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# Scaling up Renewable Energy in Developing Countries: finance and investment perspectives

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## EXECUTIVE SUMMARY

Scaling up the use of renewable energy is a key plank of building a genuinely low carbon energy system. This is needed to deliver both significantly reduced greenhouse gas emissions, greater energy security and resilience to volatile fuel prices, as well as access to modern energy.

Accessing greater finance and investment will be decisive to achieve higher levels of renewable energy (RE) uptake in developing countries. The scale of capital flows required are very significant indicating that private finance from outside national boundaries is likely to be required, alongside domestic sources of capital.

This paper, written for those involved in understanding and shaping policy, aims to provide an evidence-base from private sector financiers involved in developing countries (described as emerging markets) identifying issues faced in making RE investments in the 2008-2009 period. This provides a basis for understanding conditions for scaling up investment in renewable energy. The focus is on scaled-up implementation of available RE technologies, rather than early-stage technology development.

The RE sector in developing countries is on the radar screen for mainstream financiers and investors: and there is already private investment activity in many countries, although this varies widely. Significant commercial potential is seen in RE as a growth sector, notwithstanding the impact of the financial crisis, which was a strong feature of this period. Basic energy supply and demand, as well as climate change and domestic factors are key drivers for interest in RE.

### **There are several challenges to scaling up investment into renewable energy.**

Delivering an attractive commercial return for the risks taken is a central challenge for private investors, while taking into account that there are different risk/return thresholds for different investors. The linked issue of bringing RE technologies down the cost curve is also a priority to improve economics.

In common with the situation in industrialised countries, RE is rarely able to compete directly with conventional sources in the current marketplace. Characteristics such as high up-front capital costs, higher perceived risk as technologies and many project developers have less track record, and an existing policy environment often favouring or subsidising conventional energy, are contributing factors.

Smaller-scale endeavours face further challenges given the level of due diligence required as a proportion of the overall deal size. Small enterprise-scale finance is identified as a significant, but underdeveloped, market segment that has a critical role in delivering RE on the ground.

### **National Policy – crucial**

These and other challenges reinforce the absolutely central role of effective national policy in the markets and geographies that financiers do find attractive – this was strongly emphasised in all jurisdictions. There is no ‘one size fits all’ policy formula: the overall policy environment, including incentives such as feed-in tariffs, need to translate into commercial investment options.

To build an environment for attractive investment opportunities, characteristics of policy include: clear objectives, coverage of issues from planning and permitting to delivery and grid regulations, enforcement, a time horizon consistent with underlying finance needs, and stability: described as ‘investment grade’ policy in a companion paper<sup>1</sup>. Embedding RE policy in wider utility and energy sector policy, and tackling risk factors in the broader energy sector

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<sup>1</sup> ‘Unlocking Finance for Clean Energy: the Need for ‘Investment Grade’ Policy’, December 2009, Kirsty Hamilton, RE Finance Project, Chatham House.

is a central issue at the on-grid end of the market. In developing countries, a robust social policy, and clear economic policy, can contribute to the sense of market stability.

Gaps, failures or lack of integration in policy and regulation, that build risk for investors, are likely to result in a greater need for public finance to enable commercial investment in developed and developing countries; or put another way, a well designed policy environment can be one of the most effective ways of reducing risk for investors.

## Public Financing

Notwithstanding existing capital flows to emerging markets, and even in the context of strong national policies, developing countries present a range of risks for financiers that can make it difficult or impossible to invest. In this context multilateral banks and public financing (Export Credit Agencies and national development banks etc) have a key role in enabling commercial activity or accelerating it. Public finance has arguably increased in importance, both near-term to plug gaps in the provision of capital linked to the financial crisis; and to facilitate the very significant scale-up of private finance into RE in a much wider range of developing markets, as this has risen to the centre of the policy agenda<sup>2</sup>.

As yet, private financiers do not see government allocations to this agenda, through the multilaterals and public institutions, commensurate with the scale of financing requirements implied by climate scenarios.

*“The ‘mythical pot of gold’ [of private sector capital] won’t arise without clearly set out national policies, covering the energy sector; and a clearly laid out, scaled-up role for public finance that will augment what the private financiers are already able to do.”*

Private financiers are looking for well-targeted, well-designed and scaled public finance that fits actual gaps on the ground. Areas for attention include: smaller-scale projects; support for developers; accelerated commercial scale-up of key technologies to facilitate cost reduction; and delivery infrastructure. Greater integration between national policy development and availability of well-designed public risk reduction tools for commercial investment (e.g. around PPA payment security) is required. Board level mandates are likely to be required for public institutions in order to provide longer-term, more strategic provision to this sector.

## Next Steps: lining-up a roadmap

Although investment is already taking place, financiers are looking for a much clearer outline and plan for RE market development: the scale and timeframe policymakers want to achieve, the investment required, and mechanisms for facilitating this: particularly given the scale associated with mitigating climate change and by fundamental energy demand.

This is not so much a single roadmap, as building a shared agenda between policymakers and financiers to ‘line-up’ the key ingredients to enable investment plans to be made and capital to be mobilised.

This will need to be at national/regional level: particularly the development of effective national energy policy including wider infrastructure needs, as well as a foundation for designing international policy or public finance mechanisms.

Regular direct exchange between policymakers and financiers will be an important part of delivering this, as well as being a valuable method of getting feedback on, or anticipating factors that may impact capital flows.

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<sup>2</sup> There is a growing body of more detailed analysis on the role and options for public finance to ‘leverage’ scaled up private finance flows – see footnote 16 below.

## 1. INTRODUCTION

There is now a clear record of rising investment in the renewable energy (RE) sector, with strong exponential growth experienced between 2004-2007. The financial crisis emerging mid-2008 impacted global investment: growth slowed considerably in 2008, and in 2009 there was an overall decline of 6.5%, according to Bloomberg New Energy Finance. This decline was, however, much smaller than predicted mid-2009, and breakdown of statistics indicates that the market was held up by strong growth in the Asia-Oceania region, with investment in Chinese wind and solar plant a notable feature (increasing 27% and 97% over 2008 respectively), partly offsetting investment declines in the US and Europe<sup>3</sup>. Asia-Oceania investment overtook North American investment for the first time.

Despite the 2009 dip the overall trend is clear, and in 2008, for the first time, global investment in new RE power generation capacity (including large hydro) was greater than the investment in fossil fuel generation. In developing countries, in 2008 a detailed breakdown found financial investments reached \$37.7 billion a 27% increase over 2007, contrasting to a decrease developed country investment linked to the impact of the financial crisis. The share of global investment in emerging markets increased to 31% in 2008, a rise of 5% over the previous year.

There was also significant annual growth at country level in 2008: with investment in sustainable energy in China growing by 18% (25% in Asia-Oceania in 2009), India by 12%, Brazil by 76%, and in Africa as a whole by 10%, albeit from a small base<sup>4</sup>. These statistics underline that by 2008 emerging markets had become a clear growth sector for renewable energy investment, albeit in many cases from a small baseline.

The growth trend for renewable energy in developed and developing countries has the capacity to benefit in both directions. The increasing deployment of renewable energy together with lower cost manufacturing opportunities in emerging markets can accelerate further cost reductions and contributing to affordability, reinforced by the existing policy-led scale up and demand for renewable energy technologies in industrialised markets.

### 1.1 Method

To help policymakers better understand the public policy side of scaling up renewable energy in emerging markets, an evidence-base of the issues faced currently by financiers was sought, as an important perspective on next steps required.

This work was executed through three Finance Roundtables in India, Brazil and London in 2008 and 2009<sup>5</sup>, involving leading, mainstream, transactions-focused financiers in infrastructure and renewable energy (both banking and private equity), as well as public financing organisations<sup>6</sup>.

The Roundtable format used open questions: where and what private sector financiers were investing in; what factors were driving interest in particular markets; what issues were arising in the policy arena; and a sense of their perspective on market outlook for the RE sector in developing country markets.

This format provides an 'on the ground' evidence base from the financiers and investors at the front end of building RE market activity, and highlights key areas for governments seeking to scale up RE investment. The focus is primarily on renewable electricity, although several

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<sup>3</sup> 'Clean Energy Investment down just 6.5% in 2009; Asia outstrips the Americas', Bloomberg New Energy Finance press release, 7 January 2010.

<sup>4</sup> 'Global Trends in Sustainable Energy Investment, 2009', UNEP Sustainable Energy Finance Initiative and New Energy Finance, June 2009.

<sup>5</sup> The Roundtables took place alongside specialised RE finance conferences, originating with GreenPower Renewable Energy Finance Asia (Singapore 2007); and for this work Euromoney, Renewable Energy Finance Forums in India (November 2008) and Brazil (April 2009).

countries have a focus on biofuels (biodiesel, bioethanol), particularly Brazil, and several SE Asian countries.

The paper is based on the overview from the London Roundtable reflecting banks and investors with a mix of large-scale and small-scale interests, not country specific. Inputs and perspectives are included from the specific Brazil and India Roundtables, alongside additional input from financiers and project developers based or active in developing countries, and participation at relevant RE finance conferences.

This should not be read as a review of any individual national energy policy framework, as these are always evolving, but rather as an illustration of key finance sector parameters for investment.

## 2. CURRENT RENEWABLE ENERGY ACTIVITY

Renewable energy is no longer a niche market for many financiers, and there is already activity in a range of emerging, or developing, markets. On the radar from London are Asian markets, particularly India and China, along with Turkey, Morocco, South Africa and other parts of Africa, Middle East and Latin America, particularly Brazil, are also attracting interest.

Within Brazil, India, China and other developing countries some domestic banks and a range of international banks and private equity firms are investing or seeking opportunities in the sector; utilities, major construction companies and other large public and private project sponsors are active, as evident in the level of participation at specialist renewable energy financing conferences from China to the Middle East.

International banks are interested or already involved in emerging markets, particularly if they have a track record of involvement in other sectors in a particular country, or there is demand from their existing clients. Risk can be reduced and comfort levels increased by working with public finance institutions or multilaterals.

Private equity (PE) will generally invest in growth opportunities at the right time in market cycles, and the growth potential is evident in relation to RE in emerging markets, given energy security of supply, exposure to fossil fuel prices, climate change (although the latter may not be the priority at national level) and so on.

Energy supply deficits, in India, were described as creating a compelling investment case in the sector in general terms: "When economic coal runs out, then there is nuclear to fill the gap, perhaps – but it is a pretty chunky gap and all the issues need to be sorted to deliver [nuclear] on time and on budget". Solar is seen as having very significant potential in this context, even prior to the Indian government policy in this area.

Within the Asian region, from London, India was of particular interest due to the perception there is a level of financial stability, that banks are still around to lend, and that the RE market is relatively 'advanced' in terms of policy support and different technologies. Banks and private equity players from Europe and US were also in attendance at the RE Finance conference in India, alongside some strong local banking players and RE companies.

