2009) at page 127.

6.3 The EU Renewable Energy Directive of 23 April 2009.

The EU-Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 ("***EU RE Directive***") establishes a common framework for the promotion of energy from RE sources and sets mandatory national targets for the overall share of RE sources in gross final consumption of energy[221], amongst other things[222].

The commission recognises the opportunities for economic growth through innovation and a sustainable competitive energy policy and that RE production depends in large part from local or regional small SME generation. Opportunities for growth and employment, that local/regional investment in RE provide, are important drivers for the EU.

The EU RE Directive built upon and implemented the "Renewable Energy Road Map – Renewable Energies in the 21st Century: Building a More Sustainable Future" which demonstrated that a[223]:

- 20% target for the overall share of energy from RE;

- 10% target for energy from RE and transport;

[221] Meaning the energy commodity is delivered for energy purposes to industry, transport, households, services including public services, agriculture, forestry and fisheries including the consumption of electricity and heat by the energy branch for electricity and heat production and including losses of electricity and heat in distribution and transmission.
[222] Article 1: EU RE Directive.
[223] EU RE Directive at paragraph 21, L140/18: The indicative trajectories used should be based on 2005 levels of emissions as that is the latest year for which reliable data on national shares of RE are available.

- 20% target for improvement in energy efficiency by 2020[224].

Member states can also encourage their local authorities to exceed the EU targets[225].

Member states can also participate with other member states in cross border support of energy from RE without affecting national support schemes. It introduces optional cooperation mechanisms between member states which allow them to agree on the extent to which one Member State supports the energy production in another and on the extent to which the energy production from RE should count towards national overall targets of one or the other[226].

The EU recognises the market failure in current electricity prices of not including the external cost of carbon. It seeks to encourage full carbon accounting for electricity costs[227].

6.4 The UK Low Carbon Transition Plan 2009 (*"Plan"*)

An important function of EU law, is how Member States implement their binding EU RE Targets and I intend to review the UK response to highlight their climate change policy.

[224] Which will assist member states achieve their RE targets: which are expressed as a percentage of grossed final consumption of energy
[225] EU RE Directive at paragraph 23: L140/19.
[226] EU RE Directive at paragraph 25: L140/19.
[227] EU RE Directive at paragraph 26: L140/19.

The Plan sets the UK's plan to transition to a low carbon economy by 2020. Three quarters of the UK's electricity comes from coal and gas and the power and heavy industrial sectors account for 35% of the UK's emissions. The UK aims to provide virtually all electricity by 2050 from RE; nuclear or fossil fuels (with CCS if proven) and by 2020 around 40% from similar sources[228].

The Plan states that there is roughly 40% more carbon dioxide in the atmosphere than there was before the industrial revolution and such high levels had not been experienced on earth for at least 800,000 years. Global average temperatures have risen by 0.75% since about 1990[229]; global sea levels have risen by 10cm over the last 50 years and are conservatively estimated to increase between 18-59cm by the end of this century[230].

The Plan notes that the low carbon and environmental goods and services market is worth an estimated £3 trillion worldwide[231]. The UK's low carbon economy is now worth £106 billion per year and is aiming to be a world leader[232]. The UK also recognises their moral duty to act on climate change[233]: which Australia is struggling with.

[228] UK Low Carbon Transition Plan page 9.
[229] UK Low Carbon Transition Plan at page 23.
[230] UK Low Carbon Transition Plan page 24.
[231] UK Low Carbon Transition Plan at page 29.
[232] UK Low Carbon Transition Plan at page 30.
[233] UK Low Carbon Transition Plan at page 30.

The Plan acknowledges that the EU ETS will not be sufficient by itself to deliver the carbon savings required and thus Complementary Measures are being used[234].

The Plan aims to (amongst other things): deliver emissions cuts of 18% on 2008 levels by 2020 (over a third reduction on 1990 levels)[235]:

- Deliver emissions cuts of 80% by 2050;
- Generate 30% of all electricity from RE by 2020[236];
- Providing £120 million investment for offshore wind; and
- An additional £60 million of investment in marine energy.

The Plan notes that in order to avert the most dangerous impacts of climate change, global average temperatures must rise by no more than 2°C: meaning global emissions must start falling before 2020 and then fall to at least 50% below 1990 levels by 2050[237].

