

Document of
International Finance Corporation

PORTFOLIO APPROACH TO DISTRIBUTED GENERATION
OPPORTUNITIES (PADGO) PROJECT

SRI LANKA

GEF
PROJECT DOCUMENT

January 23, 2008

SUSTAINABLE ENERGY
ENVIRONMENT AND SOCIAL DEVELOPMENT DEPARTMENT

ABBREVIATIONS AND ACRONYMS

CC	Climate Change
CEB	Ceylon Electricity Board
CGF	Global Financial Markets Department (IFC)
CHP	Combined Heat and Power
CO ²	Carbon Dioxide
DG	Distributed Generation
DSM	Demand Side Management
ECF	Energy Conservation Fund
ESD	Energy Service Delivery project
FI	Financial Institution
GEF	Global Environment Facility
GHG	Green House Gas
GoSL	Government of Sri Lanka
GWh	Giga (1,000,000,000) Watt Hour
IDA	International Development Association
IFC	International Finance Corporation
IPP	Independent Power Producer
KWh	Kilo (1,000) Watt Hour
MPE	Ministry of Power and Energy
MW	Mega (1,000,000) Watt
MWh	Mega (1,000,000) Watt Hour
NCRE	Non-Conventional Renewable Energy
OEM	Original Equipment Manufacturer
O&M	Operation and Maintenance
OP	Operational Program
PADGO	Portfolio Approach to Distributed Generation Opportunities
PPA	Power Purchase Agreement
PUC	Public Utilities Commission of Sri Lanka
RERED	Renewable Energy for Rural Economic Development
RFP	Request For Proposal
RPF	Risk Participation Facility
SEA	Sustainable Energy Authority
SPP	Small Power Producer
TA	Technical Assistance
T&D	Transmission and Distribution
TYDF	Ten Year Horizon Development Framework
UNFCCC	United Nations Framework Convention on Climate Change
WB	The World Bank

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SRI LANKA
PORTFOLIO APPROACH TO DISTRIBUTED GENERATION OPPORTUNITIES
(PADGO)

CONTENTS

	Page
A. PROJECT DEVELOPMENT OBJECTIVES	5
1. Project Summary.....	5
2. Project and GEF Policy Objectives.....	7
3. Key Performance Indicators.....	8
B. STRATEGIC CONTEXT	9
1. Country and Sector Issues.....	9
2. Major Related Projects – RERED Project	15
3. Fit with IFC/ World Bank Group Strategies	16
C. PROJECT DESCRIPTION SUMMARY.....	17
1. Project Components	17
2. Partnership and Co-Financing Arrangements	21
3. Financing Plan.....	22
4. Implementation Arrangements.....	23
D. PROJECT ANALYSIS AND RATIONALE	24
1. Economic and Financial Rationale	24
2. Fiduciary	25
3. Safeguard Policy.....	25
4. Incremental Cost and Greenhouse Gas Reduction	25
5. Cost Effectiveness.....	27
6. Sustainability and Replicability	27
7. Exit Strategy for GEF	29
8. Potential Risk and Mitigation.....	30
9. Monitoring and Evaluation of Outcomes/Results	31

LIST OF TABLES

Table 1: Major Indicators.....	8
Table 2: Generation Capacity and Demand.....	9
Table 3: Demand Growth and Data Projection.....	10
Table 4: Percentage of Generation Capacity per Fuel Type – Ten Year Development Framework.....	11
Table 5: 2007 Tariffs for Non-Conventional Renewable Energy Source.....	12
Table 6: Project Cost and Financing Plan.....	22
Table 7: Implementation Arrangement.....	24
Table 8: Expected Investments Under PADGO Project.....	26
Table 9: Avoided Emissions and GEF Leverage.....	27

LIST OF FIGURES

Figure 1: Diagram of PADGO Concept.....	7
Figure 2: Sector Structure for Non-Conventional Renewable Energy.....	13
Figure 3: Sample Risk Participation Facility Structure.....	17

LIST OF ANNEXES

Annex 1: Country and Sector Background	32
Annex 2: Major Related Projects Financed by the Bank and/or other Agencies.....	41
Annex 3: Detailed Project Description.....	43
Annex 4: Estimated Project Costs.....	51
Annex 5: Implementation Arrangements.....	52
Annex 6: Monitoring and Evaluation/Logical Framework.....	56
Annex 7: Project Appraisal and Rationale.....	59
Annex 8: Incremental Cost/Greenhouse Gas Reduction Analysis.....	62
Annex 9: Responses to STAP Report/Comments.....	66
Annex 10: Support Letters.....	90

A. PROJECT DEVELOPMENT OBJECTIVES

1. Project Summary

Background:

The traditional mainstream power sector model pursues economies of scale, based on large central generation facilities accompanied by a developed transmission and distribution (T&D) network. This requires large investment capital and strong institutional capacity and support which is not always available in a developing country context. The lack of access to reliable energy has impeded economic development in rural and peri-urban areas where there is no grid, but also in urban areas where such infrastructure, while existing, is quite unreliable.

Distributed Generation (DG), the smaller-scale production of electricity at or near the energy demand, has emerged as an attractive alternative in addressing energy access issues. The promotion of advanced distributed energy technologies can help to improve and increase energy access for underserved populations while limiting environmental degradation. In addition to addressing the issue of access, DG has the potential to improve reliability of energy supply, improve efficiency of electricity supply, lower pollution through utilization of efficient and/or renewable energy, and increase supply security by diversifying the supply source. This will also allow investors to approach investments in the energy sector in a modular fashion. Instead of large bulk capital investment required under the traditional electricity network model, the modular approach to investment will lower the hurdle for new entrants to the electricity market. The Portfolio Approach to Distributed Generation Opportunities (PADGO) approach identifies and addresses barriers to the penetration of clean DG projects.

The barriers identified are as stated below:

- a) Regulatory Framework – regulations in the power sector are designed around the large central generation model, and these may not be amenable to DG. The exceptions made are for renewable energy resources, especially where the idea may be to promote an expanding mini-grid model. For greater propagation of DG regulatory regimes need to provide a more level playing field for a portfolio of clean DG technologies;
- b) Technology – many promising DG technologies exist today, while new ones are constantly moving from research to prototype and then the commercial space. However, developer/operators may not have enough familiarity with the technology to make the choice of technology, or quality service providers along the value chain (e.g. Operation & Maintenance (O&M) providers) may not exist. More effort is needed in developing these resources;
- c) Contracts and Agreements – consumers that would benefit from DG, such as industrial consumers suffering the consequences of unreliable power, or peri-urban and rural populations who are not even grid connected, may lack the knowledge about required contracts such as power purchase agreement (PPA), O&M Contracts and Long-Term Servicing contracts;
- d) Financing – as the business model is not understood by most financial institutions, the perceived risk in financing such models would be higher than what it actually is. In addition, the project financing model, very apt for large central generation units, is too expensive and cumbersome when the project size is much smaller. The size of the capital requirements also limits the Financial Institutions (FI) that could provide these funds to be limited to large, multi-national banks.

Project Concept:

The PADGO project has been designed and incorporating lessons learned from earlier technology-driven projects undertaken by IFC using GEF and other donor funds over a decade. The project, therefore, is designed to be a flexible framework that allows for adaptation to the local energy needs, available energy resources and various operating constraints.

The technologies used will not be static, but diverse and flexible in order to cater to needs of the customer segments that it would serve. A range of smaller capacity energy generation technologies will be considered based on efficiency, modularity and reliability, and match them to the customer segments and their performance requirements. Locally available renewable fuels such as biomass, solar energy, and wind-power with low operating and maintenance costs, or fossil generation but at higher efficiency levels (such as CHP applications) are examples of technologies under consideration.

A replicable model of transaction will be provided to lower transaction cost for all stakeholders. We will also structure replicable methods for financing these technologies, since project finance leads to disproportionate transaction costs when applied to smaller projects. Smaller unit sizes may be financed through local or regional capital markets. This will be supported through financial product to be provided by IFC to local financial institutions as needed.

There are basic components of PADGO which work as a framework to support proliferation and replication of the DG business model (see Figure 1):

Performance Standards – To ensure that the technology used under this framework addresses environmental concerns as well as access to energy, voluntary “Performance Standards” will be established as guide to available technologies and assessment of their appropriateness. The standards will not only require compliance with IFC’s environment performance standards, but standards in energy efficiency and operational performance. The standard will ensure that the technologies which promote clean and efficient energy will be facilitated under this framework. It would also provide a tool to improve the emission performance of investments in the portfolio over time.

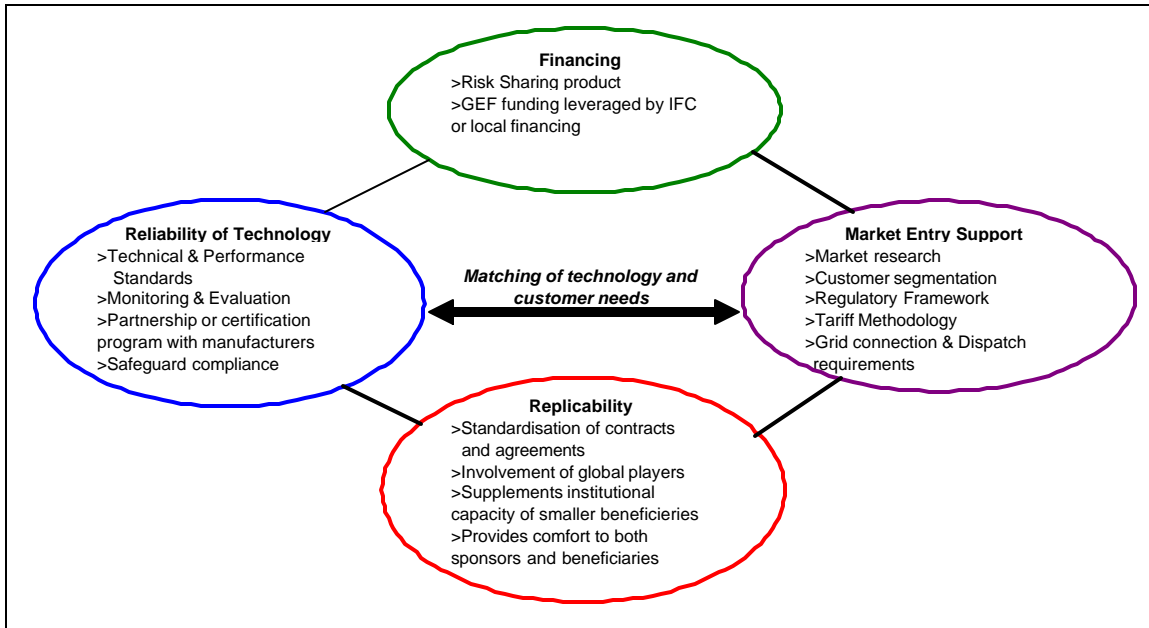
Standard Contract and Agreement – The power purchasing agreement, concession (TOR or management) contracts and other agreements will be standardized to provide comfort to operators/ business developers, as well as to ensure quality of service to the consumers. The standardization will also allow for easier replication in other markets/regions.

Market Entry Support – Using donor funds, IFC will supervise/ implement research to facilitate entry to each market. The objective of the study will be to ensure that impediments to DG either do not exist, or are more likely mitigated. The study will include a) Consumer segmentation and affordability, b) Regulatory framework and tariff methodology, c) Technical specification to grid connection and dispatchability.

Financial Support – In addition to sector and technical knowledge provided by above TA activities, support through financial products will be provided to the local Financial Institution (FI) to i) increase their lending capacity where there is a constraint, ii) lower the “perceived risk” while increasing the capacity to assess the “real risk” of lending to DG projects. The financial products under consideration in Sri Lanka pilot project is Risk Participation Facility where IFC will take 50% (or any % agreed upon with the participating FIs) of credit risk of loan portfolio in the DG sector. Other financial

products that may be applicable in other markets are credit line, quasi-equity line, stand-by credit line, etc.

Figure 1: Diagram of PADGO Concept



Sri Lanka Pilot Project:

Sri Lanka was chosen as the country to develop the first pilot project, after careful consideration. The country has been developing renewable energy through the World Bank’s Renewable Energy for Rural Economic Development (RERED) and Energy Sector Development (ESD) initiatives and the electricity grid coverage ratio of 60% represented significant need. The project will continue market development that RERED project initiated. The good understanding and working relationship with the government in the Renewable Energy sector that was fostered during RERED will be utilized to promote the DG concept.

2. Project and GEF Policy Objectives

Project Objectives:

The project’s objective is to reduce CO₂ emissions through displacing central fossil fuel based generation and to improve access to cleaner and more reliable source of energy for underserved population thus removing the impediment for further economic growth. PADGO provides a framework under which the various parties (manufacturers, developers, operating companies, banks, rural communities, beneficiary companies, etc.) are provided tools to lower transaction cost such as template agreements and contracts, performance standard for equipments, and financing opportunities to encourage entry into the market while maintaining quality of service provided. The framework is designed to be flexible to address the various local constraints and available energy resources to allow for replication in other countries/regions. The objective of the TA assignment will be to develop the components (legal agreement templates and technology performance standards) of the framework and to develop the markets and sub-projects to be implemented under the PADGO project.

The first phase of this initiative will focus on Sri Lanka, and will have three specific goals:

- (1) Releasing lending capacity at local banks for financing < 10 MW type mini-hydro and other DG technologies through the establishment of a replicable framework, and a risk sharing product,
- (2) Introducing new fossil and biomass based DG generation technologies and new private sector players (Original Equipment Manufacturers (OEMs), entrepreneurs etc.) to Sri Lanka through one or more clean energy pilot projects, and
- (3) Taking the first steps towards a portfolio approach to promoting a diverse mix of clean DG generation technologies.

The framework and the implementation experience gained in Sri Lanka are meant to inform a second phase of the initiative wherein the framework will be used for scaling-up sustainable lending for DG generation in Sri Lanka. This approach will be expanded in the second phase to include other countries in the region as potential sources of capital or additional transactions undertaken using the same framework approach. With sufficient experience in structuring, and with sufficient payment history, a diversified portfolio amenable to securitization can be developed.

GEF Policy Objectives:

The Program is being submitted under GEF Operational Program (OP) 5: Removal of Barriers to Energy Efficiency and Energy Conservation, and OP6: Promoting the Adoption of Renewable Energy by Removal of Barriers. The expected outputs are closely linked to two strategic priorities for the climate change (CC) focal area. The approach is consistent with the following GEF strategic priorities: CC-1 Market Transformation for High Volume Products and Processes and CC-2 Increased Access to Local Sources of Financing for Renewable Energy and Energy Efficiency.

3. Key Performance Indicators (Annex 3 & 6)

The key indicators are outlined in the Logical Framework on Annex 6. Some of the major indicators are as follows:

Table 1: Major Indicators

Components/Tasks	Major Indicators
Project Objectives	
Overall	Tons of GHG reductions attributable to projects financed under the project
Component 1	
Risk Participation Facility	\$ amount of loan assets that the risk sharing product is covering
Component 3	
Capacity Building	# of loans made to new DG projects
Knowledge Management	# of companies and entities that received information on DG

B. STRATEGIC CONTEXT

1. Country and Sector Issues (Annex 1)

Country Economic Overview:

Services contribute nearly 55% of the GDP and the sector employs 21% of the 7.5 million-strong labor force. The industrial sector comprises 28% of GDP, with manufacturing in areas such as apparel, leather, chemical, petroleum, plastic and rubber forming 70% of industrial production. Exports of textiles and ready made garments constitute nearly 50% of Sri Lanka's export revenues (followed by tea at 13%) and provide most of the employment in the industrial sector. The key to Sri Lanka's export performance has been its relatively low wage rate, skilled labour and incentives provided by the Government of Sri Lanka. The United States of America is the leading export destination (over 32%), with the United Kingdom at second place (around 14%).

