ESMAP
Energy Sector Management Assistance Program

Background Paper

FINANCIAL MECHANISMS FOR CLEAN ENERGY IN SMALL ISLAND DEVELOPING STATES

WORLD BANK GROUP
Energy & Extractives

ESMAP Mission
The Energy Sector Management Assistance Program (ESMAP) is a global knowledge and technical assistance program administered by the World Bank. It provides analytical and advisory services to low- and middle-income countries to increase their know-how and institutional capacity to achieve environmentally sustainable energy solutions for poverty reduction and economic growth. The SIDS DOCK Support Program is funded by Denmark and Japan.

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ABBREVIATIONS & ACRONYMS

ASEAN	Association of Southeast Asian Nations
AOSIS	Alliance of Small Island States
ASDF	Aruba Sustainable Development Foundation
AusAID	Australian Agency for International Development
CCAP	Center for Clean Air Policy
CCI	Clinton Climate Initiative
CDB	Caribbean Development Bank
CDM	Clean Development Mechanism
CHP	Combined heat and power
CHUEE	China Utility-based Energy Efficiency Finance Program
CIF	Climate Investment Funds
CSP	Concentrated solar power
DANIDA	Danish Development Cooperation Agency
DEDE	Thailand Department for Alternative Energy Development
DIN	Deutsches Institut für Normung
ENCON	Thailand Energy Conservation Fund
ESCO	Energy service company
EE	Energy efficiency
FIT	Feed-in tariff
GEF	Global Environmental Facility
GHG	Greenhouse gases
IEG	Independent Evaluation Group
IFC	International Finance Corporation
IFI	International financing institution
IREDA	Indian Renewable Energy Development Agency
IRENA	International Renewable Energy Agency
ISO	International Organization for Standardization
LED	Light-emitting diode
LDC	Least developed country
MDB	Multilateral development bank
MoU	Memorandum of Understanding
MFI	Microfinance institution
MW	Megawatt
M&E	Monitoring and evaluation
PCG	Partial credit guarantee
PCN	Project Concept Note
PFAN	Private Financing Advisory Network
PFI	Private Finance Initiative
PICs	Pacific island countries
PPP	Public private partnership
PE	Private equity
PV	Photo voltaic
RE	Renewable energy
REEEP	Renewable Energy and Energy Efficiency Partnership
RLF	Revolving loan fund
ROI	Return on investment
RSF	Risk-sharing facility
SEFP	Sustainable Energy Finance Project (WB)
SIDS	Small Island Developing States
SME	Small and medium enterprises
SPV	Special Purpose Vehicle
TA	Technical Assistance
TEERF	Thailand Energy Efficiency Revolving Fund
TÜV	Technischer Überwachungsverein
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
WB	World Bank
WBG	World Bank Group

All currency in United States dollars (USD or $), unless otherwise indicated.

EXECUTIVE SUMMARY

This report explores the potential financing mechanism options that could be employed to catalyze more private sector investment in clean energy (renewable energy and energy efficiency) in the Small Island Developing States (SIDS). Various financial instruments that have been used successfully to date are described and placed in the context of the issues and constraints of the SIDS, with suggested options for discussion and follow up. The broad conclusions of the report for discussion by SIDS stakeholders are:

- The availability of an appropriate financing mechanism(s) alone is unlikely to prove sufficient to achieve SIDS clean energy investment goals unless capacity building, project development, financial and non-financial barriers and risks to renewable energy deployment and energy efficiency promotion are addressed. There are financial instruments that may meet the diverse circumstances of the SIDS but there is no universal solution to recommend either at each country, sector, or regional level. Therefore, it is important for SIDS stakeholders to agree on a process of capacity building, project pipeline development, governance, management, and reaching out to best practice models that can inform financing decision making. This process will lead to a series of investment opportunities for investors to consider.
- Pipeline project identification and development leading to investment-ready projects are key tasks. This preparatory phase is comparatively costly, particularly in SIDS, where there may be a large number of small projects. The USAID Private Financing Advisory Network (PFAN) project in Asia addressed this issue through business plan development, match-making, and mentoring to ensure that adequate business and finance plans were prepared and were capable of attracting financial support, matched sponsors with sources of private finance. Therefore, funding for capacity building will be necessary for project identification, screening, business, and investment planning.
- The diverse needs of SIDS countries require institutional capacity to select project and financing options. This could be done at the individual island level, working closely with local commercial banks and regulators, as well as at the regional or global level. Building this capacity could begin with expansion and deepening the project pipeline together with a comprehensive assessment of regulatory and business climate conditions.
- Local banks and financing institutions need to be supported to enter the clean energy finance market. Therefore financial instruments should be designed and structured in close collaboration with the sector. Credit lines and partial credit guarantees offered to financial intermediaries by international financial institutions (IFIs) have been particularly effective for encouraging lending to energy projects. Locally available debt finance is important for project sponsors to be able to leverage their equity and have access to local currency funding. It should be recognized that in the case of local commercial banks it can take two years or more for a new finance product to be developed and implemented.
- International Finance Corporation (IFC), the private sector investment arm of the World Bank, has substantial experience of financing private sector clean energy investment both directly (in the case of large-scale project finance) and indirectly through financial intermediaries using a range of financial instruments and mechanisms, such as partial credit guarantees for example, to support smaller investments and lending. These instruments have incorporated a strong technical assistance component to the Bank to assist with project, technical, and financial risk appraisal and provide good lessons learned to assist SIDS to engage with their local commercial banking sector on clean energy finance.

- Another successful model is that of the Indian Renewable Energy Development Agency Ltd (IREDA) that was established with World Bank support and now has funding support from several IFI partners. It operates at the national level and is owned by the Ministry of New and Renewable Energy to develop and finance clean energy. For SIDS, it is unlikely that at individual country level the model could be workable in a similar way. However, a regional-level approach with joint ownership of independent centers, though more complex, may be possible.
- ***Revolving Loan Funds.*** Typically these operate at a national level and are used to provide loans for energy efficiency and renewable energy improvements with loan repayments recapitalizing the fund to enable additional lending. Typically, revolving funds have been used for energy efficiency improvements at residential or industrial premises, usually small and medium enterprises (SMEs). Some successful case studies include the Thailand Energy Efficiency Revolving Fund being one example. Creating a global fund at a large enough scale able to operate effectively across the SIDS would be a captivating prospect for many island states, but is probably unrealizable. It is recommended that this is explored at a regional development bank level, for example with the Caribbean Development Bank. It may be possible to structure a revolving fund at a national level, but it would need to be one of the larger islands states where there are sufficient numbers of eligible projects. With initial capitalization sought from the development partners, the challenge would be in sourcing recapitalization funding as the initial funding is on-lent to project developers. The fund would need to be independently held and managed by either a regional development or commercial bank. The fund could be structured to provide credit lines or partial credit guarantees to participating banks.
- Private Equity Fund. A regional level or series of regional private equity funds might work in the SIDS context if there are sufficient deals for financing. This option might be viable if the private equity (PE) fund is set up without the typically required in-built profitability, which would allow for simpler structure. For this to work, the PE fund would have to be managed professionally and independently, and investments would have to be chosen based on the commercial viability of projects.
- Investment Trust. An alternative to the creation of a private equity fund could be to set up an investment trust with a small seed capital of perhaps $20 million. This would cover the essential project development and capacity building elements and provide some funds that could also be used as equity or grants to approved projects. Co-financing should be a condition in the investment strategy. Such a trust could play the lead role in project structuring and act as a co-financing catalyst, using trust fund resources to plug financing gaps where required. By focusing on project development, the trust fund should be able to attract outside sources for funding, as PFAN was able to, and leverage private sector investment. UNEP estimates that public funding could leverage up to 15 times the amount of private sector resources. If set as a target, then the $20 million seed funding could result potentially in $300 million of total project investment over five years.

1 BACKGROUND

1.1 PREAMBLE

The Small Island Developing States (SIDS) was first recognized as a distinct country grouping in 1992. They are divided into three geographic regions: the Caribbean; the Pacific; and Africa, Indian Ocean, and South China Sea. Each of these regions has a regional cooperation body: the *Caribbean Community*, the *Pacific Islands Forum,* and the *Indian Ocean Commission*, respectively. Many SIDS are members or associate members of these regional cooperations. The SIDS are a diverse group of islands, with varying population sizes and land areas, but are mainly characterized by being heavily reliant on expensive imported fossil fuel and vulnerable to the effects of climate change. With imported fuel representing a large percentage of gross domestic product in many islands, the SIDS are actively engaged in shifting to renewable sources of energy. Most SIDS countries are members of the Alliance of Small Island States (AOSIS).

1.1.1 SIDS DOCK

In December 2010, in Cancun, Mexico, the SIDS Sustainable Energy Initiative, called **SIDS DOCK** was launched. SIDS DOCK *"is an initiative among member countries of the Alliance of Small Island States (AOSIS) to provide the Small Island Developing States (SIDS) with a collective institutional mechanism to assist them transform their national energy sectors into a catalyst for sustainable economic development and help generate financial resources to address adaptation to climate change*."[1] SIDS DOCK aims to specifically support the SIDS to develop and deploy renewable energy and improved energy efficiency through a range of initiatives that should contribute to: a more balanced energy portfolio; energy savings; and reduced fossil fuel consumption and greenhouse gases emissions. Currently, there are 31 member countries of SIDS DOCK, listed in Annex 1. Their goal is to achieve the following by 2033*: (i) increase energy efficiency by 25 percent (2005 baseline); (ii) generate a minimum of 50 percent of electric power from renewable sources; and (iii) achieve a 20 to 30 percent decrease in conventional transportation fuel use.*

SIDS DOCK has four principal functions:[2]

1. Assisting SIDS with developing a sustainable energy sector, through energy efficiency and development of renewable energy resources;
2. Providing a vehicle for global mobilization of financial and technical resources to catalyze clean economic growth;
3. Providing SIDS with a mechanism for connecting with the global carbon market and taking advantage of the resource transfer possibilities that will be afforded; and
4. Serving as a mechanism to help SIDS generate the financial resources to invest in climate change adaptation.

[1] http://sidsdock.org/

[2] Achieving Sustainable Energy for All in SIDS and Rio+20 Informal Ministerial Meeting, Presented by: Al Binger, SIDS DOCK Coordinator, 07 May 2012

1.2 Related Work

This report builds on the substantial volume of published material on financing mechanisms and instruments for clean energy, and the related work produced for SIDS DOCK and on the Green Infrastructure Finance report prepared by WB and AusAID.[3] "Green Infrastructure Finance," as defined in the report, makes the important point that is **the combination of financial and nonfinancial interventions and instruments that can make green investments in infrastructure more affordable and less risky to private sponsors, financial markets, and governments.** The report is not specific to SIDS, but makes a relevant point: "**without fully considering all criteria that influence investment decisions…financial interventions on their own can only deal with a limited set of solutions.**"

There are numerous reports available on barriers to renewable energy/energy efficiency financing. SIDS are faced with numerous constraints and barriers to achieving their clean energy objectives, described later in this report, although many of these are not unique to small islands. Further, a large body of literature exists on issues relating to climate finance and several hundred sources of information were included in the compilation. Also reviewed was the report on the strategic and implementation plan prepared by Aruba Sustainable Development Foundation.[4]

1.2.1 SIDS DOCK Concept Paper: National Financing Mechanism

While this report was being prepared, another report[5] and guidebook[6] had been prepared on behalf of SIDS DOCK by Philip LaRocco (Adjunct Prof. at Columbia University) et al. and was submitted to the United Nations Development Programme (UNDP) and the World Bank (WB) in December 2012. This paper was reviewed, as part of the background documentation for the current report.

1.2.2 International Finance Corporation

The International Finance Corporation (IFC) is the private sector investment arm of the World Bank and has substantial experience of financing private sector clean energy investment both directly and indirectly through financial intermediaries, using a range of financial instruments and mechanisms that combine technical assistance with investment. In January 2012, IFC produced a report[7] on its clean energy investments that have been supported by concessional finance. The executive summary provides a good assessment of what has worked in IFC's sustainable energy financing programs. The report explains how each program has evolved over time, incorporating lessons learned about design as well as risk levels, many of which are relevant for SIDS. IFC's partial credit guarantee instruments have been effective in addressing the perception by the banking sector that lending for clean energy projects may expose a bank to financial risk. These instruments have incorporated a strong technical assistance component to assist with project and technical risk appraisal so that the bank is able to better understand the clean energy business and price the loans accordingly. Availability of financing and effective financing mechanisms to achieve clean energy investment are important constraints but are just two of

[3] Baietti, 2013; Baietti et al. 2012; World Bank 2012.

[4] Strategic and Implementation Plan to Transfer Sustainable Energy Technologies that are SIDS-Appropriate, Final Draft Strategic and Implementation Plan, Aruba Sustainable Development Foundation (ASDF), December, 2012.

[5] Concept Paper Regarding National Financing and Carbon Market Access Mechanism(s) for Small Island Developing States.

[6] Guidebook for Decision-Makers Concerning the Attraction of Low Carbon Finance to Small Island Developing States, December, 2012.

[7] Review of IFC Sustainable Energy Finance Investments Supported with Concessional Funding, Financial Mechanisms for Sustainability, January 2012.

many barriers. The experience of WB/IFC, for example, suggests that a holistic approach is required to address each of the constraints rather than focusing on just one.

1.3 Financing Clean Energy

Any financing mechanisms for clean energy, including both renewable energy and energy efficiency, need to be flexible to accommodate a broad range of project sizes and type of financing required. Whereas projects in excess of $10-20 million typically would be financed through project finance, smaller projects, such as many of the ones found in SIDS, are usually financed through corporate borrowing from commercial banks. Thus, the involvement of local commercial banks willing to lend to energy projects is key to the successful establishment of any financing mechanism. Special funds can help to overcome issues related to smaller sized energy efficiency projects. International financing institutions (IFIs) provide finance through a variety of debt and equity instruments either directly to larger renewable energy projects, for example, or, in the case of small-scale projects, via credit lines and partial credit loan guarantees to financial intermediaries. There is a wealth of information on the various types of financing structures and mechanisms that have been and are being used to finance clean energy. Reports by the European Union, IEA, IRENA, UNEP, World Bank Group, among others, were reviewed for this report. In its public finance mechanisms report,[8] UNEP provides a good overview of the various public finance instruments that have been used to finance clean energy development. The report mentions that these mechanisms should be structured to act along the entire chain of financial intermediation, which can include development finance institutions. Public sources of funding should be used to leverage commercial financing. UNEP estimated that typical leverage ratios range from 3 to 15:1.

1.4 Objective and Scope

1.4.1 Objective

The objective of this report is to identify and assess options that can help increase investment in renewable energy and energy efficiency in SIDS through the adoption and funding of financing mechanisms by SIDS and development partners with special attention given to the role that the private sector could play. The availability of financing is just one of several barriers to investment in renewable energy and energy efficiency in SIDS. Many renewable energy technologies are characterized by high initial capital costs with relatively low operating costs compared to thermal alternatives. This cost structure can present an obstacle to obtaining financing for renewable energy investment. And despite high cost of diesel-based generation, factors such as remoteness, very small scale, and lack of private sector-friendly environment may mean that renewable energy projects still have an incremental cost compared to thermal alternatives. In many countries, barriers still remain in terms of awareness of energy efficiency opportunities and accessing commercial financing for energy efficiency investments. By providing an analysis of options for a financing facility to catalyze renewable energy and energy efficiency, this work is intended to inform the discussions among SIDS and development partners interested in actions to stimulate investment in renewable energy and energy efficiency.

