



ENERGY EFFICIENCY AND THE FINANCE SECTOR

A survey on lending activities
and policy issues

A report commissioned by
UNEP Finance Initiative's
Climate Change Working Group

January 2009

UNITED NATIONS ENVIRONMENT PROGRAMME



UNEP Finance Initiative
Innovative financing for sustainability

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Development Bank of Japan



JBIC



Münchener Rück
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Swiss Re



FOREWORD FROM THE CLIMATE CHANGE WORKING GROUP

Decades of seemingly abundant and artificially low priced energy are taking their toll. The value of precious resources accumulated by nature over centuries has been slashed. These are being squandered. The waste does not translate - yet - in our accounting systems, while its impact on climate and the environment is already perceptible and threatening our future.

Current scenarios to ensure that global warming does not exceed 2°C by the end of this century converge: the potential of energy efficiency to reduce GHG emissions is huge and it offers the lowest abatement cost in the short term. Why is it that markets fail to capture the value of Energy Efficiency? In some cases, in the building sector for instance, technology is available, but finance is still lagging. This has to change. Energy efficiency is a crucial piece of the puzzle to control climate disruption within the required timeframe, to combine vital environmental and economic returns while increasing energy security. In this, as in other on-going initiatives to mitigate and adapt to climate change, the financial sector can innovate and make a difference.



CLAIRE BOASSON

Co-Chair of the UNEP Finance Initiative
Climate Change Working Group in 2008

FOREWORD FROM THE UNEP FI SECRETARIAT

In February 2008 the UNEP Finance Initiative Climate Change working group met in Paris to explore its' work programme for coming years. The compass guiding the meeting was Lord Stern's stark message that climate change was the "greatest market failure ever." Within that systemic market failure, the financial institutions gathered around the table also identified the current inability of market actors to effectively recognize and seize the financial potentials behind energy efficiency as another critical market failure that has exacerbated the threats posed by global warming.

For decades, our market system has left "cash on the table" with its failure to recognise and integrate energy- and broader resource efficiency disciplines across the broad sweep of business, industrial, commercial and construction activities. This report probes - - strictly a financial services perspective - - the reasons for this failure to see energy efficiency as a distinct asset in its own right. The document offers practical, pragmatic and market relevant recommendations for both the financial sector and policy-makers to take into consideration as we move towards the landmark UNFCCC CoP 15 in Copenhagen, Denmark, in December 2009. The report should be read in conjunction with UNEP FI's broader climate change work undertaken in recent years and being prepared to inject the financial services view into the Copenhagen process. The work of the UNEP FI member company executives who contributed their thinking and experience to the making of this report, as well as our UNEP colleagues at SEFI (Sustainable Energy Finance Initiative), is greatly appreciated.



PAUL CLEMENTS-HUNT
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LIST OF ACCRONYMS

CDM – Clean Development Mechanism

DB – Development Bank

EBRD – European Bank for Reconstruction and Development

EE – Energy Efficiency

ESCO – Energy Service Company

ESP – Energy Savings Project

FI – Financial Institution

JI – Joint Implementation

“MUSH” – Municipalities, Universities, Schools and Hospitals

RE – Renewable Energy

UNEP FI – United Nations Environment Programme Finance Initiative

VC/PE – Venture Capital & Private Equity

EXECUTIVE SUMMARY

This survey was carried out in 2008, when high and volatile oil prices, steadily rising demand for energy, and global imperatives, such as climate change, created significant renewed attention to energy efficiency – both in the policy and commercial world.

UNEP Finance Initiative sought to provide an evidence base on current lending activities in the energy efficiency space, as well as views on this issue through a survey among financiers. Identifying market activity and where market failure is occurring, from a finance and investment perspective, is critical in formulating appropriate policy responses from governments, as well as signaling how financial sector actors may move forward.

Insights were sought through a series of structured interviews with a range of mainstream public-sector and private-sector financial institutions, as well as two specialised financial service companies. This is an indicative set of financial institutions (FIs) rather than a comprehensive review of all activities or geographies in this area.

The survey explored:

- Whether and how external drivers to reduce energy use on the supply and demand side are impacting lending activities, both in terms of client demand, due diligence procedures, and new product development;
- Specific financing issues for energy efficiency;
- The role of government regulation in developing this market;
- Other issues relevant to the evolution of energy efficiency financing and investment.

The definition of energy efficiency (EE) was left deliberately broad in order to capture the widest range of activities possible. However, from the outset it was recognised that energy efficiency would fall into two main categories: firstly, specific activities to deliver energy savings, for example, through entities such as energy service companies (ESCOs); and secondly, activities and opportunities that are spread throughout the entire spectrum of banking operations. It was anticipated that the latter may not be defined as energy efficiency per se, and this was reinforced during the survey.

The following section on **key findings** is structured, in analogy to the overall report, as follows: current market activities, key external and internal drivers including specific barriers raised, financing issues, and policy and regulatory issues. These are followed by a set of **core recommendations** both to financial practitioners and policy-makers.

KEY FINDINGS

CURRENT MARKET ACTIVITIES

Public-sector financial institutions

Public-sector FIs are leading efforts to mainstream EE into their institutions, and to develop financing tools and options for a specific range of energy efficiency activities. This is primarily due to the government mandate and resources that enable these institutions to offer, for example, lower interest rate finance, grant-finance for technical services - both internally within the FI and externally - such as energy efficiency audits, and other forms of assistance to private and public sector clients. The scale of effort varies across institutions, as does the level of experience and focus to date. Activities are not limited to developing countries; Germany and France, for example, have public-sector FI programmes aimed at stimulating national EE activities in specific domestic market segments.

Private-sector financial institutions

Private-sector FIs are very interested in EE (“perhaps the next goldmine”), which is consistent with existing sustainability commitments or renewable energy lending programs, yet find it difficult to get the level of scale and financing opportunity required to make specific energy efficiency activities commercially attractive, particularly in the context of project finance. In general, there was little evidence of dedicated activities by private-sector FIs in this area. The exception, in this survey, is in the US, where state and federal regulation has provided conditions for the development of business models based around energy service performance contracting.

On the other hand, funding for EE activities may be folded into more general borrowing activities - e.g. corporate, consumer, or municipal finance - or be described as “modernization” or “refurbishment”, and may therefore not be visible as energy efficiency efforts by the lender. This makes it difficult to assess the scale of activity or demand and, more broadly, raises important questions about definitions.

Innovators

Innovative financing methods are being developed, amongst others, by specialised commercial finance providers. These include new models to enable significantly scaled-up financing opportunities for energy service providers in developing countries, and integrated ‘single contract’ financing for energy efficiency and renewable energy in the US.

KEY EXTERNAL AND INTERNAL DRIVERS

Energy prices and power shortages

High and volatile oil and energy prices, as well as severe power shortages in some countries, are generally important drivers for energy efficiency, particularly noted in energy intensive parts of the industrial sector where energy expenditure can be a very significant part of operational costs. These drivers are creating an increased general interest in taking commercial advantage of EE opportunities.

However, as confirmed by survey participants, the groundswell of general interest observed does not in itself produce specific, bankable EE options, without other factors being in place.

Demand for energy efficiency

Despite high (2008) and volatile energy prices, energy security issues, and awareness of climate change policy drivers, there is a mixed picture of actual demand for energy efficiency both from private and public-sector clients.

Where grant-finance and/or subsidized EE services and finance are available, public-sector FIs still require external marketing to clients and internal marketing to other parts of the financial institution in order to create interest and demand for those products and services. This may reflect the relative lack of track record of many FIs in the area, although it should be noted that some FIs, notably in the public-sector, have made extensive, market leading efforts to mainstream EE throughout the financing activities of their institutions.

Private-sector FIs found that energy intensive sectors are leading demand; this was, however, not a uniform picture as many FIs have not seen demand increase for EE-related lending at all. This could be due to the FI's particular client base, or the sections of the FI involved in the survey, such as project finance or 'sustainability' departments, and whether they would be in a position to observe actual increased client interest for energy efficiency finance. In contrast, when clients are tackling EE improvements through general corporate finance, as described further below, on the lender's side these are unlikely to show up as energy efficiency related efforts. However, this mixed picture may also indicate that energy efficiency improvements simply remain a relatively low priority in many parts of the economy.

Internally, the trend for private sector FIs is to give increased priority to sustainability and climate change, and many have begun to assess how these factors can be mainstreamed into business activities. This, however, takes time to operationalise and does not, per se, include efforts to offer energy efficiency finance. Internally, most institutions interviewed already have in place corporate energy use targets.

FINANCING ISSUES

Energy service companies

In the field of dedicated energy efficiency finance via energy service companies (ESCOs), a range of well documented challenges are encountered. ESCOs are generally companies which offer energy demand reduction services, often financed through so-called 'performance contracting', where the energy savings generate cash flow which pays for the installation of the equipment and a margin. Highlighted in this survey were the following challenges:

- **Scale** – individual projects are considered to be too small to be commercially 'interesting' for mainstream private-sector FIs. However, one FI specialised in energy services is developing methods to streamline and aggregate individual EE projects to enable project finance scale. Another FI highlighted the need for a stronger policy environment to establish the conditions that will attract large-scale ESCO activity.
- **The "asset" problem** – energy savings, which underpin the usual ESCO business proposition, are not a conventional 'asset' against which a bank will lend. In other words, cash-flow from energy savings is not a familiar form of revenue or collateral to back lending (although clearly any additional equipment provided would be an asset). This means that FIs, particularly local FIs, need to become familiar with the nature, as well as the performance and credit risks of energy savings financed projects in order to be comfortable with providing debt. Despite not being uniformly available, partial-risk loan guarantees aimed at reducing these risks and facilitating finance, particularly in developing countries, represent an effective approach.
- **Lack of loan/credit guarantee mechanisms** – linked to the above, loan/credit guarantee mechanisms can play a key role in facilitating finance, particularly for smaller scale ESCOs. Experience from some actors, however, indicates that the guarantee schemes that exist today are for larger amounts and involve a "tedious and long process for approval". Developing lean credit guarantee mechanisms tailored to smaller-scale projects would help address this deterrent to EE lending activities.

Carbon finance

Linked to carbon savings achieved through emissions reduction projects, carbon finance has played a mixed role in stimulating EE projects so far. While some of the FIs closely or increasingly link EE with carbon finance, or have carbon emissions as a primary motivation (structurally within the institution, or at project level), others establish no such link, even where the institution may have dedicated carbon activities, such as trading. New possibilities of generating carbon credits at larger scale are opening up, notably through programmatic approaches under the Kyoto Protocol's Clean Development Mechanism (CDM), thus enabling larger scale activities beyond the current project-by-project structure; at least one private-sector FI in the survey was developing options for energy efficiency using this avenue.

Local financial institutions

Local FIs have a key role to play in EE financing, particularly in developing countries but also in OECD countries at regional bank or retail level (e.g. mortgage finance and property). Ensuring that these institutions are able to understand the characteristics of different parts of the EE market, and that options for engagement are commercially attractive, will be crucial to rolling out financing at scale.

Time and resources

Time and resources are required to assess opportunities and to develop appropriate financing products across FIs. For public-sector FIs, mandates to do this are mostly in place and generally include a basket of issues alongside activities related to sustainable energy and carbon finance, reflecting broad external drivers for energy efficiency; let us note, however, that resolution around EE specifically is advised.

On the other hand, for private-sector FIs, board level policies needed to enable the mobilization of resources are generally not in place. The dedication of time and other resources is, however, essential to examine and understand new EE opportunities, in the context of FIs' activities, and to (re)develop relevant financial products and due diligence procedures across FIs' divisions.

POLICY AND REGULATION

Serious market failures exist in most jurisdictions. The perception is that governments are not providing a clear and compelling set of targeted policies and incentives to pursue EE options across the economy at a meaningful scale. The rapid, policy-led growth in renewable energy (RE) investment in many countries was highlighted as a positive example that should be emulated.

EE targets alone, even if stringent, however, are insufficient if they are not incentivised appropriately, implemented on the ground effectively or integrated with other parts of a sustainable energy policy to ensure policy signals are not conflicting. Reliance solely on high energy prices is equally insufficient. This is one of the fundamental findings from survey participants: prices alone are not sufficient to overcome barriers. In a policy context, there is no 'silver bullet' or new single policy that could do the job alone; what is required is the development of systematic EE targeted policies, incentives and implementation efforts across different sectors.

Public-sector financial institutions

For public-sector FIs the government mandate has been at the helm of the development of EE activities, although the ability to roll out services, generate projects or accelerate demand will also be governed by the external regulatory environment.

Several positive examples were given of public-sector finance being used, often in combination with private-sector finance, to develop the underpinnings of a dedicated EE market, including: the development and offering of risk reducing tools, the promotion of

increased local financial institution capacity as well as the introduction of standardised monitoring and evaluation systems for EE which reduce transaction costs and facilitate the use of carbon finance. Albeit innovative and of high value, such 'public-private' activities are so far not operating at a significant scale.

Private-sector financial institutions

For private-sector FIs, the policy and regulatory environment remains a key aspect of stimulating investment activity in this area. Government policy will play a central role in bringing to the attention of FI boards the seriousness of EE activities as part of the energy landscape, and creating the conditions such that the resulting value can be captured commercially.

Government – “lead with own estate”

Governments, arguably, have the most immediate interest in EE and are in a position to take early and thorough action in relation to their own estate, facilities, institutions and funds. Additionally, the specificity of the mandate they provide to public-sector FIs, the incorporation of energy productivity into broad macroeconomic goals and policy, as well as the 'demand' for EE services from the public sector are all important avenues for further signaling the priority of EE, and creating an environment conducive to increased EE efforts.

KEY RECOMMENDATIONS

FOR THE FINANCE SECTOR

- Establish explicit board level recognition of energy efficiency within the core business strategy of the FI, as well as within sustainable energy or climate change strategies.
- Formulate a board-level mandate to establish dedicated EE resources and competence, in order to:
 - analyse the institutional opportunity across the range of relevant operational divisions (corporate, retail /mortgage, project finance, etc.),
 - develop options for financial products, and
 - further these options internally.
- More specifically, assess the opportunity to institutionalise a systematic 'energy efficiency audit' process on loans to projects or clients in key energy-using sectors in order to systematically capture EE gains at the very outset of operations and to deepen client offerings.
- Create the opportunity for FIs to work together on the development of technology EE standards and benchmarks in order to standardise approaches and facilitate financing and technology transfer.

FOR POLICY MAKERS

- Ensure policy consistency towards EE through an integrated sustainable energy policy framework explicitly designed to incentivise *bankable* EE opportunities, at meaningful scale, and targeted to relevant sectors. The development of such frameworks will require a thorough audit of EE barriers and perverse regulatory structures.
- Formulate clear board-level mandates in public-sector finance institutions and equivalent entities at local and sub-national level. Such mandates must aim to internally establish dedicated EE competence and resources and to systematically pursue EE efforts across financial operations by means of, for instance, mandatory energy efficiency audits on all relevant transactions and spending.
- As relevant, explicitly include EE in economic development strategies being discussed with public-sector FIs. Particularly, focus on leveraging EE into specific policy and regulations governing energy and infrastructure development, but also into broader policy on overall economic development.

- Examine whether an amendment to OECD guidelines for export credit agencies would facilitate appropriate loan offerings to energy savings technologies or services, in light of the recent decisions in the area of renewable energy;
- Induce a meaningful demand for EE services and finance by targeting public institutions and facilities for large-scale retrofit programs to kick-start market activity. As a second step, further develop the private-sector market for EE services and products, through, for example, specific incentives or regulations around performance contracting, or programs supporting commercial utility activities in this area.

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1. BACKGROUND

1.1. MACRO-ECONOMIC SITUATION

The dramatic rise and volatility experienced in oil and energy prices during 2008, combined with heightened public awareness and political concern over climate change and energy security has propelled energy efficiency (EE) issues back onto the agenda.

The use of 'energy efficiency' - high efficiency technologies, infrastructure and processes, alongside demand reduction and retrofit strategies - can play a vital role in reducing the energy intensity of economic activity, avoiding the need for significant new supply, while at the same time reducing reliance on imported fuels and exposure to energy price volatility. In contrast, business-as-usual energy use would set the world on course for significantly rising fossil fuel use, leading to dangerous levels of greenhouse gas emissions, and rising global insecurity.

The severe global financial conditions since 2008, and concern over global economic slow down, have made managing costs, including high energy costs, a much higher priority in many parts of the economy and society.