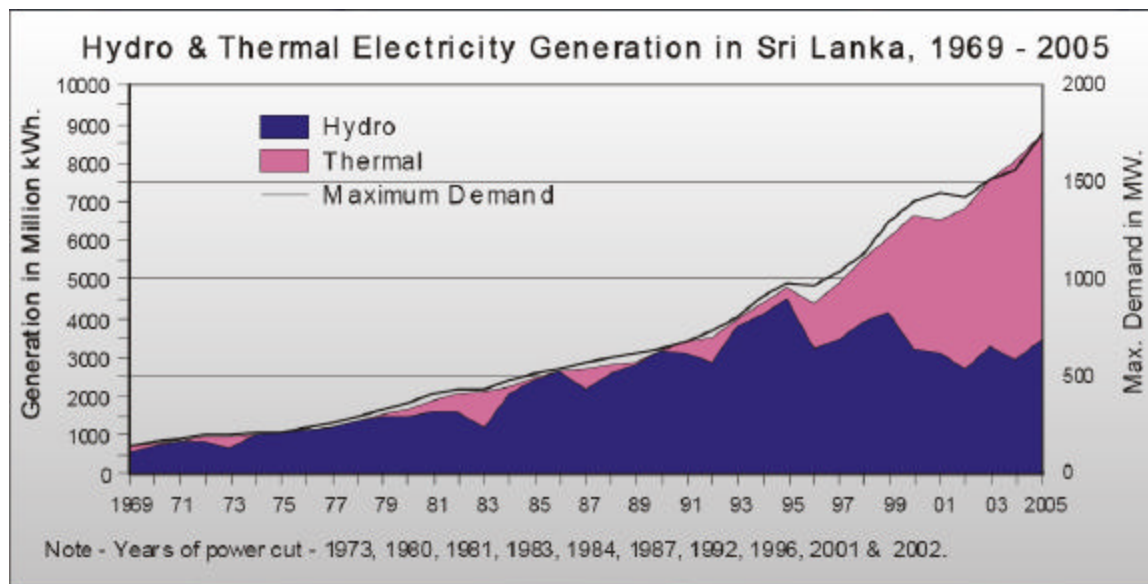
Country Eligibility:

The Democratic Socialist Republic of Sri Lanka ratified UN Framework Convention of Climate Change ('UNFCCC') on May 26, 1994.

Power Sector Overview:

Sri Lanka has a population of 19.9 million with a per capita Gross Domestic Product of US\$1,355 in 2006. Last year, the per capita electricity consumption was 394 kWh and 78.1% of the 4.6 million households had access to electricity¹. The country's total electricity consumption increased by 7.6% to 8,884 GWh in 2006. 51% of the country's demand was met with thermal power and 49% with hydropower. Hydropower generation increased by 34% in 2006 due to favorable weather conditions. Hydropower accounts for 53% of the total installed capacity of the country. (see Table 2)¹

Table 2: Generation Capacity and Demand

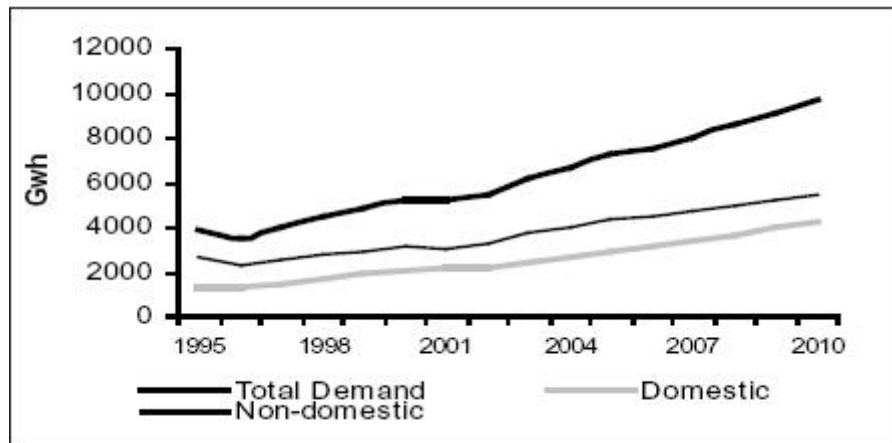


Source: CEB, Statistical Digest 2005

¹ "Market Assessment of Distributed Generation potential in Sri Lanka", DFCC consulting

The demand for electricity has been growing at a steady pace. The sales and number of customers for electricity has been increasing an annual average of 6% and 8% respectively during the last decade. Accordingly, the average annual additional electricity generation requirement would increase from 600GWh in 2006 to 700GWh in 2010, as the demand is expected to continue growing at a steady pace of 7 – 10% average per annum.

Table 3: Demand Growth Data and Projection



Source: Central Bank of Sri Lanka, “News Survey” No.27, Jan. - Mar 2007

Regulatory Framework:

The regulatory framework of Sri Lanka’s power sector comprises of 4 entities. The National Energy Policy and Strategies (NEPS) drafted in 2006 define the institutional responsibilities of these four entities:

- *The Ministry of Power and Energy (MPE)*

The ministry is responsible for the country’s energy sector. As such, MPE formulates national policies and strategies and oversees their effective and timely implementation.

- *The Public Utilities Commission of Sri Lanka (PUC)*

Established under the Public Utilities Commission of Sri Lanka Act No. 35 of 2002, it regulates certain utilities industries pursuant to a coherent national policy. PUC are empowered to execute regulation as individual industry legislations are enacted and made effective.

- *The Energy Conservation Fund (ECF) – Sustainable Energy Authority (SEA)*

Established under the Energy Conservation Fund Act, No.2 of 1985 to finance, promote and initiate activities and projects relating to efficiency, conservation and demand-side management of energy. ECF also investigates and encourages alternative sources of new and renewable energy. Legislation has been presented to the parliament on May 22, 2007 to reconstitute the ECF as the *Sustainable Energy Authority (SEA)* with a broader mandate to analyze, develop and recommend policies while sourcing and managing funds to achieve stated objectives. The new SEA is also designated to operate as ‘balancing mechanism’ between the CEB and SPPs operating under the technology tariff regime, the details of which will be provided later.

o *Ceylon Electricity Board (CEB)*

CEB is a single, vertically integrated, state-owned electric utility, which is responsible for the planning, generation (public sector), transmission, distribution and sale of power in the country. CEB generates electricity from medium and large-scale hydro power and thermal plants. CEB also purchases thermal power from eight Independent Power Producers (IPPs) and non-conventional renewable energy based electricity from over fifty Small Power Producers (SPPs). CEB sales account for 88% of the total distribution while Lanka Electricity Company (LECO) services the balance consumers. LECO is a fully owned subsidiary of CEB.²

Government Policy – Power Sector Development:

A “Ten Year Horizon Development Framework from 2006 to 2016” (TYDF) proposed by the Government of Sri Lanka (GoSL) in November 2006 details the key issues and proposes strategies and targets to be achieved by 2016 to develop the energy sector.

Access to energy is one of the key issues that are being addressed in this report. Though the Central Bank Annual Report for 2006 states that 78.1% of the households in the country have been electrified by the year end, TYDF estimates that 75% of the households have been connected to the national grid, while 3% are served by off-grid facilities. By 2016, the TYDF strategy is to ensure access to 95% of the households by investing in grid extensions and establishing off-grid energy services. By 2016, 85% of the households are targeted to be connected to the national grid and another 10% will benefit from off-grid electricity solutions.³

Another issue addressed in the TYDF is the issue of energy security and fuel diversity; in this context, the study sets strategy for increase in generation capacity through Coal and Non-conventional Renewable Energy (NCRE) sources. The strategy proposed by TYDF imposes a moratorium on oil-burning power plants until non-oil resources provide 90% of the grid supply. The development of coal power plants and the remaining large and medium scale hydropower potential has been prioritized. The public sector will invest on major hydro-electric projects and the pioneering thermal plants. The private sector will be invited to develop subsequent coal-fired power projects and identified medium-scale hydropower plants. (see Table 4)⁴ The plan is ambitious; this translates to about net addition to generation capacity of 3,900 MW worth of Coal and 500MW worth of NCRE by 2016, while lowering power generation from oil substantially.⁵

Table 4: Percentage of Generation Capacity per Fuel Type – Ten Year Development Framework

	Hydro	Oil	Coal	NCRE*
Present - 2006	37.7%	58.2%	0.0%	4.1%
Interim - 2011	21.4%	3.3%	65.2%	10.0%
Target - 2016	19.9%	2.2%	67.3%	10.7%

* NCRE - Non-Conventional Renewable Energy

Source: Market assessment of Distributed Generation in Sri Lanka, DFCC Consulting

² “Market Assessment of Distributed Generation potential in Sri Lanka”, DFCC consulting

³ Ibid.

⁴ Ibid.

⁵ Assuming that the total generation capacity will need to increase from 2429MW to 5900MW (“Incorporating Social and Environmental Concerns in Long-term Electricity generation Expansion Planning in Sri Lanka”, Energy Forum, 2006)

To achieve this goal, work on Norochcholai Coal Power Plant started on May 11, 2006. The coal power plant is being constructed in Puttalam, at the southern end of Kalpitiya peninsula. It will be constructed in three stages, with a capacity of 300MW per plant per year, making a total capacity of 900MW by 2010. The project cost for the first phase is US\$455 million, to be built under Design, Build and Transfer basis by the China National Machinery and Equipment Import and Export Corporation (CMEC). Out of the project cost, US\$300 million is to be financed as concessional loan from Chinese government and US\$155 million as supplier's credit from Export-Import Bank of China. High quality low Sulphur containing coal is due to be supplied from Australia, South Africa and Indonesia.⁶ The coal plant is expected to contribute greatly to the energy security issue, but controversial as opponents of the project claim serious environmental concerns.

Other future expansion plans include a) Upper-Kothmale Hydro Plant (150 MW) by 2010 and b) Kelawarapitiya Combined Cycle Diesel Plant (300 MW) by 2008.

New Policy on Non-Conventional Renewable Energy (NCRE) Source:

The new policy mechanisms are being prepared by the government focuses on encouraging expansion of generation capacities on NCRE technologies other than mini-hydro:

- *Technology Based Tariff* – To incentivize the private sector investments and financing of NCRE technology projects other than mini-hydro, tariffs per each technology to be promoted will be set to ensure minimum profitability according to their individual cost structures. The tariff is expected to have maturity of 15 – 30 years according to technology. It is also expected to have tiered structure, with elevated tariff level for the first 7 – 10 years to assist in debt repayment, lowered flat level tariff for rest of the period. The technologies in this regime are Mini-Hydro, Biomass, Wind, Waste-to-Energy, Waste Heat Recovery.

2007 tariff for mini-hydro, biomass and wind has now been announced in July 2007. The tariffs for other technologies are to be announced later;

Table 5: 2007 Tariffs for Non-Conventional Renewable Energy Source

<i>US\$/KWh*</i>	O&M	Fuel (Biomass)	Fixed Rate (1-6yr)	Fixed Rate (7-15 yrs)	Total Tariff (1-6yrs)	Total Tariff (7-15yrs)
Mini-Hydro	0.009	NA	0.07	0.03	0.08	0.04
Wind	0.015	NA	0.13	0.05	0.15	0.06
Biomass	0.008	0.05	0.05	0.02	0.10	0.07

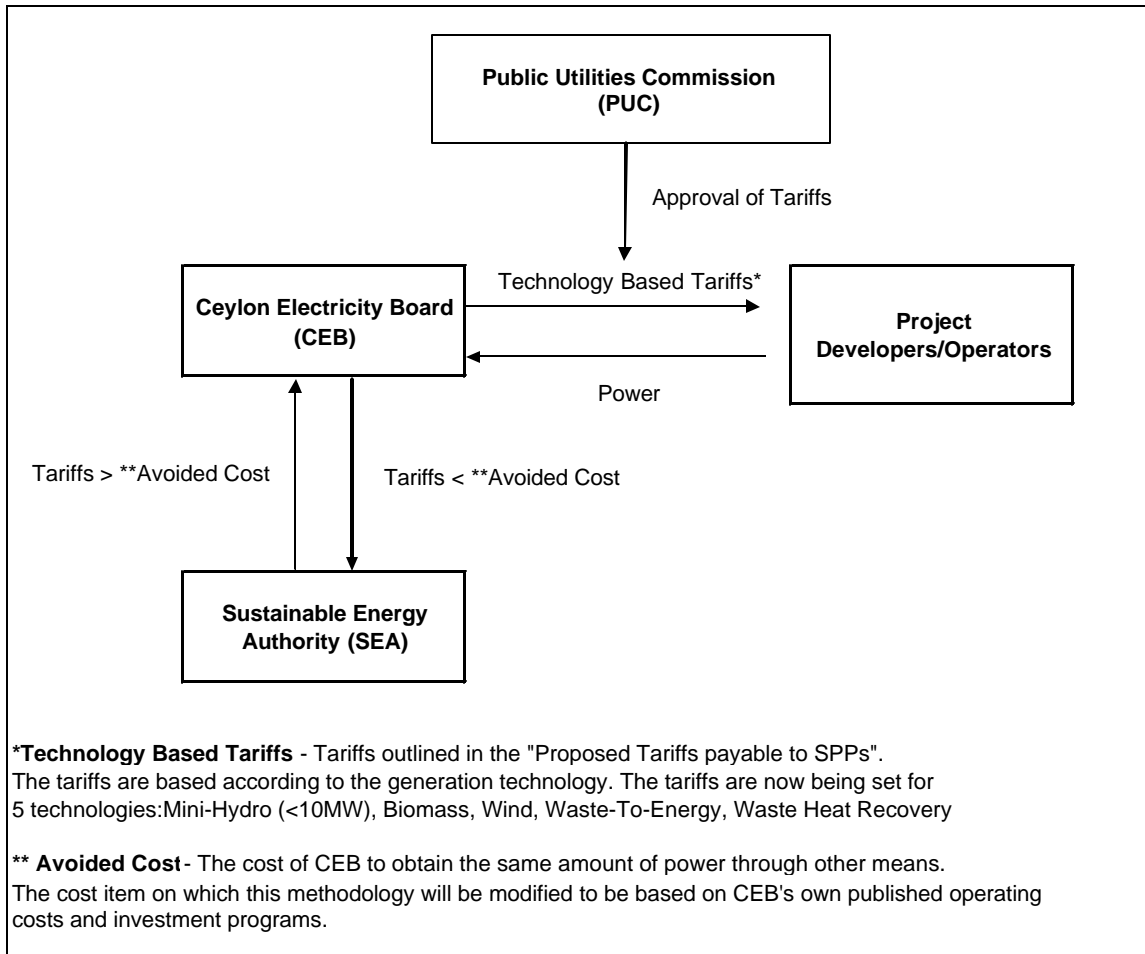
* Tariffs are translated to US\$ using US\$=111SLR rate
 Source: “Purchase of Electricity to the National Grid under Small Power Purchase Agreements (SPPA)”
 Energy Conservation Fund. July 2007

- *Sustainable Energy Authority* – The Energy Conservation Fund, institution under Ministry of Energy and Power responsible for promotion of energy conservation, will be upgraded to Sustainable Energy Authority (SEA). The bill has already been drafted and approved by the cabinet, and submitted to the parliament for discussions on May 22, 2007. The institution will be mandated with below objectives;
 - a) Research in applicable technologies in energy efficiency and renewable energy,
 - b) Promotion of investments in energy efficiency and renewable energy,

⁶ “Project Review Report”, Infrastructure Unit, Department of Foreign Aid and Budget Monitoring, Ministry of Plan Implementation, July 2006

- c) Balance payments in the tri-party agreement between CEB, PUC and SEA for implementation of the new technology-based tariff regime. (details provided in Figure 1.1)
- d) Authority to impose levy or tax to finance the above tri-party arrangement

Figure 2: Sector Structure for Non-Conventional Renewable Energy



Under this arrangement, the SEA would pay CEB when the tariff is higher than the calculated avoided cost of CEB. On the other hand, SEA would receive payment if the avoided cost is higher than the tariff. The calculation methodology of the avoided cost would also be modified to use published CEB investment and operational cost data, in an effort to increase transparency to the calculation.