The UK has made good progress so far reducing its emissions by 21% below 1990 levels already: nearly doubling their KP commitment with over 800,000 employed in the low carbon business.

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[234] UK Low Carbon Transition Plan at page 9.
[235] The IPCC suggests developed countries should collectively reduce their emissions by 25-40% below 1990 levels by 2020. See UK Low Carbon Transition Plan at page 31.
[236] The UK's share of RE (in the EU) in 2005 was 1.3% and will need to increase to 15.2% by 2020. See EU Package at page 117 (Annex 6: Sharing the 20% RE Target amongst Member States).
[237] UK Low Carbon Transition Plan at page 5.

The UK electricity market is privatised and operates in a competitive market regulated by the Office of Gas and Electricity Markets (Ofgem)[238]

6.5 The UK Renewable Obligation (2002) (RO)

The RO is a similar policy tool to the RET in Australia[239]. It has increased RE generation in the UK from 1.8% (2002) to 5.3% (2008) and the UK is now number one in the world for installed offshore wind capacity and by 2010 the RO coupled with the LEC should be worth around £1 billion per year to the RE industry[240].

The UK have also extended the end date of the RO from 2027 until 2037 giving developers and funders' confidence that projects built up to 2020 will receive support from the RO to make them commercially viable: but, support per projects will be limited to 20 years[241].

In addition the UK is removing its 20% cap on RE generation to allow the RE market to grow as much as possible between now and 2020[242].

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[238] UK Low Carbon Transition Plan at page 55.
[239] My experience and recent discussions with Mr Peter Hanley (Head of Utilities and Climate Change: Macquarie Bank, Sydney, Australia) and Mr Nicholas Churchward (Senior Associate, Burges Salmon, Bristol, UK) both confirmed that Australian and UK Banks take a fairly cautious approach to securing debt to the ROC/REC and LEC due to: political/regulatory uncertainty, price volatility and technology risk all potentially impacting on permit prices. It would appear that market practice is either for these environmental benefits to either flow to the off-taker (for an increased electricity price) or stay with the developer (for a reduced electricity price) structured in the PPA.
[240] UK RE Strategy page 54 and the UK Low Carbon Transition Plan page 61.
[241] UK RE Strategy at page 55. Pre June 2008 projects will be subject to the 2027 phase out: whilst new projects will be eligible until 2037.
[242] UK RE Strategy at page 55.

The UK banded the RO in April 2009 to reflect the cost differences between the different technologies[243]. The banding policy is flexible and allows for early reviews of the banding if urgent action is needed[244].

The UK are also considering introducing a "revenue stabilisation mechanism" for RE generators to stabilise instances where RE generators receive excess profits if electricity prices are high they receive higher prices for "off take" plus the ROC and maintaining an unchanged ROC price in such instances may not be best value for consumers. In this case, it is proposed that the RE generators will not receive the full benefit of extra revenue, which could reduce the price paid by consumers. Alternatively when wholesale prices are low, both new and existing projects are not commercially attractive: it is proposed that they should not bear the full risk of wholesale price fall.

It is likely that rather than changing the RO a "contract for difference" mechanism will be introduced (as has been introduced in Spain and the Netherlands).

It would work alongside the RO as follows:[245]

[243] See <http://www.opsi.gov.uk/si/si2009/pdf/uksi_20090785_en.pdf> accessed on 23 August 2009.
[244] It is planned that, in order to ensure investor are able to secure an appropriate return on the investment in the current economic climate, offshore wind could receive up to 1.5 to 2.0 ROCs per MWh (if orders are placed in 2009/10) and 1.5 to 1.75 ROCs per MWh (if new orders are placed in 2010 to 2011) if they meet specified completion criteria.
[245] UK RE Strategy at page 57 to 59.

(c) In a period of time (i.e. yearly) when a wholesale value of RE exceeded a set level, RE generators would make a corresponding payment into a fund; and

(d) In a period of time (i.e. yearly) when the value fell below the set level, generators would receive a corresponding payment from the fund; and

(e) The fund's cash flow from the above payments will be spread across electricity supply.

Although the RO is available for all sizes of installations, it is focused on base-load RE[246]. For distributed energy where RO was not the right instrument, the UK government focused on grants making over £130 million available.

6.6 Proposed UK National Feed-in Tariff (FiT) for Renewable Heat

The Energy Act 2008 (UK) seeks to introduce FiTs and a Renewable Heat Obligation (***RHO***)[247] and is viewed as an important extension of the UK renewable energy strategy[248].