“A global revolution is needed in the ways that energy is supplied and used. Far greater energy efficiency is a core requirement.”

“A dramatic shift is needed in government policies.”

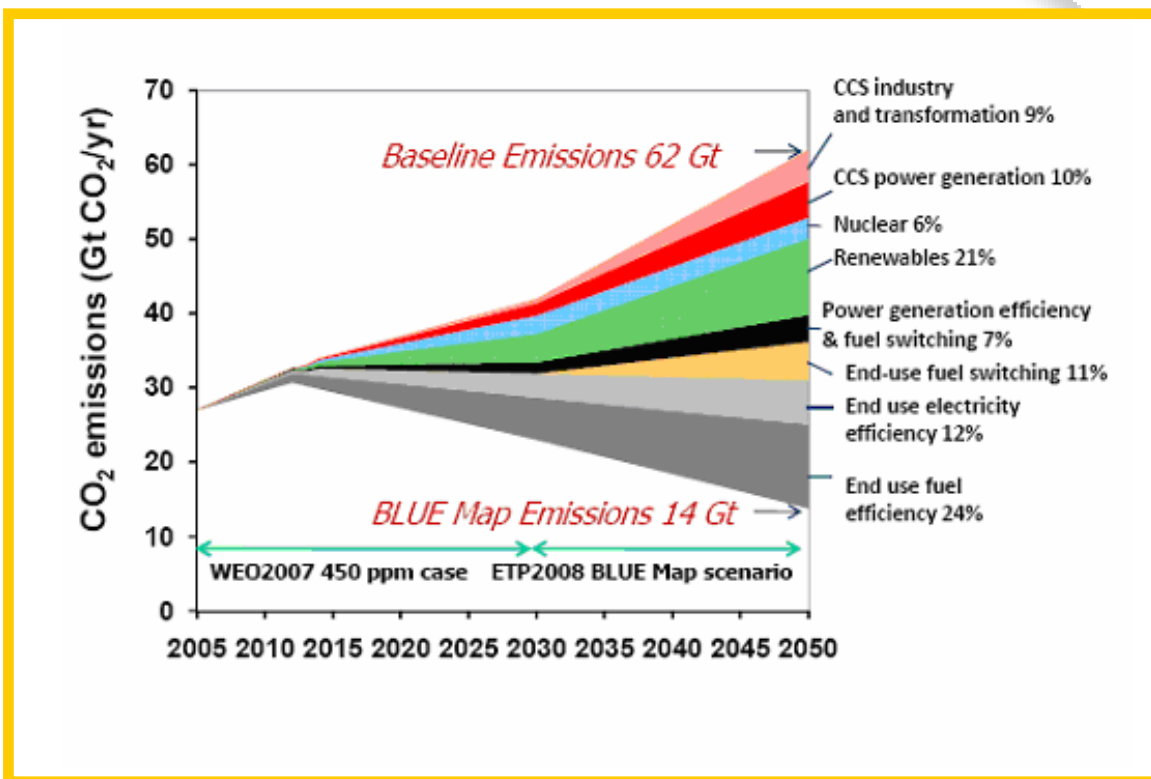
IEA, Energy Technology Perspectives 2008, Scenarios and Strategies to 2050

These factors reinforce the need to understand the blockages around EE implementation and to develop approaches, including policies, which enable financiers to unlock the value such that investment can flow.

Two publications and their graphs illustrate the scale of the opportunity:

- EE was given an unprecedented role in the International Energy Agency's 2008 report on *Energy Technology Perspectives*: the role of delivering over half of the emissions reductions required to have a chance at stabilizing global climate change by 2050.

A new energy revolution: cutting energy related CO2 emissions



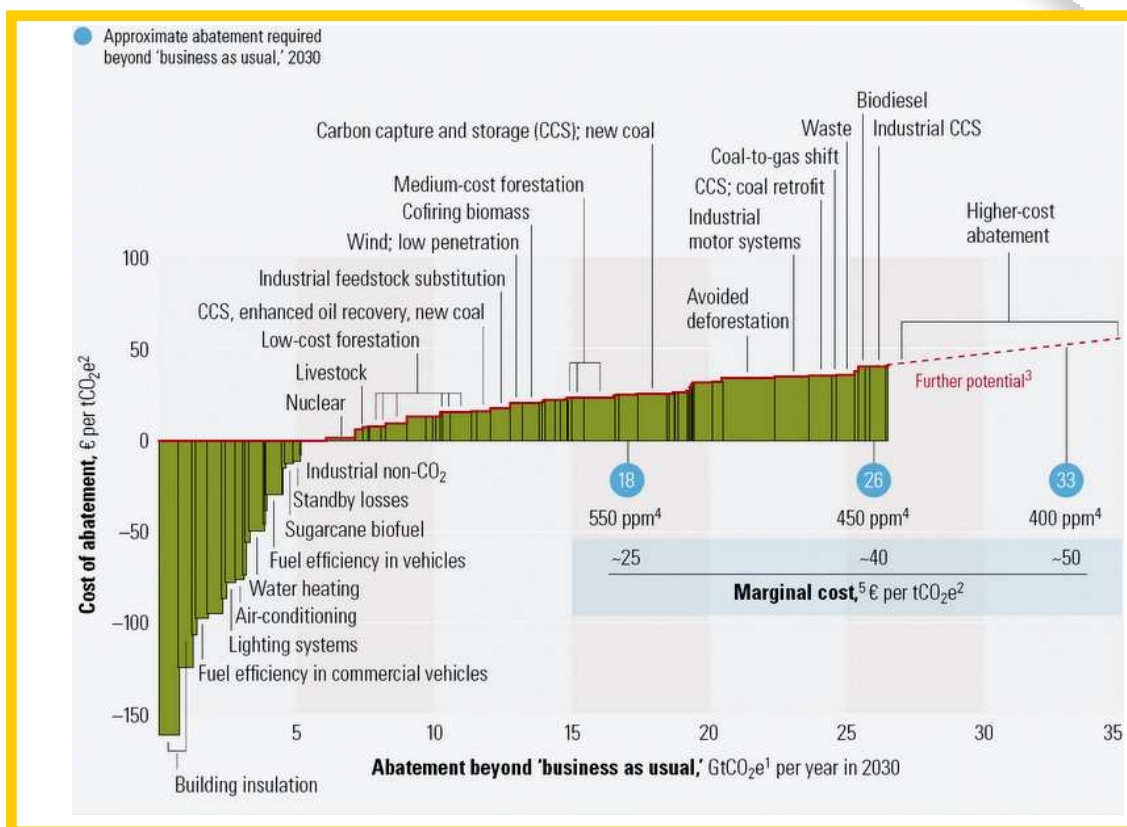
Source: International Energy Agency (2008), *Energy Technology Perspectives*

The lower four categories add up to 54% of the total – EE is therefore the single largest contributor to achieving a 50% reduction in emissions by 2050. This is an ambition level that is already being overtaken by some governments considering up to 80% emissions reductions, globally, by 2050¹.

The advantages are not only related to emissions; the IEA estimates that, on average, investing \$1 on demand-side energy efficiency can save more than \$2 on the supply-side.

- The now well-recognized *Vattenfall* greenhouse gas abatement cost curve², graphically illustrates very significant cost-effective options available. Those in the bottom left, below the X-axis, are at negative or zero cost in economic terms.

Global cost curve of GHG abatement opportunities



Source: Vattenfall / McKinsey (2007)

Country specific studies allocate the same scale of EE potential to deliver cost-effective emissions reductions. In the US, for example, EE is calculated to deliver close to 60% of all cost-effective emissions reductions in a scenario aiming for a 60-80% cut in emissions by 2050³.

1.2. THE CURRENT INVESTMENT SITUATION

Annual investment in energy efficiency technologies reached \$1.8 billion in 2007. Although relatively small in value, this is the part reasonably straightforward to measure: specific Venture Capital and Private Equity (VC/PE) investment in EE technologies (as opposed to EE deployment through corporate finance products). However, perhaps more significant than the number itself, is the growth rate: the 2007 figures show a substantial 78% increase on the previous year, and represent close to 20% of all VC/PE flowing into the sustainable energy sector according to *UNEP's Sustainable Energy Finance Initiative*⁴. This is a positive development if taken as a rough proxy for overall EE technology investment, and signals the development of the new technologies that will underpin efforts in this area.

Another way to measure activity is through the activity of energy service companies (ESCOs) which deliver energy services and EE improvements to companies including public facilities amongst others. The 2006 annual revenue of ESCOs is now estimated at \$11.6 billion and projected to grow rapidly in markets like the US⁵. This *New Energy Finance* analysis highlights improved policy and regulation, as well as higher prices and climate change concerns contributing to rising ESCO activity⁶.

On the carbon-finance front, the statistics are not so positive with the proportion of Clean Development Mechanism (CDM) projects in the area of EE being 'severely under-represented', according to World Bank technical analysis. Just 10 percent of the emission reduction credits traded in the carbon market stem from EE projects. Small, dispersed, end-use EE measures have been 'largely bypassed' altogether, despite offering very significant GHG mitigation potential⁷.

1.3. INVESTMENT OPPORTUNITY

"Perhaps the next goldmine".

Current investment levels and recent growth rates reflect the rapidly increasing attention to the EE 'sector' today, compared to recent years. However, overall identified market potential internationally is considerably more extensive.

There is a substantial investment opportunity: McKinsey estimates that \$170 billion per year globally invested in 'energy productivity', could feasibly cut projected energy demand growth by half by 2020⁸. The breakdown is \$83 billion per year in the global industrial sectors; \$40 billion in the residential sector; and commercial and transport sectors at \$22 billion and \$25 billion respectively. On average, McKinsey calculates, these investments would generate an internal rate of return of 17 percent from future energy savings.

Meanwhile the US alone has \$160 billion per year in 'untapped efficiency service markets'⁹.

These recent statistics on the scale of investment opportunity, add to an accumulating stack of reports covering energy efficiency potentials, cost savings, and avoided energy costs (including electricity transmission and distribution), alongside the assessment of cost effective carbon reduction.

One striking and positive backdrop in the broader clean energy sector has been the exponential growth in renewable energy (RE) investment in just four years: from \$33.4 billion in 2004 to over \$148 billion in 2007. Renewable energy asset financing now represents close to 10% of total global energy infrastructure investment, signaling that a transformation of the energy sector is already underway. National policy frameworks and regulatory incentive structures have played a decisive role in determining which countries have secured investment in this sector.

The characteristics of the EE and RE markets are very different. EE is a disaggregated set of activities throughout the economy; it reduces costs rather than generating revenues

(excluding emerging EE activities with a carbon revenue stream). However, the RE statistics show that very significant growth is possible on the basis of concerted action to create the appropriate investment conditions.

1.4. SURVEY APPROACH

A total of 16 Finance Institutions (FIs) were involved in the survey: the majority of these institutions are members of UNEP's Finance Initiative and responded to a request to participate; examples of smaller companies offering specialised financial services in this area were also pursued to provide a more detailed view of innovation in this space. This sample of FIs is therefore indicative of the situation in the broader finance sector, rather than providing a comprehensive overview; and time constraints meant that some important geographies, such as China, are not fully represented.

The survey sought to examine and understand:

- **Current practice** - 'state of the market' at present - what EE-finance approaches are being undertaken by public and private finance institutions; where does this sit on the radar screen?
- **Drivers** - what the underlying internal and external drivers for EE within these financial institutions are.
- **The policy and regulatory issues** around EE finance from the financier's perspective; including issues linked to the Kyoto Protocol Flexible Mechanisms.

The survey was completed through direct (face to face or phone) interviews, in the majority of cases, using a set of guidance questions (see Annex I), but allowing a flexible conversation based on the bank context and current activities.

In a number of cases the interviews were conducted with several people from the same institution, reflecting the fact that types of EE finance activities vary, but also that often no single person was responsible across the institution. In a couple of cases, an interview was unable to take place due to the difficulty of identifying who would be most appropriate to talk to.

From the outset there was explicit recognition that EE covers both financial products specifically focused on energy savings, but also the inclusion of energy efficiency considerations into already existing processes (e.g. due diligence) or financing areas where it represents only one component (e.g. corporate finance).

A broad view of EE was taken, covering both supply and demand side activities that the banks chose to include in their responses, rather than a tight definition.

However, the issue of definitions came up in some interviews from the outset, and it was seen to be important to know what was being included, as well as in relation to:

- Monitoring EE 'sector' trends, and ability to assess this on a comparable basis between financial institutions;

- Analysis of, and response to, market failures in this area, in terms of financial product development;
- Designing policy or regulatory responses to identified market failures.

This report sets out the current activities of the FIs involved, which are categorised into public-sector FIs (this category includes the Development banks), private-sector FIs and specialist companies. Interview insights and findings are organised into:

- Current market practice, including external and internal drivers;
- Financing issues; and
- Policy and regulatory issues, from the perspective of FIs.

2. CURRENT MARKET PRACTICE

2.1. PUBLIC-SECTOR FINANCIAL INSTITUTIONS¹⁰

The survey involved public-sector FIs that ranged from:

- Development banks: from those at a relatively early stage of developing programs in this area, whether via existing programs - such as CAF's carbon activities - or through new clean energy investment activities - such as IADB's *Sustainable Energy and Climate Change Initiative* -, to those with extensive experience such as the EBRD;
- FIs operating within OECD countries with public mandates, such as Caisse des Dépôts, in France, and KfW, in Germany (the latter has both programs in Europe, as well as extensive international development activities);
- A public-sector FI with an Export Credit Agency role, JBIC, which has a primary low-carbon focus.

The defining characteristic of this set of FIs is the government mandate that enables a concessional approach to financing that would not be possible in a fully commercial situation, and the ability to offer zero or low cost technical assistance or services.

Types of activity include:

- Low interest rate loans for specified activities or technologies, often driving market activity beyond national standards or norms (particularly evident in the case of France and Germany);
- Provision of grant money to clients for specialised technical assistance, or use of internal specialised technical assistance (both internally and with clients);
- Some risk mitigation options such as partial-risk guarantees;
- Assistance with the development of policy and regulatory frameworks at government level, generally in response to a specific request;
- Contribution to funds being developed (public-private, or privately managed) to provide equity investment to enterprises;
- Carbon-finance related expertise (for lending to supply-side, or demand-side, efficiency projects or programs).

There are differences in the scale of financial resources allocated; differences in the starting points and maturity of the programs; and differences in the internal resources and integration of the FIs. Table 1 summarizes the current EE activities and where they fit in under the Institution's commitments. A broader outline of the public mandates, within

which EE activities take place, is provided in Annex III; it should be noted that some of the institutions are in the process of developing further EE activities.