Although the above developments are encouraging for the promotion and utilization of renewable energy resources by DG producers in Sri Lanka, they only address one aspect of project development, namely off-take of the power. There remain many other critical issues that can prevent projects from being developed. Some of the issues include:

1. Lack of proper legal arrangements for fuel supply for biomass and waste-to-energy projects – For power producers that use biomass or waste as fuel or raw materials for gasification, the problem of supply security is a key concern in Sri Lanka and elsewhere. Both availability and prices have known to fluctuate once the “waste” material is known

to have economic value. There is a need to establish a mechanism for ensuring a legal arrangement that is transparent and equitable for all parties involved, and covers supply and transport issues related to the biomass supply for the plants in question.

2. Lack of agreements or coverage of construction and operational risk – The coverage of construction and initial operational risk for large power plants has been traditionally borne by the EPC⁷ contractor in the form of a turnkey contract. On the other hand, product warranties for small-scale generators are provided for the equipment by OEM⁸s, while insurance companies may provide additional coverage through property insurance. DG projects are mostly too small for tight EPC contracts, while the product warranties leave significant gaps in operational risk as they usually do not include adequate performance warranties and operations training required for long-term efficiency of the facility.
3. Lack of agreement with local communities, government agencies, stakeholders – Unlike large power projects which have established best practices in dealing with environmental and social issues (IFC's performance standards being one example), small-scale power project do not have such standards. The projects are also burdened with obtaining permits through a maze of various institutions, while ensuring that the stakeholder involvement is adequate. The net result is an unsustainably high transaction cost, and hence fewer transactions.

Although some of these issues may have Sri Lanka specific elements, most of them are common in all DG and renewable energy projects in most of markets.

Key Medium-Term Sector Issues:

- 1) **Financial Sustainability of CEB** – The CEB has been in financial disarray for some time now, and has been known to be delinquent on payments to large thermal generation plants. In an effort to insulate the economy from rising fuel costs and providing subsidies to households, the CEB has been maintaining the tariff below their generation cost. Their profits and cash balance has been negative for the last five years and their operations are maintained through government support.
- 2) **Sustainability of SEA** – As the diagram above shows, the function of the SEA is to act as balancing mechanism to allow the implementation of the new technology based tariff while not increasing the financial burden on CEB. The financing of the mechanism is required, but the funding source is not clearly identified. Although SEA will be given the authority to impose levies, the source of the levy is not clear at this point. At least in the initial stages, there will need to be a budget allocation from Ministry of Finance to allow this mechanism to function.
- 3) **Transmission Grid Capacity and Stability** – Utility grid interconnection and distance of generating assets from load centers, transmission and distribution level losses, and system grid stability issues among others can pose potential technical challenges and constraints to project implementation. These constraints and challenges will need to be studied on a case by case basis to define the appropriate solution. While the resource allocated may not be sufficient to identify a

⁷ EPC: Engineering, Procurement and Construction

⁸ OEM: Original Equipment Manufacturer, e.g. GE, Mitsubishi, Siemens etc.

comprehensive solution to grid planning, an attempt will be made to identify and document the key challenges that the national grid may face and make recommendations on technical solutions with the integration of these DG assets.

- 4) **Security Status of Sri Lanka** – The security situation in Sri Lanka, with the on-going conflict with the Lankan Tigers of Tamil Eelam (LTTE) and the Government, has been volatile since resumption of hostilities. This has impacted Sri Lanka in its credit ratings and in its funding requirements for the government for defense purposes. If the conflict intensifies, the impact on the economy and in investments in this sector could be substantial.

2. Major Related Projects – RERED Project (Annex 2)

Energy Services Delivery (ESD) Project (1997 – 2002):

The ESD project was a pilot initiative with the objective to a) promote the provision by the private sector, NGOs and cooperatives of on and off-grid energy services using environmentally sustainable renewable energy technologies, b) reduce long-term demand for electricity through demand side management (DSM), and c) strengthen public and private sector capacity to deliver energy services through renewable energy and DSM. The project was financed through funding from International Development Association (IDA).

The three components of the project were:

1. ESD credit line for medium and long-term financing for renewable energy
2. The pilot grid-connected wind farm (3MW) to demonstrate viability of technology
3. Capacity building to improve service delivery

The total project cost was US\$44.8 million (IDA: US\$22.3 million, GEF: US\$5.7 million, Counterpart Funding: US\$16.8 million). All objectives and targets were met;

Renewable Energy for Rural Economic Development (RERED) Project (2002 – 2011):

Building upon the success and lessons learned from ESD project, the RERED project was launched in 2002. The project objectives were; a) Improve rural quality of life by providing electricity access to remote communities through off-grid renewable energy technologies, and b) Promote private sector power generation for the main grid from renewable energy resources.

The four components of the project are:

1. Grid connected and off-grid hydro, wind and biomass renewable technologies,
2. Financing and grant mechanisms for solar home systems and other solar energy applications in rural areas through private companies, NGOs and MFIs,
3. Technical assistance for income generation and social services delivery improvements based on access of villages to electricity,
4. Technical assistance for promotion of energy efficiency, development of carbon trading mechanisms, and integration of renewables into government policy and provincial council development strategies and sector reform initiatives.

The initial total project cost was US\$133.7 million (IDA: US\$75 million, GEF: US\$8 million, Counterpart Funding: US\$50.7 million).

On June 14, 2007, US\$40 million of supplemental financing to RERED Project was approved by the board of the World Bank. The additional funds are expected to finance additional 50 MW and off-grid electricity services will be extended to 60,000 additional households and 500 rural micro- and small-scale enterprises in rural areas.

3. Fit with IFC/ World Bank Group Strategies

At the June 2004 Bonn International Conference on Renewable Energies, the World Bank Group pledged a 20% increase every year for next 5 years in RE/EE investments. RE is defined as wind, solar, geothermal, biomass and mini-hydro (>10MW). The project will contribute to net additional investments in these fields.

Additionally, the PADGO framework and pilot project will contribute to the IFC RE strategy by providing a new business model and platform on which the RE projects can be scaled-up. The team has and will continue to consult extensively with officers in both the country unit and CGF, to reflect both regional and industry department strategy priorities and concerns.

The project would be building upon the success of its predecessor projects, ESD and RERED projects implemented by the World Bank. The team has been in close discussion with RERED Task Team and Sri Lanka country office of the World Bank in structuring PADGO project, and has come to agreement on supporting the transition of the sector from concessional financing to commercial sustainability. As the sector has been developed through IDA assistance, the project will address the strategy of smooth and secure transition to more commercially based project development in RE and DG in Sri Lanka. The extension of this strategy will also be the exit strategy for GEF funds in this sector as well.

C. PROJECT DESCRIPTION SUMMARY

1. Project Components (Annex 3)

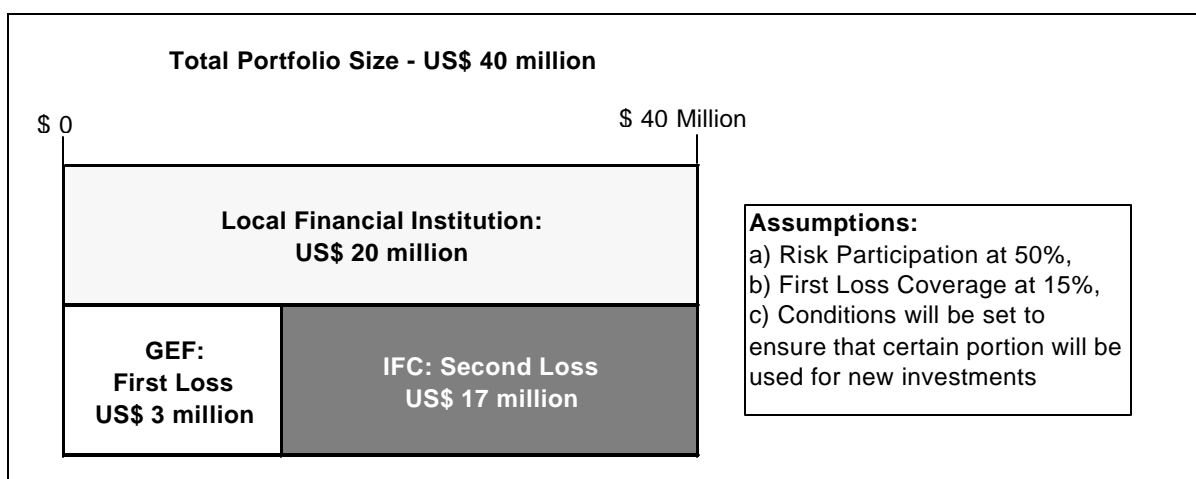
Component 1 – Risk Participation Facility (US\$ 3.0 million)

The Risk Participation Facility (RPF) has two objectives;

- a) Releasing lending capacity of the FI by taking on half of their risk portfolio for new investments in renewable energy,
- b) Assist in expanding the FI lending to new investments and technologies in DG sector.

In the RPF product, the GEF funds cover the first loss portion, while second loss will be leveraged by IFC funds from the Global Financial Market Department (CGF). The FIs will take on the uncovered portion on Pari Passu basis, which will allow them to manage the risk while addressing moral hazard issues surrounding credit guarantees. (See Figure 3.1)

Figure 3: Sample Risk Participation Facility Structure*



*The structure and numbers are indicative and subject to change; only for discussion purposes

The above figure 3.1 is illustrative table for illustration of the structure and impact that the RPF product may have. The above example assumes;

1. Pari passu sharing of the asset risk will be done at 50-50 basis,
2. The first loss portion to be covered under GEF assumed to be 10% of the portfolio,
3. There will be conditionality (or another tranche of RGF with difference risk sharing and first loss coverage percentages) to ensure that the new investments are to be encouraged and not just re-cycling of funds tied up in mini-hydro assets.

The product structure and leverage provided by IFC will depend upon and contingent upon due diligence to be conducted by the CGF. Some of the factors that would affect the structure and leverage, but not limited to, are a) Historical portfolio performance (both in mini-hydro and as whole), b) Size of individual loans of projects taken by the FIs, c) Due diligence and risk management process of FIs, d) Interest rate and profitability expected from these projects. In order to ensure sustainability and robust due diligence

process, the initial group of participating FIs will be chosen from financial institutions with pre-existing relationships with IFC.

During our fact finding mission in Sri Lanka, it became clear that the characteristics of the banks and the banking sector made the risk-participation facility an attractive product. The banks' appetite for such financial product, as well as for technical assistance support offered in PADGO framework (See Component 2 and 3), were high. (see Annex 3)

Component 2 – Technical Assistance for establishing the PADGO framework (US\$ 1.77 million)

Task 1: Technology Performance Standard Report – Estimated Cost: \$ 350,000

A detailed report will be prepared on the available technology to be applied as DG. The output will be that the performance standard in efficiency and environmental compliance will be established. The study should take into consideration the following;

1. Provide data and details of operational data and requirements for each of the applicable DG technologies.;
2. Identify major manufacturers for each technology and their products, along with maintenance and supply chain in each of the developing country markets.
3. Provide guide and notes in assessing each of the technologies for operational and financial risks,
4. Based on above study outputs, the consultants are also required to make arrangements for a workshop in Sri Lanka, with the venue and location to be suggested and agreed with IFC. The consultants will be required to organize and provide the material, venue, refreshments during the workshop.

Task 2: Standard Contracts and Agreements – Estimated Cost: US\$450,000

Consultants will conduct a detailed study on the type of commercial transactions possible, and produce, based on Sri Lankan and global experience, Templates for various partnering agreements and contracts. The Consultant will be required to make recommendations where opinions are divergent, and would need to provide concrete suggestions for lowering transaction costs and supplementing institutional capacity where it may be found wanting. The consultant will be required to actively engage various stakeholders to obtain input and feedback, and encourage participation in the project.

1. Establishing a model for contractual/partnering arrangements between the various stakeholders in small power producer and DG sector. The contractual arrangements for the technologies below should be formulated to ensure the operation of plants through contractual obligations and enforcement mechanisms for service delivery and performance;
 - Mini-hydro
 - Biomass
 - Wind
 - Waste-to-Energy
 - Waste Heat Recovery
2. Template of legal documentation would be provided to implement and enforce each of the contractual arrangement models. The documentation to be considered include, but not limited to i) Power Purchase Agreement (PPA), ii) Operating Contract, iii) Construction Agreement, iv) Right of water or land use, v) Long-term Servicing Contract, vi) Fuel Supply Contract.

Work on technology specific PPA is contingent upon PUC and CEB agreement, upon which the consultant may provide input into the formulation. The consultant will contact CEB and PUC, with assistance from IFC, to negotiate their involvement in the process.

3. Mid-Term Report will be presented by the consultant in a Workshop to gain feedback from the local stakeholders: The models will be presented in the form of a mid-term report to be presented as one document folder to be reviewed by the workshop participants. The workshop will invite local banks, project developers, relevant government agencies and equipment manufacturers.
4. Final Report

Task 3: Market Study (Sri Lanka) – Cost: \$ 23,075

The objective of this task is to conduct a market assessment of companies working in, or interested in working in, the RE sector in Sri Lanka. Co-implemented with Environmental Business Finance Program (EBFP), who will cover 50% of the cost, the market assessment will be used to help the project team (assignment completed in August 2007);

1. Identify the gap between financing needs and current FI offerings, within the context of current market conditions in this sector;
2. Identify key target market segments where DG investments are most feasible, as well as profiling what these investments look like;
3. Structure financial products accordingly; and
4. Decide upon the most appropriate delivery mechanism and partner(s) for such investments;

Task 4: Pilot Project Development (Sri Lanka) – Estimated Cost: US\$ 300,000

Consultant will conduct a study to select the geography for the project and to match the consumer needs of the selected market with appropriate technology/ies. The consultant will be required to actively engage various stakeholders to obtain input and feedback, and encourage participation in the project. The following tasks are identified as Consultant scope:

1. *Feasibility Study on the New Technologies* – A study to be conducted to identify the market constraints in Sri Lanka for applicable technologies under the new tariff regime – mini-hydro, biomass, wind, waste-to-energy, waste heat recovery. The assignment is to be Sri Lanka specific in providing guidance in assessment of the technologies applicable. For this assignment, the technologies will be assessed under the new tariff regime.
2. *Study of issues on transmission grid capacity* – A study to be conducted to assess the limitations of existing transmission grid limitations in Sri Lanka, in the context of significant additions of small power generation capacities.
3. *Project Development Support* – Conduct technical studies based on submitted documents by the project developer and propose solutions that will ensure the sustainability of the project.

Task 5: Market Study for Replication (Southeast Asia) – Estimated Cost: US\$650,000

The consultant will conduct a study on applicability of DG in Philippines, Thailand and Indonesia. The consultant will be required to actively engage various stakeholders to obtain input and feedback, and encourage participation in the project.

- a) The consultant will conduct and create market assessment reports for Philippines, Thailand and Indonesia.