[246] UK Low Carbon Transition Plan at page 205. It is estimated that the carbon savings resulting from the RO will reach 93.9 million tonnes of GHGs (Budget 3: 2018 to 2022): the largest saving of all Complementary Measures in the UK.
[247] The RHO will be the driver behind a massive increase from renewable heat from current levels below 1% up to around 12% by 2020. The RHO will be available to a broad range of technologies and target groups.
[248] Heat is usually consumed near where it is generated and FiTs will support micro generation and small scale RE

It is expected that the simplicity of the FiT will compliment the RO by enabling those outside the energy business to get involved and it is believed that FiTs are the most appropriate mechanisms for distributed energy resulting in FiTs to be eligible for installations of up to 5MW[249] generation capacity per site: making it clear the RO will continue to operate for large scale projects – but some RE projects up to this cap will be eligible for both ROCs; LECs; [250] and FiTs[251].

FiTs are a legally guaranteed minimum payment per unit of electricity[252] for RE and already operate in 19 other EU member states as well as other countries worldwide.

They are viewed as attractive and effective tools for smaller non-professional generators[253] as it is shown with the community partnership project "citizens" wind farm in Creussen in Germany (population around 5000) where they implemented three turbines with a total capacity of 4.5MW (enough to power at least 2500 homes)[254].

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[249] 5000 kW.
[250] Levy Exemption Certificates (***LECs***) under the Climate Change Levy is a tax on fossil fuel generation of approximately 10-13% which RE generators are exempt from payment and may trade LECs with fossil fuel generators in order for the fossil fuel generators to meet their compliance obligations. See the Climate Change Levy (General) Regulations 2001 (UK).
[251] HM Government, UK Renewable Energy Strategy, presented to Parliament by the Secretary of State for Energy and Climate Change by command of Her Majesty (July 2009) ("***UK RE Strategy***") at page 63.
[252] p/kWh.
[253] i.e. homes/communities.
[254] UK RE Strategy at page 64.

FiTs should be in place by April 2010[255] and the RHO by April 2011[256] and the UK are providing £45 million of support for existing grant schemes up until the start of these schemes in 2010/11.

6.7 Proposed Additional New UK Complementary Measures

In order to assist the RE sector, the UK has doubled the rate of capital allowance relief available for new investment to 40% for one year (effective from April 2009) as well as freeing up £40 billion worth of new capital from the European Investment Bank (***EIB***) through direct lending to energy projects and intermediate lending to banks.

The UK is also bringing together the EIB, banks and developers to ensure that new framework lending and other products deliver rapid and sustained investment for small and medium RE projects[257].

In addition, taxation tax measures including the:[258]

(a) New zero carbon homes benefit from the stamp duty relief;

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[255] UK RE Strategy at page 65.
[256] UK RE Strategy at page 65.
[257] UK RE Strategy at page 53. Three UK banks started work on the 27th July of 2009 with the EIB on a programme to lend up to £1 billion to onshore wind farmers over the next three years. The cash, part of the additional £4 billion of EIB lending to support UK energy projects announced in the budget will help get building started for onshore wind projects which have been hit by the credit crunch: particularly small and medium sized farms. RBS, Lloyds and BNP, Paribas Fortis have teamed up with the EIB on the introduction by the Department of Energy and Climate Change and Her Majesty's treasury. Firms can also apply for DECC cash to develop offshore wind technology. There will be up to £10 million in grants part of the £120 million announced in their renewal energy strategy to support offshore winds.
[258] UK renewable energy strategy at page 62.

(b) Investment in certain energy saving plant and machinery benefits from enhanced capital allowances;

(c) A reduced rate of VAT applies to provisional residential installation of certain micro generation technology; and

(d) Revenue from the sale of ROC or LECs and electricity from household micro generation are exempt from income tax.

7. CONCLUSION

It is clear that policy on RE has been developing since the early 1970's. Had the US not walked away from the negotiating table upon the election of former President, George W Bush, the world would most probably have implemented more RE to-date.

However, America's absence, gave the EU a head start and it has and continues to race forward in the "race to the top" and it is where the global carbon market is currently based: although, I have not focused on America: it is not far behind, as it realises the importance of the new "green industrial revolution".