Within Africa, South Africa was on the radar screen plus parts of North Africa, however the rest of the continent is a different proposition. In the 5 years to the start of 2008, it was noted, only one independent power project reached financial close in Sub Saharan Africa (SSA), however during 2008 a raft of power projects were done, attributed to the acceptance of more commercial parameters by governments – in other words, a change only occurring very recently. There is also a significant power deficit across Africa raising conflicting aims between delivery of the cheapest generation, and the higher up front cost of RE – also experienced in other jurisdictions.

The challenge of affordability, or cost-competitiveness came up several times, not least as 'subsidizing' clean technology can be seen to take national resources away from areas such as healthcare, nutrition and education, although existing subsidies to conventional energy are also noted.

### 2.1 Factors helping to drive investment into countries

International banks and investors are interested in countries where they already have existing strengths, where the policy regimes are strong (discussed further below) and where they can get deals at the right scale.

Existing client interest will create interest in RE opportunities in a specific market, as will existing experience in the power or energy sector where country risks are understood.

Scale of opportunity is another key factor for some institutions. Given the extensive due diligence required to complete a project, or enter a regime, financiers want to be able to do multiple, or larger, deals to make that worthwhile. This contrasts with the fact that a significant



proportion of RE projects in developing countries are of small scale. There are specialised investors interested in particular sub-sectors and smaller-sized projects, with fund-raising for this space occurring. Finance issues linked to smaller deal size are discussed in section 4.2.

A set of risks that would otherwise be a barrier to investment, can be reduced through a range of public finance entities, including government-backed Export Credit Agencies (ECAs) such as OPIC in the US, EKF in Denmark; 'multilaterals' such as the World Bank, Asian Development Bank, European Investment Bank, and national development banks, e.g. the Brazilian Economic Development Bank, BNDES.

In addition, the quality and availability of the RE resource, and cost of relevant technology, will guide investment. For solar, for example, there are different technologies that can be used at different scales, from photovoltaics (PV) to concentrated solar power (CSP), and a limited set of countries with the optimal resource characteristics for the given technology.

This highlights the importance of accurate and comprehensive resource mapping at national level. At the Indian Roundtable, the need to complete wind resource mapping across the country was raised as a central issue for capturing the full wind potential in the country. On the finance side it is also a precondition for being able to assess the revenue generating potential of wind projects, given that electricity production is linked to wind speed.

It is also pointed out that RE in developing countries is a true market in that there is strong potential demand by end-users: 'unlimited need' for energy together with a willingness to pay for energy (even at the smallest scale end of demand). This strong demand is seen as a powerful underlying driver for investment, once policy conditions are in place.

### 3. FINANCIAL SITUATION

A powerful feature of the project period has been the financial crisis, with particularly acute impacts in the banking sector in late 2008 and the first part of 2009. The provision of debt was significantly constrained making financing more costly, if available at all, from international banks. Occurring on top of existing risks in many emerging markets,<sup>7</sup> this made conditions very difficult, and was a common message in developing countries, with notable exceptions in China, seen in 2009 investment statistics, and locations where there was less overall impact.

From a project finance perspective, particularly in the first part of 2009, there were often severe constraints on credit for bank lending. As a consequence many international banks returned to lower risk, known markets, known project developers: resulting in much more focus on western Europe and the US; and sponsors or project developers that were already clients.

Financial conditions affected the ability of banks to do deals: alongside less availability of debt it was more expensive, and in many instances loans only available for shorter tenors (6 or 7 years compared to 15 years). Internal competition for allocating capital within banks made deals more complex and slow. A degree of 'nationalism' also occurred as banks retrenched back to home territories, particularly those recapitalised by governments. All of these factors increase the challenge for RE development in new markets, particularly for access to affordable debt.

Although financial conditions bounced back by mid-2009, further easing towards the end of 2009, the general view is that conditions are not back to normal, and constraints will continue to play out over the next 2-3 years perhaps longer, as banks continue to repair their balance sheets. Nevertheless, throughout this period ongoing interest remained in the RE sector from private finance.

In London, an example of the impact of the financial crisis in India was provided. Pre-crisis, an estimated \$600 billion of RE investment in India had largely been through corporate balance sheets, backed up by guarantees. In 2007-2008, the first 'non-recourse' RE project financing was successfully closed, however, by the peak of the crisis this had become "last year's business". Banks that were doing business under the constrained financial conditions were operating on the basis of short loan tenors, making raising longer-term debt to cover the duration of a project extremely difficult.

Things were very difficult at the smaller scale end of the market, one London-based investor fundraising for rural local power generation in India, reinforced the fact that only a very limited number of debt financing institutions were interested in that market segment.

At mid-2009, economic conditions exacerbated concern that government commitment to RE policy would not be sustained. This added to the risk that an economic pendulum swinging towards a higher inflation world, coupled potentially with recession-linked lower electricity demand, added risk for projects with short tenor debt in that they would face refinancing mid-project, at a time of potentially higher interest rates. By the end of 2009, certainly in the context of European-based investment, longer loan tenors were once again becoming available<sup>8</sup>.

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<sup>7</sup> See also 'Private Financing of Renewable Energy – A Guide for Policymakers', Chatham House, Bloomberg New Energy Finance, UNEP, December 2009 ([www.chathamhouse.org/eedp](http://www.chathamhouse.org/eedp); and websites of the other organisations).

<sup>8</sup> Chatham House Renewable Energy Finance Project, 'Summary Note: UK Renewable Energy @ Q4-2009, looking ahead', January 2010.

*“Policies that we’ve seen in the last 7 or 8 years have done a marvellous job at creating a multibillion dollar industry. This has created truly global players that deploy technologies, a global sector. There is very little difference between products coming out of India, China for RE equipment, and what is produced over in Europe – it’s reliable but cheaper. The problem we have for the future, I’m personally not sure I believe that 15 year tariffs are going to hold.”*

Currency risk and domestic capital market engagement (for local currency based lending) is another factor that has to be managed. While currency risk is not new, the appetite for taking that risk over a project-length period by some banks during the financial crisis increased project costs. This is also raised further below, in Section 6, on the role of multilaterals & public finance.

One RE project developer from the Middle East observed that support for RE had ‘niched out’, in his view, over the last year or so, compared to 2008, as a number of variables came into play. These included priority being given to shoring up the balance of national accounts and fiscal induced issues linked to the financial crisis; meeting basic energy demand needs at lowest cost; and a perception that the west may be less committed to policies/directions as was initially thought to be (with international climate policy outcomes in Copenhagen given as an example).

### 3.1 Increased importance of public finance

Similar to the role of public stimulus packages in OECD countries linked to renewable energy, the role of the public finance multilaterals and ECAs in emerging markets increased in importance to maintain momentum and drive forward market development, given their potential both provide capital directly on both the debt and equity side, as well as reduce risk.

In Brazil, BNDES, the Brazilian state-owned development bank is a central and important provider of debt to RE throughout the crisis. However, the extent of their role did raise the matter that “a whole sector could do down if BNDES reviewed its policy on its debt provision.” From this perspective, at this risk averse time, relying on a single state-owned bank itself created a risk to the system. Should a change in its role occur, other multilateral lending institutions would have to be in a position to step-in otherwise there would be “very detrimental impacts on a large number of companies.”

While these issues and market sentiments may reflect a particular point in time after the peak of the financial crisis, nevertheless this strongly underlines the importance of governments reinforcing commitment to RE policies and linked incentives. Embedding RE policies as a central part of delivering broader medium-term energy policy objectives, if not economic and social policy, would help build market confidence.

*This highlights the need to engage regularly with financiers to understand market conditions, anticipate risks – on both the policy and finance side - in order to maintain, and accelerate, sector momentum. As one financier stated: “We need trillions of dollars coming into this sector.....how can this situation be managed so that we don’t end up getting into trouble with the sector in 3 or 4 years time [if economic or financial conditions worsen]?”*

Not all markets were affected by the financial crisis however: the RE Finance Forum in Beijing in May 2009, indicated that shortage of capital was not a central issue in China; indeed international financial sector players also described ongoing interest from their clients in China given very large potential for demand, and reinforced by the 2009 investment statistics. Across the Middle East impacts also varied between countries, not all being negatively impacted e.g. Saudi Arabia and Egypt where local financing has been more readily available, compared to the heavily hit Dubai.

More generally, one financier pointed to the important role that emerging markets have played in sustaining economic activity, noting that economic growth in Sub Saharan Africa, for example, continued at 5-7% regardless of global issues: “This should contribute to investors recognising that these are pretty good places to work”.

## 4. KEY FINANCE ISSUES

*"If you don't have a story where you're coming off this expensive curve, you might get one or two deals done, but why.... if it's just expensive and going to stay expensive, why would you do that?"*

### 4.1 Are the returns there?

Despite the level of interest, and market activity, a significant factor in enabling commercial investment remains the economics of RE relative to conventional energy. In most cases RE is not commercial on its own, making it difficult to deliver attractive return, and justify an investment case internally in a financial institution.

The challenges include: high up-front capital costs; the costs of the technology; various risk factors including country risk and those linked to the policy and broader business environment; and the costs of the existing energy supply in a country. The latter might be artificially low due to subsidies to conventional fuel (or in some situations linked to a large hydro base in the power system - installed capacity in Brazil, for example, is around 80% hydro).

Banks, private equity (PE) investors and institutional investors all have different expectations of returns, and will take different levels of risk. While banks will focus on the security of getting loans repaid, and need to understand and manage risks accordingly; private equity players will take greater risk but expect to get a higher level of return for doing so. Project developers will need both access to equity and debt financing, something which is harder if they are new companies as they have less track record. Perspectives from banks, private equity and project developers reflect these different interests.

To attract private equity as a source of capital, RE is still largely a rather low return proposition at present generating returns in the range of 8-15%, whereas 25% or so returns would generally be expected depending on the risk. While there is a set of PE actors looking for opportunities, "the pieces don't quite line up... to drive large scale capital infusion". This view at the London Roundtable was echoed in Brazil and India Roundtables, and has been exacerbated by the high cost of debt during the financial crisis.

#### 4.1.1 Moving RE technologies down the cost curve

As one global bank described the present challenge: without further government support 'how many rules of corporate finance can I break, and for how long?' Capital moves globally and therefore institutions will be making decisions relative to other options: as an international PE investor commented if there are higher returns investing in a policy-backed European market compared to an emerging market: "it makes it tough to justify investment there".

Other global finance sector players may adopt a strategy of investing in RE in the mature markets, such as western Europe and the US, to bring the technologies down the cost curve and then subsequently be more 'aggressive' in developing markets. To shift this strategy towards emerging markets earlier, governments will have to act to provide conditions or tools that reduce risk and increase returns.