- b) The consultant will also interact with another consultant who will be organizing the dissemination workshop in Southeast Asia

Component 3 – Capacity Building and Knowledge Management (US\$0.45 million)

Capacity Building – Estimated Cost: US\$300,000

Training will be provided to the participating FIs based on the technical and financial studies produced under Component 2. The objective of the training will be to train local FIs and/or project developers on;

- a) Technical details of DG technologies, mainly wind, biomass, waste-to-energy, waste heat recovery,
- b) Information and data literacy required to perform adequate due diligence on technical, operational and financial risk of DG projects,
- c) Assessment of technical, operational and financial risks of SPP and/or renewable energy projects.

As part of the implementation arrangement to develop and deliver the required technical assistance, one local staff with appropriate sector background will be hired to;

- a) Implement capacity building program of PADGO project
- b) Supervise consultants based on overall requirement of the project,
- c) Plan, organize and implement the training/workshop,
- d) Support project/ sector development.

South Asia Enterprise Development Fund (SEDF) is a multi-donor facility managed by the International Finance Corporation (IFC) in Colombo. SEDF has agreed in principle to host and supervise in IFC Colombo Office in Sri Lanka, as TA arm which has the required expertise, experience and relationship with the FIs in Sri Lanka. The new staff cost will be funded under the GEF funds for the initial 3 years (US\$ 200,000). If the need continues after three years, the salary funding will also need to be discussed among interested parties (SEDF, SE, CGF). The budget table for the staff is provided in Annex 5.

Knowledge Management - Estimated Cost: US\$150,000

Dissemination Material and a workshop would be organized with the objectives to:

- a) Disseminate information and data obtained in the other components of PADGO project to promote DG technologies and projects,
- b) Bring various stakeholders such as project developers, financiers, technology providers, etc. to facilitate project development in DG projects in Sri Lanka.

The capacity building staff and SEDF staff with support from HQ and/or external consultant will be required to actively engage various stakeholders to obtain input and feedback, and encourage participation in the project.

Component 4 – Monitoring & Evaluation (US\$0.15 million)

Monitoring and Evaluation – Estimated Cost: US\$150,000

The auditing of the project accounts, as well as monitoring and evaluation of achievements of project objectives will be conducted at mid-term and end of the project.

Component 5 – Project Management (US\$0.02 million)

Project Management – Contribution by SEDF: \$ 20,000

They have committed to provide US\$ 20,000 of contribution as budget, as well as in-kind contribution by assigning a staff part-time and hosting the dedicated full-time capacity building implementation staff in their office.

2. Partnership and Co-Financing Arrangements

Partnership:

The team has worked extensively with below local stakeholders during the preparation of this project:

Public Utilities Commission of Sri Lanka

As regulator of Ceylon Electricity Board (CEB) and other natural monopolies, the Public Utilities Commission (PUC) has been consulted and supports the project. The team has consulted and gained input from the Director General (Mr. Wijayatunga), as indicated in the support letter that was attached to the Project Documents dated March 22, 2006. With the new tariff methodology and mechanism due to be implemented, the team expects to work closely with PUC and CEB on the implementation of the project. Additionally, if agreed, IFC will work with PUC and CEB in drafting and structuring the new technology based PPA.

Sustainable Energy Authority (formerly Energy Conservation Fund)

With the conversion of Energy Conservation Fund (ECF) as the Sustainable Energy Authority (SEA) with a broader mandate to analyze, develop and recommend policies while sourcing and managing funds to achieve stated objectives, SEA is a natural partner for this project. The team has been in consultation with the Chairman (Mr. Ananda Gunasekera) and CEO (Mr. Harsha Wickramasinghe) of ECF from early stages of preparation of the project. Under the new mandate, the project team and SEA will closely coordinate to ensure the success of the project.

Co-Financing Arrangement: (see Annex 4 and 10)

The project has received strong support from IFC's Global Financial Markets Department, as well as external donors such as Japanese Government, indicated in the financial leverage and letters of support provided by these entities.

IFC

To leverage the GEF funds in the Risk Participation Facility (RPF), IFC is now considering the structure of the product to i) cover credit risk on pari passu basis with participating FIs, ii) use GEF funds as first loss coverage to ensure the sustainability and efficiency of the project. The first loss is expected to be at 5 – 10%, depending on the due diligence on portfolio performance and pipeline of projects in the new technologies. In this case, the expected US\$3 million will be leveraged by ratio of 1:5.6, assuming that the IFC will provide US\$17 million of second loss coverage.

Additionally, IFC will provide additional funds of US\$250,000 for Market Study in Southeast Asia for Replication of PADGO projects (Component 2, Task 5: see Annex 3), which will be co-financed by the trust fund from the Japanese government (see below section). The funds are expected to be used in dissemination and workshop in Southeast Asia, to be organized to disseminate information on DG and its potential as well as results from Sri Lanka pilot project.

IFC – South Asia Enterprise Development Facility (SEDF)

SEDF, a multi-donor facility aimed at reducing poverty through SME development in South Asia, has committed to co-finance the training program for participating FIs as part of their Access to Finance Program. The budget provided will be up to US\$20,000.

Japanese Government

The Japanese government has agreed to provide total of US\$750,000 to support two TA activities: i) Component 2, Task 1 – Technology Performance Standard Report, ii) Component 2, Task 5 – Market Study in Southeast Asia for replication of PADGO project. The Application is now in its final stage, and we are awaiting the final official approval.

Other External Donors

Discussions are currently underway with multiple donors on funding Task 2 and 4 of Component 2. While US\$ 750,000 from Japan and contribution from IFC facilities (Sustainable Business Innovator & SEDF) totaling US\$ 282,000 are more than adequate to fulfill the co-financing criteria indicated in the council document (US\$ 400,000), the team will be working diligently to complete the funding before launch of the project.

3. Financing Plan (see Annex 4)

The financing plan for Component 1: Risk Participation Facility is contingent upon due diligence performed by IFC’s CGF department, as well as the appetite of participating banks for the product provided.

Table 6: Project Cost and Financing Plan

							(thousand US\$)
Components	IFC*	IFC**	GEF	Japan TF	SEDF	Other	TOTAL
Component 1:							20,000
Risk Participation Facility	17,000		3,000				20,000
Component 2:							1,762
Task 1 - Technology Performance Standard Report				350			350
Task 2 - Standard Contracts and Agreements						450	450
Task 3 - Market Study (Sri Lanka)		12					12
Task 4 - Pilot Project Development						300	300
Task 5 - Market Study for Replication (SE Asia)		250		400			650
Component 3:							450
Capacity Building			300				300
Knowledge Management			150				150
Component 4:							150
Monitoring & Evaluation			150				150
Component 5:							20
Project Management					20		20
TOTAL	17,000	262	3,600	750	20	750	22,382

* IFC funds used for second loss from Global Financial Markets Department - Subject to Change and for discussion only

** IFC Sustainability Business Innovator budget allocation

4. Implementation Arrangements (see Annex 5)

The program term for Phase 1 of the initiative is 84 months or 7 years from the date of GEF CEO Endorsement. During this period all three objectives of the program will be pursued and are expected to reach logical conclusions. In the seventh year, the team will focus on evaluation or possible extension, as well as putting in place lessons learned so as to exit successfully from the market. Refer to Annex 5 for further details.

Program Term and Phase 2

This framework and the performance benchmarks being developed will inform Phase 2 of the initiative, which will focus on building transaction volumes for a diverse portfolio of different technologies, applications and perhaps even off-taker risks. We believe that once sufficient experience has been gained in the risk sharing product (with the mini-hydro portfolio) and one or more of the pilots have progressed sufficiently towards financing, it will be appropriate for the Task Manager to initiate activities towards Phase 2. This will be done only after an evaluation report on Phase 1 has been completed, as required under GEF policies. For this purpose, funds have been procured for market study for replication in Southeast Asia, namely in Philippines, Indonesia and Thailand. (see Annex 3 and 4)

Management of GEF Funds

As a member of the World Bank Group and an Executing Agency of GEF, IFC has the appropriate systems set up to deal with GEF funded projects in a host of countries. Funds for project implementation and for the risk sharing facility would be routed through the normal Trust Funds managed by the World Bank. In Sri Lanka this process is expected to be quite smooth since there is a history of GEF funded initiatives implemented by the World Bank Group.

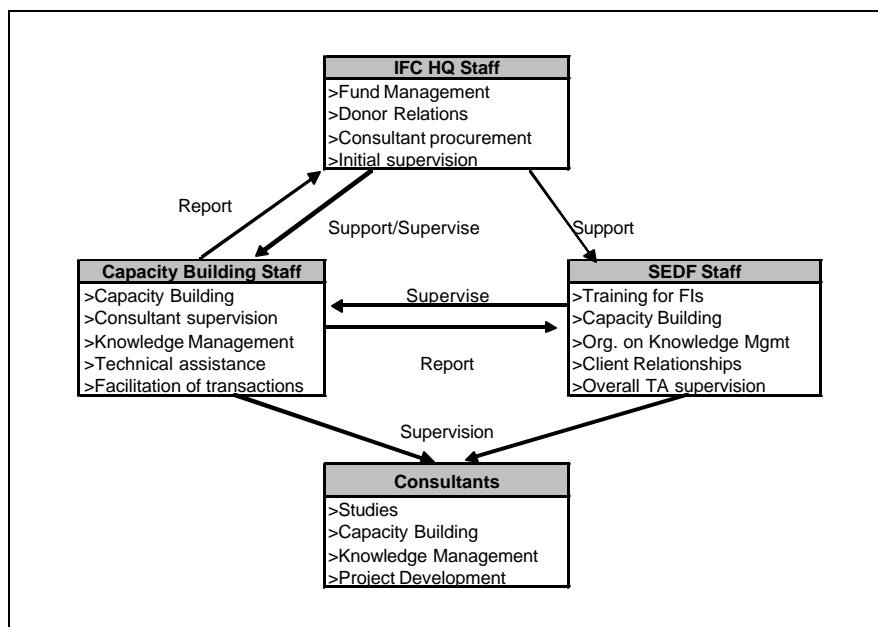
Implementation Arrangement

The Technical Assistance activities will be undertaken by consultants to be hired under procedures laid out in “AMS 15.07: Policies and Procedures for the Selection and Use of Consultants for Operational Purposes”, which became effective April 1, 2004. All individual TA tasks in Component 2 and 3 will be tendered as separate consulting assignments. (see Annex 5)

The supervision of the consultants will be conducted by the Project Implementation Unit (PIU) that will consist of the IFC Staff in Washington DC, SEDF Colombo office staff, dedicated IFC staff stationed in Colombo office. (see Table 7 and Annex 5 for details)

For preparation and early implementation stage, the Washington based staff will be providing majority of input as well as support on consultant selection, fund management and reporting through out the project period. During implementation however, the local staff in Colombo office and SEDF is expected to provide the majority of input and facilitate the project implementation locally. One new staff is expected to be hired locally under the project, which the Colombo office has agreed to host and support. The new staff will be funded under the project for initial two years, but contingent upon sector development and project replication, the staff may be supported further through other sources.

Table 7: Implementation Arrangement



D. PROJECT ANALYSIS AND RATIONALE

1, Economic and Financial Rationale (Annex 7)

Renewable Energy Projects in Sri Lanka

The mini-hydro projects, in some cases even at the low US\$ 1 million, were shared among the 12 participating banks. These banks were active in this market and therefore have diversified portfolio of 12 – 15 projects with total amount of US\$15 – 25 million each. According to the discussion with commercial banks, the performance of the Mini-hydro projects has been very strong, thus providing them with good returns.

The government recently established new feed-in tariffs based on the RE technology, the tariffs will be paid for 15 years, however, the rates are decreased significantly after 6 years. Obviously, the high initial tariff for the years 1-6 is designed finance constructions costs. (see Table 1.5 in Annex 1) The new tariff for Mini-Hydro remains attractive while tariffs for wind and biomass are expected to attract interest from investors.

Risk Sharing Facility

Based on the strong cash flows, loans are usually repaid within 5 years of operation, i.e. loan tenors are typically around 7 years. The banks typically charge risk margins of approximately 4% p.a. for financing SHP projects. As banks calculate that about 50% of their interest margin is taxed, the banks' margin is around 2% p.a. This factor makes interventions through RSF not only attractive to the FIs, but an effective product to free up their lending capacity to the sector.

Participating Banks

Detailed financial analysis of the participating banks will be conducted, once IFC has signed a mandate letter with candidate bank for the Risk Sharing product portion of the project.

2. Fiduciary (Annex 7)

Procurement

The project and all procurement will be conducted by the PIU consisting of IFC staff. The IFC staff in Washington will be responsible for all procurement. It will be carried out in the manner that is consistent with WBG/IFC procurement guidelines and procedures.

Financial Management

Financial management and reporting will be the responsibility of the PIU, with support from Resource Management Team in IFC. IFC has experience in managing GEF funds and familiar with the requirements and procedures of GEF. Therefore, no issues are foreseen in the financial management.

3. Safeguard Policy (Annex 7)

This project has been classified as a Category FI project according to IFC's Environmental and Social Review Procedure.

During appraisal for Risk Sharing Facility portion by Global Financial Markets Department after signing of the mandate letter with the FIs, IFC will further analyze the participating banks' portfolios and the activities proposed to be supported with IFC financing for types of transactions, size, tenor and industry sectors and determine the Applicable Performance Requirements, if any, that would include a combination of:

- The IFC FI Exclusion List and/or
- The applicable Sri Lankan social and environmental Laws and regulations and/or
- The IFC Performance Standards

IFC will also review, if required, the capacity of the participating banks to manage social and environmental risks and to establish and maintain a Social & Environmental Management System (SEMS). If required, IFC will suggest Supplemental Actions to address any gaps in each participating bank's SEMS.

Based on the review, the participating banks will be required to:

- Develop an, or upgrade, if necessary, any existing SEMS, prior to disbursement to the satisfaction of IFC
- Identify responsible, qualified persons to manage and implement the SEMS
- Commit to implement the SEMS, to ensure that the investments/activities supported by IFC financing are in compliance with the Applicable Performance Requirements
- Submit a periodic report to IFC as per a format to be provided by IFC

4. Incremental Cost and Greenhouse Gas Reduction (Annex 8)

Baseline Scenario

According to the TYDF mentioned earlier, the capacity expansion will rely heavily on coal plants construction (see Page 12) while electricity generation using Diesel Oil will be reduced greatly. Although a significant renewable energy increase is expected, it would not be enough to totally displace diesel generation. As coal will increasingly take over the base-load generation, the additional renewable energy capacities will displace the remaining diesel generation as cheaper marginal generators.

Incremental Cost

Component 1: Risk Sharing product – Below are the assumptions used to estimate the investments that would be encouraged by risk sharing product under the PADGO framework;

GEF 1st loss coverage: US\$3 million
 IFC 2nd loss coverage: US\$17 million
 Portfolio Risk Coverage ratio: 50/50
 Debt-Equity Ratio of projects: 70/30
 Total Investment Amount under PADGO: US\$57 million

As new investments, it is assumed that projects in mini-hydro, wind and biomass are going to be implemented. This is consistent with a) the new tariff regime, b) interview that we had with banks and project developers, c) government policy on promotion of these technologies. Using the capital costs and load factor estimates, the assumption was made that 20 MW of Wind, 6 MW of Biomass, 20 MW of mini-hydro electricity generating capacities can be financed. The total installed capacity to be financed will total 46MW.