Table 1. Public-sector financial institutions

Financial Institution	Main commitments	Key features
AfDB	<p>EE integrated into operations, mainly dealt with by Private Sector department, and Government lending division on Energy and <i>Information and Communication Technologies (ICT)</i>.</p> <p>'<i>Financing Small Scale Energy Users</i>' (FINESSE) Program, due to finish end of 2008.</p> <p>Finalising the <i>Clean Energy Investment Framework for Africa (CEIF)</i>, to provide increased access to energy whilst making maximum use of clean energy; and in parallel developing its Climate Change Risk Management Strategy.</p>	<p>FINESSE: NL government \$5.3 million to mainstream EE&RE across bank activities. It supports Task Managers and Investment Officers to identify potential EE finance and prepare pre-feasibility studies. Has focused on RE, now looking at EE opportunities e.g. in industrial, and water sectors.</p> <p>Under CEIF setting up <i>Clean Energy and Climate Adaptation Facility for Africa (CECAFA)</i>, aimed for 2009, and expected to offer both technical assistance and project investment funds.</p>
ADB	<p><i>Energy Efficiency Initiative (EEI)</i>, launched in 2005.</p> <p><i>Clean Energy Financing Partnership Facility (CEFPF)</i> was set up in April 2007 with a target of \$250 million to help finance the EEI.</p> <p>In 2008 has approved \$100 million of investments in five new private equity funds operating in the clean energy sector.</p> <p>Other Initiatives, include:</p> <p><i>Carbon Market (CMI)</i> approved in November 2006;</p> <p><i>Energy for All Initiative</i> started in February 2008;</p> <p><i>The Sustainable Transport Initiative (STI)</i> approved in January 2006.</p>	<p>Aim to invest \$1 billion per year on EE, from 2008 to 2010, to catalyze capital flow to EE and RE projects in six initial priority countries. This target has been met for 2008.</p> <p>An additional \$3 million grant to expand the initiative to six further countries has been approved.</p> <p>This aims to build the policy, regulatory, and institutional environment for RE and EE, and provide grant assistance for specific projects reducing GHG emissions.</p> <p>In late 2008, \$15.59 million was allocated for projects out of \$31.4 million available.</p> <p>This investment capital is to help establish the equity funds targeting a total investment of up to \$1.2 billion in clean energy projects (see Yes Bank below). Working with UNEP to provide seed finance incentives to help these funds offer investment and services to early stage project and enterprise developments.</p> <p>These initiatives aim to:</p> <ul style="list-style-type: none"> * provide additional financial resources during carbon project development via <i>Asia Pacific Carbon Fund (APCF)</i>, as well as technical support for potential CDM projects; * scale up access to modern sustainable energy services for the poor via a regional partnership for village-based energy access projects, among other approaches; * invest \$1.5 billion in the transport sector to catalyze capital flow to EE, low GHG, transport systems.
CAF	<p><i>Latin American Carbon Program (PLAC)</i> established in 1999; more recently there has been a stronger focus on RE/EE specifically.</p> <p>2 years ago a \$130 million fund was created with KfW.</p>	<p>With carbon emissions market as a starting point, CAF is now very interested in EE/RE opportunities both in CDM project development, and beyond.</p> <p>The \$130 million fund with KfW is for equity positions in clean energy (supply and demand side) including EE.</p> <p>CAF has also set up its own Clean Tech Fund, again clean energy equity investments.</p>
Caisse des Dépôts	<p>With an international team in place since 2004 to research the economics of climate change, carbon performance is gradually mainstreamed throughout CDC's activities.</p> <p>In 2007, a 3 year €150 million investment programme was launched to promote renewables.</p>	<p>CDC's program of EE loans, in the social housing sector, totaled €16 million at midyear 2008.</p> <p>These were in the form of lower interest rates, long term; and a new refurbishment programme launched January 2007: again a lower interest rate for a proportion of costs was offered, weighted to a list of EE technologies implemented.</p>

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	CDC loans towards social housing now include EE incentives in construction and refurbishment.	
EBRD	<p>Has had an environment mandate since its inception; and there is Senior Management recognition and support for EE as part of a broader <i>Sustainable Energy Initiative</i>.</p> <p>EBRD is the only IFI with dedicated EE team which identifies opportunities across all the bank's operations, and provides specialist resources to realise these.</p> <p>Also has the Netherlands EBRD Carbon Fund, and Multi-lateral Carbon Credit Fund (MCCF).</p>	<p>EE targets are allocated across the bank by country and by sector, covering activities on supply and demand side. In 2007, around €1 billion was spent.</p> <p>Specific EE activities include: developing specialised EE investment mechanisms e.g. ESCOs; industrial EE opportunities with bank clients; carbon credit opportunities; RE promotion with power team.</p>
IADB	<p>Set up the <i>Sustainable Energy and Climate Change Initiative</i> (SECCI), approved by the Board in March 2007.</p> <p>One of its objectives is to mainstream SECCI activities into IADB's operations. There is a \$20 million fund from the Bank, and about \$17 million from a Multi-donor Fund.</p>	<p>SECCI supports RE, EE, carbon finance and adaptation to climate change. EE includes energy efficiency audits (grant financed), energy efficiency training and maintenance workshops. This is targeted at both public (e.g. publicly owned companies) and private sector activities. For example, works actively with the Bank's water division which lends to publicly owned water companies, on energy efficiency programmes.</p>
JBIC	Mandate to use a broad range of financial instruments (in lending and other) for projects that contribute to environmental conservation and improvement in developing countries.	The focus has been on EE and a Low Carbon agenda: Cogeneration projects; broader use of natural gas; energy saving (e.g. CCGT power stations); and support for RE. Focus at present is on improving EE in major energy using sectors in developing countries and large economies e.g. Thailand and Indonesia. Financing is directed to both private sector and public sector but share of the private sector is increasing. From 2008 it was given mandate to expand equity finance (\$150 million for this year) into environmentally friendly options: part of this has been used to invest in an ESCO fund.
KfW - Activities in Germany	<p>KfW has operations both internationally, and in Europe and Germany.</p> <p>€16.6 billion was spent on Environmental and Climate Protection Measures in 2007, representing around 20% of total financing volume. These are dispersed through various 'Banks' within the Group.</p> <p>€1 billion is allocated from the German National Budget for interest subsidies and grants in the private housing sector for EE and modernisation measures. (The related credit volume for EE/modernisation in the private housing sector was much higher).</p>	<p>In Germany and Europe, long term and low interest loans are available, via retail bank or savings banks. The 'Promotional Bank', provides low IR loans for commercial enterprises, Small and Medium Enterprises (down to self employed individuals) on EE and environmental activities.</p> <p>Various low IR loan programmes cover the private housing sector for EE/modernisation that exceeds national standards to a specified level (retrofit or construction), plus municipalities and schools.</p>
KfW - Development Finance activities	<p>Special Facility for Renewable Energy and Energy Efficiency ('4E' Facility), launched 2005.</p> <p>From start of 2008 this continues under the broader umbrella of the <i>Initiative for Climate and Environmental Protection</i> ('IKLU').</p>	<p>The 2005 Special Facility met its original €500 million of commitments in 3 rather than 5 years; of which more than half were in EE enhancing projects.</p> <p>The IKLU will provide at least €2.4 billion in low-interest loans by 2011, to encouraging developing and emerging countries to invest in environmental/ climate protection. A substantial part is expected to be invested in projects that increase EE: e.g. in energy generation, transmission and distribution as well as rational use of energy by industry, commerce and private households, and also EE transport systems.</p>

2.2. PRIVATE-SECTOR FINANCIAL INSTITUTIONS

This set of private sector FIs are headquartered in Europe, India, Japan, South Africa and the US; all offer full commercial services, and the majority have retail operations in at least some of their countries of coverage.

All have clear environmental or climate change policies and the majority have existing lending programs for renewable energy, led by the European banks that have substantial project financing activity in this area.

The majority of these institutions are very interested in EE, but do not have EE-specific teams or programs in this area. An important issue in this set of FIs is that of the visibility of EE in areas of financing such as corporate finance or consumer finance, where borrowing may be used for EE activities by clients, but not be requested as such (e.g. on-balance sheet energy improvements in a commercial company).

Bank of America, in its US operations, is the exception in terms of having a specific energy services team. This team, pursues financing opportunities, that are enabled by explicit federal, state, and local regulation, which is giving rise to the development of an energy service company (ESCO) market, delivering energy services to reduce or manage demand.

Given the regulations, and the history in this area in the US, the finance sector is viewed as efficiently organised to capture these opportunities, with the ESCO market in 2006 standing at around \$3.6 billion (ESCO industry revenues from energy services, with energy efficiency accounting for \$2.5 billion of that)¹¹. 82% of ESCO industry revenues come from federal, state/local public institutions, and public housing authorities – this is often called the ‘MUSH’ market – municipalities, universities, schools and hospitals.

The ‘non-MUSH’, or private sector segment, in 2006, was split between commercial (9% of total), industrial (6%) and residential (3%) facilities (see Box 3. below for a Case Study on the US legislation and trends in this area). However, the latter market segments (i.e. the non ‘MUSH’ segments) represent about 80% of energy use in the US, but only around 20% of ESCO activity, suggesting considerable further opportunity¹², and signaling ongoing, and quite substantial, market failure.

Nedbank, South Africa, and Yes Bank, India, both operate in countries characterised by severe power shortages, adding increased attention and urgency to energy efficiency. However, as commercial banks, they face similar constraints, as their peers in other countries, of having to develop commercially attractive, bankable opportunities. Yes Bank has a specific EE lending facility available for off-balance sheet EE activities, although the absence of large-scale ESCOs in India has so far made that difficult to utilise.

Key issues raised:

- **Time, internal resources and competence** are required to develop commercial strategies and products in energy efficiency, whether in terms of models for financing ESCOs, or in the context of integrated procedures throughout the

institutions' activities. Board level attention and policy may be required mandating a dedicated effort to pursue these opportunities.

- The absence of **clear regulation** and policy at national and sub-national level is noted and seen as crucial by many of the private-sector FIs; some also view it as the role of Government to standardise and aggregate EE opportunities in some areas in order to enable scaled-up investments.
- Enabling greater '**visibility**' of EE as well as formulating specific definitions, are important so that FIs 'know what it is we're talking about'; measurement and verification are also clearly central to the income streams in both the ESCO business model as well as in the context of carbon finance and related approaches.
- **Scale** of financing opportunity is a consistent theme: many of the private-sector FIs will project finance deals only above a certain size, and ESCOs, for example, are regarded as too small and complex to be commercially interesting.

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Table 2. Private-sector financial institutions

Financial Institution	EE in the institution	Types of activity
Bank of America	<p>In 2007, BoA launched a \$20 billion, ten-year environmental initiative addressing climate change, including EE and clean energy investments & services, focused primarily on client offerings.</p> <p>Energy Services sits within energy and leasing in the 'Global Corporate Investment Bank', the commercial banking arm of BoA.</p>	<p>Of the \$20 billion, \$18 billion will be in lending, advice and market creation in the environmental area, including EE. This will include activities in Real Estate Banking, Corporate and Investment Banking and Carbon Emissions Trading. \$100 million will be used for its own energy conservation measures.</p> <p>Energy Services offers financing products that take advantage of favourable state and federal market regulation: key markets are via Federal agencies, and the 'MUSH' markets (Municipalities, Universities, Schools and Hospitals). In the latter EE activities benefit from tax exemption. Most commonly a performance contracting model is used where the energy savings achieved, cover the up-front costs. The specific regulations define which party takes performance risk.</p>
Dexia	<p>No formal EE activities in the bank.</p> <p>EE may come up under other headings e.g. where borrowing entities use the money for energy savings, without being categorised as such.</p> <p>Recognition of sustainable development at highest level, including RE, Climate Change, and carbon neutral strategy for own emissions.</p>	<p>Dexia was ranked second in New Energy Finance international league tables for Clean Energy Project Finance (mandated lead arrangers by total deal value).</p> <p>In 2006, 58% of its energy-related project finance was on renewable energy.</p>
Fortis	<p>No formal EE activities in the bank.</p> <p>As above, EE may come up under other headings e.g. where borrowing entities use the money for energy savings, without it being categorised as such.</p> <p>Recognition of environment at highest level in bank: there is an Environmental Board that reports to the main Board. Carbon neutral strategy for own emissions, including energy saving and use of RE (60% of all energy use).</p>	<p>As with Dexia, there is a very active mature Renewable Energy Project Finance team, and Fortis currently has RE exposure in the region of €0.5 billion.</p> <p>Expects that EE financing model will have to evolve.</p>
Mizuho	<p>No formal program of EE in the bank.</p> <p>Sustainable Development Division sits within the Global Structured Finance Division, mainly PF and financial advisory business.</p> <p>Signatory, along with other banks in this table, to the Equator Principles, which references EE. Mizuho provides a detailed outline of its implementation of the Principles under project finance (including under syndication) and financial advisory activities.</p>	<p>Active in the development of 'Climate Principles', along with other banks and The Climate Group – this will set emissions goals and examine new business opportunities.</p> <p>In the broader PF division (global) – the main focus is RE, including solar in Spain, and wind in Bulgaria.</p> <p>Likely to approach EE in context of the above, rather than as separate new business line.</p>
Nedbank	<p>Has a Climate Change position statement, Board level approval, includes carbon management program, and commitment to developing innovative financing for Clean energy and EE.</p> <p>Has specific energy intensity, carbon, water and paper reduction targets for the bank; and a cross Departmental 'Environment Forum' within Nedbank.</p>	<p>Signed National Energy Efficiency Accord with government in 2005 (currently being revised upwards with stakeholders).</p> <p>Nedbank is pursuing various carbon finance and CDM activities, including energy efficiency projects.</p>
Yes Bank	<p>Has a specific lending program for EE.</p> <p>Setting up South Asia Clean Energy Fund (SACEF), with Global Environment Fund – a US Private Equity firm; and equity contribution from ADB.</p>	<p>The EE lending program is focused on off-balance sheet, limited or non-recourse finance; however challenge to utilise this in current marketplace.</p> <p>SACEF is raising a \$300 million growth capital fund - for investing in clean energy opportunities across the region.</p>

2.3. THE INNOVATORS

While the majority of FIs in the survey offer a wide-range of financial services and are multinational in focus, effort was made to include some smaller, specialised financial and project service companies involved in developing specific new models for financing EE. This was to capture a sense of areas of innovation in the field, although clearly innovation emerges within larger FIs as well.

With only two institutions in this category it is clearly not comprehensive, however it indicates that, as with RE and carbon finance, new players are emerging bringing combined EE and financial expertise to bear on the challenges, particularly in the dedicated ESCO model.

MMA Renewable Ventures (MMARV), in the US, is both structuring EE services and developing combined EE and RE financing packages. EPS Capital Corp. is working in Mexico and China to develop EE business opportunities on a project finance scale.

This has involved addressing methods of risk management, time horizons for provision of finance, and the level of EE understanding of local financial institutions (LFIs) (see Box 2. below for a Case Study on EPS Capital Corp).

Table 3. Specialist financial services

Institution	Type of institution	EE activity focus
EPS Capital Corp	International Energy Efficiency Project Finance firm; it assists end-use facility owners and developers to financially and technically develop/structure energy saving projects for financing on a performance basis; sectors include industrial process facilities, utility and district heating plants, healthcare & other large buildings; a variety of "proven" energy savings technologies are used.	As well as industrial sector focus in international markets, they are also working on Financing models to create the conditions for 'Project Finance' scale in EE markets. This includes working with entities to develop credit or performance risk guarantees for Local Financial Institutions – to facilitate the financing of energy saving projects (ESPs) through the savings achieved; and the aggregation of ESPs through Special Purpose Entities, to provide scale. Another approach used in China, is setting up \$100 million EE fund that invests equity (alongside debt) into 'paid from savings' ESPs, which can then be aggregated.
MMA Renewable Ventures(MMA RV)	Develops, finances, owns and operates renewable energy and energy efficiency assets in the US, focused on energy cost management for its customer base. Pipeline of over \$500million clean energy investments. Dedicated group to focus on EE investments.	Mid to large scale EE retrofit and cogeneration projects, typically energy intensive firms in the industrial and commercial sector. It removes up-front cost barriers by financing, owning, and operating the energy efficiency assets on behalf of its customers, who 'pay what they save': an agreed amount per unit saved. At the end of the contracted period, the customer has different options, including renewing the contract or buying the assets. EE is a cash-driven rather than tax-driven investment; and is more attractive in US states where there are cash incentives available for Demand Side Management. MMARV creates customised integrated finance solutions for combined EE + RE generation.

3. EXTERNAL & INTERNAL DRIVERS

This part of the survey sought insight on which factors the FIs see as driving interest in EE and the scale of this, both externally and internally. This included whether it was 'market push', i.e. the FIs developing financial products or services and selling them to clients, or 'demand pull' from clients themselves. The intention was not to take a 'barriers and opportunities' approach; however, where specific barriers were raised these are included.

It may be interesting to note that although the interviews were held over the July to September 2008 period, during the escalating financial credit or sub-prime crunch, the latter only came up once as a key driver for overriding market behaviour. In this case, it was seen to be resulting in more demand, generally, for public financing, but not a great change from borrowers towards RE/EE. Having said that, cost management in the real economy was raised, as it would be expected, to become more of a priority in any related economic slow down.

3.1. EXTERNAL DRIVERS

High energy prices and power shortages

High oil and energy prices, combined with rising public and political awareness of climate change and policy responses to reduce emissions are key factors driving widespread general interest in EE.

Energy price rises are passing through to significant increases in production costs, and both public-sector and private-sector banks report energy intensive industry clients (publicly or privately owned) leading demand for energy saving improvements. This is occurring in the context that energy prices are expected to remain high in the long term, due to ongoing growth in energy demand.

Latin American Development banks (DBs), for example, highlighted the water industry and agro-processing clients, where energy now accounts for approx. 50% or more of operational costs. This is a particular issue in regions or member countries that are dependent on oil imports and exposed to international price rises and volatility. In sectors where energy may amount to 40 or 50% of production costs, savings even in the region of 4-5% can be a significant benefit for business.