#### 4.1.2 Emerging Markets Risk and RE Technology Risk

There is a range of risks that financiers will assess and need to be able to manage when considering the provision of finance in emerging markets. As described in the Finance Guide, these include the stability and maturity of the political system; overall legal, regulatory, tax and business environment; local currency investment and impact of exchange rate fluctuations, devaluation or the vagaries of domestic monetary policy; as well as energy markets, infrastructure.

Renewable energy technology risk is a further area: a particular type of technology may be perceived as having a relatively high risk due to less track record of operation, or that the financial institution has little familiarity with understanding and managing those risks. Project finance debt providers are generally not comfortable with taking technology risk generally and will expect the risk to be covered by other creditworthy parties or avoided altogether - technology risk is seen as an equity risk.

This makes things additionally challenging for RE, particularly compared to conventional energy technologies, and is exacerbated if project developers or companies looking for finance are relatively new companies, or new to sector, as their lack of track record will add to perceived risk for investors, making it more difficult for them to access finance.

At the Roundtable in Brazil, different issues were highlighted in relation to the demand for and supply of finance at different scales, highlighting the role for tools for mitigating risk for bank lenders, and availability of concessional equity finance.

- Project developers: public finance, will be particularly important for new actors coming in to the sector; these entities are likely to find it more difficult to get bank loans from both local financial institutions and international banks as they often have little track record, alongside perceived technology risk.
- Smaller investors: priority for public finance should remain focused on smaller investors or funds, or smaller deal size to enable them to be active players, given the particular issues they face (see section on smaller deal size below).
- Private equity players must be able to produce returns commensurate with their risk/return expectations. Financial conditions need to be monitored as conservative approaches by banking towards risk, and very high rates for loans, can stop PE moving into a region (noting that the Brazil Roundtable, in April 2009, was at a time of particularly constrained credit internationally).
- Local content requirements from national or local public finance entities (e.g. the Brazilian Economic Development Bank, BNDES) and the tax environment, need to be assessed by policymakers to ensure these are not obstructing investors or developers<sup>9</sup>.

#### **4.1.3 Challenge of capturing RE benefits for financiers**

Although RE is characterised by high up-front capital requirements that contribute to making RE appear 'expensive', nevertheless operating expenses may be low, particularly if the fuel cost is zero (solar, wind), and there is an added benefit of reducing national exposure to fossil fuel price volatility and attached costs, as noted by an international project developer in Latin America.

Subsidies to conventional energy also distort the cost equation making it additionally difficult for RE to compete in many situations. For off-grid small-scale applications, there is the benefit of avoiding the cost of new transmission or distribution infrastructure.

For the individual investment decision, however, these and other benefits are difficult to monetize and need to be recognised through the national policy environment.

These issues illustrate the importance of national policy to drive overall sector development and experience at national level, as discussed below. However, financiers acknowledge that

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<sup>9</sup> The 'Latin American Legislation Research Note' *New Energy Finance*, 4 August 2009, notes that local content requirements that have been a characteristic of some RE tendering processes in the region (e.g. 'Profina', Brazil's 2002 RE promotion policy where 60% of equipment had to be purchased in Brazil) will not play a significant role in the Region's more recent round of tenders in Argentina, Peru and Brazil. However, to access BNDES credit programme, loans must be used to purchase equipment produced in Brazil, although *New Energy Finance* notes that these limits do not apply to loans sourced from the various state-controlled banks (greater than 50% owned by the government).

the question developing country governments will legitimately ask is: ‘how much will it cost, for how long, to get where?’

As raised above, the affordability of RE, relative to conventional energy, is an important issue for policy development and policy stability.

This increases the focus on translating and aligning the benefits that RE brings with goals in areas such as energy security, economic and social development (including access to modern energy sources), industrial strategy and issues like climate change where increasing constraints on greenhouse gas emissions from fossil fuel can be anticipated.

## 4.2 Challenge of smaller deal size

A particular set of issues is faced by those engaged in smaller projects. As many financial institutions are only able to finance larger deals this, exacerbated by constrained financial conditions, means securing debt and getting projects off the ground has been particularly difficult, notwithstanding investor interest. This came up at all of the Roundtables.

The economics of smaller projects are not as attractive for project finance, particularly given the extent of due diligence required. Public finance institutions or export credit agencies (ECAs) also find smaller project finance options difficult. At the London Roundtable, a \$20 million waste-to-energy deal in Africa was given as an example of a project having difficulties for this reason, although even this is not a ‘small enterprise’ project and would normally be large enough to attract project finance from banks if soundly structured.

### 4.2.1 Due Diligence

One international bank described the debt-size typically of interest to commercial banks, as set out in the table below.

Debt sought	Attractiveness to commercial banks
>\$20 million or greater	Sponsors should be able to raise on non-recourse (project finance) basis from commercial banks
\$10 million to \$20 million	Some banks will provide this level of debt, but likely to be very difficult
\$10 million or less	Very difficult, if not impossible on an individual project basis

Due diligence costs are typically in the region of \$0.5 to \$1 million to fully assess the range of risks and other factors, the smaller the deal size the bigger the impact on project economics.

Banks will want to feel confident in the assessment of the various risks around the project, and structuring those, such that revenues required to repay the debt are secure (noting that, as a project proceeds, banks receive the margin they charge, but if the project fails the banks lose the remainder of their loan, minus any assets they are entitled to).

Although many banks are primarily interested in larger-scale projects, this can be in terms of overall megawatts of deals, and does not have to mean a single big project. Banks prefer not to do research into one country or region and then do only a single deal and move on. “Having done a lot of that legwork, you want other projects to follow, and renewable energy can lend itself to that.” Nevertheless, for financiers or developers seeking finance for one or two projects, or raising money for funds to invest at smaller scale, the situation is difficult given the typical situation above.

Private equity funds targeting smaller projects in Latin America emphasised the challenge in accessing debt finance, with banks seen as being very conservative about the real risks involved.

This indicates an important role for public finance entities in being active in this area, to facilitate projects below \$10 million-size accessing finance, and even more particularly below \$1 million - 'enterprise-scale'.

The US export credit agency OPIC (Overseas Private Investment Corporation) reiterates the lack of reasonable financing alternatives for SME borrowers considering transactions requiring less than \$20 million: it sees many larger international companies focusing investment in developed markets where there are stronger regulatory frameworks, stable political systems and an ability to hedge against currency risks. Nearly all of OPIC's financing and insurance transactions were undertaken by SMEs and private equity funds, which it sees as willing to take higher risks in search of higher growth returns.

#### **4.2.2 Enterprise-scale: significant market segment**

A further gap was identified between the micro-finance scale and conventional scale projects. The huge opportunity in micro finance is seen as fairly well established in terms of viability and profitability, however, the slightly larger 'enterprise level' – small institutions and companies - is very difficult to finance, and this is exacerbated if enterprises are new and don't have a long credit history, as above.

With the very low energy access to energy in many developing countries there is a 'true market' for more modern electricity. One African project developer noted that people already pay significantly higher rates for their power through dry cell batteries, kerosene etc; and the higher up front cost of RE is still competitive relative to those costs. Additionally, the load levels are much lower in developing countries. This, coupled with higher transmission losses, leads to better economics for the more modular RE sources compared to the very large generation sources such as coal.

The capital formation opportunity for this market segment is regarded as being at least as big in overall volume as micro finance, and yet few institutions are seen to be tackling this<sup>10</sup>.

Investors highlight the importance of some intermediation and aggregation at the enterprise level, as well as having the right range of products in place. Very importantly, this needs to be demand driven, which means both from recognition from governments (policy-driven demand), and getting banks comfortable with smaller projects, and methods for structuring finance.

As discussed in Section 6, below, more targeted focus on public finance in this area, including the extent to which government can support effort through state, local and regional banks, is regarded as being as important as efforts in larger projects by multilaterals and public finance institutions. Greater engagement with local financial institutions, alongside international lending and private equity entities, is seen as a key part of arriving at solutions. Kenya has recently announced a 'Green Energy Fund', for example, that will provide low interest loans to SMEs that want to generation RE or invest in EE projects.

#### **4.2.3 Local Financial Institutions**

In addition to more and targeted public finance, another solution for financiers is to work with local financial institutions (LFIs), an approach relevant for large as well as smaller-sized projects.

As well as being important actors at national level, LFIs can play a crucial role in getting the deals done and enabling overseas investors to enter a market. As well as issues linked to local currency based lending, LFIs can facilitate support from Multilaterals and ECAs by acting as the borrower, leading due diligence and taking local project risk, e.g. for ECAs and the

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<sup>10</sup> There is significant body of work for reference at the microfinance level, e.g. 'Access to Sustainable Energy Services through Innovative Financing', Solar Electric Light Company ([www.selco-india.com](http://www.selco-india.com)); and fostered through partnerships such as the Global Village Energy Partnership; and the Renewable Energy and Energy Efficiency Partnership. Enterprise-scale financing has been pioneered by organisations such as E&Co, [www.eandco.net](http://www.eandco.net).



external banks that work with them. This approach is seen as relatively streamlined. It also highlights the importance of LFI experience with the range of RE and energy efficiency<sup>11</sup> technologies, and the policy and regulatory context.

This was the case for one UK firm doing mini-hydro schemes in India that were too small to make project finance due diligence feasible for each project. In this case this firm worked with a local Indian bank that could take the project risk and do the due diligence, and this smoothed the way for involvement of a public finance entity alongside the firm.

However, involvement of local banks is not always straightforward. Not only do many LFIs not have a track record with newer technologies, but one financier active in Africa noted that African banks generally don't have large dollar reserves meaning that finance will involve local currency risk and exposure to base interest rates. Floating rates are made up of a margin, or spread, on top of the base lending rates that might be in the 18-20% range, if not more, making long-term finance costly and very difficult in local currency. In Africa most large local currency funding is linked to the 90-day local Treasury bill rate, which also determines local bank base rates (as 90 day T-bills are an alternative use for money rather than lending). This means pricing is determined by African governments appetite for cash, described as 'often voracious' and the impact this has on interest rates, with 45% interest rates noted at one point in Zambia.

In addition, experience has found that local banks are often reluctant to provide the long tenor loans sought by many RE projects (and large conventional power projects): 15 year loan tenors are needed given the cash flow profile, for debt repayment. However, for many banks, as well as credit risk issues from longer loans, the banks' own balance sheet needs managed given the risks of providing long-term debt based on short term deposits. The underlying issue is the degree of sophistication of capital markets required to provide access to long-term finance. In Africa where 'not many' countries have bond markets, and even where this does exist, e.g. Tanzania, the liquidity doesn't go beyond 5 years. This means that mobilising finance for small projects through local banks is seen as very challenging in the short term, with public finance solutions only starting to emerge.

To conclude, according to one experienced financier in this space, the smaller deal size is 'the name of the game' for most developing countries (except perhaps the larger emerging markets) in the next years. It is also seen as a stepping-stone for getting to larger deals. Hence the importance attached to establishing proper market conditions for smaller projects in the immediate term, alongside efforts to attract capital in to large-scale opportunities for more rapid scale-up in the energy mix.