Table 8: Expected Investments Under PADGO Project

WIND	
Total Capacity:	10 MW
Total Investment to Wind:	14 million \$
Annual electricity generation:	26,280 M W h
Plant Life:	20 yrs
BIOMASS (wood, wood based agri waste)*	
Total Capacity	4 MW
Total Project Cost	9 million \$
Annual electricity generation:	26,280 M W h
Plant Life:	20 yrs
MINIHYDRO	
Total Capacity	15 MW
Total Project Cost	35 million \$
Annual electricity generation:	59,130 M W h
Plant Life:	30 yrs
Total Investments:	57 million \$
Total Installed Capacity:	29 MW
Total Annual Electricity Generated:	111,690 M W h
Total Electricity Generated over life of plant:	2,825,100 M W h

* Assumed to use no additives or accelerants and is sustainably reforested
 Source: "Technical and Economic Assessment: Off-grid, Mini-Grid and Grid Electrification Technologies", The World Bank, November 2005

Component 3: Capacity Building/Knowledge Management – This component has been allocated US\$450,000. The component aims to provide information and training that was not previously available in Sri Lanka. The component objective is:

1. Disseminate the information and knowledge that were acquired through the TA studies,
2. Promote diversity of DG technologies,
3. Provide venue to showcase technologies and potential projects,
4. Provide venue to introduce the investment opportunities for investors and financiers,
5. Provide training to the participating FIs on assessment of DG projects using new technologies,

GHG Reduction Calculation

Based on the above assumptions, the avoided GHG reduction is calculated as below. There are key assumptions made in the calculations;

- GEF fund of US\$3.6 million,
- Emission Factor of 650 kg of CO₂/ MWh
- Diesel Plant life of 20 yrs

Table 9: Avoided Emissions and GEF Leverage

Displaced Electricity Generation	
Annual	111,690 MWh
Plant Life	2,825,100 MWh
Displaced Diesel Capacity	
Load Factor	80%
Displaced Capacity	15.9 MW
Avoided Emissions Calculation	
Emissions Factor:*	650.000 kg/ MWh
Avoided Emissions (Annual)	72,599 ton
Avoided Emissions (Plant Life)	1,836,315 ton
GEF Leverage	
Plant Life	1.96 \$/ton

*Technical and Economic Assessment: Off-grid, Mini-Grid and Grid Electrification Technologies", The World Bank, November 2005

5. Cost Effectiveness

As indicated above in the incremental cost analysis, at US\$1.96/ton of CO₂ equivalent GHG reduction, the project provides a cost effective intervention to reduce the GHG emissions.

Additionally, as a result of strong support that the project has received, GEF funds of US\$3.6 million will be leveraged to US\$22.4 million, or by ratio of 1:6, of funds under management. On the impact the project has on total investment, the GEF funds are leveraged to US\$57 million, or by ratio of 1:16.

6. Sustainability and Replicability

Sustainability:

One of the key hurdles to mini-hydro investments identified under the RERED initiative was the lack of long-term capital in the Sri Lankan market. The initiative successfully identified and implemented a solution to the tenure issue by making available an IDA loan at a low interest rate to the Sri Lankan government. This made it possible for the GoSL to make available 15 year funds to local banks for lending to the mini-hydro sector. It is this long term money that has made it possible for local banks to provide 8 year funds necessary for the financing of mini-hydro projects. Current estimates show that the RERED initiative will have added some 100 MW of mini-hydro generation to Sri Lanka's generation mix by end of 2007.

However, once the IDA credit line is fully disbursed, the tenure risk would return to challenge developers of new clean DE generation projects. Also, the next generation of mini-hydro projects is likely to require more capital costs, but mini-hydro tariff is expected to be significantly reduced; meaning lower profitability, increased risk and may required higher equity ratio. The new tariffs are expected to send a clear message about the need for diversification, by setting the tariffs based on technologies to be promoted; biomass, wind, waste-to-energy, waste heat recovery. These new technologies are expected to be allowed a higher profitability, while mini-hydro will be required to be competitive to other electricity

generation technologies including fossil. The government need and policy to diversify its generation capacity is clear.

But after a decade of mini-hydro project development under concessional funding from IDA, there are gaps for the SPPs to make the transition to more commercially sustainable (i.e. tapering down the concessionality in the sector) and diversification of DG (technology, resources used, etc.). This poses a new set of challenges to the sustainability of the current approach.

PADGO proposes to follow an incremental path towards promoting sustainability in lending to this sector:

- (1) By providing a risk sharing product, the team will be putting together the basic framework necessary for alleviating those risks that prevent local banks from making longer tenure loans to such projects. We believe that this risk sharing product will be the first step in making lending practices less reliant on soft multilateral funds, and hence is a step in the path of sustainable lending. We also believe that the sector will be a sustainable and profitable business line for the participating banks as well.
- (2) By undertaking the training of FIs in the technical and financial assessment in the DG projects other than mini-hydro will allow them to i) build a new business line, ii) expand business with creditworthy clients who enter the market, iii) diversify their portfolio and manage risk better. The transition to commercial sustainability and the portfolio approach, as the project name indicates, go hand in hand. We believe that this will not only develop and strengthen the SPP sector, but also the Banking sector as well.
- (3) By introducing global lessons learned in contractual models, technologies and companies to Sri Lanka, PADGO will also be adding to the capabilities and capacities available locally in the SPP sector. Once again this is a step towards greater sustainability.

Project Replicability:

Sri Lanka as a geography is of particular interest to the GEF's PADGO initiative because it is a country where significant GEF and IDA resources have been successfully deployed in the past. This has resulted in spawning a new industry and also in making some basic provisions in the policy side for the inclusion of mini-hydro projects into a grid where such resources have a clear impact. PADGO will attempt to replicate the success in the mini-hydro sector in the broader context of DG generation, by the following means:

- (1) Through developing a framework for DG generation that is acceptable to a broad spectrum of private sector players (banks, OEMs, trade associations, local developers, and investors) PADGO proposes to build a common replicable platform for these different players to interact and increase deal flow. Increased volumes of transactions under a common platform or framework will allow for pricing and hence fungibility of risks within a portfolio context. This will lead to a securitization approach to financing such projects, which by its very nature is replicable beyond one region or country.
- (2) By building upon the success of the mini-hydro sector, PADGO would be looking to promote new clean technologies to the mix, thus making the portfolio of small generation assets more robust and diversified in terms of fuel and other risks. This diversified portfolio approach will find applicability within Sri Lanka, but will also be a model that can be replicated (with appropriate modifications) in different countries that may have a different resources and assets, so long as the framework developed is comprehensive enough to deal with a context

that is broader than only mini-hydro projects. This will be tested in Phase 2 where a country with a larger market and manufacturing base will be included as part of the Phase 2 initiative.

- (3) By introducing significant global players to the market (e.g. General Electric, IFC's Global Finance Department, and World Association for Decentralized Energy (WADE)) to the market, PADGO is insuring that lessons learned in doing transactions in Sri Lanka are replicated in a wider global context, thus making it easier to apply a similar approach elsewhere. Furthermore, the demonstration effect of a success of this approach in Sri Lanka may in the long run lead to more governments moving towards a better enabling environment for clean DG generation. This we believe will be the ultimate measure of replicability of the PADGO approach.

7. Exit Strategy for GEF

GEF funds for TA and capacity building activities will be expended and are hence non-returnable. Therefore GEF exit strategy, in effect refers to the final disposition of the unexpended portion of GEF's US\$3 million of funds being used to guarantee non-payment in the risk participation facility (GEF's "Risk Participation Funds"). At the end of the program life, the unused portion of GEF funds would be returned to GEF, per the prevailing rules.

8. Potential Risk and Mitigation

Risks	Mitigation
<p>Poor Coordination between World Bank and IFC: If IDA continues to fund new hydro projects in Sri Lanka on concessional terms, the transition to more commercial financing will be more difficult.</p>	<p>The TA for technology performance standards will address this concern. Renewable energy will be used wherever the energy resource allows, and any fossil fuel based generation will be required to be of improved efficiency than the "business as usual" case. This is a requirement of GEF funding.</p>
<p>Lack of interest/uptake from local stakeholders: If the kicak entrepreneurs and banks are not interested in expanding the DG investments outside of Mini-hydro projects, the objectives will be difficult to achieve.</p>	<p>The project has been presented to local stakeholders during the preparation of GEF application and interest in the project by banks and project developers has been confirmed. The reform process of the government policy also clearly indicates the intent to promote diversification of DG technologies. The letters of support by the local FIs are attached in Annex 9.</p>
<p>Financing technology that does not promote GHG reduction: In addressing the issue of access to energy, the lending capacity may be used to finance diesel and other non-GHG reducing technologies.</p>	<p>The TA for technology performance standards will address this concern. Renewable energy will be used wherever the energy resource allows, and any fossil fuel based generation will be required to be of improved efficiency than the "business as usual" case. This is a requirement of GEF funding. The eligibility criteria in the term sheet of the RPF will clearly state that the loan must be made to projects that meet our technology performance standards.</p>
<p>Renewable Energy becomes Non-competitive: The development and construction of coal-based power plants may make non-conventional renewable energy uncompetitive and irrelevant</p>	<p>The ten year development plan indicates that 3,900MW of coal power plants will be the target; however, the increase is mainly to displace fuel oil based power generation and renewable energy is still indicated to be increased to 500 MW capacity or 10% of the generation mix. In addition, since the technology based tariff is based on long-term PPA, the project economics would not be affected by the alternative generation cost in the future.</p>

9. Monitoring and Evaluation of Outcomes/Results (see Annex 6)

PADGO envisages detailed evaluation of impacts to establish its effectiveness in meeting its goals and objectives under Stage 1 of this initiative. The M&E program, which is to be managed by the executing agency (IFC), will consist of monitoring the program's outputs identified in the Logical framework in *Annex 6*. In addition, the M&E plan anticipates an evaluation of the program's impacts, especially those directly related to the development of the risk sharing product and the capacity of the financial institutions to develop new projects in the area of distributed energy. The M&E plan will also evaluate the lessons learned from Phase 1 in order to inform Phase 2 of PADGO (Replication).

This data will be collected on an ongoing basis, and limited monitoring of this data will happen on a yearly basis. A mid-term and final review will be conducted in accordance with GEF procedures. In Phase 1 no baseline study will be needed since baseline emission data can be estimated from published CEB Statistics with respect to the installed generation mix. More details on this are provided in the Incremental Analysis/ Greenhouse Gas Reduction Analysis in Annex 8.

There will be a mid-term review in year 4 of Phase 1 of PADGO. This review will provide a comprehensive analysis of the Program's activities since inception and may be used to make adjustments to Stage 1 of the Program. An evaluation at the end of the project's life will be conducted by an independent consultant, and will look to evaluate the Program's success based on the stated objectives for the project. Information gathered at this stage will be similar to the information gathered at the mid-term review. The final evaluation will also look to track the Program's progress against the mid-term review and the recommendations made at that time. M&E is expected to cost about US\$150,000.

Annex 1: Country and Sector Background

Country Economic Overview

Economic Structure: Services contribute nearly 55% of the GDP and the sector employs 21% of the 7.5 million-strong labour force. The industrial sector comprises 28% of GDP, with manufacturing in areas such as apparel, leather, chemical, petroleum, plastic and rubber forming 70% of industrial production. Exports of textiles and ready made garments constitute nearly 50% of Sri Lanka's export revenues (followed by tea at 13%) and provide most of the employment in the industrial sector. The key to Sri Lanka's export performance has been its relatively low wage rate, skilled labour and incentives provided by the Government of Sri Lanka. The United States of America is the leading export destination (over 32%), with the United Kingdom at second place (around 14%).

GDP Growth Trend: Sri Lanka's overall growth of GDP has shown an improving trend in recent years. From an average of 3.6% in the 1970s, 4.3% in the 1980s and 5.2% in the 1990s, GDP growth has averaged 5.4% since 2001. The steady rise in GDP growth is largely on account of growth in key industrial sectors such as apparel and construction, with demand arising from an increasing flow of worker remittances. In 2006, GDP grew at 7.2% and real GDP growth for 2007 is estimated at 6%. Overall GDP remains relatively low at US\$24 billion.

Budget Deficit: Sri Lanka's budget deficit has risen since 2001 in absolute terms from LKR138bn (US\$1.6bn) to LKR249bn (US\$2.5bn) in 2006, and more significantly since 1990 when it was US\$800m. However, as a % to GDP, the deficit has fallen from 9.8% in 2001 to 8.9% (including 0.8% of GDP for foreign-funded tsunami-related expenditures) in 2006.

In December 2005, Sri Lanka obtained its first sovereign debt ratings from international rating agencies—Fitch (BB-) and S&P (B+). Both ratings had a stable outlook. The government initially intended to borrow around US\$1 billion from international capital markets in 2006, but postponed these plans as rating agencies revised the ratings outlook—from stable to negative—due to the resumption of hostilities between Government of Sri Lanka (GoSL) and the separatist outfit - Lankan Tigers of Tamil Eelam (LTTE). In December 2006, S&P affirmed its B+ (long term foreign currency ratings) and BB- (local currency sovereign credit ratings).⁹

Country Eligibility

The Democratic Socialist Republic of Sri Lanka ratified UN Framework Convention of Climate Change ('UNFCCC') on May 26, 1994.

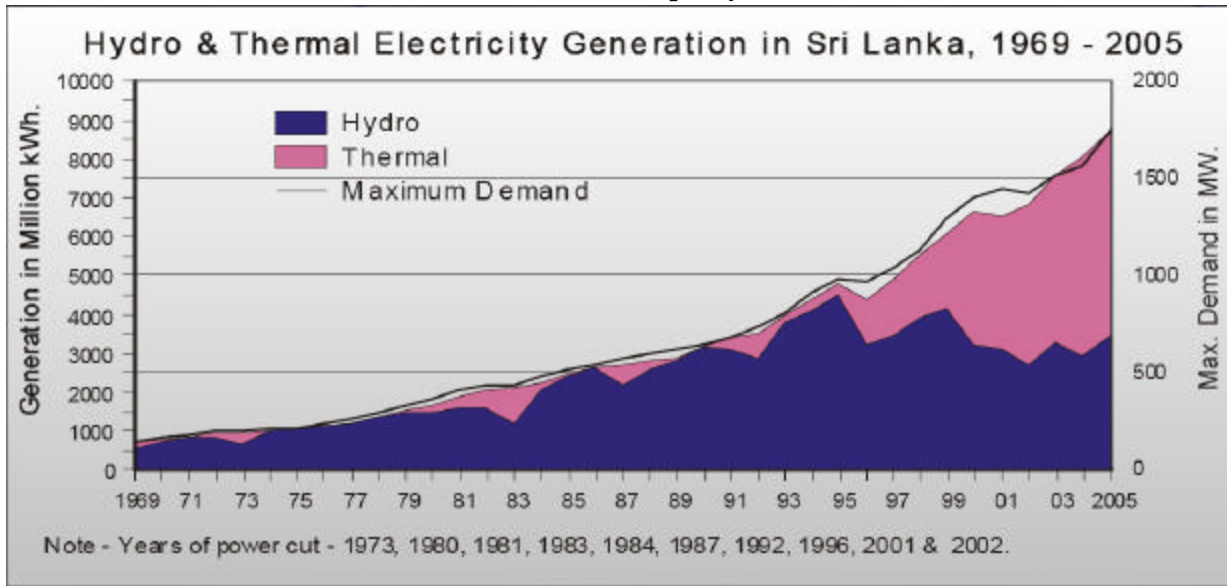
Power Sector Overview

Sri Lanka has a population of 19.9 million with a per capita Gross Domestic Product of USD 1,355 in 2006. Last year, the per capita electricity consumption was 394 kWh and 78.1% of the 4.6 million households had access to electricity¹. The country's total electricity consumption increased by 7.6% to 8,884 GWh in 2006. 51% of the country's demand was met with thermal power and 49% with hydropower. Hydropower generation increased by 34% in 2006 due to favorable weather conditions. Hydropower accounts for 53% of the total installed capacity of the country. (Refer to Table 1.1 and 1.3)¹⁰

⁹ Compiled by IFC Colombo Office

¹⁰ "Market Assessment of Distributed Generation potential in Sri Lanka", DFCC consulting

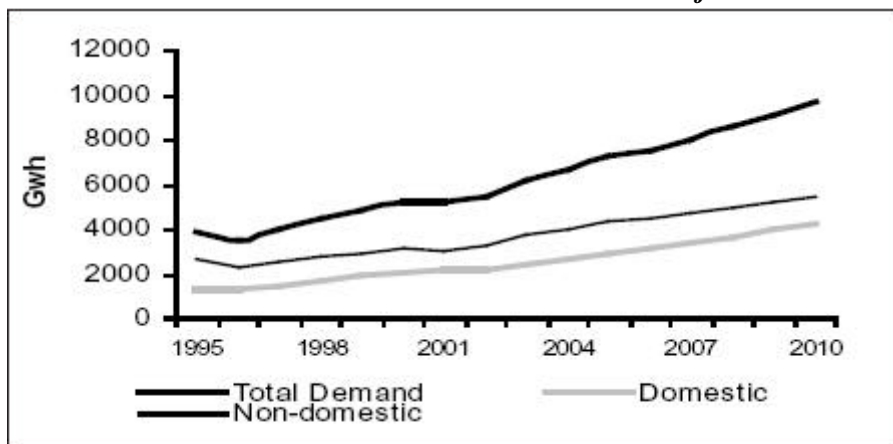
Table 1.1: Generation Capacity and Demand



Source: CEB, Statistical Digest 2005

The demand for electricity has been growing at a steady pace. The sales and number of customers for electricity has been increasing an annual average of 6% and 8% respectively during the last decade. Accordingly, the average annual additional electricity generation requirement would increase from 600GWh in 2006 to 700GWh in 2010, as the demand is expected to continue growing at a steady pace of 7 – 10% average per annum.