1.4.2 Scope of Work

The scope of work was designed in two main steps. The objective of Step 1 was to identify a small number of financing mechanisms that could be considered in more detail based on lessons learned, and to gain a better understanding of the barriers to renewable energy and energy efficiency investment and which of those barriers

[8] McLean et al. 2008.

may effectively be addressed through a financing mechanism. This was used as the basis for assessing and recommending options for more detailed assessment in Step 2, which also included the provision of guidance on key features and issues regarding implementation. This report summarizes the results of the two stages. The assessment and selection of options identifies a number of measures that would be needed to stimulate increased private sector participation—project sponsors and developers, equity funds, lending institutions—for energy efficiency and renewable energy. Much of the background material reviewed for this report has been summarized in the annexes.

2 CONSTRAINTS AND KEY ISSUES

2.1 BARRIERS FOR RENEWABLE ENERGY AND ENERGY EFFICIENCY INVESTMENT

The availability of financing is one of several potential barriers to increased investment in clean energy. In many countries, barriers still remain in terms of awareness of energy efficiency opportunities and accessing commercial financing for energy efficiency investments. Previous experience from WB, IFC, and others, and the recent SIDS report from Columbia University, indicates that having in place the appropriate financing instruments, mechanisms, grants and concessional funds alone cannot solve all the issues relating to the uptake of clean energy investment. Many, but not all, renewable energy technologies are characterized by high initial capital costs with relatively low operating costs compared to thermal alternatives. This cost structure can present an obstacle to obtaining financing. Many of the key issues to be addressed related to barriers and constraints to investments in renewable energy and energy efficiency are not unique to the SIDS and are discussed below:

- **Adequate Project Identification and Preparation.** Pipeline identification and development; adequate project preparation; and mentoring business plan support. The preparation phase is essential in clean energy projects. It is also likely to be comparatively more costly in SIDS. The USAID Private Financing Advisory Network (PFAN) project in Asia addressed this issue by providing support for business plan development, match-making of project sponsors with financiers, and mentoring of project sponsors. PFAN was able to identify and promote project sponsors, ensure that adequate business and finance plans were prepared that were capable of attracting financial support, and then match-make sponsors with sources of private finance.
- **Investment/Business Climate.** A holistic and programmatic approach should be adopted that addresses broad investment climate issues such as taxation, import duty, energy policy. Broadly: (i) government policies and decisions should promote investments in the sector; (ii) pricing/tariff policies for energy should be financially sustainable; and (iii) regulatory frameworks should be transparent and encourage independent power producers.
- **Utilities**. Work closely with energy utilities. Demand-side energy efficiency programs should be strongly encouraged and, where practicable, utilities should be incentivized to implement them.
- **Energy Policy**. For sponsors to make an investment in renewable energy/energy efficiency and for financing institutions to support these, there needs to be a clearly implemented energy policy. Subsidized fossil fuel energy can significantly reduce the viability of renewable energy and energy efficiency projects. Appropriate tariff structure, incentives, variable renewable energy (VRE) integration planning, and power purchase agreements (PPAs), especially for larger renewable energy projects, are also required.
- **Financial Instruments**. These alone cannot address all the barriers to clean energy development. The financial sector also has to be willing to enter this market. These instruments should be designed and structured in close collaboration with the sector. In the case of banks, it can take up to two years for a new finance product to be developed and implemented. To date, credit lines and partial credit

guarantees offered to financial intermediaries by IFIs have been particularly effective for increasing investment in energy efficiency projects.

- **Access to Finance**. Before lending/investing, local commercial banks, micro-finance institutions (MFIs), private equity, and investment funds need to understand the market and specific risk issues related to clean energy finance and be convinced that there is a worthwhile market. Banks and MFIs generally look for volume of transactions with low transaction costs and easy repeatability. They need individuals, companies, and sponsors that meet their financial and risk criteria, are asset backed, and are able to borrow. Support from IFIs should be backed up by technical assistance—this should always be designed in conjunction with the financial intermediary concerned and targeted to the specific needs of that financial intermediary. Private equity funds are looking for sound companies and project sponsors with growth potential. The linkage between development banks and commercial banks is important. National development banks in SIDS often have limited capacity and generally are not pro-active in seeking working relationships with local commercial banks. In this context, if the relationship between the IFIs and regional/local development banks is not established and they are not properly capacitated, then any follow-on work between the development banks and commercial banks will fail. In SIDS, local development banks are often directly under the Ministry of Finance and they require appropriate support.
- **Banking Sector Diagnostic.** It is also essential to understand the state of the financial sector in each country; its capacity, appetite, and limitations for financing clean energy; and need for support—in terms of credit line or guarantee, and technical assistance, prior to designing a program or financing mechanism. Financial intermediaries should be identified and selected on the basis of their commitment to developing a long-term clean energy business and willingness to develop finance products to be able to effectively utilize IFI financing instruments and support. The diagnostic should examine public, development, credit unions, MFIs, and commercial institutions. As discussed, banks aim to develop product lines that can deliver certain minimum volumes of business, therefore, if a bank sees clean energy lending as complex, and involving small-size, low-volume, difficult to appraise projects, then interest in participating will be limited.
- **Sector Diagnostic.** Each SIDS country will face different industry, tourism, agriculture, fishing, and transport sector issues, challenges, and priorities. These need to be identified prior to developing specific financial products/mechanisms to address clean energy needs. For example, as identified by UNDP, small and medium enterprises (SMEs) in the tourism sector may be willing to install renewable energy and implement energy efficiency improvement measures, but not have the necessary regular income to service a bank loan. In such cases, improvements financed through the local authority and recovered over the longer term (at affordable payment) through local property taxes may be the answer. For housing, renewable energy or energy efficiency improvements, lending could be added to housing mortgage finance, for example.
- **Energy Service Companies/suppliers (ESCOs)**. These can be key actors to be supported, if they exist in the market. However, their balance sheets are often insufficient to carry large debt or to be able to support the business cash flow in markets where receiving payment maybe difficult. The WB SEFP[9] program in the Pacific Islands achieved some good success in supporting suppliers of renewable energy

[9] World Bank Sustainable Energy Finance Project, Pacific Islands, PAD, May 16, 2007.

equipment in Fiji through the program's credit guarantee instrument managed by a large commercial bank with regional presence. IFC's early energy efficiency finance programs in Hungary, for example, were designed to provide financial guarantees across the projects (which, in this case, were for boiler replacements in district heating schemes), covering local commercial bank lending and ensuring that ESCOs were able to operate. It is unclear whether there is an active ESCO market in SIDS but, if so, it could provide a useful combination of technical assistance and financing. This could be achieved, for example, through credit guarantee mechanisms. Private equity funds can also play a key role as most ESCOs, unless backed by large parent engineering companies, do not have the assets and balance sheet necessary to be able to finance equipment purchases. For instance, ESCOs that have the necessary resources can be successful in working with large hotels to refurbish heating and air conditioning systems. The ESCO finances the equipment purchase, installs the plan and maintains it, receiving payments based on the reduced cash outflows from the hotel achieved through substantially reduced energy costs.

- **New Entrants.** An increasing number of IFIs and donors are entering clean energy finance markets. This can lead to parallel schemes with the risk of competition and arbitrage between them by financial intermediaries. Improved coordination between IFI and donors is particularly important in SIDS, where project size is small and transaction costs high, including requirements for monitoring, supervision and evaluation of projects.
- **Global Funding Sources**. These may be difficult to access and may have high transaction costs and lengthy procedures. Institutional capacity may not be there to secure these.
- **Donor Action.** Some donors (e.g., European Union), have provided equipment such as home solar-PV lighting systems as part of programmatic support at subsidized cost or as grants, in response to demonstrated need and the absence of functioning market mechanisms. This is generally unsustainable as it is dependent usually on one-off program funding. Often this type of support comes without a spare parts/supply chain/maintenance operation and can have a significantly negative impact on private sector development—sometimes regarded as a low/no-cost competitor. The prospect of additional 'free' or subsidized equipment can discourage private businesses from investing. Donors and providers of grants and concessional funds should be encouraged to use their funds to build capacity and investment pipelines as a pre-cursor to leveraging private sector investment. The various IFC programs referred to in Section 1.2.2 and the recent PFAN project achieved high levels of leverage of public funds in their projects.

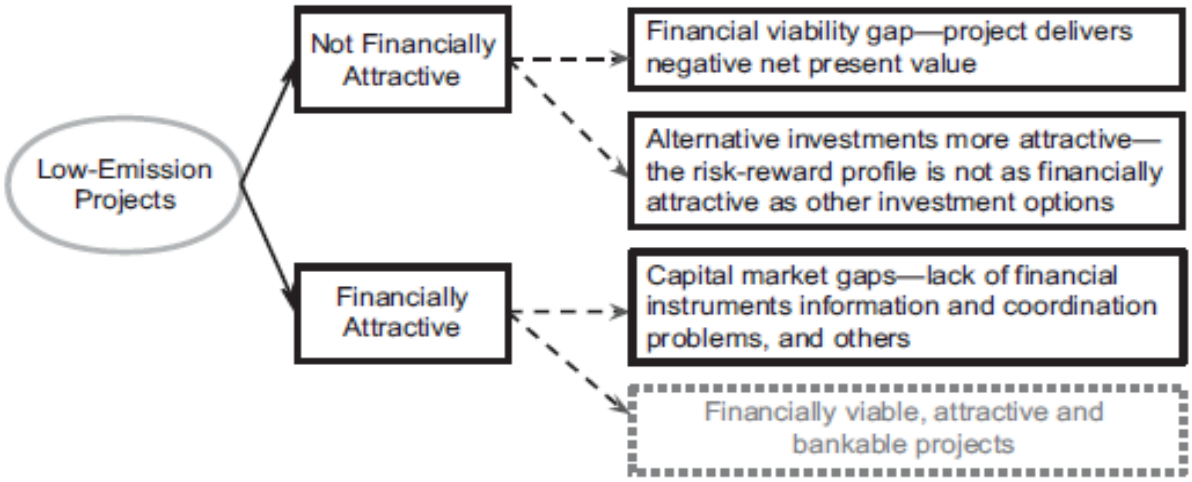
2.2 Project Identification and Preparation

2.2.1 Pipeline to 'Bankable Project'

Well-designed projects (in terms of risk, technology, operation, management) with strong sponsors, that have good rates of return on investment, and are located in favorable investment climates probably should be able to attract both commercially attractive loans and suitable equity investors. Conversely, projects/investments that are fundamentally unsound will not find financing or investors. Figure 1 below from the WB report on Green Energy referred to earlier highlights this gap. The presumption is that pipeline projects would be subject to thorough screening and preparation to ensure their 'bankability.'

Whether it is a large project being considered for investment by a private equity fund or a bank loan for an energy efficiency improvement, a level of due diligence must be performed to ensure that all these risks are assessed. The process of screening projects through to full due diligence is costly and the returns must be linked to the effort required. For example, if a local commercial bank is to offer energy efficiency loans to its customers, it has to view this in the same way that it would consider any other business. In the case of housing loans, the bank will establish a few finance products and have a team to market and process these loans. Usually, the bank will be looking for a large volume of loans, using a few products with a simple approval process that will lower overall transaction costs to maximize its return against the cost and risk.

Figure 2.1 | Why Low-Emission Projects Are Not Getting Financed



Source: Green Infrastructure Finance, Framework Report World Bank and AusAID

Financing mechanisms for clean energy should be designed to avoid 'moral hazard' or undertaking unnecessary financial risks because any costs/defaults that could incur would not be felt by the party taking the risk. The appropriate financing mechanism for clean energy investments will depend on many factors, including: scale, numbers of projects, return on investment/return on equity (ROI/ROE) requirements, debt/equity mix, but any mechanism needs a pipeline of projects to finance. Potential delays, cost overruns, resource uncertainty (in quantity and in price), technical risk, maintenance costs, sales price/volume, renewable energy premiums, and tax environment are all risks that need to be identified and managed. Because lenders typically have a low threshold for risk, clean energy investment volume will only increase as they become familiar with the project risks. Thorough project screening and preparation is required. Investors such as venture and private equity funds are structured to take a much higher level of risk, in return for which high rates of return are expected. For this, the level of due diligence is detailed and costly.

2.2.2 Programmatic Approach

The key to attracting interest of investors and commercial banks is to build or demonstrate a large pipeline of screened deals that meet the basic requirements of the financing institution. In most cases, technical assistance is needed to build the capacity of the various key players to create and develop the pipeline essential for leveraging commercial funding. Therefore, the *starting point for design of the financing mechanisms is to establish a clear pipeline of projects and to develop them to a point where they are investment ready*. This can be

achieved, for example within a bank, through a program focused on its customer base and portfolio to identify a sector such as an energy intensive industrial sector where a programmatic approach can be taken. Another example particularly relevant for SIDS is the tourism industry, which relies heavily on hotel industry income. There should be scope for implementing energy efficiency retrofit measures as well as promoting more energy efficient designs. Outside of a bank with a large potential client base, an external process needs to be established that will systematically identify, screen, and shortlist a workable number of projects against set screening criteria, for eventual full due diligence and financial engineering/structuring.

2.3 Factors for Private Sector Involvement

It is generally acknowledged that public sector resources alone in SIDS may be unable to finance the shift towards improved energy efficiency and the uptake of renewable energy, hence, the focus of this report is on private sector investment. IFC and USAID experience demonstrates that public and donor resources can be effectively used to leverage private sector investment. IFC's sustainable energy programs have utilized over $65 million in concessional donor funds to support private sector investments of more than $680 million. These investments included concessional funding of $44 million for guarantees, $18 million for credit lines, and $4.5 million for mezzanine financing. Where concessional funds were used for innovative instruments such as partial credit risk guarantees, $38 million leveraged $608 million of investments, equivalent to a leverage ratio of 16, with a maximum leverage ratio of 35 in Phase 2 of IFC's China Utility-Based Energy Efficiency Finance Program (CHUEE)[10] program. The USAID Private Finance Advisory Network (PFAN) program, part of the overall Eco-Asia Clean Development and Climate Program[11] indicated that the program funding of $15.7 million was able to leverage a total investment in clean energy of $418 million; a leverage of 27 times the amount of USAID funds. These are remarkable numbers and leverage of between 1:6 and 1:10 would be considered good/very good.[12]

For private sector involvement and financial sector support, there are a number of factors—both positive and negative—that should be considered. The following assessments would have to be carried out in order to identify them:

- International financial institution programs and/or bilateral donor programs review; take into account any lessons learned
- Market assessments to identify specific country barriers and opportunities; mapping of renewable energy resources; identification of priority sectors (e.g., tourism, transport); assessment of project sizes and numbers to determine the potential to bundle projects within a country or across a region
- A banking sector diagnostic to identify institutions either currently financing clean energy or expressing interest to do so; identify any constraints to clean energy lending (e.g., the availability of medium- and long-term loan tenor) and whether project finance is obtainable; determine if there is any interest from lenders to finance clean energy projects and their capacity ((financial and resources) to do so

[10] The IFC program, which started in 2006, is aimed at stimulating energy efficiency investments in China through two main instruments: bank guarantees for energy efficiency loans and technical assistance to market players, including utilities, equipment vendors, and energy service companies, to help implement energy efficiency projects. Both types of interventions rely on subsides funded by donors (IEG 2010).

[11] Eco-Asia Clean Development and Climate Program: Results and Lessons Learned, August 2011.

[12] Email correspondence with Prof. Phil LaRocco.

2.4 Technical Assistance and Capacity Building

Apart from working closely with the financial sector, technical assistance is also commonly required at the institutional level and during project design, feasibility assessment, and pipeline development. Getting from project identification through to feasible projects is a time consuming process and many projects fail to overcome this hurdle. The lack of early stage funding; the lack of prepared "champions" in the public and private sector; the limited access to expertise in project development, finance, and product knowledge; and the limited access to the experience in other locations are key reasons for project failures at the early development stages. Some of these issues can be addressed by mentoring and capacity building and are essential components of any finance mechanism. Support for capacity building and project development could be done in conjunction with the local commercial finance sector.