In some countries, national energy shortages are a central issue driving government, industry and consumer attention towards EE.

In India, Yes Bank noted the 40% shortfall in meeting peak demand. Despite significant investment plans for new power generation, it would still take a decade to reduce the shortfall from 40% to 10-15%, seen as more manageable. This acute factor, combined with high fossil fuel prices (particularly exposed in cement, steel, petrochemicals, textile manufacturing sectors), sustainability issues, and ever-growing energy demands in line

with the economic growth of India, has led to EE being recognized as a key component of Yes Bank's strategy.

South Africa is also experiencing severe power shortages which are currently driving government regulation on EE and increasing interest more widely across the economy, particularly within the energy intensive sectors and among consumers. However, market activity on the ground has run into the challenge that some 'green' products are seen as less desirable and more costly (the example was given of solar hot water heating compared to the more desirable conventional water boilers). Supply chain issues were also highlighted: even with government goals, the presence of an active services industry is an essential condition for actually delivering EE technologies, at scale, particularly to the smaller end-user.

However the picture is not uniform or uni-directional: as FIs look ahead to assess energy market developments, particularly in the context of oil prices, they perceive mixed signals, both from within their institutions and from governments. One FI in Latin America noted the trend of returning to coal, large hydropower, and local fossil sources, described as the elements of a 'survival strategy' for some countries dependent on oil imports. Although unlikely to crowd out already established RE or EE activities, governments are now producing policies to promote development on both fronts of the energy equation which is sending mixed signals to financiers and project developers on the future scope of, and need for, EE activities.

In Japan, on the commercial banking side, rising oil prices and oil-related commodities (at the time of interview) were resulting in the need to review the original cost estimates of a series of projects. However, in other traditional project finance areas, the high oil price can deliver benefits, for example, in the oil exploration and production sector. This means that high fossil fuel prices do not provide uniform signals within the overall banking business towards EE or lower emissions.

Client demand – companies and governments – mixed picture

There is not a uniform situation around increasing client or government demand (in the case of public-sector FI) for EE. While some FIs noted that demand was being led by those energy intensive industries particularly exposed to fossil fuel prices, other FIs - both private and public - reported no change in demand.

Three factors emerged on the company side: mixed awareness of the availability of EE services; company level issues in that cost management is not always a priority; and the question of whether corporate clients would seek dedicated, and therefore 'visible' (and measurable) EE finance, versus corporate finance (this matter is dealt with below).

In Europe, experience of the private-sector banks, within the realm of project finance, varied from little or no explicit client demand for EE to 'its starting to come on the radar'. Environmental issues, particularly climate change, were the initial reasons for that interest, but as a result of the energy price volatility in the last 12 months the argument of cost management has become increasingly prominent. Not prominent enough, however, to underpin the development of bankable EE projects. Only in light of an extended period of high oil prices (i.e. over \$100 per barrel), according to one FI, would a greater interest be

generated (both internally and externally) in the potential for large-scale opportunities in that area.

In the US, in addition to opportunities arising from widespread EE regulation (see Case Study in Policy and Regulatory Issues, below), a ‘groundswell’ in the demand for green products was noted: ‘from patients in hospitals to the industrial and commercial sector’. Building efficiency, for example, may be just starting to feed through into property premiums, and into the supply chain, where a high energy performance rating¹³, or the building’s ability to generate its own power, may be starting to become a pre-requisite for commercial property to get the premier ‘Class A’ property rating.

In addition to the observation that EE demand, where this is evident, is being led by energy-intensive companies for operational cost management reasons, a shift towards interest in ‘own-generation’, as well as EE, was noted in Latin America. This is leading to the perception that roles are changing across the energy equation leading to the emergence of new types of energy actors and new opportunities for FIs.

“Now that those companies are aware that IADB has this EE service (audits, training etc.) they are asking for it.”

However, as the highlighted quote above illustrates, there is great importance in marketing and awareness-raising to increase demand for EE services: not only externally but also internally. New products must be marketed among clients to generate new external demand (if a client does not know a product is available they may be unlikely to ask for it, or think about what it could offer them commercially); but also internally within the FI (other relevant bank divisions must be made aware that their own institution offers such services).

Cost management is, however, not always a straightforward driver within companies. EBRD noted that barriers at the company level are not limited to lack of awareness, but it was noted that planning for EE can run counter to traditional company decision-making. Conventionally, the focus of corporate capital expenditure will be directed at revenue growth rather than cost reduction, and as energy services fall into the latter category, they can be invisible in this context, at least until energy costs rise and stay high enough to get on the radar screen.

In the case of government clients - engaged directly with public-sector FIs - , the picture is also mixed. The African Development Bank reported little up-front government interest or ‘demand’ for EE in Country Strategy Papers¹⁴.

In contrast to this situation, one FI pointed to China where there is a clear government policy on improving EE under its Five Year Plan, although in this case this is more correctly an issue of policy and regulation. This is presenting opportunities as inefficient coal-fired installations struggle to improve efficiency, requiring financing and technology. In this situation, domestic energy constraints are more of a driver than crude prices.

Carbon finance

The role of carbon finance, predominantly the use of the Kyoto Protocol's Clean Development Mechanism (CDM), is also mixed across both public-sector and private-sector FIs. Although carbon finance is a term that can be used to cover a number of different types of carbon-related value streams including the CDM and Joint Implementation (JI) mechanisms under the Kyoto Protocol, which are now evolving towards more broad 'programmatic' options. There are active commodity trading desks in many FIs that trade carbon and survey participants were asked how or whether this was incentivising EE activities.

For FIs like JBIC and CAF on the public-sector side, and Nedbank on the private-sector side, carbon finance is a core driver. Several institutions, particularly on the public-sector side, have already established carbon finance teams, which is where clean energy (EE, RE and broader depending on the definitions), within the FI, will sit. Essentially, in this case, the carbon finance piece drives interest in clean energy activities. Other FIs have carbon as part of an entirely separate set of activities, e.g. in the commodity trading area.

However, let us note that, as carbon finance and government policy in this area continue to evolve, new opportunities for capturing carbon revenues are likely to be sought and these may be part of other financing divisions.

For JBIC, a key strategy is improving the EE of key energy intensive sectors: electricity, steel manufacturing, cement, chemicals, and refinery sectors, the first four of which are the major emitters of greenhouse gases in the regions it is targeting. As these are largely in private ownership, EE financing/lending is mainly aimed at the private sector.

One private-sector FI is examining the option of a Programmatic CDM approach in the buildings sector (explained further in section 4.3 below).

However, one of the European banks reported that the play between carbon finance and EE is not being made, even with strong carbon finance teams in place. This is partly due to the fact that most of the current carbon credits are not coming from EE projects. Others, such as Yes Bank in India, viewed carbon finance only as an added benefit, but not a core driver.

Another broad trend, noted in Latin America, is the regional interconnection of the grid, creating the potential to export from countries with oversupply to other countries. EE and potentially carbon finance opportunities may arise if the export was from national systems with low emissions (the examples of Brazil, Colombia and Peru were given) to those with higher carbon baselines. Again new participants in the energy equation and new opportunities were highlighted during the survey.

EE 'visibility'

“Energy efficiency is a concept it is not a project”

“What is energy efficiency, what are we talking about?”

In Europe it was noted that there is little client or corporate demand for EE, at least coming to project finance teams. However, the challenge may partly consist in recognising the demand that is already there, given the invisibility of energy efficiency efforts from the financier's point of view. EE 'visibility' refers to the characterisation of EE in the finance sector and, therefore, its measurability in financial terms.

The concept is that borrowers may use loans for EE activities, but may borrow as part of a general loan. From a banking perspective, this would appear only as general corporate finance, consumer finance or municipal loan. Part of the reason for this, is scale: if a factory, for example, wants to borrow Euro 0.5 million for an EE improvement, this will be added to the general borrowing.

The EBRD described this in more detail: EE improvements will be built into the capital investment planning process; the finance department will then assess this as part of overall company finance needs, as well as the sources of finance available. By the time external banks are approached, any detail about the actual contribution towards upgrading EE will have been lost.

Another specific example was that of large-scale equipment providers (clients of a given FI), that might have some interest in implementing EE projects in China. These, however, would likely arrange on-balance sheet financing of the technology, in which case this activity would not be apparent.

The approach of the EBRD, and more recently for several of the other public-sector FIs, and some of the private-sector FIs, has been to mainstream EE across all parts of the business, which also means it might not be characterised as 'energy efficiency' finance. This requires assessing the FI's, as well as the clients' business across the board, adding operational complexity. The definition of EE will also be important here for the scope of what is included.

3.2. INTERNAL ISSUES

Barriers

The barriers have been well documented, and the survey notably highlighted:

- Problems with staff capacity and knowledge;
- Limited availability of project preparation funding;

- Potential resistance from staff if EE is seen to add a further step (time, effort) to existing processes like environmental impact assessments;
- (i) Lack of, and need for, experience with clean energy projects among financial institutions, and (ii) a menu of suitable financing instruments tailored to the different energy efficiency markets¹⁵.

On the technical side:

EE and RE are perceived as: expensive, unknown, complicated, and furthermore, if the institution does not already have projects or other activities in the 'sector' itself, there will be little technical or political experience.

Time and resources: key for private-sector FIs

Assessing, developing, and operationalising EE financing options requires time and resources; this is particularly important for private-sector FIs: "Banks have little time to cope with the range of things going on, particularly at the moment, so it's partly a resource problem."

The central challenge a commercial bank might face when starting to address commercial EE opportunities is that, without an executive level mandate, it may be difficult to allocate time to develop this business, or even to do the basics: the 'no budget to hire an engineer' problem – hence the importance of sufficient internal resourcing and competence, if an institution wants to capture the widest assessment of new products and business opportunities.

Trends towards increased EE financing

Trends include:

- Parts of the FI business, outside the specialist internal EE services, are getting more engaged in both climate change themed operations and EE in particular. This results in new product offerings generated by those divisions (e.g. incorporating EE considerations into mortgage finance was given as an example by Bank of America);
- As experience increases, the business issues around EE are becoming more clearly understood and therefore the risks are easier to manage;
- Retrofitting FI buildings or headquarters provides a demonstration of what can be achieved, and an increasing number of FIs have defined energy-use reduction targets, often driven by sustainability considerations;
- With an expectation of sustained high energy prices in the long term, this is an issue that may gain the attention of the Board (in commercial banks) as a business opportunity raising the question of i.e. how to capture the value in energy demand reduction 'offers' to clients.

Board level consideration of EE, for commercial and environmental reasons, could lead to board level policies to focus on EE and develop business lines in commercial banks. However, a clear demonstrable commercial imperative will still be required.

Box 1. Case study: EBRD institutionalising energy efficiency

Due to the energy intensive economies of Central and Eastern Europe and the former Soviet Union, EBRD has had a mandate to work on environment, including energy efficiency, since its inception in 1991.

- ❑ A dedicated EE team was set up in 1994 comprising finance and EE technical expertise;
- ❑ The team had a mandate to develop the business of sustainable energy opportunities across all of the EBRD's lending and investment activities, providing support to project teams as well as developing and implementing new financing initiatives to support sustainable energy, such as dedicated credit lines or carbon finance.
- ❑ The starting point was an examination of the entire pipeline of projects EBRD had invested in to date (around 2200) in order to assess the full range of EE opportunities.
- ❑ One of the areas the EBRD subsequently pioneered was the integration of EE into the project approval cycle, with a focus on improving industrial energy efficiency, through an energy efficiency audit process:
 1. The EE team screens all existing and potential industrial projects at an early stage of the project cycle to assess the potential for energy savings;
 2. For those projects with good potential, the client fills out a simple questionnaire;
 3. This is followed by an initial site visit from an in-house specialist energy efficiency engineer;
 4. An energy efficiency audit is then arranged (services at no cost to client);
 5. The Bank assists the client to act on the developed recommendations, usually from its own in-house technical experts. More intensive programs, such as energy management training offers, are paid from donor funds. This applies also to the facilitation of any carbon-related benefits to be realised.

Most of the solutions identified, recommended, and implemented are on the basis of using established or best available technologies so that the Bank is not taking significant technology risk.

The energy efficiency audits represent a separate process from the environmental impact assessment as they involve different expertise profiles and deal with voluntary actions aimed at reducing costs. They also create a different type of client offering: the EE audit and implementation is not just about delivering a 'good' sustainability project, it can also enhance the economics of the project, hence its financial robustness making it more commercially attractive, with potentially higher returns on EE investments, as well as improved production in the underlying project.

4. FINANCING ISSUES

Some of the financing challenges and issues, at the level of allocating capital to EE, are already well documented. Those highlighted by the FIs in the survey fell into two main categories:

- Those pertaining to the financing models for ESCOs, i.e. the delivery of specific EE improvements or demand side management services; and
- Those arising from a broader category of activities - including 'clean energy' and carbon finance - which are often undertaken on the basis of either the FI's sustainability agenda (particularly in public-sector FIs), or on the basis of efforts to mainstream EE opportunities into existing operations.

In addition, the wider energy policy framework may make EE more challenging as, for example, in the case of energy subsidies or other perverse incentives in the policy framework (see Policy and Regulatory Issues, below).

4.1. FINANCING ENERGY SAVINGS: ESCOS

The idea of the energy service company - contracted to deliver actual energy savings - has been around for some time. The US National Energy Service Company Association (NAESCO) describes an ESCO as a business that 'develops, installs, and arranges financing for projects designed to improve the energy efficiency and maintenance costs for facilities'.

The key feature of the business model is that the compensation for an ESCO service, and often the upfront financing of the activity, are directly linked to the amount of energy that is actually saved as a result of the project¹⁶. The question whether the financier or the ESCO bears the risk of the energy savings performance, or whether they share it, depends on the business model being used and may be defined through regulation, as it is the case in the US.

Different approaches exist by which companies can finance energy savings: in one KfW survey of over 500 companies, ranging in size, it was found that almost 80% used their own sources of finance; around 50% used bank loans; and around 40% accessed public-sector assistance. Only 3% used what were described as 'alternative finance instruments' such as contracting¹⁷.

Analysis of the European ESCO market (below), and information from other sources, including the IFC and EBRD¹⁸, allude to the challenge of making this model work in practice. The comprehensive analysis in the World Bank-UNEP *Three-country study* of EE in Brazil, China, and India, concludes: "The ESCO model is not a magic bullet and does not solve basic problems of delivering energy efficiency project financing."¹⁹ This acknowledgement is widespread: an illustration being the US statistic used earlier, whereby sectors using 80% of US energy, including the industrial and commercial sectors,

only receive 20% of the US ESCO market activity by revenue; the bulk of US ESCO activity remains in markets created by regulation, mostly targeting public facilities.

European ESCO market

In Europe, a comprehensive 2007 analysis of the ESCO market²⁰ has identified an overlapping list of issues and market dynamics on the financing side (referring mainly to financing the energy service activities):

- High perceived risks and credit risks that are attached to client (rather than project);
- Lending is conventionally asset-based rather than cash-flow based, therefore raising the problem of collateral;
- Private-sector financial institutions are mainly interested in 'low hanging fruit': those projects that produce near-term commercially attractive returns. Activity around longer projects, or in some more challenging client segments, such as the residential sector, are limited;
- The dominance of large ESCOs that can invest their own funds; in this situation small ESCOs may face difficulties in convincing both clients and FIs to adopt a different type of energy performance contract (EPC).

Size is also a deterrent for private-sector FI engagement, as one European project financier stated: "One of the things that financiers won't do is spend a lot of time financing a small thing". The job of making things standardised, easier, and to create conditions for scale investments, was seen by one as a role for government. The current ESCOs market is not regarded as particularly attractive to project financiers, and was further described as 'cumbersome' with opportunities for engagement requiring work at a 'microscopic level'. In the existing European ESCO market, 58% of ESCOs would not consider a client unless they had an annual energy bill in excess of €50,000²¹, which reflects the fact that the majority of opportunities that are bankable are at larger level, again leaving the overall potential significantly under-resourced.