Table 1.2: Demand Growth Data and Projection



Source: Central Bank of Sri Lanka, "News Survey" No.27, Jan. - Mar 2007

Regulatory Framework

The regulatory framework of Sri Lanka's power sector comprises of 4 entities. The National Energy Policy and Strategies (NEPS) drafted in 2006 define the institutional responsibilities of these four entities:

○ *The Ministry of Power and Energy (MPE)*

The ministry is responsible for the country's energy sector. As such, MPE formulates national policies and strategies and oversees their effective and timely implementation.

○ *The Public Utilities Commission of Sri Lanka (PUC)*

Established under the Public Utilities Commission of Sri Lanka Act No. 35 of 2002, it regulates certain utilities industries pursuant to a coherent national policy'. PUCSL will be empowered to execute regulation once individual industry legislations are enacted and made effective

○ *The Energy Conservation Fund (ECF)*

Established under the Energy Conservation Fund Act, No.2 of 1985 to finance, promote and initiate activities and projects relating to efficiency, conservation and demand-side management of energy. ECF also investigates and encourages alternative sources of new and renewable energy. Legislation has been presented to the parliament on May 22, 2007 to reconstitute the ECF as the *Sustainable Energy Authority (SEA)* with a broader mandate to analyze, develop and recommend policies while sourcing and managing funds to achieve stated objectives. The new SEA is also designated to operate as 'balancing mechanism' between the CEB and SPPs operating under the technology tariff regime, the details of which will be provided later.

○ *Ceylon Electricity Board (CEB)*

CEB is a single, vertically integrated, state-owned electric utility, which is responsible for the planning, generation (public sector), transmission, distribution and sale of power in the country;

- Generation: CEB generates electricity from medium and large-scale hydro power and thermal plants. CEB also purchases thermal power from eight Independent Power Producers (IPPs) and non-conventional renewable energy based electricity from over fifty Small Power Producers (SPPs).
- Transmission: CEB operates the high voltage transmission system and the grid sub-stations.
- Distribution: As shown in Table 1.1, CEB sales account for 88% of the total distribution while Lanka Electricity Company (LECO) services the balance consumers. LECO is a fully owned subsidiary of CEB.¹¹

¹¹ "Market Assessment of Distributed Generation potential in Sri Lanka", DFCC consulting

Table 1.3: Power Generation Data

Item	2005	2006(a)	Growth Rate	
			2005	2006 (a)
Available capacity (MW)	2,411	2,429	1.4	0.7
Installed capacity	2,411	2,429	3.5	0.8
Hydro	1,291	1,309	0.9	1.5
Thermal (b)	1,115	1,115	8.8	0.0
Wind	3	3	0.0	0.0
Units generated (GWh)	8,769	9,389	7.5	7.1
Hydro	3,450	4,635	16.5	34.3
Thermal (b)	5,314	4,751	16.3	-10.6
Wind	2	2	-33.3	0.0
Total sales by CEB (GWh)	7,255	7,832	8.8	7.7
Domestic and religious	2,444	2,622	10.9	7.3
Industrial	2,446	2,605	7.9	6.5
General Purpose	1,254	1,395	10.8	11.2
Bulk sales to LECO	1,027	1,111	4.7	8.2
Street lighting	83	98	0.0	18.1
LECO sales (GWh) (c)	973	1,052	6.7	8.1
Domestic and religious	464	488	6.7	5.2
Industrial	240	255	6.7	6.3
General Purpose	244	282	6.6	15.6
Street lighting	25	26	8.7	4.0
Overall System loss of CEB (%)	17.3	16.6	1.0	-3.1
Number of Consumers (d) ('000)	3,807	4,066	5.8	6.8
Domestic and religious	3,361	3,593	5.6	6.9
Industrial	38	40	2.7	5.3
General Purpose	404	429	6.9	6.2
(a) Provisional	Sources:	Ceylon Electricity Board		
(b) Inclusive of Independent Power Producers (IPP)		Lanka Electricity Co. (Pvt) Ltd.		
(c) Estimates Based on actuals up to October 2006				
(d) Inclusive of LECO consumers				

Source: Central Bank of Sri Lanka Annual Report 2006

It is also pertinent to note that electricity constitutes only 7.1% of the total energy mix for Sri Lanka, pointing to the widespread use of other fuels for lighting, cooking, heating, cooling and transportation. Kerosene and firewood is primarily used in most households for lighting and cooking purposes. In areas with access to the utility grid, the customers receive subsidized electric tariffs.

The country's increasing dependence on imported fuel is evidenced by an 18.4% increase in volume of fuel used by CEB in 2004 over 2003. Due to sharp increases in fuel prices this resulted in a 55.5% increase in the fuel cost to CEB over the same period. Sri Lanka evidenced a 7.1% increase in power consumption over the same period, with the average price for power being about 7.6 US cents/kWh in 2004. This was below the cost to CEB of generating and transmitting the power, and resulted in a negative return on fixed assets and a deteriorating debt service ratio in 2004.

Government Policy – Power Sector Development

A “Ten Year Horizon Development Framework from 2006 to 2016” (TYDF) proposed by the Government of Sri Lanka (GoSL) in November 2006 details the key issues and proposes strategies and targets to be achieved by 2016 to develop the energy sector.

Access to energy is one of the key issues that are being addressed in this report. Though the Central Bank Annual Report for 2006 states that 78.1% of the households in the country have been electrified by the year end, TYDF estimates that 75% of the households have been connected to the national grid, while 3% are served by off-grid facilities. By 2016, the TYDF strategy is to ensure access to 95% of the households by investing in grid extensions and establishing off-grid energy services. By 2016, 85% of the households are targeted to be connected to the national grid and another 10% will benefit from off-grid electricity solutions.¹²

Another issue addressed in the TYDF is the issue of energy security and fuel diversity; in this context, the study sets strategy for increase in generation capacity through Coal and Non-conventional Renewable Energy (NCRE) sources. The strategy proposed by TYDF imposes a moratorium on oil-burning power plants until non-oil resources provide 90% of the grid supply. The development of coal power plants and the remaining large and medium scale hydropower potential has been prioritized. The public sector will invest on major hydro-electric projects and the pioneering thermal plants. The private sector will be invited to develop subsequent coal-fired power projects and identified medium-scale hydropower plants. (Table 1.4)¹³ The plan is ambitious; this translates to about net addition to generation capacity of 3,900 MW worth of Coal and 500MW worth of NCRE by 2016, while lowering power generation from oil substantially.¹⁴

Table 1.4: % of Generation Capacity Per Fuel Type – Ten Year Development Framework

	Hydro	Oil	Coal	NCRE*
Present - 2006	37.7%	58.2%	0.0%	4.1%
Interim - 2011	21.4%	3.3%	65.2%	10.0%
Target - 2016	19.9%	2.2%	67.3%	10.7%

* NCRE - Non-Conventional Renewable Energy

Source: Market assessment of Distributed Generation in Sri Lanka, DFCC Consulting

To achieve this goal, work on Norochcholai Coal Power Plant started on May 11, 2006. The coal power plant is being constructed in Puttalam, at the southern end of Kalpitiya peninsula. It will be constructed in three stages, with a capacity of 300MW per plant per year, making a total capacity of 900MW by 2010. The project cost for the first phase is US\$455 million, to be built under Design, Build and Transfer basis by the China National Machinery and Equipment Import and Export Corporation (CMEC). Out of the project cost, US\$300 million is to be financed as concessional loan from Chinese government and US\$155 million as supplier’s credit from Export-Import Bank of China. High quality low Sulphur containing coal is due to be supplied from Australia, South Africa and Indonesia.¹⁵ The coal plant is expected to contribute greatly to the energy security issue, but controversial as opponents of the project claim serious environmental concerns.

¹² Ibid.

¹³ Ibid.

¹⁴ Assuming that the total generation capacity will need to increase from 2429MW to 5900MW (“Incorporating Social and Environmental Concerns in Long-term Electricity generation Expansion Planning in Sri Lanka”, Energy Forum, 2006)

¹⁵ “Project Review Report”, Infrastructure Unit, Department of Foreign Aid and Budget Monitoring, Ministry of Plan Implementation, July 2006

Other future expansion plans include a) Upper-Kothmale Hydro Plant (150 MW) by 2010 and b) Kelawarapitiya Combined Cycle Diesel Plant (300 MW) by 2008.

Historical Policy on Mini-Hydro and RERED Project

The National Energy Policy and Strategies defines NRE in Sri Lanka as small-scale hydro-power (<10MW), biomass, including Dendro power, biogas and waste, solar power, wind power and, in the future, resources such as wave and ocean thermal energy.

Almost all NCRE have thus far been financed and implemented as mini-hydro plants by the private sector through the World Bank's RERED project (details available in Annex 2), which will continue to provide funds until 2011 or when the funds have been exhausted. As a result of this program, Sri Lanka is expected to have about 100MW of installed capacity of mini-hydro by the end of 2007. Some of the key growth factors can be summarized as below:

- IPPs developing renewable energy projects of less than 10MW capacity are exempt from pre-qualification process and Letter of Intent (LoI) are issued on first come-first served basis,
- Standardized Power Purchase Agreements (PPA) with CEB is stipulated for off-take of power,
- Minimum level of profitability from the project is ensured through PPA by agreeing to a minimum tariff,
- Tariff is determined before beginning of each year by CEB based on avoided cost methodology (no capacity charge). The tariff will be the average cost of units generated by CEB owned plants displaced by renewable energy, which came to be about 6 US cents/kWh,
- Government provides tax holidays ranging from 5 to 10 years, depending on the scale of the investment, and exemption from import duty during construction and implementation of the project,
- Technical assistance and quality data has been provided through the government and the RERED project.¹⁶

But as the mini-hydro nears 100MW in installed capacity, the growth has slowed as the low-hanging fruit locations in terms of geographical and hydrological conditions have been exploited. Although some 300 – 400 MW of technical potential are identified, the commercial viability and profitability in these locations remain to be seen. As need to diversify energy sources to ensure energy security and hedge the economy against oil price increases intensify, the government is now preparing to launch additional mechanisms to promote utilization of renewable energy sources other than mini-hydro.

New Policy on Non-Conventional Renewable Energy (NCRE) Source

The new policy mechanisms are being prepared by the government focuses on encouraging expansion of generation capacities on NCRE technologies other than mini-hydro:

- *Technology Based Tariff* – To incentivize the private sector investments and financing of NCRE technology projects other than mini-hydro, tariffs per each technology to be promoted will be set to ensure minimum profitability according to their individual cost structures. The tariff is expected to have maturity of 15 – 30 years according to technology. It is also expected to have tiered structure, with elevated tariff level for the first 7 – 10 years to assist in debt repayment, lowered flat level tariff for rest of the period. As of June 2007, the tariffs have not been approved, but it has obtained cabinet approved. The tariff for mini-hydro is expected to be lowered to about \$ 0.04/KWh, while tariffs for other technologies are expected at US\$ 0.06 – US\$ 0.12/ KWh range for first tier. The technologies in this regime are:

¹⁶ “Hydro Sector Study of India and Sri Lanka”, Price Waterhouse Coopers, 2006

- a) Mini-Hydro
- b) Biomass
- c) Wind
- d) Waste-to-Energy
- e) Waste Heat Recovery

2007 tariff for mini-hydro, biomass and wind has now been announced in July 2007. The tariffs for other technologies are to be announced later;

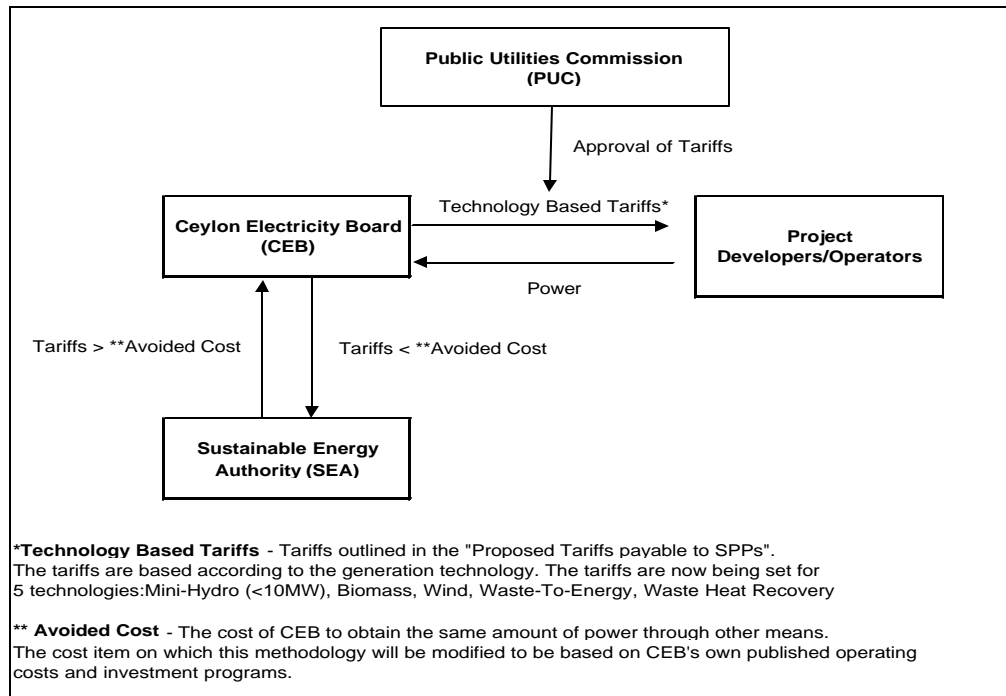
Table 1.5: 2007 Tariffs for Non-Conventional Renewable Energy Source

US\$/KWh*	O&M	Fuel (Biomass)	Fixed Rate (1-6yr)	Fixed Rate (7-15 yrs)	Total Tariff (1-6yrs)	Total Tariff (7-15yrs)
Mini-Hydro	0.009	NA	0.07	0.03	0.08	0.04
Wind	0.015	NA	0.13	0.05	0.15	0.06
Biomass	0.008	0.05	0.05	0.02	0.10	0.07

* Tariffs are translated to US\$ using US\$=111SLR rate

- **Sustainable Energy Authority** – The Energy Conservation Fund, institution under Ministry of Energy and Power responsible for promotion of energy conservation, will be upgraded to Sustainable Energy Authority (SEA). The bill has already been drafted and approved by the cabinet, and submitted to the parliament for discussions on May 22, 2007. The institution will be mandated with below objectives;
 - a) Research in applicable technologies in energy efficiency and renewable energy,
 - b) Promotion of investments in energy efficiency and renewable energy,
 - c) Balance payments in the tri-party agreement between CEB, PUC and SEA for implementation of the new technology-based tariff regime. (details provided in Figure 1.1)
 - d) Authority to impose levy or tax to finance the above tri-party arrangement

Figure 1.1: Sector Structure for Non-Conventional Renewable Energy



Under this arrangement, the SEA would pay CEB when the tariff is higher than the calculated avoided cost of CEB. On the other hand, SEA would receive payment if the avoided cost is higher than the tariff. The calculation methodology of the avoided cost would also be modified to use published CEB investment and operational cost data, in an effort to increase transparency to the calculation.