IFC's experience shows that technical assistance can successfully be incorporated with financial support to financial intermediaries in order to develop new clean energy financing business. This is usually integrated fully into the financial intermediary with a specific program agreed in advance. In general, this has worked well since technical assistance is linked directly to business development and the subsequent roll-out of new financing products. Importantly, this helps the financial intermediaries to better understand and be comfortable with the risk profiles of the investments. Technical assistance can include: support for market and pipeline development; addressing key barriers to clean energy finance; building internal capacity; and helping to identify and mitigate the financial, technical, and commercial risks.

3 CLEAN ENERGY FINANCE

3.1 FINANCIAL INSTRUMENTS

Table 3.1 contains a summary of the financing options used to finance clean energy with their various pros and cons. These range from direct grants and concessional loans to credit lines and partial credit guarantees provided through donors/IFIs to financing institutions to support private sector investment.

3.1.1 Sources of Finance

Sources of funds include financial intermediaries, government established loan funds, venture capital and private equity funds, community funds, bonds, carbon finance, and there are a number of national and international funds that have been created to provide grants or interest-free loans to developers of clean energy projects. These include, for example, the Global Environmental Facility (GEF) and the Renewable Energy and Energy Efficiency Partnership (REEEP). Annex 3 contains more information on some of these sources of funds and current investment support programs. The purpose of these facilities is to provide financing that recognizes environmental and developmental value not included in conventional financing of these projects, and to demonstrate innovative approaches that can be replicated.

3.2 FINANCING MECHANISMS TO ADDRESS BARRIERS

There is a wealth of information on the various types of financing structures and mechanisms that have been and are being used to finance clean energy. These have been covered in the SIDS DOCK National Financing Mechanisms paper. IRENA[13] has also produced an excellent report with recent examples. In its public finance mechanisms report,[14] UNEP provides a good overview of the various public finance instruments that have been used to finance clean energy development. A summary of this can be found in Annex 3.The report mentions that these mechanisms should be structured to act along the entire chain of financial intermediation, which can include development finance institutions. Given the finite public resources, public sources of funding should be used to leverage commercial financing. A few selected mechanisms are briefly described below. These are typically used for smaller scale projects and have been most successful for energy efficiency and to support balance sheet lending. Larger scale projects—energy efficiency or renewable energy—and utility-level investment is usually through project finance, involving creation of special purpose finance vehicles with complex financial structures and a mix of equity/debt, based upon project fundamentals, such that few structures are identical. Annex 4 contains more details of typical features of such mechanisms.

3.3 REVOLVING FUNDS

A revolving loan fund usually operates at a national level with the objective to provide debt financing and importantly encourage commercial bank lending. Typically, these are used to provide debt finance for smaller scale projects and have been most successful for energy efficiency improvements at residential, commercial, and industrial premises, and to support balance sheet lending. Larger scale energy efficiency or renewable projects and utility-level investment is usually done through project finance, involving creation of special purpose finance vehicles with complex financial structures and mix of equity/debt, based upon project

[13] IRENA 2012.

[14] McLean et al. 2008.

Table 3.1 | Summary of the Most Relevant Financing Options used to Finance Clean Energy

Financing Instruments	Market Segments	Market, Policy, and Financial Sector Barriers	Comments
Project financing by MDBs and development banks *Provision of concessional financing in the form of grants or soft loans*	Large-scale RE projects	When RE policies not in place Early stage RE market or immature financial market Proving/demonstrating new RE technologies To provide long-term financing in countries where local banks are unable	Particularly important for many SIDS countries
Credit line through local financial institutions *MDBs, IFIs, or donors provide financing for projects through a local financial intermediary*	Targeted at SME RE developers, particularly small hydro projects EE targeted at local banks' traditional clients—large and medium enterprises EE lending to SME clients typically requires specialized SME banks	To provide long-term financing to RE projects To increase interest and capacity in RE investment at local banks To address a lack of liquidity To increase the interest and capacity in EE investment of domestic banks through learning by doing	Incorporate TA to financial institutions for capacity building Aggressive business development New financial tailored products Look for suitable volume of opportunities
Partial credit guarantees *Promise of full and timely debt service payment up to a predetermined amount; generally provided for privately funded public projects and are specially designed to extend maturity and improve market terms*	RE technologies with resource or technology risks Emerging technologies (e.g., CSP, off-shore wind) EE targeted at borrowers with border credit rating (e.g., first-time ESCOs with credit-worthy clients and profitable projects	To mitigate RE resource or technology risks To extend loan tenure To reduce perceived risks and increase confidence of local banks that are interested in new EE business lines and borrowers	For example, IFC's programs such as IFC/GEF Hungary Energy Efficiency Co-Financing Programme (Guarantee) are generally successful with EE and as portfolio guarantees
Dedicated RE funds for debt financing	Targeted at SMEs Immature financial markets	To finance RE projects that local banks are not yet willing to invest in or where local interest rates are too high	
Dedicated EE funds for debt financing	SMEs and public sector facilities that local banks uninterested in immature financial markets	To finance secondary market (SMEs and public sector facilities) that local banks are not willing to invest in with traditional balance sheet financing and a dedicated team	High transaction costs for small-size projects Securing adequate leverage of public funds, and ensuring scale up and sustainability
Utility Energy Efficiency/Demand Side Management Funds	Targeted at utility customers and ESCOs	To provide financial incentives to overcome the high upfront cost barrier	
ESCO financing and equipment leasing	ESCOs usually target governments, public facilities, buildings, and SMEs Leasing usually used in relatively mature financial market but underdeveloped EE market	ESCOs aggregate small deals to reduce transaction costs, and offer performance-based EE services and financing for end-users	Works in mature financial markets with existing financial leasing companies, but underdeveloped EE markets to address difficulties in securing upfront financing for end-users / effective in aggregating

Financing Instruments	Market Segments	Market, Policy, and Financial Sector Barriers	Comments
		Leasing helps clients to avoid paying for upfront financing	small-scale EE projects to reduce transaction costs, offering EE services and financing to convince end-users to undertake EE measures
Mezzanine financing *Debt capital that gives the lender the rights to convert to an ownership or equity interest in the company if the loan is not paid back in time and in full; generally subordinated to debt provided by senior lenders such as banks and venture capital companies*	Targeted at SMEs	To bridge the debt equity gap for SMEs To provide subordinate loans to leverage senior debt	IFC has mezzanine fund financing available for RE
Equity funds and contingent grants that transform to a loan if the project is successful	Targeted at SME developers and early-stage technology firms SMEs and ESCOs EE technology providers Start-up EE developers	To increase access to equity funds and pre-investment funds for SMEs Motivate equity funds to move into earlier stage finance To partially cover project preparation and development costs Risk sharing in uncertain country environments where private developers are reluctant to fully take on the development risk To address limited access to equity funds for SMEs/ESCOs	Matching funds from private investors into private partner-equity fund (risk aversion of PE for clean energy due to global financial crisis) Difficult to find EE investment opportunities that match criteria High overhead, due diligence, exit costs / risk of loss, offset by high potential return
Consumer financing for EE/RE consumer products, such as utility on-bill	Targeted at consumer EE/RE products	To overcome the high first cost barrier of EE/RE products	Access to funds for individual users for investing in EE/RE products/equipment Increases consumer's affordability for EE/RE products (no one-time lump-sum up-front investment) Payment collection through electronic bill reduces transaction cost and default risk Effective to increase market penetration of consumer EE/RE products with high upfront investments

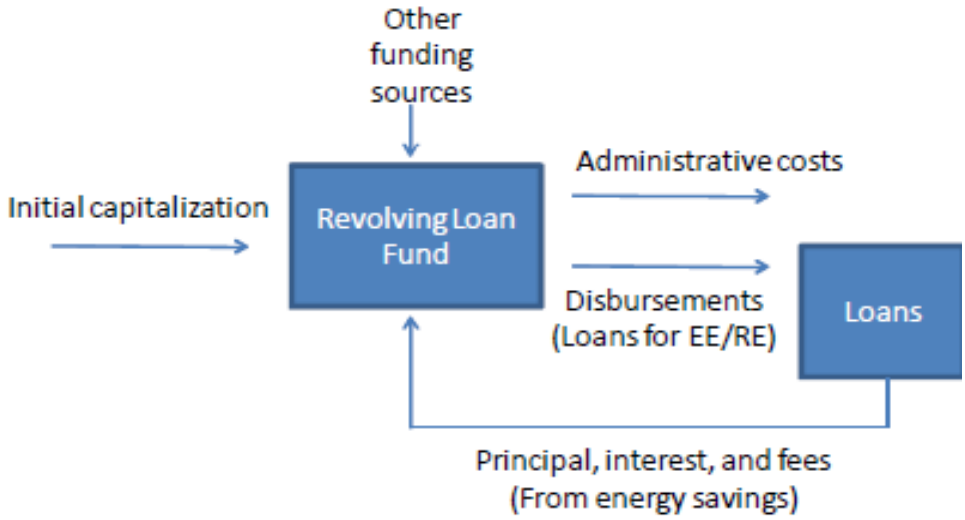
Source: United States Environment Program (2008), An overview of mechanisms being used today to help scale up the climate mitigation markets, with a particular focus on the clean energy sector: Public Finance Mechanisms to Mobilize Investment in Climate Change Mitigation and see SIDS Financial Mechanism for RE/EE (Sept 20 2012), Annex 3 'More Detailed Description of Financing Options', Financial Instruments Primarily for Renewable Energy.

fundamentals. Revolving funds are intended to address market liquidity problems where there are constraints in the local banking sector to provide sufficient levels of debt finance, which carries high interest rates. They are an appropriate mechanism where lack of liquidity in the finance sector acts as a significant barrier for private finance or when finance institutions need longer term credit lines to be able to provide loans with a longer tenor. Revolving funds are designed to be self-sustaining with an initial capital investment. However, given the time taken for loan repayments to return, and the need to be able to provide further lending, in practice these funds usually require periodic recapitalization. If operated effectively a revolving fund can operate for many years as a long-term, stable financing structure and would be suitable for SIDS. These types of funds tend to revolve slowly and can leverage private sector funding when linked to commercial banks as the Thailand fund described was, for example (see Section 3.3.2).

3.3.1 Structure

Revolving funds have traditionally been deployed to support energy efficiency projects. The fund structure illustrated in Figure 3.1 shows that loans are made from the fund to borrowers using normal lending practices to qualifying loans according to the fund administration and objectives. The principle is that the borrower is able to pay back a loan (and interest) for an energy efficiency project through the cost savings from reduced energy consumption produced through improved energy efficiency. These payments flow back into the fund so that funds could then be re-lent to new projects. For renewable energy projects, cost savings to the borrower may be from reduced fossil fuel consumption or from fiscal incentives such as feed-in tariffs.

Figure 3.1 | Typical Revolving Loan Fund Structure



Source: NREL, 2011

In theory, the fund should operate on a net basis but experience demonstrates that it takes time for the reflows to return and the level of project risk at the outset is uncertain. Loans might be offered at a lower interest rate and with a longer term payback to minimize impact on cash flow for the borrower. The interest rate paid is meant to support administrative costs so that the capital base should remain

intact. Loan tenor is usually under 10 years and may need to be backed by additional collateral. Without further capital injection, the ability of the fund to provide new loans quickly diminishes.

In this model, the fund is an entity capable of lending. However, a model that encourages commercial bank lending is where the revolving fund provides credit lines or guarantees to commercial banks on the basis that banks are in a better position to judge and price credit risk, as well as having the infrastructure and business model for lending. This is how the Thailand fund operates (see Section 3.3.2). The advantage of dedicated revolving funds is that they are less dependent on external investors than regular commercial bank resources. They also carry some disadvantages, however, as highlighted in Table 2:

Table 3.2| Table 2: Revolving Funds Pros/Cons

Pros	Cons
• Independent source of debt/guarantees • Provides a stable and affordable source of funds • Effective leveraging of public funds • Can be sustainable • Can be combined with a capacity building component for the finance sector; encourages local banks to participate and develop long-term business • Can help demonstrate the viability of clean energy projects • Targets small/medium projects, SMEs in particular	• Requires substantial upfront capitalization • Long duration required, 10 to 15 years or more, to allow loan repayments to revolve back into the fund • To continue lending, the funds may require periodic re-capitalization • Can be administratively burdensome • Typically, fund will only provide, or guarantee a portion of debt (50-80%) and so still requires good equity partners/project sponsors • Not a solution for large-scale projects

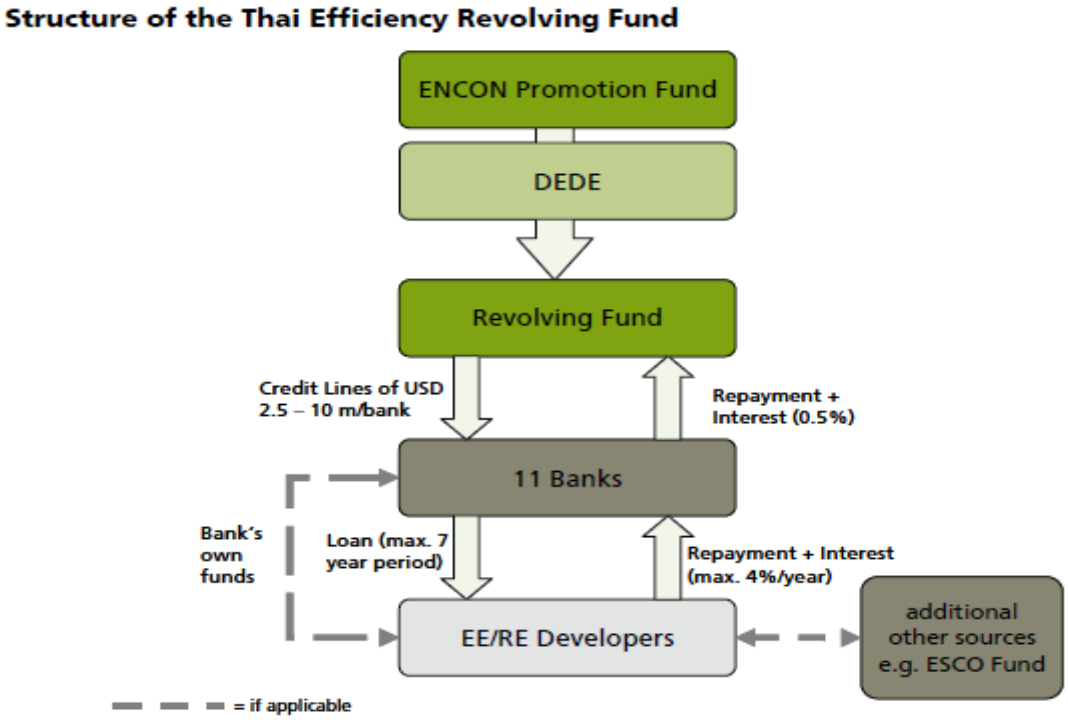
3.3.2 Success Story: Thailand Energy Efficiency Revolving Fund

A clear success story in revolving funds for energy efficiency is the Thailand Energy Efficiency Revolving Fund (TEERF),[15] which was launched in 2003 (Figure 3.2). Much earlier, in 1992, Thailand had created a national Energy Conservation Promotion (ENCON) Fund.[16] This was funded by a tax on petroleum to fund energy conservation programs and it was used to capitalize the energy efficiency revolving fund. TEERF is managed by the Department for Alternative Energy Development (DEDE)—a government agency, and funding in the form of a credit line is provided to participating local commercial banks. The banks then directly provide the individual loans for energy efficiency projects under normal commercial banking practices but with the benefit of being able to offer energy efficiency loans at a significantly lower rate than normal loans. TEERF has also been used to finance some renewable energy projects. Thailand has an extensive program of feed-in tariff incentives for financing renewable energy projects and actively encourages private sector investment. Although the banks reported to DEDE, the participating banks, not the Thai government, managed the loans and carried the risk of participants defaulting on their loans. The advantage of this model for the Thai government was that it minimized its day-to-day involvement, while ensuring eligible projects would achieve real energy savings, use

[15] The Thailand energy efficiency revolving fund (TEERF) was established by the Government of Thailand and managed by the Ministry of Energy, Department of Alternative Energy Development and Efficiency (DEDE). The objective of the TEERF is to provide access to capital for energy efficiency projects, increase awareness of energy efficiency opportunities and improve procedures and implementation of the projects. The TEERF provides credit lines to participating Thai banks (World Bank, 2012).
[16] Thailand Energy Conservation Fund (ENCON) was established in 1992 (http://www.nepo.go.th/encon/encon/Brief/html).

appropriate technology, and be monitored for effectiveness. It also helped to leverage commercial bank financing.