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<sup>11</sup> The importance of local financial institutions also came up in a report examining lending perspectives on energy efficiency internationally: 'Energy Efficiency and the Finance Sector: A Survey on Lending Activities and Policy Issues', January 2009, UNEP Finance Initiative. [http://www.unepfi.org/fileadmin/documents/Energy\\_Efficiency.pdf](http://www.unepfi.org/fileadmin/documents/Energy_Efficiency.pdf)

## 5. RENEWABLE ENERGY POLICY

### 5.1 Key role & characteristics

Policy has a central role in investment decisions<sup>12</sup>; this is an emphatic message from financiers. Setting aside constraints arising from the financial crisis, the fundamental issue for financiers is whether the policy framework establishes attractive conditions for investment, rather than the availability of capital per se.

If policy is in place the capital will be available: “if you give investors the certainty the money will come”: the overriding view at all of the roundtables, and overwhelmingly reinforced. Put another way: even if a large pool of capital is available, conditions on the ground have to be in place for private finance to be involved.

*“Everything depends on policy, without the right policy we are not going to get very far.”*

One experienced private equity player in Latin America described three areas as being of particular importance to investors: political risk in a country; policy and regulatory risk (certainty, visibility and a degree of immunity from political change); and capital or financial risk. The priority for governments should be tackling policy and regulatory issues, as financiers already have experience in understanding and managing the other two.

The scale of opportunity, and the countries that have clear, supporting policies and incentives will attract the most attention from financiers: “It’s a combination: where can a bank [or equity investor] play to its strengths, where there is the scale, and what, most importantly, are the incentives that drive that.”

Financial institutions that are looking for opportunities regionally, or indeed globally, seek the most favourable regime for providing returns.

#### 5.1.1 Clarity and Simplicity

The overall objective of the policy needs to be clear. For RE, a volume increase in the energy mix; bringing technology costs down; industrial policy, and meeting basic demand for power, or market access to electricity in off-grid urban or rural situations will imply different policy or regulatory approaches.

The need for simplicity of policy and incentives was also strongly emphasised. In a large deal a bank will have to explain the objectives and details of policy and regulatory issues across the deal from planning to delivery (and revenue generation) to an extensive set of people, including the credit committee that finally approves the allocation of funds. “If it has hair on it [complex], it gets very difficult, and therefore even more difficult if introducing newer kinds of technologies.”

As stated: “On the due diligence side, the key to the most effective policies to access the largest amount of capital is simplicity.” A complex due diligence process will expend more time and resources understanding risks, given the need for confidence in debt repayment and an adequate return on investment.

On the incentives, a London-based perspective is: “...if it’s a case of saying the Spanish government is going to pay you this much for the next 20 years [through its feed-in tariff]... it is relatively straightforward”, but “much more complicated than that it gets very hard to explain.”

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<sup>12</sup> As above, a general Chatham House paper on the importance of ‘investment grade’ policy (‘Unlocking Finance...’, December 2009) highlights that providing the conditions for financing needs to move to the centre of policymaking. Well-designed, precise policy covering all aspects in the ‘boundary of the deal’, with the right duration and stability, is key to reducing risks, providing commercial returns, and attracting finance. This is equally relevant to the policy piece of scaling up RE investments in developing countries.

Although there remain inherent complications in any policy system (the design of a 20 year feed-in tariff may include a range of features that need understood in detail), market based systems can be considerably more complex: “if the market is relatively new - you might be relying on a spot market rate, from a market that has been set up under a set of rules defined by a government that has only been in place for six months, and so on. That’s much much harder to do.” As discussed in section 7 below, a model based on a theoretical ideal of market efficiency, may in fact increase risk.

Land-use processes and permitting or licensing requirements are also important (in common with OECD markets<sup>13</sup>), alongside transmission grid access issues. One international bank highlighted the opportunity for governments to make things considerably easier by streamlining the permitting process (preferably a single government institution), and ensure that the overall process and associated information and relevant official contacts required by investors are available on one regularly updated official website, saving time and money.

### **5.1.2 Support mechanisms**

As with RE in industrialised countries, policies and support mechanisms play a crucial part in RE investments, as RE technologies rarely compete directly with conventional sources, as discussed above.

Providing conditions for attractive risk-adjusted returns is therefore a vital part of enabling domestic and international private finance to opt for renewable energy. Financial institutions, whether domestic or international will have alternative uses for capital, whether other sectors offering greater returns; other energy investments that are more familiar to financial institutions (and therefore are seen as lower risk); or potentially other geographic locations.

Existing experience with a range of RE electricity incentive options in the EU and US contain important lessons on effectiveness of support mechanism design, with policy design characteristics described by emerging market financiers in 2004 as ‘long, loud and legal’<sup>14</sup>: ‘long’ meaning that policy goals and incentives need to reflect project duration; ‘loud’ meaning sufficiently attractive to make a difference to the bottom line, and set in a legal framework to improve the perception of policy stability.

Feed-in tariffs are commonly regarded as the most successful, where a set price is awarded for delivering RE electricity to the grid, producing a stable revenue stream that is attractive to financiers and investors. Feed-in tariffs have resulted in considerable volume growth in countries such as Spain and Germany, although feed-in tariff design details and stability are also very important, with Deutsche Bank describing characteristics as transparency, longevity and certainty, TLC<sup>15</sup>. Other mechanisms include renewable energy certificate trading, linked with obligations on suppliers to provide a set volume of renewable electricity, the UK and Italy for example, and Renewable Portfolio Standards in the United States (currently at state-level); tax based incentives which have been used at Federal level in the United States, alongside various state based targets, grants, plus incentives via utility tariff setting. There is certainly attention in developing countries to the effectiveness of these existing policies, particularly from international banking or PE players that may have experience of investing in renewable energy under those support regimes.

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<sup>13</sup> Also covered in ‘Unlocking Finance for Clean Energy: the Need for ‘Investment Grade’ Policy’, December 2009, Chatham House.

<sup>14</sup> A Roundtable with emerging markets financiers formed one part of financial sector input to the Ministerial International Conference on Renewable Energies, Bonn 2004; and also reflected in, amongst other documents, an Information Paper for the UNFCCC Workshop on Innovative Options for Financing the Development and Transfer of Technologies, by Paul van Aalst, 2004, as well as documents and presentations from the finance sector and others.

<sup>15</sup> These issues are discussed in ‘Unlocking Finance’ paper, December 2009, Chatham House; also in a report by Deutsche Bank: ‘Paying for Renewable Energy: TLC at the Right Price, Achieving Scale through Efficient Policy Design’, DB Climate Change Advisors, December 2009.

### **BOX 1: BRAZIL: EVOLUTION OF NATIONAL POLICY APPROACH**

At the Brazil Roundtable, financiers described Latin American countries as adopting their own approaches reflecting national circumstances, stage of policy development, and the evolution of policies and support mechanisms at national level. Energy demand is growing at 5% per annum in the region and an estimated 90GW of new supply is needed in the coming decade (a 50% increase over current installed capacity), focusing attention on indigenous sources of supply, and a perception that renewable energy will be a growth sector in the region.

Tenders or auctions are an approach used in Brazil and a range of Latin American countries. New Energy Finance notes that Argentina, Brazil, Mexico, Peru and Uruguay, for example, use or have signalled intention to use specific tenders to support achieving RE targets, sometimes linked to a single technology (e.g. wind), sometimes a range. This enables the national regulator or national power company to organise implementation of RE in line with goals. Success of this approach will be linked to factors such as the attractiveness of power purchase agreement (PPA) prices, often pre-defined prior to the tender; whether there are national content requirements for equipment, which can be an obstacle for some project developers; and other issues e.g. transmission grid access.

The first major wind-only auction in Brazil took place on December 14, 2009, and is an example of the evolution of the Brazil's national tendering approach coming after its 'Proinfa' programme, adopted in 2002, after a time of severe power shortages. Proinfa introduced a goal to implement 3.3GW of RE, broken down into wind, biomass and small hydro, and implemented through a tendering process (Proinfa included mandates on Eletrobras, the main utility, to accept the energy, with costs passed on through the tariff). As described at the Roundtable, the price was very high, but acceptable due to 'alarm' at the power rationing that had been experienced.

There were a number of lessons from Proinfa, as raised at the Roundtable and in further input. Finance was not generally seen as a limiting factor under the programme, although in practice this may have been the case for larger developers or companies that could afford the level of guarantees the Brazilian Bank of Economic Development, BNDES, was looking for (reported as 130% of investment), and as a Proinfa mandate BNDES was the only bank allowed to provide financing loans under programme. Teething problems were also noted for some developers, and after five years of Proinfa it was reported that only 30% of wind has been installed in part due to the technical quality of projects presented to the programme. The 60% local content rule also raised issues: in the case of wind there was just one manufacturer with available stock at that time.

However, despite these issues, many associated with new sector development, Proinfa is regarded as having built new RE sources into the mix, lowered costs, created the sense of the potential for the development of an RE industry, and it provided an important national experience base both on the policy side and the sector.

With energy demand projected to continue growing at close to 5% per annum out to 2020, the government strategy revolves around securing energy supply. According to information released late in 2009, prior to the auction, the ceiling price for the auction was established at a level on average 25% lower than during Proinfa tariffs, and there was significant interest. However, New Energy Finance analysts indicate that constraining factors are that the price ceiling could squeeze margins throughout the value chain and put pressure on local project developers as well as turbine manufacturers, although ongoing restrictions on use of imported turbines, vis a vis access to lower cost financing, will benefit local manufacturers.

In Brazil, BNDES has played a central role in sector development, providing real-estate-based, policy-based lending into the sector, as noted in both the Brazil and London Roundtables. This has been particularly important during the financial crisis, with two footnotes from financiers: the national content requirement for accessing its lower cost finance, and secondly its dominance in the market could introduce sector risk if the institution substantively altered its policy towards renewable energy. The role of BNDES would be a good case study of the role of public finance in sector development at national level.

### **5.1.3 Sequencing and Timing of Policy development**

The detail of how support mechanisms operate has consequences for margins and potentially sources of finance, but in addition the timing of when policy details and linked regulation are defined, or placed in law, also impact when investment actually takes place.

#### **BOX 2: THE PHILIPPINES**

A good example of the importance of detail and timing is the Philippines: its renewable energy legislation adopted in June 2009 created strong interest. It sets out a range of tax breaks and tax incentives, and lays the foundation for a renewable portfolio standard, priority grid connection, and a feed-in tariff (the latter to be formulated by the end of January 2010).

As the New Energy Finance briefing 'Philippines renewable energy legislation: new wave of investments awaits policy details' reports, there was a surge in interest in wind investment (including Korean and Japanese utilities as well as Philippine companies). 800MW of planned capacity, at October 2009, was expected with the legislation in place. However, while a 'larger second wave' of investment was anticipated, this was seen as dependent on the details of the RPS and the feed-in tariffs.