Although the above developments are encouraging for the promotion and utilization of renewable energy resources by DG producers in Sri Lanka, they only address one aspect of project development, namely off-take of the power. There remain many other critical issues that can prevent projects from being developed. Some of the issues include;

1. Lack of proper legal arrangements for fuel supply for biomass and waste-to-energy projects – For power producers that use biomass or waste as fuel or raw materials for gasification, the problem of supply security is a key concern in Sri Lanka and elsewhere. Both availability and prices have known to fluctuate once the “waste” material is known to have economic value. There is a need to establish a mechanism for ensuring a legal arrangement that is transparent and equitable for all parties involved, and covers supply and transport issues related to the biomass supply for the plants in question.
2. Lack of agreements or coverage of construction and operational risk – The coverage of construction and initial operational risk for large power plants has been traditionally borne by the EPC¹⁷ contractor in the form of a turnkey contract. On the other hand, product warranties for small-scale generators are provided for the equipment by OEM¹⁸s, while insurance companies may provide additional coverage through property insurance. DG projects are mostly too small for tight EPC contracts, while the product warranties leave significant gaps in operational risk as they usually do not include adequate performance warranties and operations training required for long-term efficiency of the facility.
3. Lack of agreement with local communities, government agencies, stakeholders – Unlike large power projects which have established best practices in dealing with environmental and social issues (IFC’s performance standards being one example), small-scale power project do not have such standards. The projects are also burdened with obtaining permits through a maze of various institutions, while ensuring that the stakeholder involvement is adequate. The net result is an unsustainably high transaction cost, and hence fewer transactions.

Although some of these issues may have Sri Lanka specific elements, most of them are common in all DG and renewable energy projects in most of markets.

Key Medium-Term Sector Issues

1. Financial Sustainability of CEB – The CEB has been in financial disarray for **some** time now, and has been known to be delinquent on payments to large thermal generation plants. In an effort to insulate the economy from rising fuel costs and providing subsidies to households, the CEB has been maintaining the tariff below their generation cost. Their profits and cash balance has been negative for the last five years and their operations are maintained through government support. With mini-hydro plants, they have been paying the SPPs on time because of the small amount relative to other generations and because it had the lowest marginal generation costs. It remains to be seen if CEB will be able to continue under the new technology scheme.

¹⁷ EPC: Engineering, Procurement and Construction

¹⁸ OEM: Original Equipment Manufacturer, e.g. GE, Mitsubishi, Siemens etc.

2. Sustainability of SEA – As the diagram above shows, the function of the SEA is to act as balancing mechanism to allow the implementation of the new technology based tariff while not increasing the financial burden on CEB. The financing of the mechanism is required, but the funding source is not clearly identified. Although SEA will be given the authority to impose levies, the source of the levy is not clear at this point. At least in the initial stages, there will need to be a budget allocation from Ministry of Finance to allow this mechanism to function.

3. Transmission Grid Capacity and Stability – Utility grid interconnection and distance of generating assets from load centers, transmission and distribution level losses, and system grid stability issues among others can pose potential technical challenges and constraints to project implementation. These constraints and challenges will need to be studied on a case by case basis to define the appropriate solution. While the resource allocated may not be sufficient to identify a comprehensive solution to grid planning, an attempt will be made to identify and document the key challenges that the national grid may face and make recommendations on technical solutions with the integration of these Distributed Generation (DG) assets.

4. Security Status of Sri Lanka – The security situation in Sri Lanka, with the on-going conflict with the Lankan Tigers of Tamil Eelam (LTTE) and the Government, has been volatile since resumption of hostilities. This has impacted Sri Lanka in its credit ratings and in its funding requirements for the government for defense purposes. If the conflict intensifies, the impact on the economy and in investments in this sector could be substantial.

Annex 2: Major Related Projects Financed by the Bank and/or other Agencies

An Overview of the World Bank Program in the Energy Sector

Energy Services Delivery (ESD) Project (1997 – 2002):

The ESD project was a pilot initiative with the objective to a) promote the provision by the private sector, NGOs and cooperatives of on and off-grid energy services using environmentally sustainable renewable energy technologies, b) reduce long-term demand for electricity through demand side management (DSM), and c) strengthen public and private sector capacity to deliver energy services through renewable energy and DSM.

The three components of the project were:

4. ESD credit line for medium and long-term financing for renewable energy,
5. The pilot grid-connected wind farm (3MW) to demonstrate viability of technology,
6. Capacity building to improve service delivery

The total project cost was US\$44.8 million (IDA: US\$22.3 million, GEF: US\$5.7 million, Counterpart Funding: US\$16.8 million). All objectives and targets were met (See Table 2.1).

Table 2.1: Performance Assessment of ESD Project

<i>Project Component</i>	<i>Target at Appraisal</i>	<i>Achieved by Project Closing in December 2002</i>
Grid-connected minihydro by the private sector	21 MW	31 MW (involving about 10 private minihydro developers and 15 subprojects, with more capacity planned)
Pilot Wind Farm	3 MW	3 MW wind farm commissioned in February 1999 and certified in May 2000. Wind projects as high as 30 MW being proposed by several private companies.
Solar Home Systems	15,000 (revised at midterm review) ⁴	21,000 installed in rural homes as of end-2002. Four major vendors have invested in extensive sales and distribution networks. About 1,000 systems were being installed per month by end-2002.
Village Hydro Systems	250 kW through 20 systems serving 2,000 households	350 kW through 35 village hydro systems serving 1,732 households completed and certified by Chartered Engineers

Source: ESD Project, Performance Assessment Report (No. 29532), World Bank

Renewable Energy for Rural Economic Development (RERED) Project (2002 – 2011):

Building upon the success and lessons learned from ESD project, the RERED project was launched in 2002. The project objectives were; a) Improve rural quality of life by providing electricity access to remote communities through off-grid renewable energy technologies, and b) Promote private sector power generation for the main grid from renewable energy resources.

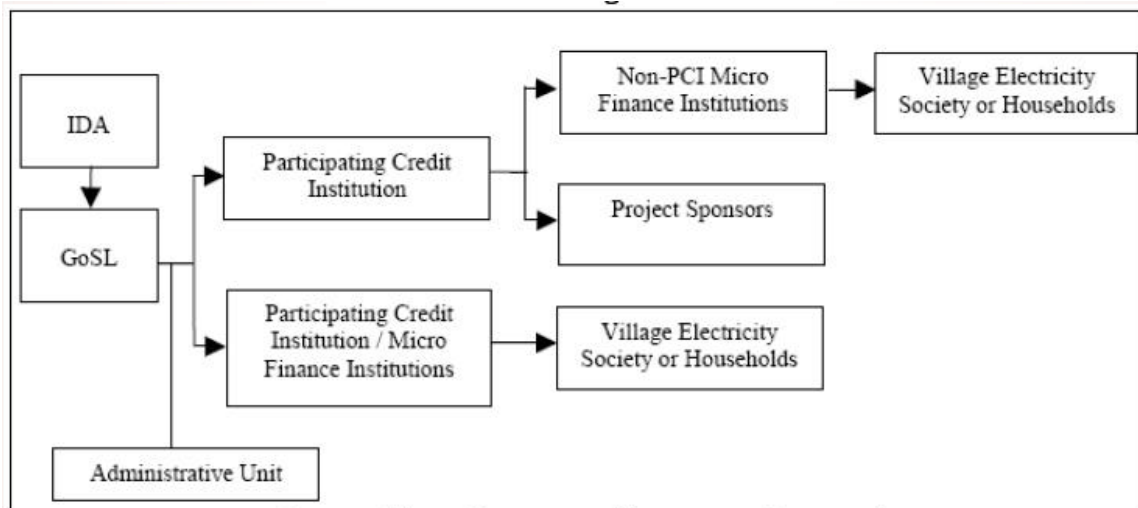
The four components of the project are:

5. Grid connected and off-grid hydro, wind and biomass renewable technologies,
6. Financing and grant mechanisms for solar home systems and other solar energy applications in rural areas through private companies, NGOs and MFIs,
4. Technical assistance for income generation and social services delivery improvements based on access of villages to electricity,
5. Technical assistance for promotion of energy efficiency, development of carbon trading mechanisms, and integration of renewables into government policy and provincial council development strategies and sector reform initiatives.

The initial total project cost was US\$133.7 million (IDA: US\$75 million, GEF: US\$8 million, Counterpart Funding: US\$50.7 million).

The DFCC Bank was appointed as Administrative Unit (AU) to administer the credit component and part of grant components. Eleven Participating Credit Institutions met and maintained the eligibility criteria set forth in the project, for access to technical assistance and on-lending of IDA funds. The funds were on-lent in Sri Lanka Rupees (SLR) at Average Weighted Deposit Rate (AWDR) with Central Bank of Ceylon taking on the exchange rate risk. The funds can finance up to 80% of the sub-loan subject to US\$8 million ceiling limit per project, up to period of 10 years with no more than 2 years of grace period. (See Figure 2.1)

Figure 2.2: Implementation Arrangement of RERED Project



Source: RERED Project, Project Appraisal Document, World Bank

On June 14, 2007, US\$40 million of supplemental financing to RERED Project was approved by the board of the World Bank. The additional funds are expected to finance additional 50 MW and off-grid electricity services will be extended to 60,000 additional households and 500 rural micro- and small-scale enterprises in rural areas.

In the new supplemental financing portion, the pricing methodology of the project will be revised; from using the Average Weighted Deposit Rate (AWDR) to using an average of AWDR and fixed deposit rate. This represents about 1 – 2% increase in interest rate, bringing the lending rate to the projects by banks to 17 – 18%.

Annex 3: Detailed Project Description

Project Objectives:

The project's objective is to reduce CO₂ emissions through displacing central fossil fuel based generation and to improve access to cleaner and more reliable source of energy for underserved population thus removing the impediment for further economic growth. (PADGO) provides a framework under which the various parties (manufacturers, developers, operating companies, banks, rural communities, beneficiary companies, etc.) are provided tools to lower transaction cost such as template agreements and contracts, performance standard for equipments, and financing opportunities to encourage entry into the market while maintaining quality of service provided. The framework is designed to be flexible to address the various local constraints and available energy resources to allow for replication in other countries/regions. The objective of the TA assignment will be to develop the components (legal agreement templates and technology performance standards) of the framework and to develop the markets and sub-projects to be implemented under the PADGO project.

The first phase of this initiative will focus on Sri Lanka, and will have three specific goals:

- (1) Releasing lending capacity at local banks for financing < 10 MW type mini-hydro and other DG technologies through the establishment of a replicable framework, and a risk sharing product,
- (2) Introducing new fossil and biomass based DG generation technologies and new private sector players (Original Equipment Manufacturers (OEMs), entrepreneurs etc.) to Sri Lanka through one or more clean energy pilot projects, and
- (3) Taking the first steps towards a portfolio approach to promoting a diverse mix of clean DG generation technologies.

The framework and the implementation experience gained in Sri Lanka are meant to inform a second phase of the initiative wherein the framework will be used for scaling-up sustainable lending for DG generation in Sri Lanka. This approach will be expanded in the second phase to include other countries in the region as potential sources of capital or additional transactions undertaken using the same framework approach. With sufficient experience in structuring, and with sufficient payment history, a diversified portfolio amenable to securitization can be developed.

GEF Policy Objectives

The Program is being submitted under GEF Operational Program (OP) 5: Removal of Barriers to Energy Efficiency and Energy Conservation, and OP6: Promoting the Adoption of Renewable Energy by Removal of Barriers. The expected outputs are closely linked to two strategic priorities for the climate change (CC) focal area. The approach is consistent with the following GEF strategic priorities: CC-1 Market Transformation for High Volume Products and Processes and CC-2 Increased Access to Local Sources of Financing for Renewable Energy and Energy Efficiency.

Project Components:

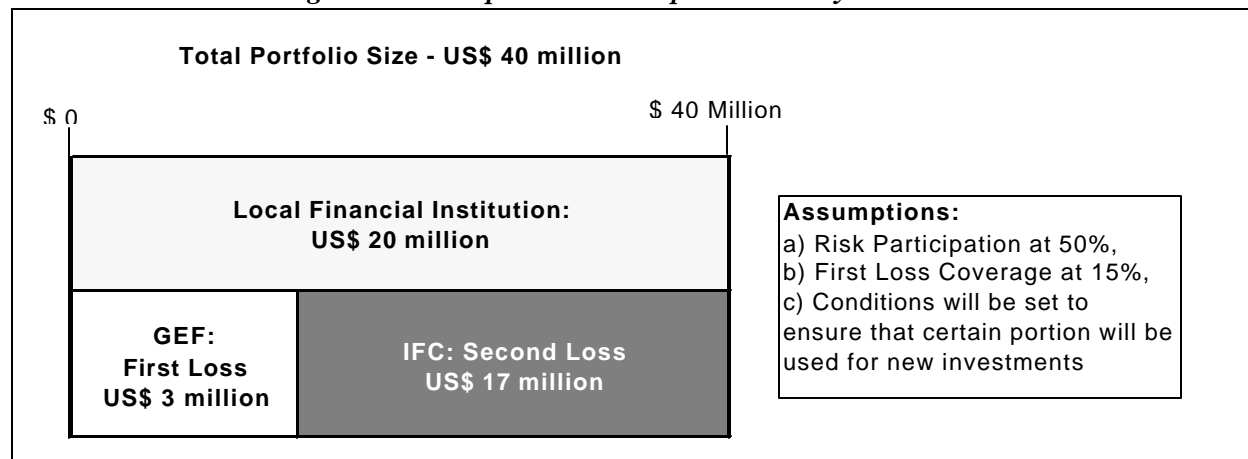
Component 1 – Risk Participation Facility (US\$ 3.0 million)

The Risk Participation Facility (RPF) has two objectives:

- a. Releasing lending capacity of the FI by taking on half of their risk portfolio for new investments in renewable energy,
- b. Assist in expanding the FI lending to new investments and technologies in DG sector.

In the RPF product, the GEF funds cover the first loss portion, while second loss will be leveraged by IFC funds from the Global Financial Market Department (CGF). The FIs will take on the uncovered portion on Pari Passu basis, which will allow them to manage the risk while addressing moral hazard issues surrounding credit guarantees. (See Figure 3.1)

Figure 3.1: Sample Risk Participation Facility Structure*



*The structure and numbers are indicative and subject to change; only for discussion purposes

The above figure 3.1 is illustrative table for illustration of the structure and impact that the RPF product may have. The above example assumes;

1. Pari passu sharing of the asset risk will be done at 50-50 basis,
2. The first loss portion to be covered under GEF assumed to be 10% of the portfolio,
3. There will be conditionality (or another tranche of RGF with difference risk sharing and first loss coverage percentages) to ensure that the new investments are to be encouraged and not just recycling of funds tied up in mini-hydro assets.