Figure 3.2 | Thailand Energy Efficiency Revolving Fund Structure



Source: Frankfurt School - UNEP Collaborating Centre for Climate & Sustainable Energy Finance

As can be seen from the structure, commercial banks are able to obtain 10-year credit lines of between $2.5 to 10 million at a nominal 0.5% interest (originally this was at 0% to encourage local banks). Under the terms of the scheme, the participating banks can on-lend this for qualifying clean energy projects at a maximum of 4% (compared to market rates that typically varied upwards of 9%), with a long loan tenor of up to 7 years, again significantly longer than the loans typically offered in the market. Initial technical support from DEDE specialists provided banks with the necessary support to better understand the clean energy market and the confidence to finance these projects. According to Center for Clean Air Policy (CCAP),[17] by 2012, 13 public and commercial banks participated in EERF, resulting in 294 projects, with a total investment of approximately $519 million ($ 235 million from the fund and $284 million from commercial banks). Over 50% of the total investment was provided by the banks themselves as they blended their own funding sources with the revolving fund credit line, into single loan products.

Since 2003, as participating banks have become more confident, they have built up in-house teams to promote clean energy lending, appraise projects, and better understand project risks. Early concerns were that as the banks were taking the credit risk that they might only lend to their creditworthy customers (those they would lend to anyway) and would focus on the borrowers balance sheet which would restrict lending. The implication was that (i) the facility might not encourage cash flow project finance lending, and that (ii) lending to SMEs with weak balance sheets would be limited. However,

[17] EERF 2012.

experience has shown that the banks have extended lending beyond the original expectations when Thailand began to phase out the fund in 2011. As noted by the Institute for Industrial Productivity (IIP), "EERF has allowed commercial banks to become familiar with EE project financing and, in doing so, promoted EE development to industrial and commercial customers."[18]

3.3.3 Operation of a Regional Clean Energy Revolving Fund

Establishment of a regional fund would first require the creation of a registered legal entity that has the capacity to provide loans/grants/guarantees directly to projects, or to participating development banks and regional and local commercial banks, for on-lending. Local banks could have a number of roles, depending on the final fund structure as determined by local conditions and development partner interests. The fund could be held by a development bank or a local commercial bank with transaction managed by that entity. As in the example of the TEERF, the fund could on-lend to local banks providing credit lines to be used specifically for energy efficiency/renewable energy projects. The fund could also offer bank lending guarantees. Commercial banks should be encouraged to co-finance projects. Unless a legal entity is established with the institutional capability and administrative capacity to act as a fund manager, then it is recommended that funding is channeled through financial intermediaries as in the case of Thailand, which has demonstrated the clear advantages of such an approach. The role to source finance, assist with project preparation, and develop capacity within the financing institutions acting as technical support could be taken on by an public/government institution or agency, as was the case of DEDE in its support of participating Thai banks.

Given the issue of scale and numbers of projects at most individual countries in the SIDS context, a regional approach would be recommended with funds held and managed by a regional development bank, such as the Caribbean Development Bank, or a commercial bank operating at a regional level. For instance, in the Pacific Islands, a certain bank (name withheld in this report) now has experience with partial credit guarantee funds. Under the World Bank's SEFP Program,[19] it held and managed a $5 million fund that was used with some good success to support suppliers of renewable energy equipment through the program's credit guarantee instrument. Participating commercial banks were able to obtain a 50% guarantee against loan defaults on qualifying clean energy lending. Using this approach, commercial banks were encouraged to provide lending for clean energy projects. As the fund providing the guarantees to the participating commercial banks was held and managed by a regional commercial bank, there were none of the capacity or institutional issues involved, in managing funds/issuing loans/guarantees.

Criteria for the operation of a revolving fund would need to be negotiated in the context of prevailing market conditions and in accordance with development partner requirements. The following are criteria that could be considered for such a fund in the SIDS context:

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[18] EERF 2012.

[19] In the PICs, the WB"s SEFP targeted this type of project through a financed risk sharing fund to back a 50% credit risk against individual projects. The drawbacks to the program were identified soon into the program that had an overly complex structure, and the program was revised following a mid-term review and the focus moved away from individual loans to support for suppliers. For smaller individual loans to purchase basic solar PV lighting and solar home systems, for example, an MFI is better placed to address this market and so MFIs and credit unions should be encouraged and supported. This could be achieved through grant, credit line or portfolio PCGs. Build small and medium sized "energy through enterprise" businesses to supply this small, niche but profitable market as well as hire-purchase, mobile banking (World Bank Sustainable Energy Finance Project, Pacific Islands, PAD, May 16, 2007).

Initial Capitalization Target:	$10-20 million held and managed by a regional development bank or regionally based commercial bank; expected fund life 20 years
Financing:	Provided by participating local commercial banks supported by credit lines, grants, and credit guarantees from the fund
Eligible Projects:	Targeted mainly at energy efficiency, but some smaller scale renewable energy, with broad technical eligibility criteria established by technical experts to ensure that the most promising projects are financed; financial viability determined by commercial bank to ensure that appropriate risks are taken
Technical Assistance:	Provided to participating banks, as well as project development and business plan support to sponsors; cost should be borne by the bank but could be done on a cost share basis; cost of technical assistance to project sponsors covered by grant funding
Credit Lines:	$1 to 5 million with a max 10-year loan tenor issued with a small interest rate charge to cover management. Commercial banks can then on-lend to individual projects/companies at discounted fixed interest rate set at a maximum level below prevailing market rates
Partial Guarantees:	For those banks not interested in a credit line, a percentage of the fund could be set aside and used to provide interested banks with partial credit guarantees for their clean energy projects on a portfolio basis
Project and Loan Size:	Maximum project size of $10 million with total maximum debt financing of 70% (fund + commercial bank); a maximum loan size available per project under the revolving fund credit line could be established; maximum loan tenor would be 7 years
Co-financing:	Loans should typically be made on a co-financing basis with revolving fund loans combined with commercial bank loans and equity financing by sponsors

3.4 Private Equity Fund

A global level private equity fund model may be impracticable in the SIDS context. However, a regional level or series of regional ones might work, if there are sufficient deals for financing. For instance, IFC's experience in the Pacific Islands indicates it is a challenge to find the scale and volume of deals necessary for a profitable PE fund. By restricting deals to clean energy the issue may be that the project pipeline shrinks dramatically and so the question would be whether the fund could find sufficient bankable deals. If the intention is to have a modified PE fund without the typically required levels of in-built profitability, then this option might work. If the investment objective is just to be sustainable and not necessarily produce the typical returns expected of a PE fund, then its structure could be simpler. The management of a newly created PE fund should be under a professional, independent fund manager, who would be responsible for investment decisions. In addition, there would be an investment committee to determine whether to provide funds to a project. This would be done in accordance with

the fund's agreed upon strategy and based on commercial viability, and, thus, are more likely to be financed in countries where the investment climate and project profitability are more conducive.

3.5 Investment Trust

Another option considered is the creation of an investment trust with a small seed capital (e.g., $20 million). This could cover the project development and capacity building elements and provide funds that could also be used as equity or grants to approved projects. In any event, the projects would need co-financing (this should be a condition in the investment strategy) and would likely need some local debt financing. The trust's key tasks would be to: (i) play the lead role in project structuring (which requires a strong corporate finance/structured finance capability) on behalf of the project sponsor; and (ii) act as a co-financing catalyst, using Trust Fund resources to plug financing gaps where required. This would require systematically formalizing relationships with a broad range of financial (and risk sharing) partners, both local and external. By focusing on project development, the trust fund should be able to attract outside sources for funding as PFAN was able to, and leverage private sector investment. As with PFAN, as one of several operating conditions, a leverage target could be set for the trust. If a 1:15 ratio were set as the target, then the $20 million seed funding could result in $300 million of total project investment over five years. This total could be arrived at through some direct investment and grant support, but utilizing funds mainly to source other funding.

Table 3.3 provides an indicative comparison between the private equity, investment trust, and revolving fund models:

Table 3.3 | Comparison between Different Models

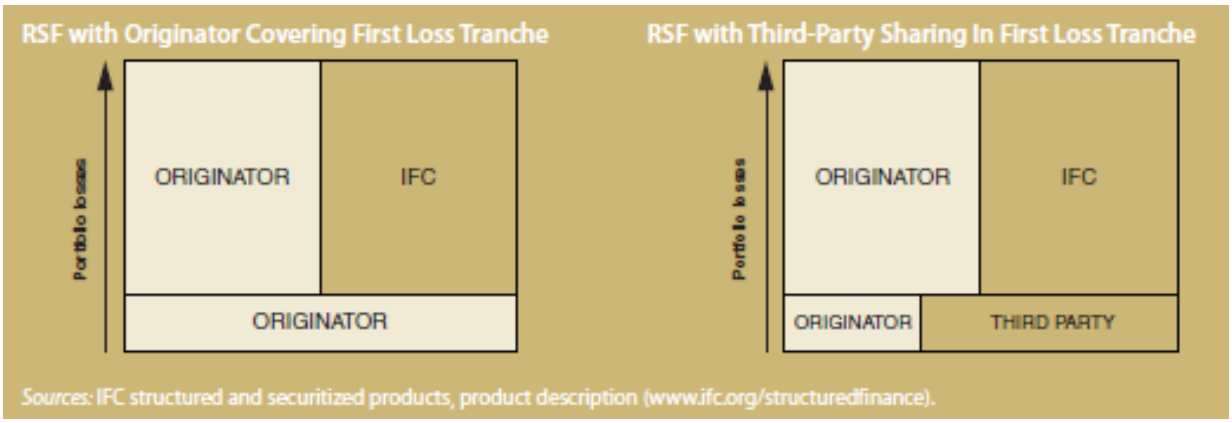
	Private Equity Fund	Investment Trust	Revolving Fund
Type	Usually RE projects, but some larger standalone EE projects	RE or EE projects	Usually EE, but some RE
Funding	Funds sought from private investors (limited partners); typical range $100m+ on fully commercial basis with target ROI of 18-25%	$ 10-50 million	$ 20-50+ million
Additional Finance	Closed-end funds; additional finance usually through creating a new follow-on fund	Raised as needed	Recapitalized periodically
Finance Provided to Projects	Equity; can seek to use equity provided by fund to leverage debt finance, if needed	Co-finance; equity and grants, specifically designed to leverage other investment and loans	Loans at concessional rates
Time	10 year life with initial 5 year investment period, with exits sought as soon as possible to maximize return	Flexible	Fund life: 15-20 years Credit lines to banks: 10 years Loan tenor to borrowers: 7 years
Technical Assistance	Not provided by fund, but fund manager will be working closely to ensure investments are successful	Specifically structured to provide TA, capacity building, and investment	TA can be provided to participating banks to support their borrowers
Management	Professional fund managers incentivized by PE fund model of 2%+ management fee and profit share, typically 20% above a hurdle rate of return (roughly 8%)	Professional fund manager with terms and incentives, as negotiated	Typically held and managed by regional development bank, commercial bank

Source: Authors

3.6 Partial Credit Guarantees/Risk Sharing Facilities

The objective of using risk sharing facilities (RSFs) for clean energy is to address the risk concerns of commercial banks. These have been typically offered as partial credit risk guarantees (PCG) to provide the bank with some protection against non-performing loans/defaults and, thereby, encouraging new/increased lending. Whether structured as an individual loan or portfolio guarantee, a risk sharing facility can help the bank build a successful clean energy lending business, develop its client base, and through an integrated technical assistance package, provide information and experience needed for appropriate risk assessment and pricing. The goal is to better understand and the risk sharing facility should no longer be required (see Annex 4). PCGs have their limitations as loans are still governed by bank lending policy, central bank requirements, and good business practice, which are typically aimed at reducing the bank's collateral requirements.

Figure 3.3 | Typical IFC Risk Sharing Facility Structure



Source: IFC structured and securitized products, product description: www.ifc.org/structuredfinance

Note: The example above illustrates a loss-sharing agreement between IFC and a bank, where IFC will reimburse the bank at a fixed percentage for a portion of any losses incurred that exceed an agreed threshold, usually on an eligible assets portfolio basis. Eligibility criteria for new loans as are also pre-agreed. These are added to the facility portfolio during a ramp-up period or until the portfolio reaches a predefined limit. The first loss portion of any losses can be covered by a third party (GEF or a donor, for example). With clearly defined criteria and integrated TA losses are rare, thus, any donor is able to very effectively leverage its funding, making these types of RSFs useful for promotion clean energy investment.

3.7 Potential Approaches

Given the numbers of islands involved, with differing investment and business climates, sector issues, and diversity of project needs, it is unlikely that there could be one single financing mechanism or approach that could be applicable to the variety of investments needs faced by SIDS.

3.7.1 Local, Regional, and Global Mechanisms

Different financing mechanisms often work at different scales (i.e., local, regional, national, sectorial, etc.) For instance, revolving funds are often created to support a wide range of energy efficiency investment types in a particular country. Energy efficiency projects are usually supported through grants, with lending and balance sheet financing in the case of households and commercial buildings. In the case of a bank with a regional presence, lending could be across a region through a support

mechanism such as a risk sharing facility or a specific credit line. For very small end-user loans for small solar systems, micro-finance institutions may be one of the viable options to serve isolated off-grid communities, using micro loans that could be implemented with grant support.

3.7.2 Sector Approach

Energy efficiency programs have been designed to target specific industry sectors, for example, high energy intensive sectors such as cement, glass, and steel, and these often incorporate benchmarking to ensure that industry aims for appropriate technology and best operating practice. In Asia, programs have targeted sectors, such as textiles and garments, where there are large numbers of industries and where energy costs may represent a higher proportion of operating costs. For SIDS, appropriate sectors to explore might be tourism/hotels, agri-business (with the potential for biomass energy generation) and transport. A range of energy efficiency options can be explored, ranging from simple replacement of lighting with CFLs or LEDs, effective implementation of energy management measures, energy efficiency pumps, motors, heating, ventilation, or air conditioning. This requires an active energy services sector and energy auditing expertise, and should be coupled to a financing product, again, available from a local bank or energy efficiency fund. If a bank has a large number of clients in a specific sector, then it makes business sense to explore the potential for offering energy efficiency loans. For banks with sufficient lending capacity portfolio, PCGs would be appropriate.

At the commercial level, particularly SMEs, an element of grant support and support for energy audits and project preparation and costing can be catalytic in overcoming some of the barriers to investments in energy efficiency. Energy policy should be supporting these investments, but where energy costs are subsidized price may not provide a sufficient incentive. In addition, SMEs may not have sufficient borrowing capacity and/or may have already used their assets to back loans for higher priority investments. The availability of the PCGs mentioned above could be used by banks to partially off-set the collateral requirements and to move banks away for asset backed lending to cash-flow based lending. Such a program would be targeted at a specific interested financial intermediary, with either a credit line or PCG, depending on circumstances, and would need to incorporate technical assistance to the bank and/or industry, and involve energy service companies and consultants to perform energy audits. Grants could be incorporated into this.