US market

A useful outline from US Bank Hannon Armstrong, categorizes the financing issues for securing further growth in the US market²² (Box 2 on next page):

Box 2. Example: steps to upscale EE financing from a bank angle

- Aggregation at the end-user, ESCO, and finance structure level is key to profitable and scalable investments in EE;
- Even with aggregation, most renewable energy projects have more appeal to investors because they are larger and one has to do fewer transactions for the same volume;
- As well as size issues, the technical finance characteristics of EE are inferior to renewable energy and traditional energy assets from a collateral and security perspective;
- From a CO2 perspective, however, EE is a far more effective investment per unit of investment and worth the effort;

Summary of EE Financing Structures and Business Models:

- The traditional market for 3rd party financing of ESCO services is well served by the existing model;
- Further penetration of the existing model requires significant changes in the finance structure to meet the needs of new end-users;
- Each class of end-user seems to require a tailored solution. For example, what works for commercial office buildings will not work for shopping malls; what works for public schools will not work for private schools, etc;
- Solutions are possible and will create some interesting finance opportunities;
- The single biggest change from 2007 to 2008 was a gratifying realization among virtually all end-user classes that EE is an essential tool in climate change and for the first time we are seeing demand-pull for these solutions, not just supply-push.

Hannon Armstrong, 2008.

This US example focuses on the need for solutions to target different types of end users.

EPS Capital Corp aims to reduce transaction costs by streamlining small scale EE ESCO models (or Energy Performance Services, EPS companies), reduce risks and aggregate the individual EE projects to produce a 'project financeable' scale of investment opportunity. The EPS Capital Corp case study (Box 2. below) outlines this in more detail.

In addition, EPS Capital Corp in China and some public-sector FIs, have tackled the challenges of debt financing in this area through the development of specialized equity funds²³.

EPS Capital Corp emphasizes that the challenge is not a lack of capital, but the ability to access funds through local financial institutions (LFIs), due to the disconnect between current lending practices of LFIs and the particular characteristics of energy-savings-based projects.

This echoes one of the key findings of the comprehensive joint World Bank-UNEP *Three-country energy efficiency study* on Brazil, China and India²⁴, which emphasizes that finance itself is not the core of the problem, rather the institutional issues, and alignment between project development and a set of well packaged and marketed set of projects for investors: “Lack of domestic sources of capital is rarely the true barrier; inadequate organizational and institutional systems for delivering projects and accessing funds are actually the main problem.”

India

In India, YES bank has a specific lending program for EE projects, targeting projects structured in an off-balance sheet manner, with limited or non-recourse financing. The Bank also has a small team that can spend part of its time looking for opportunities that meet internal credit and underwriting standards. However, the facility remains largely unutilised to date.

The problem is the lack of larger-scale ESCOs in India which have the size and quality to implement medium or large industrial-scale projects. In a European and US context, the dominant ESCOs include subsidiaries of the large utilities or equipment manufacturers, such as Dalkia (France), Siemens Building Technologies (Germany), with Honeywell, Trane and Johnson Controls, all active in the US²⁵ but these companies, or their equivalents, are not present in India.

For on-balance sheet EE financing, Yes Bank actively works with clients to assist them in ‘selling’ EE improvements internally, should that be required – for example, if additional capital expenditure is required for an identified EE improvement, Yes Bank provides the financing through corporate finance. This serves both the bank’s strategy to be active in the EE space as well as its client relationship offering.

At municipal level, small-scale ESCO initiative in India is outlined in Section 4.2 below. This has been developed by the specialist NGO, the Alliance to Save Energy.

4.2. DEVELOPING COUNTRIES AND LOCAL FINANCIAL INSTITUTIONS (LFIs)

The ADB has analysed the basket of issues arising in efforts to mainstream ‘clean energy’ finance, including EE projects, in developing countries.

It identified that clean energy projects are often characterised by:

- Small scale: many projects are within a \$200,000 to \$2 million range, have short one to three year payback periods, and often only require local currency financing and credit support;
- High transaction costs: in terms of processing time including requirements on social and environmental safeguards;
- Challenges arise if local financial institutions (LFIs) are unable to provide finance due to lack of institutional and technical capability and experience;

- As raised above, EE projects often require financing on the basis of “savings” as opposed to ‘assets’ and ‘revenues’, adding other kinds of risks to the equation which are different from those analyzed in conventional methodologies for project due diligence²⁶.

To overcome these limitations and accelerate implementation of clean energy projects, ADB has established its *Clean Energy Financing Partnership Facility* to contribute to greenhouse gas emissions reductions in the Asia-Pacific region by buying down capital costs of new and pre-commercial renewable energy and energy efficient technologies, which would otherwise have difficulties in sourcing funding. Other DB’s are developing or providing specialized services (see current market practice, section 1.1 above).

As in Section 4.1., the importance of LFIs was often reiterated during the survey. ADB, for example, has partial-risk guarantees in some countries, a grant provision that can cover the first part of any losses, so that LFIs get more comfortable with the risk. In the survey it was noted, however, that there can be regulatory barriers to the use of partial-risk loan guarantees: in one country it is regarded as foreign debt, in another all loans must be backed 100% by an asset.

The development banks in the survey had very mixed experiences of working with LFIs: in some regions the majority were described as being at ‘first base’, without awareness of products for EE, or sensitised to it as a possibility in terms of providing credit lines.

For EPS Capital Corp, the approach has been to provide training, and to work with those that are in front of developing activities in this area. As a private sector company, EPS Capital Corp has accessed public-sector grant funding to provide training and other aspects of building capacity. The focus of training includes the use of standardised methods to measure and verify (M&V) savings (being developed for international use²⁷), to build technical capacity and confidence in the delivery of energy savings, reduce perceived risk in the financing models, and reduce loan process and transaction costs. This is covered in more detail under *Carbon finance* below.

Box 2. Case study: EPS Capital Corp in Mexico & China

To increase the potential for scaled up financing opportunities, in other words, larger deals which might be of interest to larger project finance scale investments, EPS Capital Corp has been developing two models: one in Mexico, the other in China; countries where there is already an appetite for ESCO activity. Although utility sectors and regulation may be different in different countries, the fundamentals of identifying EE opportunities and structuring them to be paid for from the savings are the same.

Barriers identified:

- Lack of commercially available financing from local financial institutions (LFI) suitable for energy saving projects (ESPs);
- The characteristics of ESPs that make this difficult is that cost reductions generated from energy savings are not a source of profit or an 'asset' that banks understand or are comfortable to lend against. This is coupled with the lack of familiarity with the ESP entities, their risk profile, and therefore their evaluation. In other words, if an ESP defaults from debt servicing (which would also imply the energy saving project was not performing), the bank would normally look to repossess an asset that has value – energy savings do not fit that bill in the traditional sense. Credit and performance risk are therefore an issue;
- In both China and Mexico most banks will not take credit risk beyond tenors of three years. The aim of the models described below is to get a minimum tenor of seven years.

EPS Capital Corp's approach:

1. In Mexico, a country that displays support for ESCOs but also constraints in terms of financing in the right form:

- EPS trains LFIs on how to evaluate the characteristics of ESPs as well as their risks and benefits;
- Promote confidence that the EPS model delivers savings, and that debt will be serviced, notably through the development of performance and credit risk guarantees. In this, EPS Capital Corp is working with the Mexican Development Bank (NAFIN) on a newly developed set of 'cutting edge' guarantees in order to enable LFIs to feel comfortable when dealing with the risks;
- Demonstrate a model of aggregating ESPs into a special purpose entity, by means of using standardised methodologies and contracts to evaluate, measure, and evaluate the savings. The aim is to reduce transaction costs and scale-up the financing levels.

EPS Capital Corp accessed grant financing from various sources to contribute to the development of each of the steps above; the ESPs themselves were using a model where the savings pay for the costs of the project.

2. In China, which also has strong support for energy efficiency:

- Performance guarantees are not available, although, the IFC does offer its standard partial credit risk guarantees to banks. However, neither IFC nor any other governmental agency or entity had established a performance guarantee mechanism like NAFIN is doing in Mexico. EPS Capital is raising a \$100 million equity fund (with a

view to scaling up to \$500 million in five years) in order to provide large equity requirements of Chinese banks to finance ESPs;

- The fund will be used to put in up-front equity (bringing in debt and equity on a 50:50 basis), with the special purpose entities buying ESPs from Chinese ESCOs at a price where the ESCO realises a construction profit and a share of the long-term savings;
- Assist ESCOs in increasing technologies and project size;
- Use Special Purpose Entities (as above) to aggregate the ESPs.

These methods of managing risk should tide banks across a period to the point they get comfortable with collateralizing the savings without a guarantee, i.e. they take the risk on.

There needs to be a well-operating banking sector that knows how to do credit evaluations and reasonably developed, enforceable contractual law – or methods of managing it (e.g. in China).

Municipal Level Activity

The Alliance to Save Energy in India is also working on an innovative financing mechanism to implement EE and water projects directly with the public-sector municipality. In this case, municipalities are bundled together and contract with ESCOs to implement energy efficiency measures (as outlined below). This also uses the international IPMPV standard.

Box 3. Example: The Tamil Nadu Water and Energy Efficiency Project

The Tamil Nadu Municipal Water and Energy Efficiency Project which operates in 29 towns through the use of Energy Performance Contracts.

Energy efficiency and water-energy projects in India have been constrained by several barriers:

- Financing;
- Lack of awareness and low confidence in ESCO projects in the public sector;
- Reluctance of the ESCO industry to undertake public sector projects, due to non-payment concerns.

The objective was to create confidence in the use of performance contracts in the public sector among all stakeholders by ensuring the success of the Tamil Nadu Municipal Energy Efficiency Program. This resulted in a first of its kind bundled Municipal EE project.

Issues

- Availability of Finance to ESCOs;
- Payment Guarantee Mechanism to ESCOs;
- ESCO projects in India often falter, if not fail, due to disputes over quantifying energy savings resulting from the project.

Solutions

- Tamil Nadu Urban Infrastructure Financial Advisory Services Limited (TNUIFSL) indicating willingness to finance ESCOs;
- Setting up of Trust & Retention Account (TRA) with electricity bill payment escrowed;
- Using the International Performance Monitoring and Verification Protocol (IPMVP);
- Overseeing Project progress and providing technical support to develop local capacity;
- Document IPMVP's suitability to Indian scenario;
- Develop financing tool kit including performance contracting case studies for replication in other cities;
- Facilitate market transformation.

TN Municipal EE Project Specific

- Providing technical advisory (TA) to TNUIFSL; bid documents developed after many consultations with all stakeholders;
- 29 towns divided into 3 geographical groups based on physical proximity;
- Bid Evaluation Process:
 - Expression of interest (EOI) – 13 Responses;
 - Request for proposal (RFP) issued to 8; responses to RFP – 6;
 - Letter of Intent (LOI) issued to 2 ESCOs;
 - TNUIFSL indicating interest to finance ESCOs.
- Investment grade audit draft report discussion in progress.

Replication in Gujarat

- Providing TA to Gujarat Urban Development Company (GUDC) under USAID ECO III (Energy Conservation and Commercialization III) project;
- GUDC implementing Municipal water and energy efficiency project through out the state;
- IL&FS Ecosmart is providing Project Management support to the project;
- Highlights of the Project:
 - Pilot EE projects in 10 towns; EOI received 17 responses;
 - RFP issued to 11 ESCOs and 8 responded;
 - EOI issued for energy efficiency in 149 towns; responses received from 20 ESCOs including international and national ESCOs;
 - Power Trading Corporation has evinced an interest in being a Super ESCO and will shortly be signing an agreement with GUDC.

Based on this experience, the Alliance highlights the two following areas as key to expanding such activities: firstly, developing mechanisms for enforcing payment for EE services procured by end users, especially public sector (including municipal) entities, given that it is important to establish a sound payment structure for the cash flows arising

out of an EE project based on performance contracting, to ensure that repayment is made to all stakeholders as agreed at the start of the project.

Secondly, establishing credit guarantee funds for ESCOs to decrease financial risks, and encourage local commercial banks to work with national credit guarantee institutions to obtain credit guarantees and increase lending to EE projects and ESCOs.

Carbon finance

Carbon finance can provide a potential additional revenue stream that can facilitate a project achieving financial close. However, as mentioned in the introduction, only approximately 10 percent of the volume of emission reduction credits in the Kyoto Protocol compliance market, at present, stem from EE projects; of those around 90% of projects in the pipeline at mid-2007 were being developed in the major energy intensive sectors of iron, steel, cement and chemicals. The small, dispersed, and end-use EE measures have so far 'largely been bypassed' altogether, despite offering very significant GHG mitigation potential²⁸.

Survey participants reflect this low volume, presenting a very mixed role for carbon finance in EE projects, and more broadly.

CDM projects given as examples in the survey were: sewage treatment, landfill gas, waste treatment, biomass energy, cogeneration and demand management (through popularising energy-saving home electric appliances).

However, this 'carbon' revenue stream will be dependent both on the type of greenhouse gas being reduced²⁹ and the national baseline against which the project is being measured. Methane based reductions, for instance, as in some of the above examples, will generate a higher volume of carbon credits (Certified Emissions Reductions, CERs, under the CDM), when compared to CO₂, given that its Global Warming Potential is over 20 times higher. Equally, if an EE project is displacing energy from a coal-heavy national energy system (e.g. China or South Africa), it will deliver more emissions reductions, than against a gas-based system.

CAF, for example, provides both carbon-related and conventional project finance, and is providing options where a project can mix both sources of finance.

Several institutions are exploring how carbon revenue streams can be added to, or generated from, planned project portfolios, furthermore, a number are involved with carbon funds including: EBRD (the Netherlands EBRD Carbon Fund, and the Multi-lateral Carbon Credit Fund), JBIC (working in partnership with the Japan Carbon Fund), KfW (KfW Carbon Fund).

One private-sector FI is examining programmatic CDM approach for EE in buildings, as mentioned above. 'Programmatic CDM', is a relatively new approach that seeks to enable larger scale activity beyond the original 'project by project' approval process. In this case, rather than apply to only one project e.g. a single building (where the transaction costs would be extremely high and the carbon revenue inflows very small indeed), it would target a number of buildings.

Emissions cuts are achieved through “CDM program activities” (CPAs). These must all apply the same methodology, be implemented in the same type of facility or structure, and be coordinated by the same managing entity. However, they can occur in an unlimited number of places and can be implemented over time up to 28 years³⁰.

The project developer needs to be able to prove in this case that the energy saving technology has been fitted; outline what will be measured; report and verify this; and then monitor the actual savings. The fact that this is being examined and developed by an FI indicates that innovation is starting to occur as rules become clarified.

As a general point, part of the challenge of capturing and using carbon finance under the Kyoto Protocol mechanisms, is that the value of the revenue stream, i.e. credit price going forward, will be dependent on the evolving international UNFCCC framework, particularly how it will be shaped after 2012 when the first commitment period of the Kyoto Protocol ends. This is being negotiated under a UN round which will not be completed before the end of 2009. This uncertainty means that post-2012 revenue streams are not yet easy to rely on, which is very short term in a project financing sense, for many financiers, despite the level of trading interest, carbon-related funds, and new approaches being examined.

Additionality

Another important factor in realising carbon value is the requirement, under the CDM and JI, that projects must demonstrate that they are additional to market activity that would have occurred anyway³¹.

This means that the carbon finance stream must be central to taking the project to financial close, or to overcoming specific barriers that cannot be overcome otherwise. This may be a challenge for EE projects built around business models where the projects are self-financing. This was noted by EPS Capital Corp, which is not pursuing carbon finance for this reason.

Measurement and verification

Within the ‘carbon finance’ arena, methodologies for measurement of emissions savings, as well as monitoring, reporting and verification (MRV) noted above, will need approval under the Kyoto Protocol’s Clean Development Mechanism (CDM)³² or Joint Implementation. This creates potential links to the measurement and verification needs, and initiatives that are aimed at standardising the ESCO energy performance contracting model. The *International Performance Measurement and Verification Protocol* (IPMVP) provides guidelines for the measurement side of EE projects, while the *International Energy Efficiency Financing Protocol* (IEEFP)³³ focuses on the ‘savings value’ of the ESCO itself, for the purposes of loan repayment and credit capacity review by LFI or others.

The World Bank’s technical report on EE and programmatic CDM notes the possibility for the IPMVP to provide a basis for emission reduction measurement and verification, and potentially even on the level of scale of programmatic CDM. This would certainly improve the potential for lower transaction costs, and more widespread acceptance over approaches to the underlying delivery and value of energy savings.

It was noted during the survey that simple and practical M&V methodology can act as a risk mitigation tool for the success of the project. A 'deemed savings' approach can be adopted wherever system-wide savings are difficult to identify, monitor and verify.