In terms of wind financing in the Philippines, public finance and local banks have an active role. New Energy Finance notes that for the most part local banks will only provide credit facilities, as a syndicate, to projects that have more than 50% local shareholders. Danish International Development Agency; the Philippines Export Import Credit Agency, the Korean Export Import Bank and the Japan Bank for International Cooperation all play an active role in support of current projects with relevant country of origin participation. The IFC is also reported starting a programme to assist domestic banks in financing renewable energy projects with financial and technical support, including credit lines, partial guarantees of up to 50% of the loan principal.

Another factor shaping investor interest is the ambition level: the Philippine government has adopted significant aims: to be the largest geothermal producer in the world, the leading wind energy producer in South East Asia and to have at least 250MW in solar, biomass and marine power.

This is an important backdrop to the scale of demand in the market but as above, financiers will look to the detail of the FIT and RPS, the government's ability to deliver its goals, and the commercial opportunity in doing so.

### **5.1.4 Stability and Longevity**

Stability and longevity of policy support is also critical. With investment horizons of 15-20 years for banks, policy stability is seen as a priority for most markets, whether in developed or developing countries, to secure repayment and returns.

In the Latin American context it was particularly emphasised at this stage of renewable energy development in the region, but it was acknowledged that one of the challenges is the vagaries of national budgetary and economic conditions: in one example a national Environment Ministry was established and subsequently completely closed down due to budget constraints.

Concern about political and regulatory changes across the region more generally, mean that RE is seen as too risky for many private sector investors and entrepreneurs: "If there are long-term rules then the private sector are creative enough to get into the game, what really kills things is the perception of the change in rules – regulatory risk." The case has to be made to investors, or a bank's credit committee, that approves loans, why investments in a particular policy regime will be durable.

The time-horizon of the policy will very likely directly impact the tenor of loans offered by banks. One example was given where a solar policy was 10 years in duration, and the provision of debt was directly linked to this, whereas had the policy gone out 15 or even 20 years, a longer tenor and more attractive terms may have been available (given confidence in the stability of that policy).

Confidence in policy is even more important now that the financial situation has put new strain in the credit space, and banks and other financial institutions are allocating capital very carefully. As above, the concern from London-based investors is that if national government policy support wanes, that could potentially collapse activity in a sector of the RE industry: "that will crush bank appetite in this industry and this would be very problematic" for future investments.

Approaches for achieving greater stability include: clear legislation with enforcement and grandfathering provisions that would apply to existing investments should policies change; cross party support at national level; embedding renewable energy in wider national energy and economic policy objectives; a 'strong social agenda' to create a stable trajectory of economic activity more generally; as well as reducing risk through the targeted use of loan guarantees or other public finance instruments.

### **BOX 3: INDIA: FEDERAL-STATE POLICY**

A central issue raised at the Indian Roundtable (Mumbai, November 2008) was the translation of central government or national RE policy down at State level.

India has a long history of electricity sector legislation, and there is open access to the grid for private generation, with the majority of new RE capacity being developed by private sector utilities, to date predominantly wind. Electricity is a 'concurrent issue' meaning that it is under the jurisdiction of both central and state governments, with the Central Electricity Regulatory Commission and State Electricity Regulatory Commissions governing different aspects of the electricity market operation. State regulators must specify the percentage of RE to be purchased by distribution companies within their distribution license; and tariffs are set at State level based on guidelines from the central government regulator. Non-discriminatory 'open access' to use of the grid and distribution system is written into the 2003 Electricity Act.

Motivation for electricity policy, including RE development, is the significant national power deficit, with almost every state facing a shortage. At March 2009, reports suggest that only about half of the 5 year targeted capacity for the five-year plan to 2012 will be built.

Growth drivers identified for the Indian market were: accurate, commercial-grade RE resource data, particularly for wind; access to good generating sites; strong, consistent regulations; 'real' open grid and distribution access (electricity), and greater clarity and certainty around land acquisition for projects, and availability of public infrastructure

Basic percolation of central government's RE agenda to State level has not been uniform: particularly the need to avoid what was described as 'far too much discretion' at local level. Different State approaches increase complexity for financiers and project developers, particularly in terms of the formalised priority being placed on RE, as well as critical operational issues such as network access.

Renewable purchase standards (RPS), for example, are widely different amongst states, with the need for a specific renewable law that provides a clear, unambiguous and definite direction to states, in one view, to:

1. Have an agreed level of RPS, based on resource availability, by a definite date
2. Price fixation through a feed-in tariff
3. Genuinely open access to grid and distribution networks for private actors.

Under current conditions, compliance and enforcement are particularly important, with participants in Mumbai closely watching relevant legal cases: one example was a case linked to State licensed distribution companies not meeting RPS obligations.

Tariffs, and the tariff setting process were also raised, with the November 2008 tariffs being offered for RE not reflecting actual costs of project development; a situation made more acute due to the higher cost of debt at that time. In addition, a New Energy Finance analysis of new tariff guidelines (at November 2009) indicates that many States offer tariffs below the central guidelines for preferential tariffs, and this means project developers will try and sell across state boundaries, increasing costs and complexities. Some view tariff standardisation as helping the operational efficiency of the market, particularly for foreign investors.

On the financing side: challenges have been experienced selling RE power due to the weak financial position (and credit ratings) of a number of the state electricity boards (SEBs), due to high level of power thefts and other inefficiencies. This impacts their attractiveness as a counterparty in a PPA, as described by one Indian bank after the Roundtable. In this case alternative selling mechanisms are sought: with this bank advising clients to enter into PPAs with large private power purchasers with good ratings in the Indian market, rather than SEBs.

Further input on this complex area suggests this also needs set in the context of overall affordability. Direct sale of electricity to large creditworthy corporates can address some issues on a deal-specific basis, but it may worsen the situation for the state boards being left with the remaining customers who may be less willing and able to pay.

There is strong interest in the Indian market from non-Indian financiers, both in wind and solar, as evidenced in the participants at the REFF in Mumbai, even in the context of the financial crisis. The mid-2009 government approval of plans for 20GW of solar power by 2020 has catalysed interest in that sector, alongside an incentive programme for a first phase of 1.1GW of grid-connected solar by 2013<sup>16</sup>. However, whether for wind or solar, the detailed range of issues mean that non-Indian banks and financiers must be able to build a strong internal case around their ability to manage risk.

At end 2009, policy consultations were underway on a renewable energy certificate mechanism.

Some of the issues above were reinforced by other Roundtables at the 2008 Renewable Energy Finance Forum, Mumbai. See also 'Identifying Optimal Legal Frameworks for Renewable Energy in India', November 2008, Baker & McKenzie, APP Project REDG-06-09; and New Energy Finance, 'India Renewable Energy Policy – Analyst Reaction, India's new tariff guidelines: some good and some not so good news', 16 November, 2009

### **5.1.5 General Business Environment**

At the Latin American Roundtable, it was reiterated that RE policies and incentives are only one aspect of making the sector attractive: the general environment for setting up businesses, together with permitting and licensing process for project development: a holistic approach is needed "otherwise its just putting a band-aid on an iceberg".

## **5.2. Utility and energy policy**

Utility and energy policy and regulation are as important as specific RE policies and incentives in many cases. The core issue was described by one bank: equity investment needs to be properly leveraged in a typical situation, and the banks will pay considerable attention to power off-take arrangements, the credit characteristics or solvency of off-takers and ultimately the economics, factors closely linked to utility and broader energy policy.

Also on the radar will be the costs of traditional energy as well as any national politics around policy supports for energy generally, including premium incentives for RE sources, or subsidies to the conventional sector.

*"Banks will look at the tariff and credit quality involved - that's the driver as, in a leveraged business, the banks won't lend to a power purchase agreement from a bankrupt state electricity board.... That's 101."*

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<sup>16</sup> The first phase of the Indian government's National Solar Mission has a goal of enabling 1.1GW of grid-connected solar power capacity by March 2013; alongside plans to support R&D to reduce material consumption/improve efficiency; create volume demand to facilitate domestic manufacture, as well as longer-term policy to purchase power. Ministry of New and Renewable Energy, 'Efforts to reduce cost of Solar Power', press release 11 December, 2009. <http://mnes.nic.in>.

### **5.2.1 Off-taker Solvency**

There are a “raft of countries” in Africa, and elsewhere, where off-taker solvency is an issue. The willingness and ability of utilities to pay for power, or indeed a premium tariff over a 15-20 year period is potentially challenging, particularly if they are subject to government interference, or impacted by changes of government, etc. This needs understood and dealt with on a country by country basis in terms of an appropriate response.

In Kenya, the solvency of the power off-taker is seen as less of an issue, and a range of options are possible for power supply, including RE, with indication that Kenya is considering sovereign guarantees that would further strengthen the confidence of investors. In Uganda, one London-based bank has an investment in the distribution off-taker itself, thereby creating the basis for moving forward on power projects, including small scale renewable energy projects (outlined further in Section 10).

The credit quality of the off-taker, alongside other elements of the project design, was also a priority for one investor looking across Asia for opportunities. In that region Laos was singled out as having one of the most attractive regimes: the simplest off-take contract, the simplest tariff arrangements, and a state-guaranteed obligation from the EGAT in Thailand (Electricity Generating Authority of Thailand) for the power off-take.

Even relatively mature markets with a solid history in electricity and utility policy (e.g. India, see box above) can also experience obstacles in this area. There are methods of finding credit-worthy PPA arrangements such that deals go ahead, with multilaterals such as MIGA or OPIC potentially able to cover contract revocation or frustration for example. However, to drive scale, systematic solutions are required through policy or national regulators.

In the Middle East, utilities in the region are described as being ‘much more risk averse’ than counterparts in the west. This means that while at policy level there is a drive in many countries in the region to embrace RE at par with industrialized countries (or sometimes ahead of the curve as in the Masdar initiative of the UAE), yet on the ground projects tend to be held up. This can be at the planning and issuing phase due to uncertainty on which technology directions will be pursued (e.g. PV or CSP) and the fact that most technologies don’t yet meet up to the typical reference requirements of the utilities in the region.

### **5.2.2 Access to Transmission and Distribution**

Even on top of a strong RE support mechanism there are a range of regulatory issues that need to be in place, particularly around grid access in order that electricity can be sold or delivered to end-users.

Energy infrastructure and related regulatory issues need clearly outlined including who is responsible for planning and paying if new transmission and distribution networks are required, as well as grid access provisions (particularly in the case of a state-owned monopoly).

In terms of sequencing, decisions on the underlying delivery infrastructure (e.g. transmission grid or distribution networks in the case of electricity) needed for RE must be tackled early, otherwise the financing of projects may be stalled as developers wait to see if they will be able to deliver to end-users or purchasers, and in what timeframe, closely linked to anticipating revenues.