3.7.3 Private Finance Advisory Network

One successful approach that could be applicable in SIDS is the multilateral supported Private Finance Advisory Network (PFAN), which aims to develop and bring projects to investors. The approach adopted by PFAN involves bringing together the various players in the market—sponsors, technology suppliers, energy service companies, entrepreneurs, and financiers. One area that PFAN was not so focused on was the type of support required by the private sector, which is a key issue to be addressed in the case of SIDS. Figure 3.4 illustrates the approach adopted to connect clean energy businesses/projects with financing. PFAN used a mix of policy and market mechanisms to address barriers to clean energy finance and project implementation, as well as facilitating the scale-up of businesses and projects in the sector. As discussed earlier, the PFAN Asia program achieved good leverage of USAID funding. PFAN adopted a 10-point approach:

1. Identification
2. Screening
3. Selection
4. Group mentoring

5. One-on-one mentoring
6. Pre-forum workshop
7. Investor forum
8. One-on-one meetings
9. Deal flow facilitation
10. Deal/financial closure

This programmatic approach could be incorporated into a credit line/PCG/direct lending/equity vehicle. If the support was a portfolio-based risk sharing facility, then this could cover a country or region, depending upon the bank concerned.

Figure 3.4 | Private Financing Advisory Network Operating Approach

Source: www.CTI-PFAN.net

4 CONCLUSIONS

4.1 OVERVIEW

With high energy prices in SIDS and numerous investment projects to be financed, the challenge is their scale and diverse locations possibly requiring aggregation to achieve economic scale and to be able to attract commercial investment. Any financing mechanism by itself is unlikely to be enough to achieve the clean energy investment needs of SIDS unless capacity building, project development, and non-financial barriers and risks to renewable energy deployment and energy efficiency promotion are addressed. In addition, a support mechanism would be necessary for the formulation of quality investment-ready projects that could be considered for financing under any particular instrument. Approaches to these issues could be first piloted using some seed capital for the development of a limited number of investments, while partnering with and seeking other sources of funding from donors, existing PE funds, and foundations.

4.2 REVOLVING FUND

The creation of a global revolving fund able to operate effectively across SIDS is probably unrealizable given the requirement for re-capitalizing, management, and coordination across the regions. This option could be explored at a regional development bank level or at the national level in the case of larger island states where there are sufficient numbers of eligible projects.

For a revolving fund to be established, it would need a sufficient level of capitalization to meet market demand. Given the level of public indebtedness of many SIDS countries, it is unclear how the fund could be capitalized (and periodically recapitalized) from government resources alone, so contributions from development partners would need to be sought. Deployment of clean energy should generate savings through reduced imported fossil fuel bills that could be used for the fund. If there is insufficient funding support to meet lending demand, then the revolving loan fund could be established as a guarantee fund only.

Factors to consider before establishing a revolving fund:

- Energy efficiency projects are likely to be more successful
- A professional, independent fund manager required
- Loans may be small and not considered profitable; willing local commercial banks must be identified
- Building a bank's capacity can take two years or more, with additional time to develop appropriate financial products
- Demand for energy efficiency investments are influenced by the business climate and the cost of energy
- Capital replenishments will be needed
- Potential borrowers may not meet the minimum borrowing conditions
- In the case of energy efficiency, there may not be any effective, well-capitalized ESCOs operating in the market

Indicative operational criteria for a revolving fund are presented in Section 3.3.3.

4.3 PRIVATE EQUITY FUND

A regional level or series of regional private equity funds may work in the SIDS context if there are sufficient deals for financing and the intention is to have a modified PE fund without the required built in profitability. A new private equity fund would require professional, independent fund management in charge of investment decisions.

In order to attract private sector funds, it would be essential to have the following:

- a thorough pipeline and project development to get projects to an investment-ready level;
- partnerships with regional development banks, local commercial banks, and MFIs for smaller-scale, end-user finance to encourage lending for energy efficiency/renewable energy projects—support through revolving funds, direct credit lines, partial credit guarantees—all incorporating a significant technical assistance component; and
- support from IFIs, other financing institutions, and private equity/venture capital funds that are already operating or are interested to invest in the SIDS.

4.4 Investment Trust

An alternative to the creation of a private equity fund that could be considered is the creation an investment trust with a small seed capital to provide project development and capacity building support as well as equity or grant for approved projects. Focusing on project development, would help attract outside sources of funding, including private sector investment.

Under this model, the role of the Trust would be to co-finance and co-invest with external funds, whether in the Pacific, Indian Ocean, or Caribbean. Financial returns for the Trust's participation should be negotiated, commensurate with the risk involved. These returns could be ploughed back to pay for the Trust's continuing operations, which would facilitate the goal of financial sustainability for the Trust, a key consideration going forward. Projects should require local participation and counterpart funding, and the management team should have a mandate to actively incorporate external co-financing in all transactions.

4.5 Local Commercial Banks

The availability of locally sourced debt financing for project sponsors is a key factor in scaling up clean energy investment. Commercial banks need to be convinced of the existence of a market for lending, so it is essential to work closely with interested local banks to assist them in understanding and evaluating the technical aspects of projects, as well as to help them better understand their portfolio. This type of support to local commercial banks, either those operating just at a national level to cover national projects, or banks with a regional structure, could be used to back a portfolio of projects previously identified, screened, and prepared. After that, the banks may be willing to participate or manage instruments such as a revolving fund to provide a concessional credit line for small- to medium-scale projects; a direct dedicated credit line; or partial credit guarantees through a risk sharing facility to support lending by partially guaranteeing any potential loan defaults. In addition, if a bank is interested and able to provide project finance for larger investments, then experience gained with smaller scale energy lending will be relevant.

4.6 Potential Funding Sources

- Initial seed funding from one or more development partners
- Supplemental funding from individual donors, via an internet-based funding platform
- Initial capital from one or more anchor “patient capital” investors
- Supplemental funding from specialized feeder funds (e.g., targeting emissions offset investors, major corporations active in SIDS, etc.)
- Global Environmental Facility

ANNEX 1: SIDS AND SIDS DOCK

Table A1.1 | SIDS and SIDS DOCK Countries

List of Small Island Developing States (UN Members)			
1	Antigua and Barbuda	20	Federated States of Micronesia
2	Bahamas	21	Mauritius
3	Bahrain	22	Nauru
4	Barbados	23	Palau
5	Belize	24	Papua New Guinea
6	Cape Verde *	25	Samoa *
7	Comoros *	26	Sao Tomé and Principe *
8	Cuba	27	Singapore
9	Dominica	28	St. Kitts and Nevis
10	Dominican Republic	29	St. Lucia
11	Fiji	30	St. Vincent and the Grenadines
12	Grenada	31	Seychelles
13	Guinea-Bissau *	32	Solomon Islands *
14	Guyana	33	Suriname
15	Haiti *	34	Timor-Lesté *
16	Jamaica	35	Tonga
17	Kiribati *	36	Trinidad and Tobago
18	Maldives *	37	Tuvalu *
19	Marshall Islands	38	Vanuatu *

List of Small Island Developing States (Non-UN Members/Associate Members of the Regional Commissions)			
1	American Samoa	8	Guam
2	Anguilla	9	Montserrat
3	Aruba	10	Netherlands Antilles
4	British Virgin Islands	11	New Calendonia
5	Commonwealth of Northern Marianas	12	Niue
6	Cook Islands	13	Puerto Rico
7	French Polynesia	14	U.S. Virgin Islands

*	Also LDCs
	Members of SIDS DOCK

Table A1.2| AOSIS Member States that are Members of SIDS DOCK

Pacific Ocean	Caribbean	Atlantic and Indian Oceans
Cook Islands	Antigua & Barbuda	Democratic Republic of São Tomé & Príncipe
Federated States of Micronesia	Commonwealth of the Bahamas	Republic of Cape Verde
Fiji	Barbados	Republic of Maldives
Independent State of Samoa	Belize	Republic of Mauritius
Kingdom of Tonga	Commonwealth of Dominica	Republic of the Seychelles
Kiribati	Dominican Republic	
Nauru	Grenada	
Republic of the Marshall Islands	Jamaica	
Republic of Palau	Republic of Suriname	
Republic of Vanuatu	Republic of Trinidad & Tobago	
Solomon Islands	St. Christopher (St. Kitts) & Nevis	
Tuvalu	St. Lucia	
	St. Vincent & the Grenadines	

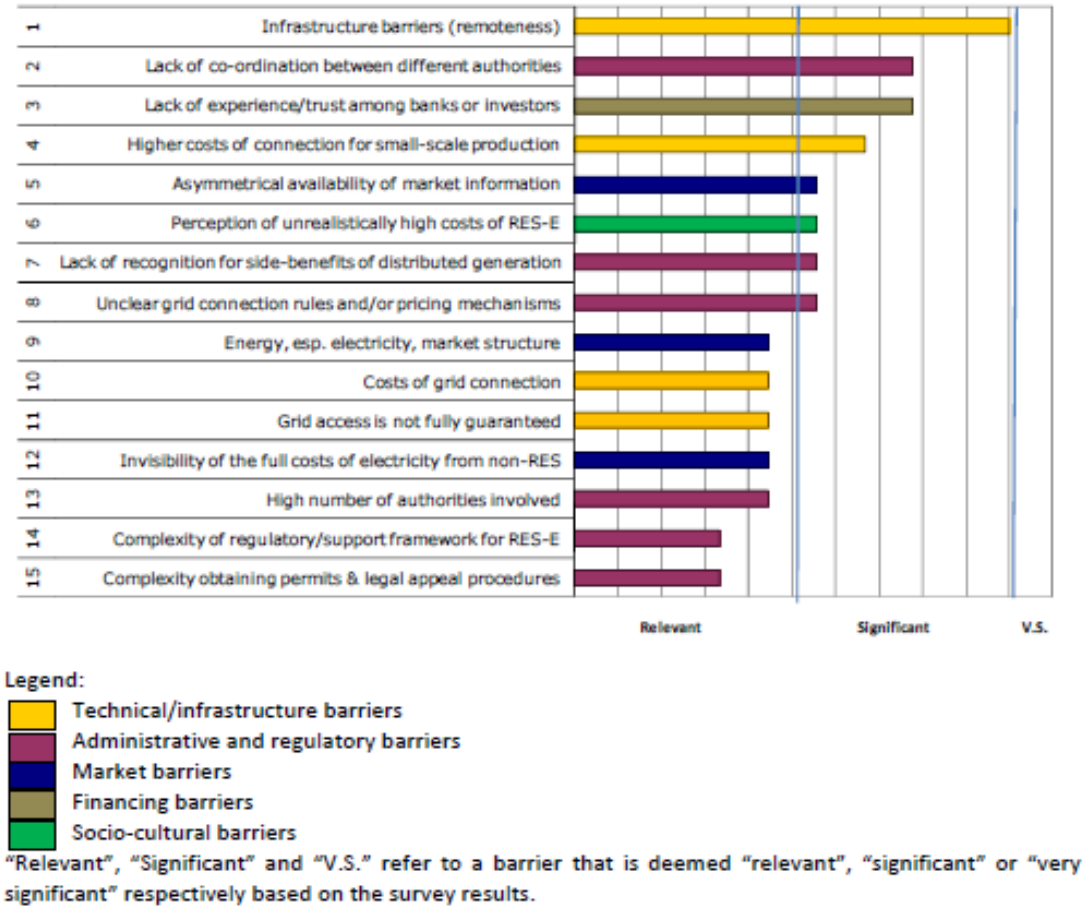
ANNEX 2: NON-ECONOMIC BARRIERS TO CLEAN ENERGY UPTAKE

Non-economic limitations and constraints to clean energy uptake have been assessed for the Association of Southeast Asian National (ASEAN) in the following areas:

- technical/infrastructure
- regulatory/administrative
- financial
- market barriers
- socio-cultural

Even though barriers have been assessed for the ASEAN countries, a number of these non-economic barriers are generic to clean energy uptake and so may also apply to many SIDS countries One of the most important challenges that investors face are the administrative and institutional obstacles (that also apply in some SIDS) including, in some cases, the absence of coherent government renewable energy/energy efficiency policies and/or lack of effective implementation that result in increased risk for investors.

Figure A2.1 | Overview of Non-Economic Limitations in ASEAN Countries



Source: Deploying Renewables in Southeast Asia (Trends and potentials), 2010, Executive Summary, p. 12; Lamers, 2009

A recent report produced by IRENA[20] identifies typical technical and non-financial barriers to renewable energy investment in developing countries that are also relevant for SIDS:

INFRASTRUCTURE CHALLENGES

"Infrastructure challenges present a major concern for energy project development. They are particularly acute for renewable energy deployment, often increasing the risk associated with renewable investments and, in extreme cases, preventing a prospective project from being taken forward. Key examples of infrastructure challenges include system constraints, lack of grid access, high grid connection costs, limited grid capacity and coverage, lack of technical standards and certification, and lack of operation and maintenance facilities" (IRENA 2012, p. 34).

LIMITATIONS IN KNOWLEDGE AND CAPACITY

"In developing countries, limitations in knowledge and capacity among relevant actors are a significant constraint on renewable energy investment. This applies to project developers, financing authorities, and public administrators. There is less experience with project finance structures, limited equipment operations and maintenance expertise, and a greater need for technology transfer support. Bankers often do not understand renewable energy technologies and are unwilling to approve financing due to an inability to assess the risk of the project. Project developers require support in business and financial planning, technical expertise, or basic information to be able to apply for project funding. Public administrators often lack the capacity to streamline approval processes effectively. Where supportive renewable energy sector laws have been passed, public administrators often lack the capacity to implement them, rendering them ineffective at facilitating investment. Similarly, lack of understanding of "carbon finance" has resulted in the inability to recognise potential Clean Development Mechanism (CDM) investments. However, this is one of several factors contributing to the underutilisation of carbon finance in the renewable energy market as part of project finance. Other factors include CDM procedures and timelines, low carbon prices and uncertainty about the post-2012 carbon market" (IRENA 2012, p. 34).

Investors interviewed for this study generally predicted that *carbon finance would not have a significant impact on the renewable energy finance* landscape in the near future.

The limitations presented above are compounded by the specific environmental challenges faced by SIDS, including:

- limited resource endowment
- growing populations
- geographic isolation
- potential for sea-level rise
- prone to natural disasters

[20] IRENA 2012, p. 34.

ANNEX 3: INVESTMENT CLIMATE

There are a number of determinants of a country's investment climate that have a strong impact on the risks perceived by private investors and the returns they anticipate from their investments. Table A3.1 summarizes these main determinants grouped by (i) policies and legislation, (ii) financial and economic instruments, (iii) programs and institutions, and (iv) regulatory environment.

Table A3.1 | Green Investment Climate Matrix

Policies		Financial and economic instruments			Programs and institutions		Regulatory environment	
Policies, targets, and legislation		**Fiscal incentives**	**Financial measures**	**Market-based mechanisms**	**Programs**	**Institutions**	**Procedures and mechanisms**	**Regulatory agencies**
Policies, specific legislation and information availability-related initiatives that have been introduced to implement policy objectives		*Incentives typically enacted to reduce tax liabilities*	*Financial instruments, schemes and subsidy arrangements*	*Markets that have been created to value and trade carbon*	*Specific programs that have been implemented to promote green investments*	*Institutions involved in a country's specific programs*	*Specifications, standards and verifiable indicators for regulating green investments*	*Institutions responsible for the regulatory environment*
• Policies, objectives and targets	• Environmental laws • Liability rules • Information availability such as eco-labeling, reporting requirements, energy auditing and best practice guidelines	• Tax credits • Tax deductions • Tax deferrals • Tax-equity swaps • Tax holidays • Loss carry forward • Reduction of levies (income or VAT) • Accelerated depreciation • Subsidies	• Feed-in tariffs • Life-line tariffs • Government loans • Guarantees • Credit lines • Equity funds • Venture capital • Grants • Bonds • Mezzanine	• Cap and trade programs • Baseline and credit programs • Offset schemes • Tradable white certificate schemes • Tradable green certificate schemes	• Voluntary programs • R&D programs • Capacity building programs • Eco-industrial parks • Smart growth zones • Waste exchange • Green Public Procurement • International organizations' programs • Local institutions' programs • Net metering	• Institutions	• Standard specifications • Corrective action plans for ensuring compliance with regulation • Emission monitoring, reporting and verification	• Regulatory agencies ensuring compliance with regulation

Source: Authors.