Carbon finance not core

Yes Bank is an example of one survey participant where carbon finance does not play a role in financing EE. Carbon credits are viewed as an added extra revenue source, but not central. The impact of carbon credits only enhances financial returns by perhaps two or three percentage points and this is not seen as significant. For Yes Bank, a project has to be financially viable (revenue sufficient to service debt), independent of carbon revenues, and only then will it get financing. Policy uncertainties going forward are also cited, as the Kyoto Protocol reaches the end of its first commitment period at the end of 2012, with the next phase of the UN regime under negotiation throughout 2009.

4.3. EXPORT CREDIT ROLE – JBIC

Carbon mitigation is a core objective of JBIC's activities; its Environment Finance Engineering Department was established in 2006, specifically to strengthen support for overseas 'environment' projects. It combines carbon expertise (CDM or JI) with its focus on major emitting energy intensive sectors (electricity, steel, cement, chemicals and refining), to improve overall project profitability, and reduce financing costs.

JBIC specifically noted that ECAs have their terms and conditions defined by the OECD Terms of Agreement. In the case of renewable energy, the OECD extended the timeframe for provision of financing from 10 years to 15 years. For EE, and energy savings - technology or services - another 'special treatment' should be examined. The different characteristics of energy efficiency financing would need to be taken into account, including types of projects and if corporate finance rather than project finance is being made available, as well as the potential range of EE activities that require financing.

4.4. PUBLIC-SECTOR FIs AND RISK CAPITAL

Public-sector FIs, which have traditionally been involved in project financing, are now looking to play a more 'catalytic role' in new technology commercialisation and new company development by providing earlier stage equity capital. The ADB has invested \$100 million into five equity funds, with the bank's involvement enabling those funds to leverage additional private sector funding of up to \$1.2 billion in clean energy projects in Asia.

CAF, ADB, EBRD and JBIC, alongside Yes Bank, for example, have also invested in public-private funds aimed at providing specialised equity investments. Note was made, for example, of an ESCO fund in Singapore, which both public and private sector FIs are investing into, indicating new types of public-private financial cooperation.

4.5. PRIVATE-SECTOR FIs – ADDITIONAL COMMENTS

Definitions

Part of the value creation in EE will rest upon how it is defined, and this has links into the discussion of visibility above (what will ultimately be counted as EE) and the issue of monitoring and verification (under the CDM as well as a component of standardising ESCO models), and, more widely, on how opportunities are understood by FIs and how they are structured into products and procedures. This may include definitions of eligible activities through regulation or future incentive schemes (and may also set out in the government mandate for concessional financing approaches of the public-sector FIs). Ultimately, this links through to public policy objectives in this area, and also client demand offering commercial opportunities to FIs.

Counterparty credit risk

Not unique to EE, but raised as an issue by private-sector FIs in relation to EE, is the challenge of assessing and managing the credit risk of counterparties, as verification of the financial capacity of the EE sponsor will be requested by the bank's credit department; this can be difficult if it is a small player, without a clear track record in the market, even if the project may 'look nice, with reasonable cash-flow'. The credit department is simply applying the same rules that are applied to normal projects: similar problems are faced by RE and 'clean tech' sectors where the sponsors are new players.

This is one area that public finance can help with, for example, through credit risk guarantees to reduce the perception of risk attached to entities with little or no financial management history, small or new players. It was noted that the statistical risk is only that around 1 or 2 percent of borrowers will default, and therefore not a 'major risk'.

One interesting approach used by KfW, in Germany, under its 'ERP Environmental Protection and Energy Saving Programme', enables companies, including SMEs and self-employed professionals, to apply for loans. The loans are disbursed through commercial banks, and the interest rate is risk-adjusted, meaning that it is fixed by the ultimate borrower's bank, on the basis of the borrower's credit standing and the value and recoverability of the collateral provided for the loan.

5. POLICY AND REGULATORY ISSUES

An important set of questions in the survey, sought to find out the FIs' perceptions of the policy and regulatory environment, and the role this would play in the growth of the EE sector, from a financing point of view.

All of the survey participants gave a high priority to the policy and regulatory environment and, most importantly, the effective implementation of policies that are adopted.

This echoed an analysis from Swiss bank UBS, mid 2008, which found that the most important driver is tightening up legislation: "High energy prices support energy efficiency. But the main driver is tighter policies on climate change and energy supply security, which would help remove obstacles..."³⁴

Two useful starting points were given by participants as to what will drive the rapid evolution of the EE 'market' going forward: the opportunity to capitalize on the set of immediate term drivers, and the longer-term perception of lower risk of EE and the sustainable energy sector more generally.

The external drivers outlined at the start included:

- 'Corrections' in fossil fuel and conventional energy (and raw material) prices, which are expected to continue to increase, as well as increasingly reflect environmental costs;
- Political and public pressure to tackle climate change, translating into new policy and regulation (risks and opportunities);
- New technologies (and processes) becoming available, better understood and increasingly commercialised in both the energy and industrial areas;
- New companies, with new business models entering the marketplace;
- EE can reduce the need for additional energy generation capacity.

These need to be aligned with the perception of lower risks associated with EE, and RE, in the longer term, as one survey participant stated:

"The person that focuses on energy efficiency realises the true, long-term value of that, and also realises that there is a limit. After achieving maximum energy efficiency, then in real terms for new energy consumption the choice is renewable energy sources, as these are the next lowest cost of energy, taking a longer-term view."

The challenge for policy and regulation is to enable FIs, particularly the private-sector FIs and emerging specialized FIs in this space, to understand that the basis for this 'longer-term' view is durable, and is able to translate to cash and capital flows today. While often stated, examples and views in sections above highlight the role that public-private cooperation can play in achieving this.

Linking EE and RE strategies in an integrated approach to sustainable energy policy and supporting regulation will need to be specific enough to address the issues raised with regards to financing EE, and clear enough to drive EE up the agenda and into the mainstream. Combined EE and RE regulation and incentives must also be integrated into wider energy and economic policy to avoid mixed signals. Such an integrated and systematic public policy approach will enable FIs to present to their boards, credit committees, and clients a commercially attractive case for early, active engagement in this market.

Given the urgent need to capture the potential of this sector, from a public policy point of view, the first issue to address is the policy barriers that are contributing to market failure in the EE area. In the graphic below, UBS provides a useful summary of the extensive literature in this area, from a financing perspective.

Barriers to energy efficiency improvements:

Agency issues	Two parties engaged in a contract can have different goals and levels of information → misaligned incentives Example of landlord/tenant, or producer/consumer of electrical appliances: Party which is in a position to decide about energy efficiency improvements is not the one paying the energy bill
Lack of information	Energy savings potential is not always that obvious as it often comes in many small pieces and not big chunks. Consumers are often unaware of the savings potential.
Lack of incentive	Large impact of energy efficiency only at aggregated level (e.g. electricity savings through energy efficient refrigerators), but little incentives on consumer level (even if it pays off), as energy cost is simply too low relative to other factors.
Policy distortions	External costs (e.g. of climate change, acid rain) are not fully included in the price of fossil fuels Fossil fuel subsidies (e.g. fuel subsidies for transport in Middle East, cheap natural gas for households in Russia).
The psychological angle	Higher energy consumption as a sign of prosperity, efficiency improvement associated with rationing, loss of comfort and therefore a priori dismissed. This argument is particularly applicable in the case of developing and emerging countries.

Source: UBS (2008).

In addition to the above, the policy framework underpinning energy, and specifically underlying infrastructure development, as well as the structure and regulation in the electricity, buildings, construction and the industrial sector, will play a key role in ensuring

EE is embedded. To fully deliver and actually implement EE, incentives and other factors will need to be sufficiently rewarding, stable, and long-term to build the 'supply chain', from the technology developers and manufacturers, to the project developers and installers underpinning the ESCO market, to services and businesses more widely.

Perverse incentives are a crucial issue. Both raised during the survey and mentioned more widely (including McKinsey's 2008 Energy Productivity Report³⁵, and The Economist³⁶), is the utility business model that links revenue to sales, creating an incentive to sell more power. The fact that several states in the US, notably California, are actively seeking to 'decouple' profit from sales through a regulatory approach, was highlighted during the Survey as a useful way forward.

In Europe, even the impact of electricity market liberalization on the development of ESCOs could only be described as 'neutral', rather than overtly positive, in the EU ESCO market report.

These examples indicate market failure at the level, not just of energy but also, of broader economic development strategies, and signal the importance of auditing government policy approaches across sectors and regulation areas for their consistency with EE goals. Underlying structural constraints need to be tackled and sound incentives put in place, if the possibility of delivering the scale of savings and efficiency, in the timeframes signaled by the IEA, is to be possible.

5.1. KEY POLICY AND REGULATORY ISSUES: PUBLIC-SECTOR FIs

Public-sector FIs have a more direct engagement with governments, both through their boards as well as their public mandates, to provide dedicated finance and services on EE, and incorporate EE aspects into their broader financial operations. The external policy environment is, however, still important for actually delivering services or finance in the real world.

This section starts with some of the key comments raised and moves on to regional examples of policy issues as provided during the survey³⁷.

- A long-term stable policy and regulation is considered fundamental to enable clean energy (including specifically EE) to go forward;
- Some public-sector FIs work with governments, if requested, and independent regulators, on the policies instrumental to achieving effective 'enabling environments';
- As providers of finance, also to the private sector, these FIs face policy and regulatory barriers, as well as barriers linked to market structure, relevant to the national or regional context. Barriers highlighted include subsidies supporting energy consumption or upstream fossil fuels, as well as negative market behaviour from dominant market players towards sustainable energy, or new entrants;
- Where 'good' policies or EE goals do exist, the quality of policy implementation on the ground remains a crucial factor;

- One possible initiative suggested is an alliance of private and public FIs to establish EE standards as benchmarks for technology used in different sectors, and geographies; this could potentially also provide a basis for technology transfer.

Regional examples of policy and regulatory issues

- **African Development Bank:**

Most African governments have insufficient regulation in place to address EE, which is limiting the market potential for EE technologies at present. An important focus of Development banks is to assist governments to develop policy and regulation in this area: particularly tackling low efficiencies in the electricity generation, transmission, and distribution sectors.

There is particular scope for large-scale government-led energy efficiency programs. This could involve the promotion of energy efficient lighting and demand side management, or industrial EE. The alignment between the high energy costs being faced by water pumping and agro-processing industries and the interest in developing EE projects by the relevant departments in the AfDB was noted, and highlights opportunities for taking such large-scale approaches forward.

- **Asian Development Bank:**

As energy regulatory agencies have a huge role in the clean energy agenda in the region, ADB works directly with energy regulators, as for example, the Central Asian Regulators Dialogue, and a similar effort with ASEAN regulators. Where requested, it can help draft EE and RE laws. With enabling environments in place, the private sector arm of this multilateral bank can provide the required financial products and investment. Currently, 60% of ADB's private sector lending happens in the clean energy area.

To focus effort, ADB initially targeted six countries with the greatest potential for clean energy investment, and has now added a further six smaller countries to those it is working directly with in this area. It executes a full analysis from resource mapping to market studies to identify the potential market for EE investments, across industry, commercial, buildings, lighting and so on. On this basis, a strategy, incorporating policy and regulatory aspects, is formulated based on national conditions.

- **Corporacion Andina de Fomento (CAF):**

While many governments are noted as having adopted EE programs in the region, an important issue raised by CAF was whether these programs are implemented on the ground, and produce results. Another issue highlighted was the challenges facing RE deployment, particularly at the smaller - under 20MW - project size: large utilities are not seen to have an interest in RE technologies or other types of projects that may run counter to their core activities. Market barriers still being deployed include the use of taxes and fees for energy distribution and difficulties accessing the grid dispatch system.

- **European Bank for Reconstruction and Development (EBRD):**

At EU level, Commission directives (e.g. directives in the areas of emissions trading, renewable energy, energy services and so on) play a very important role in driving

member state policy. However, directives are only meaningful if they lead to effective action on the ground. Many of the member states have plans for EE that are not implemented effectively. The EBRD region has a ‘notoriously bad’ reputation for effective implementation, new building regulations representing a prime example.

“There isn’t really a ‘new’ energy efficiency policy that’s waiting to be written – it’s more about actually implementing good policy on the ground.”

- **Japan Bank for International Cooperation (JBIC):**

Inadequate or poorly designed regulatory frameworks are creating barriers for EE investment and finance in developing countries. Subsidies to energy consumption result in energy prices being ‘much lower’ than global levels, both in the household and industrial sectors. This creates perverse incentives to energy consumers, and also extends the payback period for EE projects, thereby reducing the commercial attractiveness.

JBIC also comments on the example of RE investment that requires government support (perhaps with the exception of hydropower). Continuity and stability of the incentive system is a key issue for financiers: an independent power producer (IPP) will need a reliable power purchase agreement (PPA), and a long-term commitment from government to back up the PPA. The design of instruments to ensure all parts of the financing equation have acceptable risk levels is also directly relevant for EE.

Intellectual property rights (IPR), on the technology side, may become an issue if direct investment is being made in a technology development company (rather than technology provision); however, in this case, IPR risk mitigation could be a solution.

JBIC’s suggestion of an alliance of banks to develop further the option for EE standard setting, within relevant sectors, and subsequent benchmark development, including guidance for technology transfer, derives in part from the observation that private financial flows are much greater than the funds pledged through the G8 or official development assistance (ODA), and therefore, means to facilitate private sector flows towards EE are key.

If even fractions of these public funds, through public-sector FIs for instance, could be used to provide incentives, for example through interest rate reductions, this would improve the ability to leverage private sector finance to flow into EE activities. Such forms of public-private activity were deemed to be effective in accelerating EE uptake, both in OECD as well as in developing countries.

5.2. KEY POLICY AND REGULATORY ISSUES: PRIVATE-SECTOR FIs

This section starts with some key points raised by the private-sector FIs in the survey and then provides some of the broader issues and options discussed, followed by some specific regional examples.

- Government policy and regulation is, and will, play a crucial role, in creating finance opportunities, at scale, in EE. Scale is especially important to attract capital flows from the commercial banking community;
- Options suggested to create scale opportunities include: bundling energy efficiency requirements in public facilities; utility sector regulation to incentivise 'negawatts', and examining the "white certificates" market (for trading certified energy savings);
- The identification and removal of perverse incentives, by policymakers or regulators, is also important, including examination of underlying market structures, for example, where there is a direct relationship of utilities' sales to their profits, and 'agency issues' like the landlord-tenant split, amongst others;
- Creating a strong investment environment at national level, through clear, legally based policies and regulations, is needed, to both develop new businesses dedicated to EE activities, such as ESCOs and service businesses (e.g. metering, installation etc), and to incentivise EE strategies throughout the economy;
- More generally, clear public policy in support of EE will help provide the right signals and a long-term opportunity horizon to entrepreneurs, and the venture and equity finance which will be at the helm of new company developments³⁸.

Discussion

Policy is needed to promote EE: relying on rising energy prices, or a price-based approach alone, is neither sufficient, nor reliable. This is despite the perception that fossil fuel prices are going up in the medium to long-term, and will remain high, with price volatility being a central characteristic of 2008 prices.

The reason pricing alone is insufficient, as described by one of the survey participants, is that energy elasticity of demand is very low: petrol prices have to be very high to alter transport decisions for example, and even then there is a disconnect between demand reduction actions and supply side or upstream market dynamics. High prices are also good for the oil or electricity supply business. This is an important factor when aiming for a significant reduction in carbon emissions over a two or three decade time-period; and highlights the need for policy oversight.

Several survey participants highlighted the role that policy and incentives have played in successfully driving significant investment into RE, and said the equivalent for EE is required.

"Some kind of regulatory framework to support EE will be essential to promote its growth, otherwise it will be adhoc schemes.".... "Unless you specifically target the area, it's difficult, there isn't anything to 'latch on to'".

This was also described as the 'asset' factor: banks tend to prefer to be able to calculate the benefits in the context of a specific scheme, over time. At present, there is a lack of any kind of transparent schemes for energy efficiency that would provide that condition.

Given the government and market shift towards recognising the public importance of EE, “the issue is now how to set it in a structure that you can get comfortable financing.”