Australia has just implemented its expanded national RET: which will be a huge boost to RE investment in Australia, although favouring Wind and Geothermal. What is clear, is that the UK ROC is far more advanced than our RET and that we should learn from the UK experience on this quantity

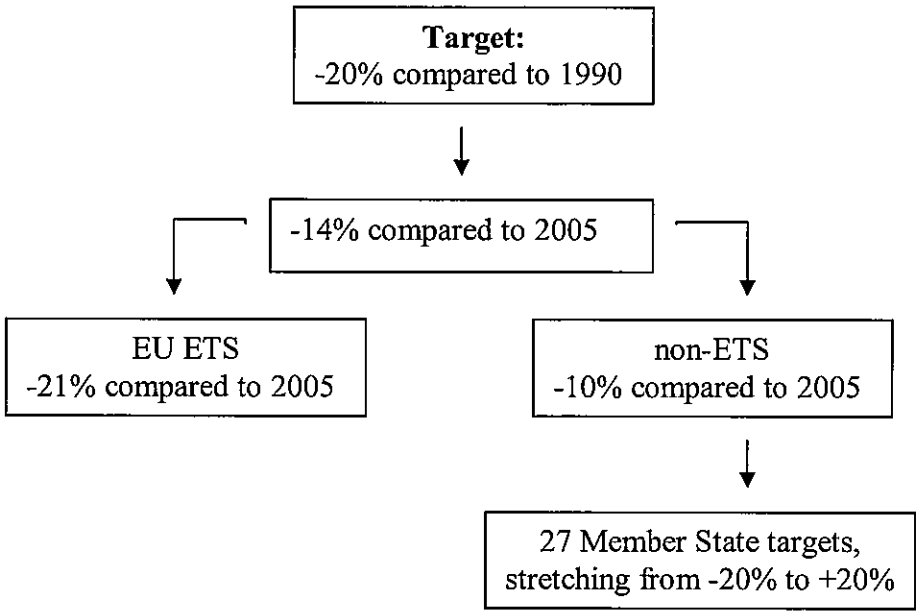
based policy tool. There is strong support from industry for a national FiT in Australia to possibly assist RE that may be disadvantaged under the RET.

Australia will need to be a "fast follower" as it appears unlikely that a substantial amount of RE technology will be developed in Australia. There is still strong political opposition to the Carbon Pollution Reduction Scheme in Australia, in part, reflecting separate but strong interests groups.

There are critical issues around: IPCC climate change projections; national policy choices for incentivising RE; barriers to investment and development of RE; access to capital; funding mechanisms to be used (especially in "developing" nations); and discussions in Copenhagen in December 2009, which will all impact on global responses to mitigation.

We are at a "tipping point" in the global economy: will Australia ride the tide or be dumped on the shore?

SCHEDULE 1: EU ETS TARGET



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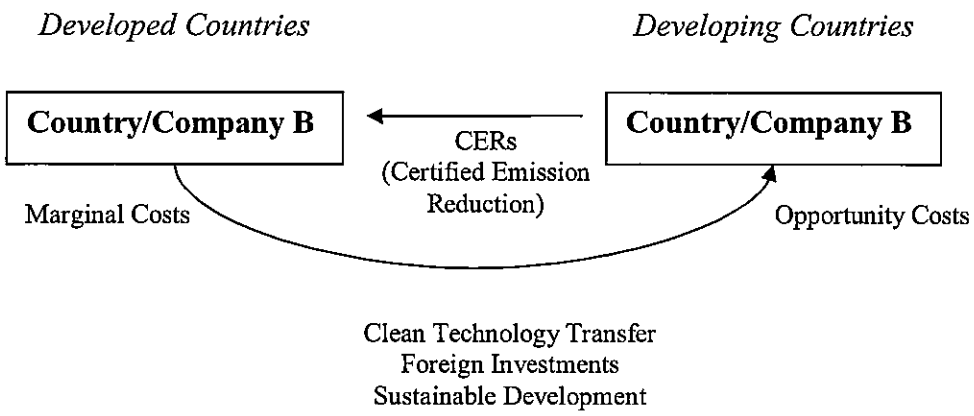
[259] Sharing of EU GHG emissions reduction target in 2020