South Africa provides an example of issues arising in this area in the context of ongoing national policy development. The country successfully adopted a ‘refit’ mechanism: feed-in tariffs for four RE technologies - in March 2009<sup>17</sup>, and these tariffs produced around 8000MW of applications for PPAs and grid connections.

The electricity system has a single dominant utility, Eskom, and this entity together with the National Energy Regulator of South Africa (Nersa) and the Department of Energy

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<sup>17</sup> New Energy Finance, ‘Regulatory wrangling lays foundations for South Africa renewables build-out’, 2 November 2009.



subsequently had to work through the procedural and design issues for the broader electricity system to enable RE projects to proceed. Issues included the designation of responsible parties at each stage of the process; project licensing and selection processes; PPA terms and conditions; and determination of what costs are likely to be incurred in new capacity build and how this will be funded. Industry players are quoted indicating that - subject to the resolution of the range of issues - 725MW could be developed in the next two to three years, and 4-8GW in the 5-10 years following<sup>18</sup>.

The feed-in tariffs successfully attracted experienced international RE project developers, such as Mainstream Renewable Power and RES, however as an illustration of what additional issues policy needs to cover, market players and analysts in the final months of 2009 highlighted:

- Need for longer term targets: overseas investors want more comfort that there is a long-term markets in SA, beyond the initial 2013 plan;
- Need for transparent rules over grid access and PPAs: project developers cannot risk that power would not be able to be guaranteed grid access, or have its power purchased (this is a particular issue as the Single Buyer's Office, SBO, is situated within Eskom);
- Clarity over whether the SBO would be required to purchase all of the RE produced: while price certainty had been created through the REFIT, certainty over the volume of power that would be contracted has not, which places undue risk on developers<sup>19</sup>.

### **5.2.3 Basic Utility and Energy Policy**

In Sub-Saharan Africa (SSA), the issue of the credit-worthiness of off-takers and opportunities for RE investment per se, were seen as secondary to the need for firm utility and energy policies and solid sector financiers. Nigeria, for example, was described as a country "essentially paralysed" on policymaking for the past 7 or 8 years, in terms of decisions over the basic structure of the utility sector: the issue of splitting into 12 or 14 distribution companies; whether there should be a single buyer model; and other complex structural issues: "Every few months a different international advisor flies by, contributing to the confusion."

### **5.2.4 Market Liberalisation**

One lesson that can be observed from the EU situation is the potential trade off between simplicity and 'market sophistication': in terms of the broader utility sector structure. Liberalisation, splitting up utilities to create a competitive 'market efficient' model has been the general direction in the last 2 to 3 decades, the stage along that transition can impact financing.

The unbundling process brings with it a range of uncertainties, however, that may impede build-out of new supply: the transition to a liberalised, competitive market model may take 20 years to the point where merchant power plant investment would be feasible. Countries that move too quickly are seen at risk of not get the basics in place that create confidence in the new model, and consequently investment will be seen as too risky.

At the beginning of that process deals may be more straightforward: a single credit enhanced off-taker (e.g. state owned electricity company) buttressed with guarantees, perhaps from the

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<sup>18</sup> As above, NEF also reports that under Refit Phase II feed-in tariffs were adopted for a further five technologies at end October 2009.

<sup>19</sup> 'SA needs longer term renewable energy targets to unlock sector potential', interview with Eddie O'Connor, head of Mainstream Renewable Power, 3 November 2009, Engineering News, [www.engineeringnews.co.za](http://www.engineeringnews.co.za)

World Bank, or another mechanism to reduce perceived risk around the credit worthiness of the off-taker, such that banks will get involved.

If the utility sector is broken up quickly the 'new' utilities are now unknown quantities, and will be seen as having higher credit risk, and this can lead to a 'huge increase' in the cost of capital: this is notwithstanding any overarching potential gains in economic efficiency that go along with the theoretical model of unbundling. Even in a European context, there is an impact on credit quality, as well as the potential impact on energy security.

This reinforces the fact that the wider energy or utility market structure and energy policy objectives need closely aligned with the delivery of RE objectives, and business models for energy efficiency, to avoid conflicting signals, and provide an attractive investment environment.

There are also a broader set of linked policies in the area of agriculture; transport; water; trade and so on.

### 5.3 International Climate Policy

The overwhelming view is that while strong international climate policy is very important as a backdrop to RE financing, "a signal of robustness or resolve on behalf of international governments towards climate change", it doesn't feed directly in to project economics or investment decisions as it stands.

However, the way the new international political agreements are translated through into national policy e.g. specific RE policies or any impact on energy prices is highly relevant.

As one institution put it: international policy has to succeed "There isn't a plan B and an awful lot of legislation has to cascade down from there." Another financier was more focused on the 'G2 or G3': the dynamic between China and the US, but from the perspective of underlying energy supply and demand.

On the broader question of the financing element of international climate policy, "there needs to be more honest discussion about what public policy does and what public funds do." In the lead up to the Copenhagen round of UN talks there was much discussion about leveraging the private sector and carbon markets, at the same time as governments were seen to be exhibiting a 'demonstrable reluctance' to adequately contribute to public finance, especially from OECD, Annex I parties.

In one rather blunt view, preceding Copenhagen: "... finance ministries don't want to cough up the extra billions [of incremental costs], so there is a lot of rhetoric about leveraging private capital but it really it is just waffle."

In terms of the financing mechanisms written into the Copenhagen Accord: up to \$30 billion of 'fast track' finance between 2010 to 2012, and the \$100billion per year from public and private sources by 2020, a critical issue for private financiers will be how that finance is made available and for what i.e. will it make any difference when doing deals on the ground, by when and at what scale.

The design stage of these facilities will be a critical point to involve financiers to advise on the structure of instruments to facilitate private finance to the greatest scale possible. Even with potentially a large pool of capital available, conditions on the ground will need to be attractive: if it goes through governments what will be the terms of access etc.

Leveraging greater RE investment on the ground also needs the policy underpinnings: "Until we see policy tools that actually, honestly do that then it will be hard to get the leveraging of private sector capital governments are asking for. Its not least-cost generation and public policy needs to do more with public funds to get close to least-cost generation."

More generally, there is a lack of confidence in whether governments are taking the implementation of emissions policy seriously, certainly at a scale that reflects the climate science. Political discourse and associated international policy are not translating through to a set of decisions that appear convincing to market players. Experience of over-allocation of

greenhouse gas permits under the EU Emissions Trading Scheme, even though this does not directly impact renewable energy investments per se, has reinforced a perception that, in the current economic environment, governments are likely to undermine the effectiveness even of their own instruments.

### **5.3.1 Carbon Finance**

Carbon finance was not a significant feature of any of the Roundtables, and in general carbon revenue is seen as 'icing on the cake' for mainstream financiers with a limited role at present, particularly in contrast to the central importance of national policies and other regulatory aspects. Although there has been strong use of carbon finance for renewable energy in some particular situations<sup>20</sup>, these may be linked to a country's coal-based baseline against which CO2 emissions reductions would be measured, or particular institutional support from the government.

Financiers involved in carbon finance teams, or project developers specialising in Clean Development Mechanism projects that generate carbon credits, do seek methods of using that value in renewable energy projects. Some banks may seek ways to use this income stream with projects that are on boundary line: where the ERPA (Emissions Reduction Purchase Agreement, the long term carbon selling contract) with a reputed buyer, may help the financing decision, as described by one Indian bank.

This was also outlined at the 2009 RE Finance conference in Beijing: the head of project finance at one integrated carbon asset management firm discussed challenges to monetize potential carbon income stream in RE project finance. Additional to international policy and pricing uncertainty, issues include: the credit quality of the ERPA for a CDM project, and whether it is bankable in a mainstream project finance context; can structures be developed here it is used to draw in additional debt; and clarity over the treatment of carbon assets in banking regulations<sup>21</sup>.

In terms of financing tools linked to UN policy, such as CDM, some public finance entities are starting to offer post-2012 carbon funds to buy credits, to reduce risk in that market; and also to engage in programmatic CDM, given the potential in that approach for scaling up the delivery from the CDM mechanism.

However, policy risk remains high in a period when the post-2012 phase of the UN treaty, including the CDM and operational rules for any evolved emissions market mechanism, remain under negotiation.

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<sup>20</sup> In September 2009, New Energy Finance noted that 90% of new Chinese wind projects were applying to qualify for credits, 'China wind CER yields drop as domestic turbine manufacturers increase share', Carbon Markets, Global Research Note, 2 September 2009. This note also refers to the four levels of feed-in tariffs that have been implemented, alongside GW wind 'mega-bases' planned in five regions.

<sup>21</sup> Sudhir Bhat, Head of Project Finance, First Climate, 'Approaches to developing carbon monetization vehicles', 13 May 2009, Renewable Energy Finance Forum China.

## 6. ROLE OF THE MULTILATERALS & PUBLIC FINANCE<sup>22</sup>

*The scale, design and targeting of public finance are key to whether this will galvanise significant private sector money into the RE sector, and whether the specific segments that most require public finance are able to benefit.*

Linked to the international climate policy discussion and financing provisions, the scale of overall funds required to meet 450ppm greenhouse concentrations (estimates in a range around \$500 billion per year out to 2030<sup>23</sup>) means that very significant private finance resources must be attracted towards implementation of this agenda internationally, with renewable energy a central plank for delivery.

Private financiers expect the multilaterals and public finance entities such as ECAs to provide a scaled-up set of current products and facilities, e.g. loan guarantees, partial loan guarantees, revolving credit facilities, to reduce risks in some of the areas identified above, and to facilitate returns thereby creating a stronger internal case for market activity.

In addition, at national level, government-backed national banks and sub-national entities e.g. local government, as well as private domestic financial institutions also play an important role in providing local currency-based lending.

However, to get the sheer scale of investment in RE or energy efficiency, very significant additional public support will be required: “Dress it up as you like, its going to involve taking more money from tax payers in the OECD and using it for driving down private sector costs for investing in what is not currently least cost” in emerging markets.

### 6.1 Design

The packages and products from public finance need to cater for what private finance recipients actually need to get deals done: “if its big players [looking for additional public finance products] that’s fine; if its going to be small individual distributed generation, then the products need to cater for that”. This is the point where private financiers, with the relevant experience need much greater involvement in the design and structuring of public financing instruments (as raised above in relation to mechanisms under the Copenhagen Accord).

One constraint, observed by a firm fundraising in Europe, is that the international or governmental institutions are still predominantly viewing this in the context of the sustainable or responsible investment desks, meaning that this is a relatively small-scale source.