Some policy solutions

Various policy solutions were put forward by survey participants as approaches that could help the lending side of the EE financing equation. These should be seen in the context of other initiatives that identify key elements of the policy agenda for EE, including, for instance, the importance of setting efficiency standards for appliances, equipment and buildings³⁹.

While one financier noted that the most direct approach would be a straight compulsory set of targets on society, to which consumers would have to adjust, a more politically palatable alternative is the creation of ‘proper incentives’. To be effective, incentive measures would require a variety of mechanisms, differentiated by sector, in order to be specific enough to generate commercial activity.

To create commercial options for EE financing:

- Target, firstly, governments’ own facilities: enable the private sector to engage with the potentially very significant (“MUSH”) market in public-sector facilities and accelerate the start of a wider EE/ESCO market. The key feature here is that the owner of the facilities, be a local, regional or national government, is in a favourable position to aggregate the pool of facilities thereby creating large scale, even project-financeable, EE projects. This could be seen as a parallel approach to the US which specifically targets and incentivises ESCO activity in the public facilities/federal estate market (see Box 3. below).
- Encourage procurement of EE equipment, using lifecycle cost assessment where possible.
- Tackle disincentives at the utility level: specifically where linkage between sales and profits undermines the commercial case for optimising demand reduction. Incentives are needed that enable utilities to develop a business model for selling demand reduction. A utility could sell negative kilowatt hours (i.e. ‘negawatts’), but would require regulatory support to enable the savings to be monetized: “like huge ESCOs in a way, but less cumbersome”. Note was made of such efforts in the US to decouple profit from sales, often through tariff-based regulations; different regulatory approaches would be required in liberalized markets.
- White Certificates (WC) are seen as a ‘typical’ EU-style policy which might facilitate business models for saving energy. A ‘negative kilowatt hour’, or saved unit of electricity, is the same everywhere (compared to the supply of kWh which is produced differently in each country, and has different constituencies of interest). A WC would be awarded for every unit of electricity saved, potentially linked to carbon which would enable EE to be tied, or more strongly linked into a functioning carbon market. Energy savings could be obligated on utilities or specific sectors in this way, with WC’s traded between those actors to meet obligations. However, at present “this is not really something which is yet very visible” and the ‘huge,

expensive regulatory and social infrastructure that would be required' was noted, as a strong disincentive.

- Service businesses, including ESCOs, and the industries deploying the devices that underpin this market (e.g. metering or software that can monitor and manage consumer power at peak time) need to be in place. This 'supply chain' is essential to enable actual implementation. This is a growth business sector, but a proper regulatory framework is needed to demonstrate sustained demand, and that the government commitment is sufficiently durable to invest against.
- A standardised way to measure savings in end-use consumption and the retrofit market (which may also be described as refurbishment or modernisation) also need to be developed. Caisse des Depots, in the public-sector FI category, for example, had to develop its own methodology for assessing and rewarding implementation of EE through refurbishment in the French social housing market.
- The car manufacturing sector was described by one survey participant, as a 'pure political issue': the simplest route being Governments deciding to set binding limits on vehicle fuel efficiency, in the context of the available technology.

Regional examples

In addition to the **US** case study below, note was made that the US Congress had tried to use tax policy in the buildings sector in 2005 through a commercial buildings tax credit. However, the success of this approach was seen to be limited at that time, by the landlord-tenant split problem: the owners of the (commercial) real estate were not economically incentivised to improve EE as they could not pass the costs to tenants who are usually the direct beneficiaries of energy efficiency improvements. Furthermore, there was not a lot of gain in the underlying property value which might have provided an upside for landlords: "there wasn't really a return on investment for them". This is now seen to be starting to change as energy (and other resource) efficiency starts to become "centre stage" in the typical negotiations between tenants and investors.

In **South Africa** regulation is seen as a very important cornerstone. A political process is now underway that may result in energy savings of around 10% (against a baseline), becoming mandatory, coupled with large penalties for underperformance. A levy on power from non-renewables has been announced that should transfer into a 'pot' - some kind of fund, that may be used for RE.

In **India** efforts by Yes Bank are not directly driven by regulation, however, the effect of power shortages in the country, within certain regions, has produced an environment that makes regulation even more important. Power pricing regulation is very localised in India⁴⁰: some innovative state utility regulators have recently adopted laws that reward consumers displaying decreasing power consumption with lower tariffs.

However, more is required on the regulatory front: as raised above, in India investment and policy conditions are required that will attract larger international ESCOs to come to the country and provide 'project finance scale' opportunities.

Box 3. Case Study: US regulation, energy performance contracting

Private-sector FI engagement in the energy services business is predominantly driven by federal, state or local regulation, which sets out the way energy services are financed, including the allocation of risk.

- **State & local facilities:** Tax exempt financing can be used for municipalities, state and local government facilities, universities, schools and hospitals (the so-called 'MUSH' market). In this case the most basic form of financing is 'self-funding': aggregated energy savings achieved, in terms of cost reductions, must at least cover the overall cost of implementing the program. In this form of funding, the FI engages directly with the end user, to provide the financing, and the ESCO has responsibility for the design and installation of energy efficient technologies and provides ongoing operations and maintenance services, hence taking the performance risk.
- **Federal facilities¹:** Under energy performance contracting in this market, the FI would provide the financing, in most cases during construction/installation of the EE, and when the 'performance' period begins, the government makes payments reflecting the value of the actual savings achieved. In this case the FI would assume some of the performance risk. Energy service performance contracts (ESPC), as defined, and through regulation, are one of the ways that federal energy saving programs can be financed. In January 2007 an Executive Order was adopted (13,423) requiring federal facilities to reduce energy use per square foot (including industrial and laboratory facilities) by three percent per year through the end of 2015 or by 30 percent by the end of FY 2015, relative to 2003 baseline.
- **Utility/ratepayer funded:** In a number of states there are authorized budgets for utility energy efficiency programs, sometimes raised through Public Benefit Funds/Systems Benefits Charge (SBC)². The latter is generally a small levy on electricity bills, usually accumulated into a fund to provide public benefits, including EE. The SBC may be diverted into a pool of money, at state level, which then may be available – through a variety of mechanisms – as a cash incentive for EE programs, including third party incentives.

The US-based National Association of Energy Service Companies, in its 2007 Bi-annual survey of the ESCO sector outlines recent trends:

"Average annual growth between 2000 and 2004 was only 3%, down from 20% in the 1990s. We attribute this to:

- stalled retail competition,
- fallout from the Enron bankruptcy,
- a sunset in the legislation that enables performance contracting in the federal market, and
- industry consolidation.

Survey results indicate a recovery in 2004–06, with growth again reaching 20% per year. Factors contributing to recent increases in ESCO activity include:

- customer response to rising energy prices,

ENERGY EFFICIENCY AND THE FINANCE SECTOR

- renewed interest in energy efficiency and climate change,
- re-authorization of energy savings performance contracts (ESPC) in the federal market,
- the adoption of aggressive energy savings goals for federal agencies, and
- The ramping up of public-benefit, and ratepayer-funded energy efficiency and renewable energy programs.”

The composition of the ESCO industry continues to evolve with significant industry consolidation since 2000; however, a significant number of small, independent ESCOs are still active in local and regional markets.

6. CONCLUSION

Analysis and rhetoric about energy efficiency potential are not being matched by capital flowing towards those options on the ground, nor by a clear policy and regulatory environment. However, long term drivers (energy prices and climate change) are starting to raise EE up the agenda, both in policy terms and onto the radar screen of financiers.

Although interest in the 'sector' is evidently increasing across the financial institutions in the survey, for the most part, the conditions are not yet there to create opportunities 'at scale' to make EE an interesting investment opportunity. Part of the challenge of both understanding trends, and catalysing activity is the definition: EE applies to both an economy-wide level, across multiple sectors (and financing services), as well as to specific, EE-dedicated activities around energy services.

Although there are clearly lending activities going on, and some strong examples of innovation by those developing the tools and business models that will create new market opportunities, these are, as yet, at a fairly small scale, especially in the context of the very substantial investment as well as climate change mitigation opportunity.

On the policy front, there is a very patchy situation as countries are not yet providing an overriding, clearly visible framework for sustainable energy that is specific enough to indicate EE as a priority.

An effective and integrated policy approach is not only important to reflect the urgency and the level of transformation within the energy economy needed to cope with climate change and energy security issues, but also needs to create the conditions for scalable, bankable investment opportunities. FIs will need to be able to justify the mobilization of resources to develop broader *operational* energy efficiency strategies across institutions and operations.

There is an element of 'chicken and egg' to this situation. However, this point in time appears to be the start of a very significant and exciting wave of activity and investment interest in this area, as illustrated by the bookshelf of new reports and analysis, not yet there long enough to gather dust.

ANNEX I: INDICATIVE QUESTIONS

UNEP Finance Initiative – Energy efficiency & the Finance Sector

This survey, focused on the lenders' perspective, was executed through a series of interviews (phone & face to face). The following questions provided guidance on areas of:

- current activity,
- drivers and barriers, and
- regulatory issues.

General

How are high energy prices, and greater policy attention to climate change, being tackled in your institution?

Is energy efficiency (reducing energy use) emerging as a lending opportunity for you as a lender, or for your clients?

EE financing activity within the financial institution: current practice

- How is your institution providing finance for energy efficiency:
 - where does energy efficiency sit within your institution? For example: project finance, infrastructure finance, corporate lending, including SMEs), or is it aggregated across a number of areas?
 - What is the business model(s) that your institution uses for EE: and are there financial/material benefits (e.g. better debt service coverage)?
 - Is EE being raised in any sector-specific ways (for example buildings/property, industrial activities, commercial, power/energy sector), are some sectors not attractive, and if so why?
 - How long has your institution been engaged in energy efficiency financing, have any factors changed over this period, and any 'lessons' learned?
 - How does carbon-related finance play out in relation to energy more broadly, or energy efficiency more specifically?
- Would you see your institution driving engagement on energy efficiency with your clients, or would you describe it as demand led from borrowers?
- Are there/have there been i) internal and ii) external barriers for developing energy efficiency financing products, how have these been overcome?
- Are there other areas within the institution that could potentially develop EE opportunities (directly or indirectly)? What will stimulate this interest?

- Are the indirect effects of EE being considered in any way – by borrowers or lenders - as for example that more energy efficient products will result in lower lifecycle energy use? Is that type of thinking giving a value in any way?

EE financing activity: regulation

- What role does government regulation play in the decision to develop energy efficiency financing products; what is the importance of, for example, regulated emissions reductions, building standards, city level promotion of energy service companies? Are there regulatory drivers stimulating client demand for energy-use related financing?
- Are there noticeable gaps in the regulatory environment, or mixed signals that make efforts in this area less commercially attractive, and/or more difficult to 'sell' internally?
- Can policy or regulation play a role in stimulating the development of more widespread energy efficiency 'markets', or consolidation of activities: should this target individual sectors or products; or should it target energy companies themselves?
- How do you see the 'energy-use' area evolving: e.g. an energy efficiency 'marketplace', in the same way that the renewable energy 'sector' has emerged, or fully integrated into existing business areas in your institution?

7. ANNEX II: INSTITUTIONS INVOLVED, AND JURISDICTION

PRIVATE-SECTOR FIS

Bank of America, US/international

Dexia, France/international

Fortis, Belgium/international

Mizhuo, Japan/international

Nedbank, South Africa

YES Bank, India

SPECIALISED FIS

EPS Capital Corp, focus on Mexico & China

MMA Renewable Ventures, US

PUBLIC-SECTOR FIS

AfDB, African Bank for Development, African continent

ADB, Asian Development Bank, Asian Region

CAF, Corporación Andina de Fomento: throughout Latin America

Caisse des Dépôts, France

EBRD, European Bank of Reconstruction and Development: Central Europe to Central Asia (formed in 1991 to cover Central and Eastern Europe and former Soviet Union)

IADB, Inter American Development Bank

JBIC, Japan Bank for International Cooperation: Japan and international

KfW Bankengruppe

ANNEX III: PUBLIC MANDATES OF THE RELEVANT FIS, PERTAINING TO ENERGY EFFICIENCY

AFRICAN DEVELOPMENT BANK

AfDB provided background information to the study.

AfDB FINESSE program (to end 2008)

Financed by the Dutch Government with \$ 5.3 million, the *Financing Small Scale Energy Users* (FINESSE) Program is assisting countries in Africa to work through the African Development Bank in mainstreaming renewable energy and energy efficiency (RE&EE) projects and programs. In working towards this overall goal, the FINESSE program increases the capacity of Bank staff and countries in Africa to identify, prepare, and execute sustainable energy investments, and develops a policy framework to guide the Bank's operations to generate an extensive portfolio of sustainable energy investment projects.

FINESSE program objectives

The FINESSE program will reach its overall goal of mainstreaming renewable energy and energy efficiency in the operations of the Bank through the following objectives:

- Increasing capacity of Bank staff to deal with renewable energy and energy efficiency projects and proposals;
- Establishing RMCs' ownership and commitment to renewable energy and energy efficient projects and programs;
- Operationalising renewable energy and energy efficiency projects and programs in the Bank; and
- Identifying and preparing renewable energy and energy efficiency projects for the Bank's portfolio.

Clean Energy and Climate Adaptation Fund for Africa (CECAFA)

As per agreement with the donor, the FINESSE program has ended by the end of 2008. As a follow up, AfDB is establishing the *Clean Energy and Climate Adaptation Facility for Africa* (CECAFA) that will continue supporting renewable energy, energy efficiency and clean energy efforts within the Bank.

The CECAFA is the main implementing vehicle of the Clean Energy Investment Framework (CEIF) that was approved by our Board in March 2008. CECAFA is expected to be operational by early 2009 and although the operations modalities are still being

finalized, CECAFA will most probably be able to provide (next to Technical Assistance) project investment funds as well.

ASIAN DEVELOPMENT BANK

ADB's clean energy development program

The *Asian Development Bank* emphasizes the acceleration of the widespread deployment of renewable energy and energy efficiency technologies in its developing member countries (DMCs). However, although many of ADB's DMCs have established country-level legislation and targets, there are significant barriers to mainstreaming the application of clean energy technologies and services.

ADB is systematically studying these barriers to focus its interventions primarily on developing an enabling environment - policy, regulatory, tariff, institutional - and to facilitate the preparation and implementation of more clean energy projects. ADB is also working toward enhancing awareness on renewable energy and energy efficiency opportunities through country-based capacity-building initiatives, as well as taking advantage of the growing carbon market.

Energy Efficiency Initiative

ADB launched the *Energy Efficiency Initiative (EEI)* in July 2005 to identify new renewable energy and energy efficiency projects set to boost investments in clean energy to \$1 billion per year starting 2008. This target is intended to catalyze investments in energy efficiency and renewable energy needed to fill the requirement of \$240 billion over 10 years for emerging Asia. The target of \$1 billion in clean energy investments annually starting 2008 was achieved months ahead of schedule. ADB is working to sustain this clean energy investment target for the next 2 years, until 2010.

To help finance EEI, CEFPF was established in April 2007. EEI designed CEFPF (*Clean Energy Financing Partnership Facility*) to fund small energy efficiency investments that require quick transactions, finance some technology transfer costs of clean technologies, and provide grant assistance for activities such as developing the knowledge-base on clean energy technologies.

Sustainable Transport Initiative

The Sustainable Transport Initiative, approved in January 2006, aims to invest \$1.5 billion in the transport sector to catalyze capital flow to energy efficient transport systems with high emphasis on reducing GHG emissions as well as overall improvements in inclusive mobility and accessibility. The initiative undertook initial work to examine urban transport project development in 5 pilot cities: Changzhou, Colombo, Dhaka, Harbin, and Kathmandu.

Energy for All Initiative

Through the Energy for All Initiative, ADB's regional departments are working to mainstream the implementation of new strategies to help scale-up replicable access to modern and

sustainable forms of energy. This entails finding the appropriate methodologies and duplicating these to provide sustainable energy access for the poor.

It is also working to establish a regional partnership to better serve the needs of its developing member countries in terms of energy security and access to modern sources of energy. This new partnership will serve as a platform to stimulate cooperation, share ideas and information, advocate new approaches and methodologies, and, most importantly, help drive the implementation of scalable, replicable and financially sustainable access to energy projects. The regional partnership will add value to other energy initiatives through its emphasis on financing and scaling up local, village-based energy access projects, while mobilizing the private sector.