Source: World Bank Green Energy Report.

Green Infrastructure Finance: Framework Report

ANNEX 4: SELECTED INTERNATIONAL FINANCIAL INSTITUTION/DONOR SUPPORT PROGRAMS

A full description of programs can be found in the World Bank Green Infrastructure Report referred to in the main report (World Bank 2012).

PACIFIC REGION INFRASTRUCTURE FACILITY

The Pacific Infrastructure Facility (PRIF) is a multi-partner investment coordination and technical facility that builds on the activities of six donor partners[21] in the Pacific. This initiative encourages a coordinated approach to infrastructure planning and development through harmonized support and improved project prioritisation. The following countries are PRIF partners: Cook Islands, Federated States of Micronesia, Kiribati, Nauru, Niue, Palau, Republic of the Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu.

"The PRIF partners are working with other development partners and organisations in the region to provide support for increased and equitable access to reliable and affordable energy. This includes exploring options for extensions to existing networks and supporting off-grid solutions for local generation that can provide rural populations with *reliable access to energy."*[22]

A number of energy initiatives are currently being coordinated through PRIF, including the World Bank-led *Energising the Pacific* initiative, which has established a forum for donor coordination for more effective programming of energy sector assistance in the Pacific. The ADB-led activity - *Promoting Energy Efficiency in the Pacific (Phase II)* - will be closely coordinated with Energising the Pacific and is designed to promote least-cost approaches to energy security through energy efficiency and conservation measures.[23]

UN SUSTAINABLE ENERGY FOR ALL INITIATIVE

Program activities, relevant for SIDS, how does it work, case studies. Objectives: "Developed countries face the combined challenge and opportunity of transforming existing infrastructure, and developing countries have the opportunity to adopt cleaner, more efficient technology from the start. These 3 objectives reinforce each other in many instances, and achieving the three together will power opportunity, maximize development benefits and help stabilize climate change:"[24]

- ensure universal access to modern energy services
- double the global rate of improvement in energy efficiency
- double the share of renewable energy in the global energy mix

Over 100 commitments mobilized, demonstrating powerful early momentum (governments, private sector, civil society organizations) to achieve Sustainable Energy for All by 2030.

[21] Asian Development Bank, Australian Agency for International Development, New Zealand Ministry of Foreign Affairs and Trade, the World Bank Group, European Commission, European Investment Bank.

[22] http://www.theprif.org

[23] http://www.theprif.org

[24] http://www.sustainableenergyforall.org/objectives

Twenty SIDS agreed to work towards 'universal access to *energy, switching to renewable energy, and reducing dependence on fossil fuels*: (for instance, Government of Barbados will increase its use of renewable energy to 29% of all electricity consumption by 2029)

HIGH-LEVEL CONFERENCE OF SIDS (May 7-8, 2012; in preparation for Rio+20 Conference)

Government of Barbados, United Nations Development Programme, and the Organisation of American States hosted a meeting—"Achieving Sustainable Energy for All in SIDS"—in Barbados on May 7-8, 2012. Over 100 heads of state, ministers, leading development experts, civil society leaders, business executives, and UN officials from 39 countries from the Caribbean, Pacific, Indian Ocean, and Africa came together to talk about policy strategies for increasing energy access, renewable energy production and energy efficiency among SIDS, resulting in the Barbados Declaration[25]--a commitment to universal access to modern and affordable renewable energy services, while protecting environment, ending poverty, and creating new opportunities for economic growth.

Voluntary commitments of 20 SIDS to take action toward providing universal access to energy, switching to renewable energy, and reducing dependence on fossil fuels.[26] Specifically:

- Barbados will increase use of renewable energy to 29% of all electricity consumption (by 2029)
- Maldives will achieve carbon neutrality in the energy sector by 2020
- Marshall Islands will electrify all urban households and 95% of rural outer atoll households by 2015
- Mauritius will increase share of renewable energy to 35% or more by 2025
- Seychelles will produce 15% of its energy supply from renewable energy by 2030
- SIDS-DOCK supports "clean energy investment & technical assistance in the Caribbean, Pacific & Africa"
- SREP (Climate Investment Fund) supports clean energy initiatives in Maldives & Pacific

At the time of the Conference, it was expected that the SIDS-DOCK program would support clean energy investment and technical assistance activities in the Caribbean, Pacific and Africa. The Scaling Up Renewable Energy Program (SREP), which is one of the Climate Investment Funds, would support clean energy initiatives in Maldives and Pacific Islands.[27]

[25] The Barbados Conference is organized jointly by the Government of Barbados and UNDP with support from Australia, Norway, UN Foundation, the British High Commission in Barbados, the Energy, and Climate Partnership of the Americas at the Organisation of American States, SIDS DOCK, and Archers Hall Design Centre (SE4All 2012).

[26] This announcement built momentum leading up to the Rio+20 UN Conference on Sustainable Development, and demonstrated SIDS's promise in achieving the goals of Sustainable Energy for All Initiative.

[27] SE4All n.d.-b

Table A4.1: SE4All Support for Clean Energy in Small Island Development States

	ACTIVITIES / PARTNERS	TIMELINE
Commitment Target	• Mobilize additional funding through the SIDS DOCK program, in order to support strengthening the enabling environment for renewable energy and energy efficiency and implementation of projects that develop, deploy, and demonstrate RE and EE initiatives in SIDS DOCK member countries. • Pilot a competition to catalyze RE and EE innovations in SIDS DOCK countries • Develop a virtual knowledge-sharing platform for RE and EE in SIDS DOCK countries	by 2013
Organizations	World Bank/ ESMAP	
Additional Partners	AOSIS, UNDP, Government of Denmark (funding) Open to additional partners	
Sustainability for All Goals addressed	Access to Energy, Renewable Energy, Energy Efficiency	

Source: http://www.sustainableenergyforall.org/actions-commitments/commitments/single/support-clean-energy-in-small-island-developing-states

CLINTON CLIMATE FOUNDATION

President Bill Clinton established the William J. Clinton Foundation with the mission to improve global health, strengthen economies, promote healthier childhoods, and protect the environment by fostering partnerships among governments, businesses, NGOs, and private citizens.

The Clinton Foundation launched the Clinton Climate Initiative (CCI) to create and advance solutions to the core issues driving climate change. CCI was launched in August 2006, to fight against climate change through a business-oriented approach to reduce carbon emissions, increase energy efficiency, provide access to clean energy technology, and reverse deforestation. Through CCI, the Clinton Foundation is supporting countries such as Guyana, St. Lucia, and Dominica.

In 2012, CCI created its Diesel Replacement Project, recognizing the pressing climate and energy challenges facing Small Island Developing States (SIDS) and Alliance of Small Island States (AOSIS) members. Despite their vulnerabilities, many SIDS have the capacity and desire to lead on reducing the use of fossil fuels and transitioning from fossil fuel-based to low carbon economies, providing models which can be replicated elsewhere, and serving as examples that spur action worldwide. According to CCI, its Diesel Replacement Project "is partnering with motivated governments to support them in advancing their agendas and needs lists for designing, developing, and implementing specific energy efficiency and renewable energy projects, in the areas of solar, wind, biomass, waste, hydro, geothermal and water."

The CCI goes on to state: "CCI provides partner governments with independent and unbiased advice at no cost. Its staff leverages business, financial and policy expertise, and CCI's access to international resources to:

- Perform technology, financial, and policy analysis to support project development;
- Help identify and engage project developers, technology suppliers, financial institutions, development banks and other stakeholders necessary to develop and finance projects;

- Work on the side of government in discussions with companies, to forge agreements so that projects can move forward, including the negotiation of contracts, off-take agreements, and commercial and financial structures; and
- Achieve benefits of scale by helping bundle multiple projects together in negotiations with global suppliers and financial institutions."

CCI's Diesel Replacement Project is partnering with over 20 island governments.

GLOBAL ENVIRONMENT FACILITY

"The GEF unites 182 governments in partnership with international institutions, NGOs, and the private sector to address global environmental issues. As an independent financial organization (as GEF identifies itself), the GEF provides grants to developing countries and those with economies in transition for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and organic pollutants. These projects benefit the environment, linking local, national, and global challenges to promote sustainable livelihoods. GEF generally provides upfront funding for technical assistance (and for project financing to a lesser extent) in a co-financing arrangement with other programs by MDBs or other organizations. GEF was established in 1991 and today is the largest source of financing for activities aimed at improving the global environment. It has allocated a total of $9.2 billion, supplemented by more than $40 billion in co-financing over 2,700 projects in more than 165 countries. Through its Small Grants Programme (SGP), it has also made over 12,000 small grants to NGOs and community organizations, totaling $495 million. The GEF partnership includes 10 agencies: the UN Development Programme, UN Environment Programme, UN Food and Agriculture Organization, UN Industrial Development Organization, World Bank, African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, Inter-American Development Bank and International Fund for Agricultural Development. The Scientific and Technical Advisory Panel provides technical and scientific advice on GEF policies and projects" (World Bank Green Infrastructure Finance Report).

CLIMATE INVESTMENT FUNDS

"The CIF are a pair of funds to help developing countries pilot low-emissions and climate resilient development. With CIF support, 45 developing countries are piloting transformations in clean technology, sustainable management of forests, increased energy access through renewable energy, and climate-resilient development. CIF are two distinct funds: the Clean Technology Fund (CTF) and the Strategic Climate Fund (SCF). The CIF are additional to existing Official Development Assistance (ODA) and aim to enable countries to continue on their development path and achieve the Millennium Development Goals. The CIF funds are disbursed through Multilateral Development Banks (MDBs) to support effective and flexible implementation of country-led programs and investments. The instruments are often combined with other bilateral or multilateral loans, and technical assistance as well as other concessional financing, in particular pro-green financing such as the GEF and carbon finance, to reduce the overall cost of borrowing. **The Clean Technology Fund (CTF)** helps scale up financing for demonstration, deployment and transfer of low-carbon technologies that possess significant potential for long-term GHG reductions. The Fund provides support through its country and region-level programs and is expected to finance from 15 to 20 programs. When a country expresses interest, the World Bank and other MDBs conduct a joint mission aimed to prepare an investment plan, meeting with government officials, private industry and other stakeholders to determine how the CTF could help scale up low-carbon activities. Based on the discussions, an investment plan is then reviewed and approved by the CTF Trust Fund Committee. **The Strategic Climate Fund (SCF)** serves as an umbrella framework to support three programs to

pilot new approaches that could scale up and transform activities related to specific climate change problems or enhance sectoral responses. The SCF includes the Forest Investment Program (FIP), the Pilot Program for Climate Resilience (PPCR), and the Program for Scaling-Up Renewable Energy in Low Income Countries (SREP)" (WB Green Infrastructure Finance Report).

Scaling-Up Renewable Energy Program in Low Income Countries

The Scaling-Up Renewable Energy Program in Low Income Countries (SREP) is a targeted program of the Strategic Climate Fund (SCF).[28] Its main objectives are:

- deployment of renewable energy solutions and expansion of renewables markets (in poorest countries)
- piloting economic, social and environmental viability of low carbon development pathways
- SREP financing supports solar, wind, bio-energy, geothermal, and small hydropower technologies and aims to stimulate economic growth by working with governments to build renewable energy markets, engage private sector, and explore productive energy use

$551 million was pledged to SREP as of June 30, 2014.

Table A4.2: Scaling-Up Renewable Energy Program in Low Income Countries

Pilot Countries		Reserve Countries
Ethiopia	Mali	Armenia
Honduras	Nepal	Solomon Islands*
Kenya	Tanzania	Mongolia
Maldives*	Liberia	Vanuatu*
		Yemen

* SIDS DOCK Members

Source: https://www.climateinvestmentfunds.org/cif/srep

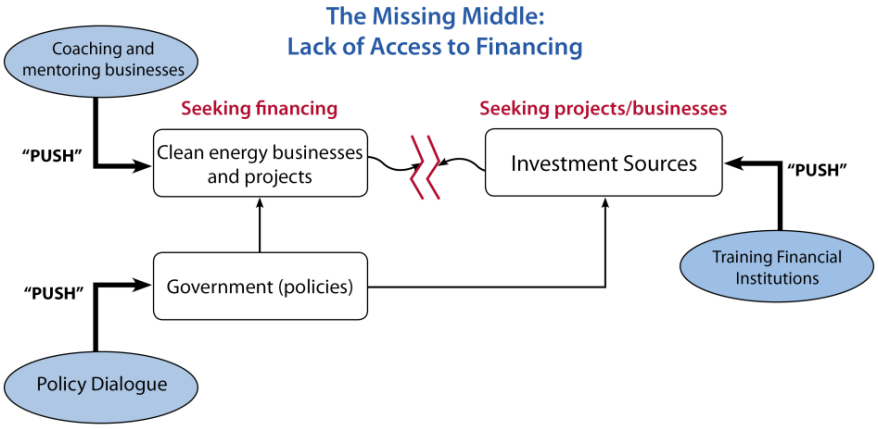
Private Finance Advisory Network

The Private Financing Advisory Network (PFAN) is a multilateral, public-private partnership initiated by the Climate Technology Initiative (CTI) in cooperation with the UNFCCC Expert Group on Technology Transfer. PFAN operates to bridge the gap between investments and clean energy businesses.

[28] CIF n.d.-a

Box A4.1| PFAN-Asia and the 'Missing Middle'

While project developers and entrepreneurs seek financing for their projects, many financial institutions and private investors are looking for a stake in the fast-growing clean energy market. Particularly in Asia, project developers often lace access to capital, particularly equity capital, and they may also lack the business skills to demonstrate the feasibility of their project to financiers. At the same time, such financiers lack access to a portfolio of projects, and the specialized knowledge required to confidently invest in renewable and energy efficiency initiatives. This is the challenge that PFAN refers to as the "Missing Middle."



Source: PFAN-Asia Sustainability Plan: Mobilizing Finance for Clean Energy Development in Asia, July 2011

ANNEX 5: FINANCING MECHANISMS AND STRUCTURES

PUBLIC FINANCE MECHANISMS

Table A5.1 provides an overview of different public financing mechanisms that can be deployed to mobilize investment in clean energy.

Energy efficiency and renewable energy financing mechanisms for lending are designed to let sponsors pay back a loan or provide a return at a rate less than or equal to the income or savings achieved. However, these projects are still subject to return on investment calculations and often compete with other projects requiring collateral against the loan and the ability to borrow the amount required. For many borrowers, the amount of the repayment that comes from cash-flow may be more important than the interest rate charged. Hence, the loan tenor is often a key factor in the ability to borrow over a sufficient length of time to reduce payment amounts. For industrial energy efficient improvements, a loan tenor extended to 5 to 7 years may be required, even though actual payback through energy efficiency savings might be sooner. A similar principle applies to small-scale renewable energy projects. For example, a micro-credit scheme might allow a purchaser of a solar-home systems to pay for this at the same rate, or lower, as would be needed to pay for kerosene or battery charging. For major retrofit of energy efficiency or installation of renewable energy in buildings, an option for financing improvements with a longer term payback is through the use of improvement charges shown as property tax increases. The investment cost could be financed by the local municipality and repaid over the longer term through higher property taxes. This also has the added advantage of permitting higher investments as repayments are recovered against the building and not the current building owner. This option could be used for a distributed generation system (cogeneration, solar PV) selling power to the grid under a long-term feed-in tariff contract. For larger stand-alone projects, there are a range of issues that need to be assessed before either capital is put at risk or funds borrowed. The project finance structure is key where the project fundamentals and return on investment determine not only whether to invest or not, but also the structure and debt/equity mix. So the key fundamental before determining the financing mechanism to support a particular investment is whether the project is first bankable. Financing mechanisms should be designed to support fundamentally sound projects and not those that would rely entirely on subsidies to survive.