This echoes findings of a report on energy efficiency and the lending sector, which concludes there needs to be clear board-level mandates for multilaterals (and national or sub-national equivalents) that establish dedicated EE competence and resources and systematically

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<sup>22</sup> As noted above, there are various sources of work in this area, amongst others: UNEP’s Finance Initiative ([www.unepfi.org](http://www.unepfi.org)); UNEP’s specialised Sustainable Energy Finance Initiative ([www.sefi.unep.org](http://www.sefi.unep.org)) has done extensive work on public finance tools; Project Catalyst ([www.project-catalyst.org](http://www.project-catalyst.org)); Lord Nicholas Stern, Grantham Institute at LSE (<http://www.lse.ac.uk/collections/granthamInstitute>); World Economic Forum ([www.weforum.org](http://www.weforum.org)); the Private Infrastructure Development Group, PIDG ([www.pidg.org](http://www.pidg.org)) and analytic work from other international private finance institutions, including DB, Standard Chartered and Climate Change Capital; pension funds such as ATP in Denmark and APG in the Netherlands; as well as Bloomberg New Energy Finance.

<sup>23</sup> There are a range of estimates projecting how much finance will be required to shift to a global ‘low carbon’ energy trajectory sufficient to keep global temperatures to below 2 degrees – in particular IEA (World Energy Outlook, Energy Technology Perspectives analysis) and New Energy Finance and others. A set of references for the second half of 2009 is included in the introduction to ‘Unlocking Finance...the Need for Investment Grade Policy’, RE Finance Project, Chatham House, Dec 2009.

embed EE efforts across all relevant financial operations, i.e. moving this into the central strategy of the institution, rather than a small 'environmental' team<sup>24</sup>.

The perception is that finance will only flow from larger private sector institutions at scale once governments demonstrate they are serious about this agenda.

In the situation where ECAs or the multilaterals are a driver of activity at national level (e.g. technology cost reduction), this needs backed by government policy efforts at national level. In the Middle East, ECAs and World Bank are seen as key players driving many of the wind and solar projects in the region. Nevertheless, a significant gap is observed between this and the traction with the respective Governments or utilities, particularly in relation to regulatory policies, and specifically for the development of solar projects. This is frustrating effort by project developers, as described by one project developer from the region.

As governments are at the helm of Governing Boards of multilaterals and national development banks, they have the capacity to line up considerably clearer instruction or mandates; as well as building 'demand' on the ground at national level for this through national policy agendas.

### ***Public Finance 1: 'Valley of death'***

In terms of its targeting, one area that does require public funding is the 'valley of death': getting technology development from the R&D phase towards commercialisation. Or, as described by the RE private equity fund Hudson Clean Energy Partners: 'Valley of death projects sit between the venture capital and project finance worlds. They are too capital-intensive for venture capital, too risky for private equity in that they require investors to bear technology and scale-up risks.'<sup>25</sup>

The role for specialised public funding is to help create the conditions where more private sector actors come in to make that process shorter and easier, and the capital more affordable for the technology developers. Specialised fund models, incorporating public finance, are now starting to be discussed by private financiers.

The primary focus of this paper is scaling up deployment of the lower-risk relatively mature RE technologies within the energy mix. However, not only is the 'valley of death' an important part of the role of public finance, but highlights the need to clearly identify which issues public finance is targeting. Further private sector response to new technology risk is highlighted briefly in section 10 below.

Small Developers: what might be described as another form of 'valley of death' is that faced by small or new developers, as identified above. Accessing debt and equity finance is difficult due to lack of operating and development track record that would provide comfort in the management team's ability to successfully implement projects through to completion. Concessionary equity financing to get such developers over the line with their first project is identified as one key means to opening up the private equity finance markets to them.

### ***Public Finance 2: Driving Technology Down the Cost Curve***

Once technologies have a commercial track record, another significant issue is driving technology costs down.

From a technology perspective, one top-down approach described is to work with a country with the right kind of industrial and energy policy framework, that wants to be involved and has

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<sup>24</sup> UNEPFI, 2009, 'Energy Efficiency and the Finance Sector', refer footnote 10 above.

<sup>25</sup> From 'Investing in Clean Technology Deployment', 2009, by Kassia Yanosek, Hudson Clean Energy Partners, kindly made available to the RE Finance Project. Note that the 'finance continuum' - the different types of finance that will invest at each stage of technological development, and the role of policy at each stage in helping 'fill the gap', have been described in some detail; see e.g. O'Brien and Usher, 2004; and illustrated in Global Investment Trends in Sustainable Energy 2009, UNEP.

the right resources and conditions for financing, for example in the solar sector, and driven costs down, through implementation. In this financier's experience "It's got to be 'story' countries, and 'story' technologies", those that can provide strong, replicable examples, to have a wider impact internationally.

CSP was a focus for discussion, particularly in London with proximity to the North Africa/Middle East region where proposals exist from investors (the Desertec consortium, DII GmbH<sup>26</sup>), policymakers (the European Commission linked Mediterranean Solar Plan) and multilaterals (e.g. World Bank<sup>27</sup> and EIB) for developing large-scale CSP, with the possibility of transmission to European markets.

These efforts for large-scale implementation are seen as a means to get from the 'roadmap' to 'road-test' stage, as described, from where scale and experience with the can drive costs down the curve.

However, even in this case, public financing instruments need to identify and tackle actual issues faced on the ground by financiers and other actors. Four main areas are picked out as challenges for new CSP technology by one international bank<sup>28</sup>: demand and price certainty; availability of both debt and equity at the right scale, and instruments that can bring that in (e.g. a guarantee facility on the debt side); managing technology risk; and attention to the water-energy nexus. Added to this are the issues of land availability and transmission access, which are often interlinked (even in the US it might take 20 years to get a major new transmission line approved and built, it was pointed out).

The first of these issues, demand and price certainty, indicates the importance of clarity over the entity or institution that power will be sold to, and confidence in that offtaker (whether exported to the EU or used at national level in the region, in the case of Middle East/North Africa). A second issue arising is the commitment and level of funding from the public financing entity and over what timeframe: setting public finance within a strategic context for policy support will be more attractive than a one-off, or very short term commitment.

### **Public Finance 3: Infrastructure**

One observation on the ground, particularly in Africa, is that even where public finance has been available, private capital and debt financiers have retreated in the last year or two: most infrastructure build has been done by state governments up front, with financiers coming in only afterwards with private capital.

An exchange between policymakers and financiers is needed as a matter of priority to better understand on the role of public finance, private finance and infrastructure build, particularly grid systems and other delivery infrastructure.

This reflects the opportunity of sidestepping the lock-in of older infrastructure where possible, plus the importance of ensuring that systems are planned that enable substantial RE and energy efficiency uptake. This kind of plan, at national or regional level, is particularly important if governments expect or require much greater private finance involvement. It can also be seen as essential for tackling climate change, as infrastructure options over the next 10-15 years will start to embed the 2050 emissions profile.

## **6.2 World Bank Climate Investment Funds**

At the London Roundtable this fund initiative was briefly described by a government representative: around \$ 6 billion over 5 years, administered by the World Bank and channelled through all the public finance multilaterals. The CIF, and its Clean Technology and Strategic Climate Funds (the latter with a sub-programme for scaling-up renewable energy in

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<sup>26</sup> [www.desertec.org](http://www.desertec.org)

<sup>27</sup> [www.climateinvestmentfunds.org](http://www.climateinvestmentfunds.org): refer to the MENA-CSP plan under the Clean Technology Fund.

<sup>28</sup> Standard Chartered memo on mobilising capital at scale for the CSP sector, October 2009.

low-income countries)<sup>29</sup> covers broader 'low carbon' and emissions reduction, not only RE, so potential sectors are addressed like transport and energy efficiency (although not land-use change elements of emissions reduction). Separately, a 1GW Concentrated Solar Power (CSP) regional investment plan is also being led by a range of banks including the World Bank, African Development Bank, IFC: the concept note suggests at least \$500 million of highly concessional finance will be blended with standard public funding, with the expectation that this will bring in private sector investment.

The majority of private financiers, certainly based in London, do not know about the Climate investment Funds (CIFs), however, the perception of one financier more familiar with CIFs is that while there is some very interesting work in Egypt, Mexico, a key issue is scaling up this activity, and 'getting to the next stage'. The provision of concessional grants and concessional loans from the IBRD, with co-financing from local development banks, has created interest from local financial institutions, as well as from the Mexican and Egyptian governments. In this view, the Mexican, Egyptian and Thai governments are looking for a carbon price and revenue generated from that for the funding: the problem foreseen with this approach is that demand in the offset market is not reliable, and will not provide a predictable income stream.

*"It goes back to that mythical pot of gold out there in the market, and the private sector just has to somehow 'come in' with nice wording from Copenhagen. They are doing a really good job, but the CIF is going to need another leg of serious [financial] support."*

Finance participants were interested in how the CIF works in practice: questions went straight to the detail of how project finance players can access the funds; will capital be available to 'fill in' shortfalls, or provide guarantees, and over what timeframe.

As described at mid-2009 CIFs are taking a programmatic approach, whereby governments complete an investment plan that is endorsed, projects are identified, and these apply to the CIF individually for financing (around the \$100 million level). At mid-2009 three government investment plans had been completed under the Clean Technology Fund (Egypt, Mexico, Turkey) with a further 6 completed by the early part of 2010 (Morocco, Philippines, South Africa, Thailand, Vietnam and a MENA-region CSP plan).

This could be potentially attractive, in the view of one London-based bank, particularly in the context of capital constraints in the market place, meaning that anything that mitigates the risk factors, brings in additional risk reduction, or even balance sheet comfort, is helpful from a commercial lending perspective.

However, from a smaller project perspective, the public multilaterals are not seen as well set up to deal with a large number of smaller projects. Risks in this smaller-scale market segment are perceived to be high, and a huge amount of intermediation between the multilaterals and the projects is required.

### 6.3 Targeting Public Finance: large scale/small scale?

There were varied perspectives on where public finance should be targeted: while it is seen as useful to extend the CIF to other countries, some view a very large scale projects (\$100 million scale) as potentially able to access funding from other sources, whereas the projects at sub-\$5 million level should be a stronger focus for public finance as these also need 70% or 80% debt financing and don't have adequate support in place to go forward with reasonable returns.

This highlights the need to establish shared and clearly articulated strategic goals for public finance: a roadmap such that private financiers understand the public policy agenda and what will underpin that from the public purse, and over what timeframe.

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<sup>29</sup> [www.climateinvestmentfunds.org](http://www.climateinvestmentfunds.org)

Some financiers view the 'mega projects' as potentially a major diversion in the energy area (with a history in some places of large-scale energy projects absorbing effort and finally never happening), including in RE. Examples were furnished from Nigeria, and there are some mixed views of large-scale solar thermal CSP in the North Africa/Middle East region if the intention is to expend significant capital for long-distance transmission of the power to Europe, compared to focusing on energy provision in the region.