CAF, CORPORACIÓN ANDINA DE FOMENTO

The Latin American Carbon Program (PLAC)

PLAC was set up by the CAF in 1999, under the leadership of its Environment Office. Its objective is to facilitate and create incentives for the participation and entry of Latin American and Caribbean countries into the emerging market for emission reductions (ERs) of greenhouse gases (GHGs).

The program has evolved in line with the gradual progress and strengthening of the market following definition of the ground rules and the entry of new actors and participants in the market.

This evolution has resulted in a program that has become a leader in the identification, development, and execution of CDM projects in Latin America, at the same time establishing and operating the first regional window for carbon purchases: the Euro 45-million Purchase Facility with the Dutch government.

The PLAC is now focusing on assuring the production and delivery of quality ERs, with acceptable risk profiles that add value to projects and strengthen the ER market.

- Development of demand

In its mission of identifying and establishing opportunities in the ER market, the PLAC is continuing its efforts toward diversification of buyers. A successful example of this activity is the Fund established by the Dutch government.

- Strengthening supply

The PLAC supports individual projects with CDM potential, from identification of the opportunity to marketing of the ER.

The PLAC maintains its focus on Latin America and the Caribbean where it has a diversified portfolio - receiving projects from both public and private sectors - for appraisal and follow-up. The PLAC also offers the option of supplementary financial services, including financing of qualified projects.

- Institutional strengthening

As a basic part of its main objectives and in line with the CAF's vision of sustainability, the PLAC is a source of effective support for training activities and knowledge transfer aimed

at strengthening the institutions in all its shareholder countries. For example, the CAF has offered support through technical workshops on the CDM and negotiations, as well as preparation of technical guides for project developers and sectoral studies, etc.

- Renewable Energy and Energy Efficiency

As part of its commitment to sustainable development, the CAF Environment Office has opened the possibility of working with renewable energy and energy efficiency projects, with or without a CDM component. The PLAC is evaluating forms of financial support that are supplementary to the CDM for qualified projects. These would include traditional and non-traditional financial products.

The PLAC is currently developing quality projects in Central America, the Andean region, the Caribbean, Brazil and the Southern Cone, with emphasis on the energy industry and transport sectors.

CAISSE DES DÉPÔTS

A long-term investor serving the public interest and France's economic development, Caisse des Dépôts is a public sector financial institution that performs public-interest missions on behalf of France's central, regional, and local governments.

Today, Caisse des Dépôts is:

- the leading administrator of French savings deposits and retirement savings;
- the leader in financing low-income housing in France and urban development;
- the long-term partner of local and regional governments;
- Caisse des Dépôts is also a leading long-term institutional investor.

Sustainable Development: Caisse des Dépôts' strategic plan *Elan 2020* sets Environment & Sustainability as one of 4 key priorities, to integrate environmental performance across operations in lending and investing in both equity and projects.

In 2007, a 3 year investment program (Euro 150 million) was launched with a target to control 5% of French production of renewable energy by 2010 (10% by 2020).

To consolidate its leading position in financial innovation to fight climate change, Caisse des Dépôts is pursuing action on a triple register: international research, consolidation of market mechanisms (registry, brokerage and trading activities), and funding.

The leader in financing of social housing in France and in urban policy, Caisse des Dépôts uses savings deposits to grant long-term loans to priority sectors designated by the French State, at the top of which is rented social housing (construction, rehabilitation...): Euro 6.5 billion in 2007. A partner of the Agence Nationale de Rénovation Urbaine (ANRU) (French National Urban Renewal Agency), it is also involved in financing urban policy. Housing loan outstandings totalled Euro 88.2 billion at the end of 2007.

From the '2007 Business Review and Sustainable Development Report':

Housing and urban development

“France’s housing shortage is currently estimated at nearly one million units. Thanks to the centralisation of funds deposited in ‘Livret A’ - passbook savings accounts - and the granting of loans to social-housing organisations, Caisse des Dépôts helps to ensure equal access to housing finance for all in France. This role is underpinned by the Public Institution’s equity investments in land and housing, its control over the SNI group (France’s top social and intermediate housing operator), and its majority stake in Icade (a leading player in real estate).

Caisse des Dépôts is determined to use these strengths to set the standard and provide impetus for social and intermediate housing. Key areas of emphasis will be the implementation of the right to housing for all, the home-ownership access program for low-income households, energy efficiency in buildings, assisted home-living facilities for the elderly, and accommodation for students and young working people. The group is targeting 40% growth in financed housing units over a three-year period, corresponding to an increase from 54,000 units in 2007 to 90,000 units annually from 2010. In addition, 18,000 existing units are to be refurbished in accordance with environmental quality standards.”

EBRD, EUROPEAN BANK FOR RECONSTRUCTION AND DEVELOPMENT

The EBRD is unique among multilateral financial institutions in that it has had an environmental mandate since its inception. The mandate commits the Bank to finance projects that are environmentally sound and sustainable. 'Environment' is defined by the Bank in its broadest sense to encompass not only ecological impacts but also worker, health, safety, and community issues.

To promote environmentally sound and sustainable development, the Bank pursues four main strategies:

- Integrate environmental considerations into every project;
- Promote environmentally oriented investments across all sectors;
- Incorporate the environmental mandate in all sector and country strategies;
- Build partnerships to address regional and global environmental issues.

Energy efficiency is a key issue in the Bank’s countries of operation as they are much more energy intensive than the EU average. All the countries exceed the EU average energy intensity and some need around five times as much energy. One reason for this is that companies and institutions are facing increasing and unsustainable energy costs as energy prices increase towards international levels.

The energy efficiency team

The EBRD is the only multilateral development bank with a specialised Energy efficiency team.

The role of the team is to:

- Develop specialised energy efficiency investment mechanisms such as ESCOs and energy efficiency credit lines;
- Identify and implement industrial energy efficiency opportunities with other Bank clients;
- Develop opportunities to sell carbon credits from EBRD funded projects;
- Promote and develop renewable energy projects, in collaboration with the Power and Energy team.

The team comprises nine professionals, including two funded with assistance from the Government of the Netherlands, one funded by the Government of Sweden and one funded by the Government of Italy. Members of the team have backgrounds in public finance, investment banking, accountancy, carbon financing and energy efficiency engineering.

Strategy

The Bank's strategy in the energy efficiency sector is to support mechanisms that develop and finance energy efficiency projects. In addition, it aims to assist its clients to identify and develop energy efficiency opportunities within their operations.

Specifically, the Bank will aim to provide direct finance to projects of a significant scale which save energy. The projects can be located in the public or private sector and concern generation, transmission/distribution or end-use. In particular:

- Industrial projects in energy-intensive industries;
- Cogeneration projects, including on-site industrial cogeneration;
- Existing or new ESCOs (in particular, the Bank supports ESCO projects which target social facilities, such as schools or hospitals).

Furthermore, the Bank will support the development of sustainable mechanisms using local banks to provide financing to smaller projects. This can be in the form of dedicated credit lines or risk sharing. It will support innovative financing vehicles e.g. finance companies or equity funds targeting energy efficiency and/or renewable energy, and help monetise carbon credits arising from emission-reduction projects. This improves the bankability of emission-cutting projects such as energy efficiency; renewable energy; fuel switching; methane capture; etc.

The Bank can support energy efficiency investments in power and district heating.

INTER-AMERICAN DEVELOPMENT BANK – SUSTAINABLE ENERGY AND CLIMATE CHANGE INITIATIVE (SECCI)

“The IADB’s *Sustainable Energy and Climate Change Initiative* (SECCI) goal is to support the LAC region in its urgent challenge to find economically and environmentally sound energy options. Its core objectives are to expand the development and use of renewable energy sources, energy efficiency technologies and practices, and carbon finance in the region...”

Funds: already approved SECCI IDB Fund (\$20 Million), plus SECCI Multidonor Fund (\$2.8 million from the UK, and additional commitments from Germany and Spain adding to about to \$15 million).

Energy Efficiency (“EE”)

SECCI is supporting the realization of energy audits as well as the design and elaboration of carbon financing components of EE programs.

Example of ongoing projects

Brazil: SECCI is supporting USIMINAS, a Brazilian steel-mining company, in the preparation of an energy efficiency program and also with the calculation of the company’s carbon footprint.

Caribbean: SECCI is preparing technical assistance operations to assess the potential for energy efficiency in the hotel industry as well as micro-generation with renewable energy. Additionally, the bundling of carbon finance will be assessed through a programmatic CDM project.

Chile: *National Energy Efficiency Program (Programa País de Eficiencia Energética-PPEE)*. SECCI is supporting the development of energy efficiency (and carbon finance) programs to be financed by the GEF. Among the activities involved are:

- Technical demonstration of energy savings and design of delivery mechanisms;
- Development of innovative financial models adapted to the Chilean context;
- Funding for the implementation of energy savings projects; and
- Sustaining the establishment of an EE market through knowledge sharing and capacity building.

Colombia: SECCI is supporting the *Asociación Nacional de Empresas de Servicios Públicos Domiciliarios y Actividades Complementarias e Inherentes (ANDESCO)*, a public service association with an energy efficiency program. Among the activities involved in this program are:

- *Investment Grade Energy Audit (IGEA)*;
- Assessment and recommendations for a maintenance plan; and

- Energy efficiency training.

Honduras: SECCI is supporting the *Natural Resources and Environment Secretariat* (SERNA) in the development of a series of technical studies, implementation of pilot projects and preparation of energy efficiency plans and corresponding investment plans.

Nicaragua: SECCI is providing a grant financed (Canada) energy efficiency program (EEP) for the water pumping stations of the *Empresa Nicaragüense de Acueductos y Alcantarillado Sanitario* (ENACAL), a water utility company in Nicaragua. Among the activities involved in this program are:

- *Investment Grade Energy Audit* (IGEA);
- Assessment and recommendations for a maintenance plan;
- Energy efficiency training; and
- Evaluation of methane use in the water treatment facility: The implementation of this project shall be done in close coordination with a previously-approved technical assistance for the Ministry of Energy of Nicaragua. This previous technical cooperation included a series of sector audits, design, and implementation of pilot projects, load-curves and financial mechanisms studies and preparation of investment plans and loans for energy efficiency.

JBIC, JAPAN BANK FOR INTERNATIONAL COOPERATION

Purpose

Japan Bank for International Cooperation has a statutory mandate to undertake lending and other operations for the promotion of Japanese exports, imports, and economic activities overseas; for the stability of international financial order; and for economic and social development as well as economic stability in the developing economies.

Support for environmental conservation and improvement

JBIC is active in lending and other financing operations for projects that contribute to environmental conservation and improvement in the developing countries by making use of a broad range of financial instruments available in its international financial operations (IFOs) and overseas economic cooperation operations (OECOs).

Support for energy efficient cogeneration projects

JBIC has provided loans for cogeneration projects that are highly energy efficient and serve to reduce greenhouse gas emissions. Cogeneration produces two forms of energy (electricity and heat) from one energy source. After power is generated by the gas turbine, heat is recovered from its exhaust gas as heated water or steam, and they are used for the hot water supply system or air conditioning. In general, compared with the case when power is bought from the conventional power plant and heat (hot water) is produced from the boiler separately, the simultaneous production of electricity and heat by cogeneration

will save fuel by about 25%. As a result, it will reduce carbon dioxide (CO₂) emissions, thereby helping to reduce air pollution.

Support for broader use of cleaner natural gas

JBIC is also financing projects that make use of natural gas on which many countries are placing their focus on in their energy policies as one of the clean energy sources. Compared with coal and oil, natural gas, when used as a fuel for thermal power plants, leads to substantial reduction in emissions of greenhouse gases and air pollutants. Given its superiority as a cleaner energy source, developing country governments are exploring ways to utilize natural gas. CO₂ emissions from natural gas-fired thermal power plants are 60% of those from coal-fuelled thermal power plants, while Nitric Oxide (NO_x) emissions remain less than half (20-37%). In addition, natural gas-fired power plants produce no Sulfuric Oxides (SO_x). Natural gas, thus, has an advantage over other energy sources in effectively reducing NO_x and SO_x, which are believed to be two principal factors causing acid rain.

Contributing to energy savings

JBIC is financing combined-cycle power generation projects that contribute to energy conservation. In a combined cycle system, power is first generated by the gas turbine, then heat is recovered from its exhaust gas and used for driving the steam turbine that generates more power. The system is thus highly efficient in energy use and serves to save fuel, thereby contributing to energy conservation. By constructing a natural gas-fueled combined cycle power plant, the project would achieve even cleaner and more energy saving effect.

Support for broader use of new and renewable energy sources

JBIC is financing projects that harness new and renewable energy sources, as they will contribute to shifting away from excessive dependence on finite fossil fuels and reducing emissions of greenhouse gases and air pollutants.

A case in point is the project aimed at increasing the recovery of geothermal heat and environmental conservation (through afforestation) in the existing geothermal power plant project. Geothermal power generation, which produces only 1/20th of CO₂ emissions per unit of electricity generated compared with thermal power generation, is an environmentally friendly power generation method. A resort to such environmentally friendly systems to meet power demand rather than the traditional power generation systems will help achieve environmental improvement.

Structurally, JBIC established an environmental finance and engineering department, in October 2006, to strengthen its support for overseas environmental improvement projects. This includes the ability to bring know-how on CDM and other Kyoto Mechanisms into investment infrastructures, in order to improve profitability and reduce costs.

JBIC has a variety of other activities in climate, including, supporting projects to reduce greenhouse gas emissions in China, partnership with the Japan Carbon Fund, and supporting ESCOs. See 'Contribution to the Prevention of Global Warming', it is Environmental and Social Activities Report, 2007.

KfW BANKENGRUPPE

KfW is 80% owned by the German government, and 20% by the Länder.

In accordance with KfW's promotional mandate, the financing and implementation of environmental and climate protection measures is a focus of business activities – in Germany and throughout the world – as well as a focus of their in-house operations. KfW:

- Promotes environmental protection measures through specifically targeted investment and finance programs;
- Reviews the environmental and social sustainability of loans;
- Conducts its in-house business operations in an environmentally friendly manner.

Environmental and climate protection measures

KfW finances environmental and climate protection measures in Germany and throughout the world. With a financing volume of EUR 16.6 billion in 2007 alone, KfW is one of the world's leading financiers in the sphere of environmental and climate protection.

That is roughly 20% of KfW's entire financing volume. To finance renewable energies KfW provided EUR 8.1 billion in Germany and abroad in 2006 and 2007 alone.

Financing of environmental and climate protection projects 2007

KfW business areas	Volume in Euro billions
Investment finance in Germany and Europe*	12.865
KfW Entwicklungsbank	1.088
KfW IPEX-Bank	2.024
- in Germany	592
- Abroad	1.432
DEG – German Development Finance Institution	608

*promotional loans KfW Förderbank and KfW Mittelstandsbank

Example: **KfW Förderbank.**

ERP Environmental Protection and Energy Saving Program

The *ERP Environmental Protection and Energy Saving Program* supports:

- All investments that protect the earth, water, and air;
- Energy conservation and the use of renewable energies; and offers
- Long-term financing at an attractive interest rate.

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²⁹ The Kyoto Protocol covers a basket of six greenhouse gases so this is strictly speaking not 'carbon finance' but greenhouse gas finance. Some of the most lucrative early CDM projects involved emissions reduction of the industrial greenhouse gases such as HFCs. As the Global Warming Potential is very high, the credit revenue stream is also very much higher and would have a much bigger impact on overall project finance.

³⁰ ESMAP Technical Paper 120/07.

³¹ ESMAP Technical Paper 120/07. The Paper provides extensive discussion on the range of issues required of EE CDM projects, and Programmatic CDM.

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⁴⁰ As described, certain energy regulatory areas are under national governance (central), others are state control, and other areas are part of a 'concurrent list' managed by both. The Central Electricity Regulatory Commission (national) sets laws nationally, and governs interstate power transfer. However pricing for consumption, distribution, generation is governed by a particular state regulatory commission.

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ABOUT THE UNEP FINANCE INITIATIVE

The United Nations Environment Programme Finance Initiative (UNEP FI) is a strategic public-private partnership between UNEP and the global financial sector. UNEP FI works with over 170 financial institutions that are Signatories to the UNEP FI Statements, and a range of partner organisations, to develop and promote linkages between the environment, sustainability and financial performance.

Through a comprehensive work-programme, regional activities, training and research, UNEP FI carries out its mission to identify, promote, and realize the adoption of best environmental and sustainability practice at all levels of financial institution operations.



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