Table A5.1 | Overview of Public Finance Mechanisms to Mobilize Investment in Climate Change Mitigation

	Mechanism	Description	Barriers	Financial Markets	Sectors
Debt	**Credit Line for Senior Debt**	Credit line provided to CFIs for on-lending to projects or corporations in the form of senior debt	CFIs lack funds and have high interest rates	Underdeveloped financial markets where there is lack of liquidity, particularly for long term lending, and borrowing costs are high	Large-scale RE and EE; wholesale loans for energy access markets
	Credit Line for Subordinated Debt	Credit line to CFIs for on-lending to projects with subordinated repayment obligations	Debt-Equity gap, whereby project sponsors lack sufficient equity to secure senior debt	Lack of liquidity in both equity and debt markets	Medium and small-scale
	Guarantee	Shares project credit (i.e. loan) risks with CFIs	High credit risks, particularly perceived risks	Existence of guarantee institutions & experience with credit enhancements	Large-scale RE and EE and energy access markets
	Project Loan Facility	Debt providing by DFIs directly to projects	CFIs unable to address the sector	Strong political environment to enforce contracts and enabling laws for special purpose entity	Large and Medium scale EE and RE
Equity	**Private Equity Fund**	Equity investments in companies or projects	Lack of risk capital; restrictive debt-to-equity ratio	Highly developed capital markets to allow equity investors to exit from the investee	Large scale grid-connected RE; energy companies
	Venture Capital Fund	Equity investments in technology companies	Lack of risk capital for new technology development	Developed capital markets to allow eventual exits.	Any new technology
Carbon	**Carbon Finance**	Monetisation of future cash flows from the advanced sale of Carbon Credits to finance project investment costs	Lack of project development capital; lack of cash flow for additional security; uncertain delivery of carbon credits	Availability of underlying financing for projects. Adequate institutional capacity to host CDM/JI project and to enforce contracts.	Large-scale RE and EE; programme of activities such as in energy access markets
	Carbon Transactions in post-2012 credits	Contracting for the purchase of Carbon Credits to be delivered after 2012	Lack of regulatory framework and short-term compliance driven buyers.	Availability of underlying financing. Adequate institutional capacity to host CDM/JI project and to enforce contracts.	Any GHG emissions reduction project.
Innovative Grants*	**Project Development Grants**	Grants "loaned" without interest or repayment until projects are financially viable	Poorly capitalised developers; costly and time consuming development process	Can be needed in any financial market context	Any sector
	Loan softening programmes	Grants to help CFIs begin lending their own capital to end-users initially on concessional terms.	Lack of FI interest in lending to new sectors; limited knowledge of market demand.	Competitive local lending markets	Medium and small scale EE and RE
	Inducement Prizes	"Ex-ante prizes" to stimulate technology development. Unproven in climate sector.	High and risky technology development costs and spill-over effects	Sufficient financing availability to deploy winning technologies	Any technology sector

**Although all PFMs are concessional in some way, and therefore include some grant component, these grant based mechanisms do not include an underlying financing component, as this capital is expected to be mobilised commercially by the target CFIs.*

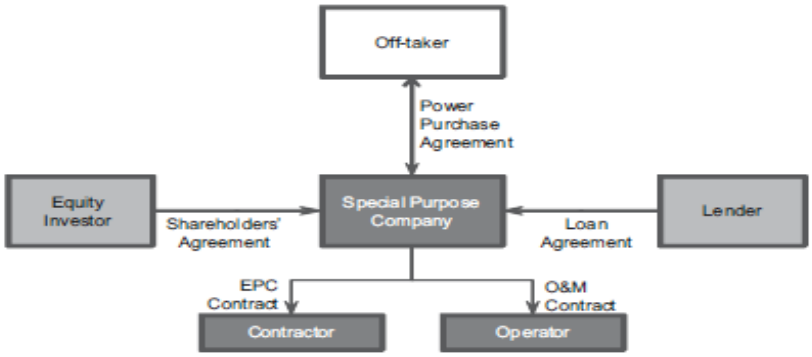
Source: Public Finance Mechanisms to Mobilize Investment in Climate Change Mitigation. UNEP, 2008

SPECIAL PURPOSE VEHICLES FOR PROJECT FINANCE

Box A5.1: Characteristics of Project Finance

Most privately developed greenfield infrastructure projects are financed on a project finance basis. Investors and lenders prefer this financing structure because project cash flows and returns can be isolated from those of other investments. Clarity on project cash flows allows investors to identify risks that affect these cash flows and the return on investment, and adopt strategies for managing these risks. Project cash flows are commonly isolated from the balance sheet of a project sponsor by creating an SPC whose only purpose is to build, finance, and operate the project. The company will use contracts with specialized firms to transfer and manage specific project risks. For instance, engineering, procurement, and construction (EPC) services will often be outsourced to an EPC contractor, while operations and maintenance (O&M) responsibilities are outsourced to an O&M contractor. Figure 3 presents a simplified illustration of the structure that could be used to project finance a power plant.

Figure 3: Project Finance for a Power Plant



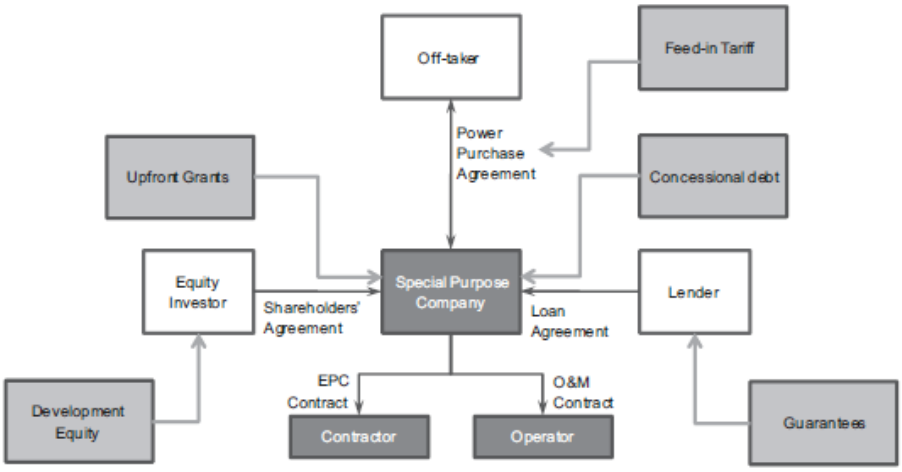
Source: Authors.

This structure gives equity investors and lenders a clearer understanding of the risks to which they are exposed, and the risk-adjusted return that they should expect from their investment. For example, by entering into a fixed-price EPC contract with a contractor, investors will transfer the risk of construction cost overruns to the EPC contractor, and could therefore reduce their return requirements—in relation to a structure in which the investors and lenders were directly exposed to this risk.

A key benefit of project finance is that it provides an effective structure to manage risks, and minimize the cost of risk and the overall cost of the project. However, this benefit comes at a cost. Creating an SPC and structuring and procuring contracts with specialized firms have significant transaction costs that are not scaled down if the size of the project is small. This means that smaller projects, with a capital investment of less than US$10 million, could find that project finance is not cost-benefit justified.

Source: World Bank Green Energy Report

Figure A5.1: Green Finance Interventions in a Project Finance Structure



Source: World Bank Green Energy Report

Table A5.2: Public Finance Mechanisms

PFMs	Description	Financial Barriers Addressed	Financial Market Characteristics	Applicable Market Segment	LP	Example
1. Credit line for Senior debt	Debt facilities provided to commercial FIs for on-lending, and usually on a full-recourse basis. Typically meets 50–80% of project cost. Can also be offered on limited or non-recourse basis depending on FIs willingness to take project risks.	(i) lack of funds among FIs; (ii) shortage of long-term funds; (iii) high interest rates.	Underdeveloped financial markets where there is lack of liquidity and borrowing costs are high.	(i) large scale and medium scale RE and EE (iii) wholesale loans for energy access markets	L to M	Thailand Energy Efficiency Revolving Fund; CORFO credit line programme
2. Credit line for Subordinated debt	Debt provided to CFIs for on-lending, in combination with senior debt to improve security for senior lender. Typically meets 10–25% of project cost. Can take other legal structures such as convertible debt or preferred shares.	(i) lack of available equity among project sponsors; and (ii) restrictive debt-to-equity ratio	Lack of liquidity in both equity and debt markets	(i) medium and small scale	M to H	E+Co CAREC Fund, FIDEME Fund
3. Guarantee	A risk management tool shares in the credit risk of project loans which commercial FIs make with their own resources. Typically covers 50–80% of outstanding loan.	(i) high credit risks, particularly perceived risks	Existence of guarantee institutions & experience with credit enhancements	(i) large- scale and grid-connected RE (ii) medium scale RE and EE (iii) energy access markets	M to H	IFC/GEF Hungary Energy Efficiency Co-Financing Programme
4. Project Loan Facility	Debt facilities organized by entities other than commercial FIs and providing direct financing to clean energy projects on a project finance basis. Can be combined with commercial financing or can be provided as credit lines to small CFIs for on-lending.	(i) lack of experience with clean energy project finance; (ii) unwillingness or inability to underwrite loans on a project finance basis; (iii) lack of long-term lending capacity.	Strong political environment to enforce contractual obligations and enabling laws for special purpose entity	(i) medium and small scale EE and RE	L to M	India Renewable Energy Development Agency; Bulgaria Energy Efficiency Fund
5. Soft Loan Programmes	Provide debt capital at concessional interest rates	(i) financing gap during project devlp stages	Lack of liquidity or interest in the target sectors	(i) medium and small scale EE and RE	L to M	Massachusetts' Sustainable Energy Economic Development Initiative
6. Equity Fund	Equity investments in clean energy companies and/or clean energy projects. Can be targeted at specific market segments, or full range.	(i) lack of long term capital; (ii) restrictive debt-to-equity ratio requirements	Highly developed capital markets to allow equity investors an exit from investees	(i) large scale grid-connected RE (ii) energy companies	M to H	(i) ADB Clean Energy Private Equity Investment funds (ii) FE Clean Energy Group
7. Venture Capital	Equity investments in technology companies.	Lack of risk capital for new technology development	Developed capital markets to allow eventual exits.	Any new technology	M to H	China Environment Fund, Carbon Trust VC Fund
8. Carbon Finance	Monetisation of future cash flows from the advanced sale of CERs which can be used to finance project investment costs or enhance project revenues. Can also be in the form of carbon delivery guarantee to minimize the risk of under-delivery of carbon credits.	(i) lack of early stage project development capital (ii) lack of cash flow to provide additional security to project lenders (iii) uncertainty in the delivery of carbon credits	Developing countries, or emerging markets	(i) large scale and grid-connected RE (ii) medium -scale RE and EE (iii) programme of activities such as in energy access markets	M to H	ADB Asia Pacific Carbon Fund
9. Project Development Grants	Grants that are "loaned" without interest or repayment until projects demonstrate financial viability.	(i) lack of sufficient capital during project development stage; (ii) costly development process	Developing countries, or emerging markets	(i) large-scale grid-connected RE considered high risk with lengthy project preparation cycle	M to H	Canadian Green Municipal Funds
10. Loan softening programmes	Grants to help CFIs begin lending their own capital to end-users initially on concessional terms.	Lack of FI interest in lending to new sectors; limited knowledge of market demand.	Competitive local lending markets	Medium and small scale EE and RE	M	MNRE/IREDA SWH interest subsidy programme, UNEP Indian Solar Loan Programme
11. Inducement Prizes	"Ex-ante prizes" to stimulate R&D or technology development. Still needs to be proven in the climate sectors.	High and risky technology development costs and spill-over effects	Sufficient financing availability to deploy winning technologies	Any technology sector	M to H	X Prize
12. Grants for Technical Assistance	Funds aimed at building the capacities of market actors. Technical assistance programmes include: (i)market research and marketing support; (ii) transaction structuring support and development of new financial products; (iii) staff training and business planning; (iv) establishment of technical standards and engineering due diligence, and (v) market aggregation programmes to build deal flow.	(i) lack of investment ready project (ii) lack of skills and knowledge among market actors	Developing countries, or emerging markets	(i) all segments in the supply side of the market (ii) demand side (iii) FIs	H	GEF, WB, ADB, UNEP, UNDP TA Programmes

**Notations: LP ~ Leverage potential, L ~ Low, M ~ Medium, H ~ High

Source: Public Finance Mechanisms to Mobilize Investment in Climate Change Mitigation. UNEP, 2008

IFC Risk Sharing Facilities

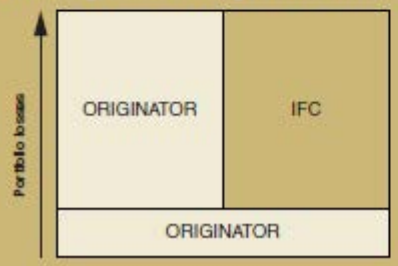
Box A5.2: Risk-Sharing Facility and First Loss Guarantees

An RSF is one of the structured and securitized products that IFC offers. It is a bilateral loss-sharing agreement between IFC and an originator of assets—a bank or a corporation—in which IFC reimburses the originator for a portion of the principal losses incurred in a portfolio of eligible assets. The RSF allows a bank or corporation and IFC to form a partnership with the goal of introducing a new business or expanding an originator's target market.

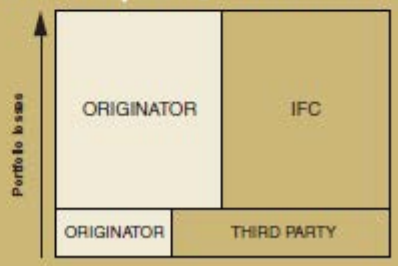
An IFC RSF typically reimburses an originator for a fixed percentage of incurred losses that exceed a predefined threshold (or first loss). The originator and IFC agree prior to signing the RSF on eligibility criteria that specify the assets to be covered under the RSF. All newly originated assets must be added to the facility portfolio during a ramp-up period that generally lasts two to three years, or until the portfolio reaches a predefined maximum volume. The originator monitors the portfolio performance and reports to IFC on a regular basis. Once the losses exceed the first loss threshold, IFC will reimburse the originator in accordance with the agreed risk-sharing formula.

Normally, an IFC RSF does not cover the first loss portion of the losses. However, IFC's role in structuring and sharing the credit risk of an asset portfolio may attract third-party sponsors. These sponsors often work together with IFC and potential originators to design RSFs intended to mobilize lending to sectors in which the sponsors are involved. The first loss guarantee by the third-party sponsors effectively covers the part of the losses that the originator should cover by itself.