In the experience of US export credit agency, OPIC, a significant percentage of clean tech and RE projects originating from entrepreneurs, small-to-mid cap companies and PE funds, require not only dedicated support and the ability to access appropriately scaled finance (OPIC provides loans and/or insurance from a minimum level of \$100,000), but also assistance navigating the permitting, regulatory and negotiation process. This is particularly so if those companies are coming from outside the national boundary. Technical assistance to national governments on regulatory regimes, down to the detail of drafting internationally acceptable PPAs and evaluating project proposals, is also seen as an important area for ECAs and multilaterals, in the context of facilitating the policy and regulatory side of the investment environment.

## 6.4 Focus on Africa

From the perspective of working in Africa, simply finding projects to invest in is quite difficult, a situation that is not expected to change over the next 5 years. As international commercial banks are rarely present, this gives the public finance entities a large role to influence the projects that get done (and on the RE front this is likely to be in line with MDB targets highlighting the importance of the Board-level mandate). However, again it was raised that it depends how these entities assess any trade-off between development benefits of plain low-cost energy, and 'more expensive' RE. This is clearly a strategic issue that needs common approaches between the various players early on.

In this area, the Private Infrastructure Development Group, a coalition of donors (public funds) seeking to mobilise private sector investment in developing countries<sup>30</sup> including Africa, targets four areas to facilitate bankable RE deals, overlapping with issues raised in the CSP example above:

The need for long-term finance: 20 year projects require 15-18 year debt, PIDG has existing initiatives that providing hard currency debt; support local currency debt and provide parallel debt when not available from private bank;

Project preparation capacity: in this case capacity to facilitate RE project preparation, through technical assistance and advisory facilities (e.g. in understanding and allocating risk)

Project development: this is focused on the nuts and bolts of getting the engineering, contractual and financing elements lined up, PIDG highlights 'Infracore' Africa and Asia as entities involved in getting projects through to construction;

Revenue certainty and payment security: a new initiative is being examined for Africa to reduce the risks around securing reliable, creditworthy PPAs, and enabling tariff levels to be set at a level that can produce commercially attractive returns.

Fiscal policy can also help the hybrid public-private finance model, in terms of incentive. The example was a tax waiver for SME money: if this was focused on the 'cleantech' sector this could 'easily deploy billions' on further technologies.

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<sup>30</sup> See [www.pidg.org](http://www.pidg.org)



## 7. NEW BUSINESS MODELS

New business models and financing structures are starting to emerge; three areas came up at the London Roundtable.

**Solar telecommunications:** combining solar investment with ‘soaring growth’ in telecommunications towers installed as part of a very high growth mobile phone industry in India is an increasingly recognised way to finance solar PV systems. Solar technology is being installed as solar infrastructure for the towers: the telecommunication companies pay for the towers, and the cost model for the infrastructure installer, as described, does not require income from charging local communities for their energy use. This results in charges being cut in half or more perhaps at community level. This provides a different model for providing energy, via RE, in areas where grid connection is not competitive or least cost.

**Electricity distribution for rural electrification:** one financier working in Uganda is putting together a facility based around an electricity distribution network for rural electrification, and involving many small projects. This involved a structure comprising public finance with a tranche from the government’s IDA allocation (the grant-making arm of the World Bank), IFC debt and the bank’s own money, enabling a blended cost of capital that is relatively cheap. Monies are used in a mini-fund, in dollars, tailored to a number of defined schemes. This structure enabled a viable approach for many small schemes that on their own would not be economic.

**Portfolio approach to new technology risk:** linked to the ‘valley of death’ discussion above, technologies that are not fully commercially proven are finding it extremely difficult to get finance, a situation exacerbated by the financial crisis. One private finance entity creates a portfolio of projects or technologies where a small segment is given over to a commercially unproven technology. This approach allows the technology risk to be spread across the whole portfolio. By taking this approach, the firm can still produce commercially interesting returns, while gaining experience and a track record for the unproven technology.

The advantage is that the next time a deal comes forward involving the new technology a previous financing benchmark exists which helps lower perceived risk.

A more fundamental question was raised over whether the conventional project finance model is still valid for scaling up finance in RE: it essentially applies a conventional energy finance model (large single centralised projects delivered via transmission infrastructure; often large global sponsors teaming up with global banks) to what is really a distributed energy technology looking for smaller more flexible financing, to deliver at scale in needed market segments. This issue is one seen at the core of the challenge of scaling up RE in Africa.

This highlights the importance of fostering an environment where financiers can see benefits to allocating time and capital towards the development of new financing models.

## 8. OUTLOOK & NEXT STEPS

The five-year outlook is generally optimistic.

Despite the financial crisis, there are still a lot of savings globally looking for asset classes where they can earn more than is possible on government securities. These span from institutional and pension funds in the OECD<sup>31</sup>, or local savings in a bank or 'under the mattress' in India or China, where there is also awareness of the low carbon growth story.

However, while there may be a potential 'wall of money' looking for opportunities to invest in this sector, there has to be the right kind of return.

A sign of new scale emerging is the Danish pension fund, ATP, which committed to a Euro 1 billion climate fund for investing in emerging economies in December 2009, based on the assessment that climate change solutions will be one of the big drivers of investment returns over the next 40 years<sup>32</sup>. Significant demand is anticipated in developing countries for funds that co-invest in areas such as infrastructure, energy production and smart electric grids. However, strong frameworks are also required, The Chief Executive of ATP, Lars Rohde, states: "We need a clear and trustworthy framework for investments. If not, these investments will probably be made, but we will need higher returns to overcome the risks."

This simply reinforces the importance of the strategic public policy agenda – policy and public finance - being in place, if governments want to achieve the investment levels that are being discussed. At the London Roundtable: "The policy and incentives are going to have to be clearer and more generous, otherwise although there will still be investment, it won't be enough." The technologies and capability exist for countries to achieve greater energy security over next five years, under the right conditions, but governments have more work to do to bring this about.

One consequence of the financial crisis is that only the 'very best' developers, the very best projects analysts, and the very best technologies have come through. As capital becomes more forthcoming to those actors and sub-sectors increasing volumes of 'renewable energy power kit' at the global level will drive down prices and project costs and drive value generation, particularly in the context of oil prices rising. The expectation is that within the next five years comparative analysis between natural gas, wind and solar will become favourable, leading to a very optimistic outlook for a substantial RE deployment.

The financial crisis also highlights the need for greater engagement between financiers and policymakers to anticipate market conditions (e.g. high inflation, high interest rate environment) and plan responses that retain momentum in the RE sector. This reflects its strong role not only in energy provision but also its potential role in industrial, employment and social policy, now being recognised in many developing countries.

Over a 5-10 year timeframe the hope is that a greater track record of RE will emerge in developing country markets showing sustained returns. This would form the basis for a more recognised asset class, which will then attract private investors and pension funds that don't currently have the data to assess performance, and engage at scale. The experience of the Danish pension fund example, above, will be an important part of building that track record.

This is not only pension funds in OECD countries but pension funds in developing countries are also starting to take an interest: with a Chilean pension fund at the Brazil Roundtable, actively developing an RE-specific fund, reflecting the earliest stages of institutional investors getting involved in renewable energy.

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<sup>31</sup> A survey by New Energy Finance and Deutsche Bank Climate Change Advisors, found that a majority of institutional investors expect to be putting more capital into the clean energy sector by 2012, with particular interest in renewable energy: 'Institutional Investors Warm to Clean Energy Despite Turmoil', 6 April 2009.

<sup>32</sup> Article 'ATP CEO speaks: making a one billion euro Copenhagen statement', Responsible Investor, 17 December 2009.

A final point is the central importance of integrating energy efficiency and demand reduction options alongside renewable energy, as a core part of a genuinely low carbon energy system. Financiers and investors have a strong interest in this 'sector', and further exchange with policymakers on conditions that can create scaled up bankable opportunities on the ground is of great interest.

## 8.1 Key areas for focus

Financiers and policymakers need to work much more closely together, including detailed finance-linked analysis, to develop the agenda required to deliver scaled up capital flows into renewable energy.

At present this needs to be at both national level to deliver national conditions for investment; and at the international level as international financing mechanisms start to get developed, or concerning scaled-up more effective use of public monies.

Gaps, failures or lack of integration on the policy side, which add to the perception of risk for financiers, are likely to result in a greater need for direct public finance tools to make a commercially attractive investment case.

Many financiers are actively seeking opportunities, but to achieve scale of investment requires a stronger collective understanding of what is going to be needed by when, and an understanding of who will do what to secure the delivery. At present many private financiers, even those engaged in RE financing, do not see the 'scale' part of the agenda being taken seriously. One financier described this as a more clearly articulated 'Roadmap' that can line-up the elements required.

With the focus on attractive risk-adjusted returns, a focus for governments is their role in reducing costs and risks, and improving returns given the lumpy playing field at national level:

- Bringing newer technology down the cost curve: who needs to do what and over what timescale, or will this happen anyway;
- Conditions for scaled investment in the near term in existing RE technologies to increase their role in the energy mix. The central importance of straightforward national policy and regulation, its stability, the detail around incentives such as feed-in tariffs or other, the importance of being embedded in wider energy policy and regulation;
- The infrastructure needs for delivering and connecting RE in the overall energy system (national and regional, i.e. cross-border), with energy efficiency is a key part. This needs a particular focus as this is not only about technologies but about energy systems, and varied interlocking policy areas such as water, agriculture;
- Public finance provisions for tackling issues that are identified as key blockages, with clear objectives, including attention to the role and needs of smaller deal size. While acknowledging that public finance is an area of much focus already, it is not visible at scale to many private financiers looking in from the outside at the challenge.

## **ANNEX 1. FINANCIAL INSTITUTIONS PARTICIPATING IN THE LONDON ROUNDTABLE**

Financiers from the following institutions participated at the London Roundtable and contributed their experience and perspectives. None of the views in this paper, however, reflect the official position or view of any individual, or individual institution. Many other financiers were involved from a wide variety of national and international financing institutions in the 18-month period.

Actis

Climate Change Capital

Deutsche Bank

ECGD

Emerging Africa Infrastructure Fund

European Investment Bank (including GEEREF, Global Energy Efficiency and Renewable Energy Fund)

BNP Paribas Fortis

Foundation for Global Sustainability (Zurich)

Good Energies

Impax Asset Management

Innovator Capital

Millennium Resources

Mizuho

Standard Chartered

Wolfensohn & Co

## ABOUT THE AUTHOR

Kirsty Hamilton is an Associate Fellow in the Energy, Environment and Development Programme at Chatham House, where she leads the Renewable Energy Finance Project, working directly with mainstream financiers on policy conditions for investment. She is currently on the Advisory Board of UNEP Finance Initiative's Climate Change Work; the World Economic Forum's Global Agenda Council on Sustainable Energy, and the Steering Committee of 'REN 21', the international renewable energy policy network. From 2005-2007 she was an Expert Reviewer of the Intergovernmental Panel on Climate Change (IPCC) fourth Assessment Report, and in 2009-2010 the IPCC's Special Report on Renewable Energy.

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