SCHEDULE 2: CDM/JI



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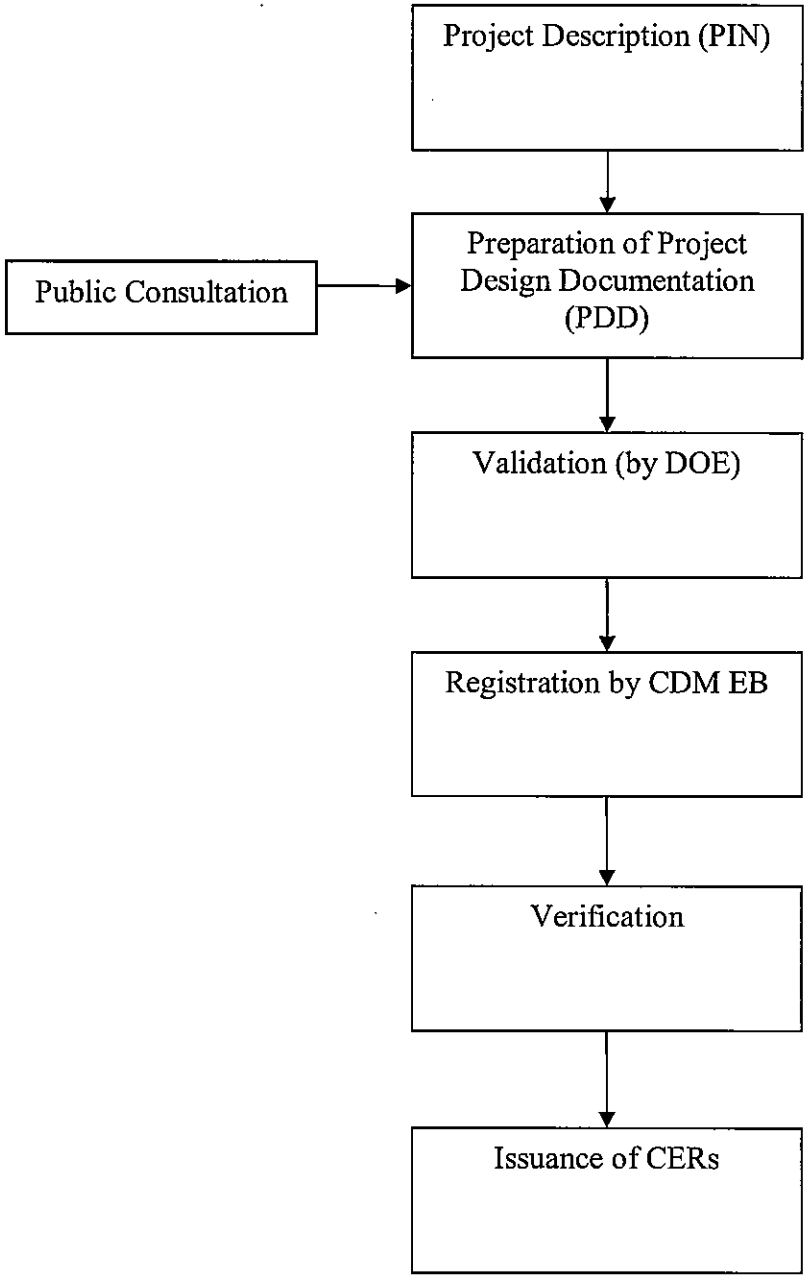
[260] Diagram of the operation of the CDM. The JI works in a similar way, except the technology transfer is from a "developed" to another "developed" country with the develop and/or funder of a JI Project taking the ERUs to assist their fund and/or offset their carbon liability.



261

[261] Stages for a CDM project. The same is true for JI mechanism except the terminology is different.

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2. Telephone Consultation with Ivor Frischknecht: Investment Director at Starfish Ventures (Australia).

3. Telephone Consultation with Nicholas Churchward, Senior Associate at Burges Salmon (UK).

4. In person consultation with Simon Hancock, Senior Associate and Osborne Clarke (UK).

5. In person consultation with Nadeem Arshad, Senior Associate at Bevan Brittan LLP (UK).

6. In person Consultation with Mr Stuart Weylandsmith (COO) of Oceanlinx Pty Ltd (Australia, UK and USA).

7. Telephone Consultation with Marcus Walker (RE Portfolio Investment Manager) Country Energy (Australia).

8. In person Consultation with Mr Peter Hanley, Head of Climate Change and Utilities, Macquarie Bank (Sydney, Australia).

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