RSF with Originator Covering First Loss Tranche

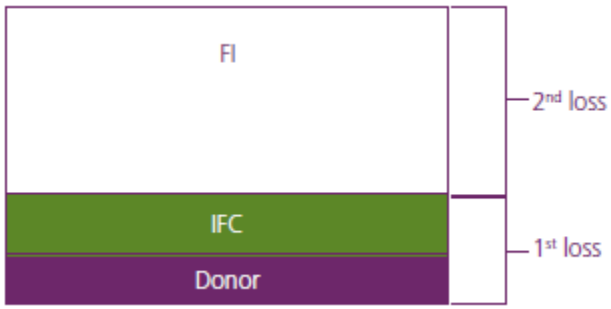
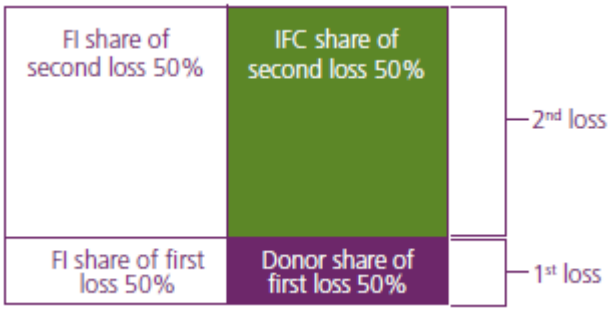


RSF with Third-Party Sharing In First Loss Tranche



Sources: IFC structured and securitized products, product description (www.ifc.org/structuredfinance).

Source: Energy Efficiency Finance: Assessing the Impact of IFC's China Utility-Based Energy Efficiency Finance Program. Independent Evaluation Group (IEG), World Bank, 2010.

Figure A5.2: Fully Subordinated First Loss Guarantee	Figure A5.3: Pari Passu Risk Sharing Facility
	
Source: IFC.	*Source: IFC.*

Each financial intermediary has to be convinced that providing these types of clean energy loans will become a profitable business line. This can be achieved with transactions of significant volume against fairly standardized

loan products, where the bank's credit officers are able to easily assess the credit risks and price loans accordingly. If the financial intermediary finds that the business would be smaller loan sizes, or a smaller volume of loans, then this business is likely to be attractive only to MFIs. Firstly, however, there needs to be enough customers that hold bank accounts and that are eligible to borrow. A financial intermediary would expect to be lending principally to its own client portfolio, which may be a limiting factor as to whether there is a business case. A financial intermediary would expect other potential borrowers to open an account with them and possibly move all their banking requirements to them. Of the IFIs, IFC has experience dating back to 1997, when (with GEF grants) it experimented with a range of options in its first program in Hungary. The program offered a first loss, partial loan guarantee for individual transactions focused on energy efficiency. Since then, IFC has expanded its range of investment in financial intermediaries to include portfolio risk sharing facilities, credit lines, and funded mezzanine finance facilities. These are usually backed with donor funds to cover a portion of first loss risk. IFC also provides loans to project sponsors, as well as making direct equity investments in large-scale renewable energy projects, particularly wind energy. For example, IFC has been working with Sogebank, a leading bank in Haiti bank to help it develop an SME lending program. The bank relied almost exclusively on asset-backed credits, putting many SMEs at a disadvantage after the earthquake disaster since they did not have the required collateral or their property rights were not sufficiently documented.

Even if the participating bank had a 100 percent credit guarantee provided by the risk sharing facility, then this should not and generally would not result in loans being offered to poor quality borrowers. Reputable financial intermediaries would be unlikely to take on the potential for an increased number of non-performing loans, with potentially adverse consequences for their reputation; share price and ability to borrow on the capital markets; and increased regulatory scrutiny. Borrower collateral may also still be a constraint.

Lessons from Past IFC Operations

- Pairing of investment and technical assistance has been the key feature in energy efficiency interventions. IFC found that the guarantee alone did not provide an adequate incentive to make banks offer energy efficiency loans (Obibuaku 2007). The financial package needed to have complementary advisory services, which often enabled the bank to assess the risks associated with the underlying loan products. In some eastern European cases, the assistance for capacity building of marketing agents, such as an energy service company, might have been needed to generate sufficient deal flows for the banks to start lending for energy efficiency investment.
- Fit with financial institutions' strategic orientation is an important dimension that IFC needs to consider when designing and marketing its energy efficiency programs. Some banks found that the design of the programs fit well with their corporate strategic orientation. For example, one bank wanted to expand SME lending activities and found that the IFC's energy efficiency program, including guarantee and technical assistance, met its needs. For other banks, the focus of the programs did not have an obvious fit with their strategic orientation. Uptake varied significantly among banks, depending on strategic fit.
- The introduction of government actions, regulatory reforms, and provision of subsidies to certain activities actively shapes the energy efficiency (and renewable energy) markets and drives banks' behavior. In Hungary, regulatory changes and promotion of energy efficiency in the housing sector created a big push for banks to market to this particular segment. In the Czech Republic, regulatory change and a European Union subsidy on renewable energy was an important boost for investment and helped the Commercializing Energy Efficiency Finance Program increase the renewable section of its portfolio. However, energy

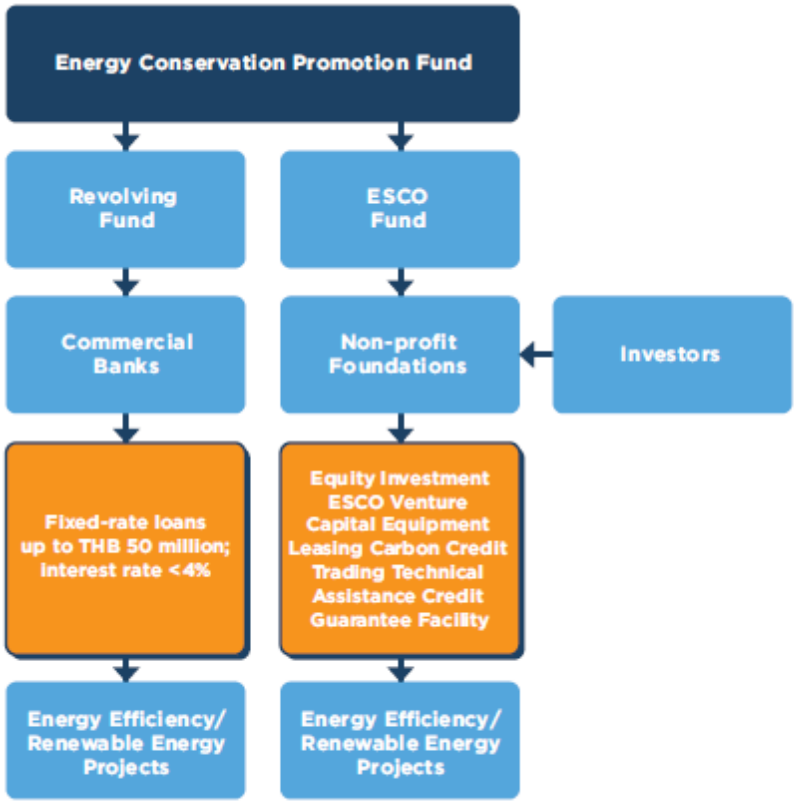
efficiency is an area where Russian public institutions are doing very little, and energy policy (including energy subsidy) does not provide strong support or incentives for energy efficiency investment. The Russia Sustainable Energy Finance Project survey on energy efficiency in the Russian Federation revealed that 81 percent of companies believe that current legislation does not promote energy efficiency.

- Sustainability depends on banks changing their culture and strategic orientation. In the Hungary Energy Efficiency Co-Financing Program and the Commercializing Energy Efficiency Finance Program, there are indications that client banks were taking the energy efficiency projects on their own and requesting lower levels of collateral and lower down payments as they became increasingly familiar with the risk of such projects (Taylor et al. 2008, p. 175). In Russia, some participants have started to finance energy efficiency projects using their own funds. However, as programs in Eastern Europe are winding down, and in light of heightened risks in the aftermath of the recent global financial crisis, some participating banks are returning to old practices, which rely heavily on collateral.
- The lessons from other programs indicate that energy efficiency finance schemes need financial incentives that match bank needs and technical assistance that targets certain market failures (technical skills, regulatory); and they need the right context (policy and market readiness). Programs may have to adjust their operations in the face of market development. Investment results have been promising (there have been no calls on guarantees so far), and IFC itself should become comfortable taking more risks with this type of investment. At the same time, emphasis needs to be maintained on cost recovery of advisory services, as such programs involve heavy staff and technical inputs (technical reviews, market studies, and administrative costs).

ANNEX 6: THAILAND CASE STUDY

THAILAND ENERGY EFFICIENCY REVOLVING FUND

Figure A6.1: Overview of the Revolving Fund and ESCO fund

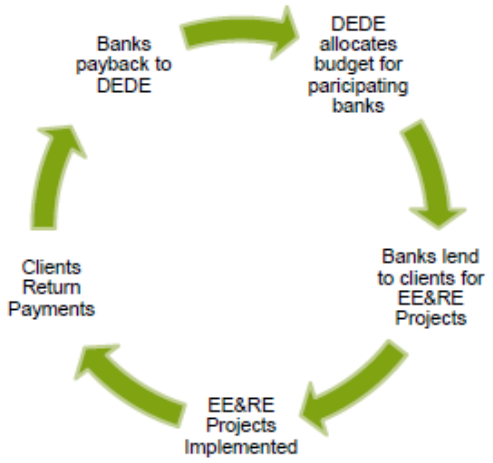


Source: Adapted from Asia-Pacific Economic Cooperation (2011). Peer Review on Energy Efficiency in Thailand: Final Report. http://www.ieej.or.jp/aperc/PREE/PREE_Thailand.pdf

"The Energy Efficiency Revolving Fund was launched in 2003 and provided a line of credit to local banks, which were then able to provide low-interest loans to developers for energy efficiency and renewable energy projects. Local banks were eligible to receive credit lines from the Revolving Fund in the range of USD 2.5 million to USD 10 million to finance energy efficiency and renewable energy projects. During the pilot phase, the Revolving Fund provided local banks with zero percent interest to spur projects. As the financing volume grew, the interest rate was subsequently set at 0.5 percent to cover administrative costs. Local banks were obligated to repay to the Revolving Fund within 10 years. With access to the Revolving Fund, local banks were able to provide low-interest rate loans which covered up to 100 percent of project costs, with a maximum of THB 50 million (approximately USD 1.6 million) per project. Project developers and ESCOs were eligible for a fixed interest rate loan of zero percent to 4 percent (compared to the market rate of 9 percent), for up to a seven-year period. The local banks were responsible for evaluating loan applications, based on the balance sheets, future cash flows, and savings from the projects. The banks also required land, building(s), or equipment owned by the applicants to serve as collateral for loans. Furthermore, project proponents were required to submit feasibility studies when applying for loans. These requirements lowered the risk that applicants might default on their loans, and because of that, very few applications were rejected. The total budgeted size of the Revolving Fund was

approximately USD 235 million over five funding phases. Funding was available for energy efficiency projects and some types of renewable energy projects, with eligible investments including: equipment and installation costs; consultation costs; civil works, piping, or necessary components; and other associated costs such as removal of existing equipment, transportation, and taxes. The participating banks managed the loans and reported to the government authority, the Ministry of Energy's Department of Alternative Energy Development and Efficiency, which ensured that all projects achieved real energy savings, monitored the banks' performance and measured the program's energy savings. This approach minimized government involvement in the financing process and helped to leverage bank finance. The cost to the government was the time value of money associated with providing zero or low-interest loans to the commercial banks, and participating banks, not the government, carried the risk of participants defaulting on their loans. **With the success of the program in building the banks' understanding and capacity to finance energy efficiency and renewable energy, in 2011, Thailand began to phase out the Revolving Fund**. *Recent lending data from the banks suggests that they have become sufficiently familiar with lending practices and are able to provide financing without government support*" (Revolving and ESCO Funds for Energy Efficiency and Renewable Energy Finance, Thailand, CCAP, Washington DC).

Figure A6.2: General Design of the Energy Efficiency Revolving Fund



Source: Chaiyawat, Chirawut (2011).

Source: National Climate Finance Institutions Support Programme Case Study: the Thai Energy Efficiency Revolving Fund, Frankfurt School of Finance & Management, GmbH 2012.

"The general flow of the Energy Efficiency Revolving Fund consists of the DEDE [Department of Alternative Energy Development and Efficiency] allocating a budget to the PBs [participating banks] with the PBs use for on-lending to clients for implementing energy efficiency and renewable energy projects. Once mature, the interest earned on these investments flows back to the PB which is used to pay back the DEDE for its original budget allocation. The interest amount for the energy efficiency and renewable energy projects is calculated to be sufficient to cover potential defaults and administrative costs. In this way, the fund is carefully designed and monitored to keep portfolio and write-offs at an acceptable level. The EERF [Energy Efficiency Revolving Fund] provides credit lines in the ranges of $2.5 to $10 million to each PB in order to finance energy efficiency projects" (GmbH 2012).

Table A6.1: International Finance Corporation Experience, 1997-2010

Table 1: Evolution of IFC's Sustainable Energy Finance Investments Supported with Concessional Funding (1997–2010)[a]

Year	Program	Country	Number of FIs	Investment Instrument	Concessional Finance Support	Source of Concessional Funds	Advisory Services	Targeted Sectors
1997	HEECP	Hungary	3[b]	First Loss Partial Guarantees for individual loans up to 50% of principal. Subordinated recovery	Guarantee fully funded by concessional funds	GEF	✓	Energy efficiency: blockhouse renovation among others
2001	HEECP2	Hungary	6	First Loss Partial Guarantees for individual loans up to 50% of principal. Subordinated recovery	First loss coverage	GEF	✓	Energy efficiency: street lighting, heating, blockhouse renovation, co-generation
2002	CEEF	Czech Republic, Slovakia, Latvia, Lithuania, Hungary	10	Individual loans pari-passu guarantees Portfolio pari-passu guarantees with 100% first loss tranche. Delegation of loan approval to FIs	First loss coverage	GEF	✓	Energy efficiency: street lighting, heating, blockhouse renovation, co-generation Small scale renewable energy
2006	OTP-School EE	Hungary	1	Portfolio pari-passu guarantees with 100% first loss tranche	First loss coverage	GEF (from CEEF)	✓	Energy efficiency: school renovations
2006	BBVA Peru	Peru	1	Credit Line	Concessional funded tranche with performance bonus feature	GEF	✓	Energy efficiency Small scale renewable energy
2006	CHUEE	China	2	Portfolio pari-passu guarantees with extended first loss (75%) 10% first loss tranche	First loss coverage	GEF	✓	Energy efficiency
2008	CHUEE2	China	2	Portfolio pari-passu guarantees First loss tranche reduced to 5%	First loss coverage	GEF	✓	Energy efficiency Small scale renewable energy
2009	RE-Mezz	Czech Republic, Bosnia, Lithuania	1	Funded mezzanine finance facility	First loss coverage	GEF	Limited[c]	Small scale renewable energy
2009	PADGO	Sri Lanka	2	Portfolio pari-passu guarantees	First loss coverage	GEF	✓	Small scale renewable energy
2009	PSEF	Philippines	2	Portfolio pari-passu guarantees RSF fees based on net spread sharing	First loss coverage	GEF	✓	Energy efficiency Small scale renewable energy
2010	Vietnam SEF	Vietnam	1	Credit Line	Concessional funded tranche with performance bonus feature	GEF	✓	Energy efficiency Small scale renewable energy
2010	Turkey SEF	Turkey	2	Credit Line	Concessional funded tranche with concessional pricing and extended tenor	CTF	✓	Energy efficiency Small scale renewable energy
2010	SEF CS	Czech Republic	1	Portfolio pari-passu guarantees FI exposed to 100% of a 5% first loss tranche	No	NA		Small scale renewable energy

[a] Separately IFC launched a program in Russia in 2005 that offered to provide financial intermediaries (FIs) with sustainable energy credit lines (without donor support). The participating FIs asked for the advisory support and long-term funding by IFC on market terms. The Russia program is not included in this report.
[b] Only one FI used the guarantees.
[c] To cover independent engineer costs.

Source: IFC, January 2012

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