The product structure and leverage provided by IFC will depend upon and contingent upon due diligence to be conducted by the CGF. Some of the factors that would affect the structure and leverage, but not limited to, are a) Historical portfolio performance (both in mini-hydro and as whole), b) Size of individual loans of projects taken by the FIs, c) Due diligence and risk management process of FIs, d) Interest rate and profitability expected from these projects. In order to ensure sustainability and robust due diligence process, the initial group of participating FIs will be chosen from financial institutions with pre-existing relationships with IFC.

During our fact finding mission in Sri Lanka, it became clear that the characteristics of the banks and the banking sector made the risk-participation facility an attractive product:

- a) The mini-hydro projects, in some cases even at the low US\$1 million, were shared among the 12 participating banks. These banks were active in this market and therefore have diversified portfolio of 12 – 15 projects with total amount of US\$15 – 25 million each.
- b) The interest income is taxed at 55%, which means that more than half of their margin is actually taxes. So even after sharing net margin with IFC, the banks will see an increase in their ROE.
- c) The banking sector is in general conservative and the perceived technology risk is slowing the development of projects that use technology other than mini-hydro.

The banks' appetite for such financial product, as well as for technical assistance support offered in PADGO framework (See Component 2 and 3), were high

Component 2 – Technical Assistance for establishing the PADGO framework (US\$1.77 million)

Task 1: Technology Performance Standard Report – Estimated Cost: \$ 350,000

A detailed report will be prepared on the available technology to be applied as DG. The output will be that the performance standard in efficiency and environmental compliance will be established. The study should take into consideration the following;

1. Provide data and details of operational data and requirements for each of the applicable DG technologies. The details to be included are as below, but not limited to;
 - Capital Cost per capacity
 - Fuel Specifications,
 - Operating Cost (fixed and variable),
 - Maintenance Requirements,
 - Average down-time,
 - Operational Efficiency,
 - Standard performance level (energy efficiency, emissions;
2. Identify major manufacturers for each technology and their products, along with maintenance and supply chain in each of the developing country markets. The details to be included are as below, but not limited to;
 - Manufacturers for each technologies,
 - Warranties provided,
 - Available maintenance capacity in developing countries,
 - Availability of long-term maintenance contract;
3. Provide guide and notes in assessing each of the technologies for operational and financial risks,
4. Based on above study outputs, the consultants are also required to make arrangements for a workshop in Sri Lanka, with the venue and location to be suggested and agreed with IFC. The consultants will be required to organize and provide the material, venue, refreshments during the workshop.

Task 2: Standard Contracts and Agreements – Estimated Cost: US\$450,000

Consultants will conduct a detailed study on the type of commercial transactions possible, and produce, based on Sri Lankan and global experience, Templates for various partnering agreements and contracts. The Consultant will be required to make recommendations where opinions are divergent, and would need to provide concrete suggestions for lowering transaction costs and supplementing institutional capacity where it may be found wanting. The consultant will be required to actively engage various stakeholders to obtain input and feedback, and encourage participation in the project.

1. Establishing a model for contractual/partnering arrangements between the various stakeholders in small power producer and DG sector. The model should have a broad enough scope to allow it to be used across companies but specific to market and technology requirements in Sri Lanka. The contractual arrangements for the technologies below should be formulated to ensure the operation of plants through contractual obligations and enforcement mechanisms for service delivery and performance:
 - Mini-hydro
 - Biomass
 - Wind
 - Waste-to-Energy
 - Waste Heat Recovery

For each technology, the report should clearly outline:

- a) Identified risks during financing, construction, commissioning and operation,
- b) Risk mitigation measures for each risk,
- c) Diagram of contractual arrangement model as a whole.

The objective of this task is filling the gap between EPC contract and retail warranties, which may partially cover commissioning and operational risks that are lacking for current DG investments. As a tested case, the consultant should summarize the risk and mitigation measures taken for mini-hydro projects in the past, and then construct a new model of contractual agreements adapted to the changing risk profile of the sector, i.e. phasing out of the RERED program in 2011.

2. Template of legal documentation would be provided to implement and enforce each of the contractual arrangement models: The documentation to be considered include, but not limited to:
 - Power Purchase Agreement (contingent upon agreement with CEB, SEA & PUC)
 - Operating Contract
 - Construction Agreement
 - Right of water or land use
 - Long-term Servicing Contract
 - Fuel Supply Contract

If the PUC and CEB agree, the consultant may provide input into the formulation of the technology specific PPAs. If the consultant is to provide input to CEB and PUC, a holistic approach of taking the risk and its mitigation model into account in formulating the PPA should be followed. The consultant will contact CEB and PUC, with assistance from IFC, to negotiate their involvement in the process.

3. Mid-Term Report will be presented by the consultant in a Workshop to gain feedback from the local stakeholders: The models will be presented in the form of a mid-term report to be presented as one document folder to be reviewed by the workshop participants. The consultants are also required to make arrangements for a workshop at a location to be suggested and agreed with IFC. The consultants will be required to provide the material, and co-organize the workshop with consultants working on the technology study and training of participating banks.

The workshop will invite local banks, project developers, relevant government agencies and equipment manufacturers to;

- Provide training on the risks, mitigation methods and cost associated with each model as per output from Task 1 & 2,
- Gain feedback from stakeholders on these models,
- Introduce Sri Lanka as pilot project site for promotion of DG

The consultants will ensure that a record of all feedback and comments made by the participants will be recorded and made available in a report.

4. Final Report: The consultant will take into account the feedback gained above to his best possible ability and will prepare a final report on the contractual models and its documentations. The consultant is required to submit a comprehensive work on all scopes

work outlined in this TOR. The report would also require an executive summary. The consultant should submit five (5) hard copies and one (1) electronic copy to IFC for review. The report needs to be typed and in English, with appropriate translations provided for any non-English source of information.

Task 3: Market Study (Sri Lanka) – Cost: US\$23,075

The objective of this task is to conduct a market assessment of companies working in, or interested in working in, the RE sector in Sri Lanka. Co-implemented with Environmental Business Finance Program (EBFP), covering 50% of the cost, the market assessment will be used to help the project team:

- a) Identify the gap between financing needs and current FI offerings, within the context of current market conditions in this sector;
- b) Identify key target market segments where DG investments are most feasible, as well as profiling what these investments look like;
- c) Structure financial products accordingly; and
- d) Decide upon the most appropriate delivery mechanism and partner(s) for such investments.

Task 4: Pilot Project Development (Sri Lanka) – Estimated Cost: US\$300,000

Consultant will conduct a study to select the geography for the project and to match the consumer needs of the selected market with appropriate technology/ies. The consultant will be required to actively engage various stakeholders to obtain input and feedback, and encourage participation in the project. All information, reports or other outputs that result from this study will be the property of IFC, to be disseminated internally or externally as it deems appropriate.

The following tasks are identified as Consultant scope:

1. *Feasibility Study on the New Technologies* – A study to be conducted to identify the market constraints in Sri Lanka for applicable technologies under the new tariff regime – mini-hydro, biomass, wind, waste-to-energy, waste heat recovery. It is important to emphasize that in this context the technology in question is at a much more granular project level than in the context of a broader market study. For example, it is not sufficient to identify biomass as the most promising technology, but rather there would be reference to specific types (direct combustion, gasification, feedstock type, etc.), capacity sizes, O&M requirements, dispatch conditions etc. such that these technologies are a match with customer needs and capabilities of the country's entrepreneurs and resources. The assignment is to be Sri Lanka specific in providing guidance in assessment of the technologies applicable. For this assignment, the technologies will be assessed under the new tariff regime. Therefore, unless the circumstances change, the applicable technology here is assumed to be Mini-hydro, Biomass, Wind, Waste-To-Energy, and Waste Heat Recovery.

The task will include, but not be limited to, those identified below:

- a) Becoming familiar with the local geographic region,
- b) Understanding the rules and regulations that apply to power generation, transmission and distribution specific to this region,
- c) Establish a working relationship with IFC selected local developer/s to understand end user requirements, location for power project and other constraints,
- d) Investigate the applicability of fuels available in the local area for power generation including indigenous fuels, and renewable fuels as applicable,
- e) Identify the source and type of fuel considered for this project,
- f) Provide ranking and list of technologies according to their feasibility considering the constraints and availability of resources in Sri Lanka,

- g) Provide input and support to other consultants working on PADGO and to the workshop/ training to be arranged in Sri Lanka

Existing knowledge and experience from previous IFC/Global Environment Facility (GEF) initiatives should be utilized, as well as the RERED project of the World Bank.

2. *Study of issues on transmission grid capacity* – A study to be conducted to assess the limitations of existing transmission grid limitations in Sri Lanka, in the context of significant additions of small power generation capacities.

The task will include, but not be limited to, below;

- Identifying technical issues and bottlenecks in expanding the generation capacities due to limitations on transmission line and/or sub-station capacities;
 - Explore technical solutions to address the issue of limited transmission line capacity such as mini-grid concept or other power aggregation and dispatch concepts;
 - Make recommendations on implementing the above identified measures.
3. *Project Development Support* – Conduct technical studies based on submitted documents by the project developer and propose solutions that will ensure the sustainability of the project. The scope of the study includes, but is not limited to;
 - a) The consultant will interact with the participating banks of the PADGO project in Sri Lanka (to be determined) to obtain and assess the long-list of pipeline projects;
 - b) Short-list of pipeline projects, required assessment tasks and their TOR will be written up as initial report to be approved by IFC team,
 - c) The TOR may include:
 - examining various options with regard to the technology, fuel, end customer segment and grid connectivity,
 - Developing and assessing project economics based on all the technical and financing parameters impacting the project,
 - Interacting with the legal experts developing warranties and performance standards for manufacturers, agreements and contracts for developers/operators
 - d) The objective will be to assess the sustainability of the project by examining contractual agreements, fuel supply arrangements, institutional capacity, technical and operational expertise and governance of the sponsor,
 - e) In all their short-listed projects, the consultants should ensure that IFC's environmental and social performance standards, as well as PADGO project eligibility criteria (to be determined) are complied with,

Task 5: Market Study for Replication (Southeast Asia) – Estimated Cost: US\$650,000

The consultant will conduct a study on applicability of DG in Philippines, Thailand and Indonesia. The consultant will be required to actively engage various stakeholders to obtain input and feedback, and encourage participation in the project.

1. The consultant will conduct and create market assessment reports for Philippines, Thailand and Indonesia. The reports should include the following information, but is not limited to;
 - a) Understanding and summarizing the regulatory and tariff regimes that apply to power generation, transmission and distribution to the candidate countries,

- b) Establishing a working relationship with local developers to understand the end user requirements, location for power project and other constraints,
 - c) Investigating the applicability of fuels available in the local area for power generation including indigenous fuels, and renewable fuels as applicable,
 - d) Identifying the source and type of fuel considered for DG projects,
 - e) Gaining in-depth knowledge on the current energy distribution scenario and document technical constraints feeding power generated by DG into the system,
 - f) Proposing power aggregation and dispatch concepts that, when implemented, will improve the energy availability to the end user,
 - g) Documenting any improvements to the existing power infrastructure necessary,
 - h) Where possible, applying the lessons learned from the Sri Lanka project to improve project design and PADGO framework,
 - i) Provide proposal on how to formulate entry strategy to the DG sector for each of the countries.
2. The consultant will also interact with another consultant who will be organizing the dissemination workshop and provide inputs on the following, but not limited to;
- c) organization of the workshop,
 - d) invitee list,
 - e) present the results of the studies to the participants,

Component 3 – Capacity Building and Knowledge Management (US\$ 0.45 million)

Capacity Building – Estimated Cost: US\$300,000

Training will be provided to the participating FIs based on the technical and financial studies produced under Component 2. The objective of the training will be to train local FIs and/or project developers on;

- f) Technical details of DG technologies, mainly wind, biomass, waste-to-energy, waste heat recovery,
- g) Information and data literacy required to perform adequate due diligence on technical, operational and financial risk of DG projects,
- h) Assessment of technical, operational and financial risks of SPP and/or renewable energy projects.

The main tasks for this component is, but not limited to, below:

1. Organize the training session to be located in Sri Lanka for the FIs,
2. Be responsible for budgeting, arranging and procure for venue, logistics, equipment, transportation, guest speakers, meals, beverages, programs, dissemination materials, and other services/ goods required for the training,
3. Prepare and produce training material using consultant reports from Component 2,
4. Conduct the training session,
5. Submit the final report on the training session to IFC.

As part of the implementation arrangement to develop and deliver the required technical assistance, one local staff with appropriate sector background will be hired to;

- a) Implement capacity building program of PADGO project
- b) Supervise consultants based on overall requirement of the project,
- c) Plan, organize and implement the training/workshop,
- d) Support project/ sector development.

IFC Colombo office has agreed in principle to host. The staff will be supervised by SEDF based in IFC Colombo Office in Sri Lanka, who has the required expertise, experience and relationship with the FIs in Sri Lanka. The new staff cost will be funded under the GEF funds for the initial 3 years (US\$ 200,000). If the need continues after two years, the salary funding will also need to be discussed among interested parties (SEDF, SE, CGF). The budget table for the staff is provided in Annex 5.

Knowledge Management - Estimated Cost: US\$150,000

Dissemination Material and a workshop would be organized with the objectives to:

- c) Disseminate information and data obtained in the other components of PADGO project to promote DG technologies and projects,
- d) Bring various stakeholders such as project developers, financiers, technology providers, etc. to facilitate project development in DG projects in Sri Lanka.

The capacity building staff and SEDF staff with support from HQ and/or external consultant will be required to actively engage various stakeholders to obtain input and feedback, and encourage participation in the project. The scope of work is, but not limited to, below :

1. Organize a workshop to be held at a location in Sri Lanka to be agreed with IFC,
2. Be responsible for budgeting, arranging and procure for venue, logistics, equipment, transportation, guest speakers, meals, beverages, programs, dissemination materials, and other services/ goods required for the workshop,
3. Collaborate with consultants taking on assignments in Component 2 and produce a dissemination material for the workshop,
4. Submit a final report on the workshop to IFC.

Component 4 – Monitoring & Evaluation (US\$0.15 million)

Monitoring and Evaluation – Estimated Cost: US\$150,000

The auditing of the project accounts, as well as monitoring and evaluation of achievements of project objectives will be conducted at mid-term and end of the project.

Component 4 – Project Management (US\$0.02 million)

Project Management – Contribution by SEDF: \$ 20,000

South Asia Enterprise Development Fund (SEDF) is a multi-donor facility managed by the International Finance Corporation (IFC) in Colombo. They have committed to provide US\$ 20,000 of contribution as budget, as well as in-kind contribution by assigning a staff part-time and hosting the dedicated full-time capacity building implementation staff in their office.

Annex 4: Estimated Project Costs

(thousand US\$)

Components	IFC*	IFC**	GEF	Japan TF	SEDF	Other	TOTAL
Component 1:							20,000
Risk Participation Facility	17,000		3,000				20,000
Component 2:							1,762
Task 1 - Technology Performance Standard Report				350			350
Task 2 - Standard Contracts and Agreements						450	450
Task 3 - Market Study (Sri Lanka)		12					12
Task 4 - Pilot Project Development						300	300
Task 5 - Market Study for Replication (SE Asia)		250		400			650
Component 3:							450
Capacity Building			300				300
Knowledge Management			150				150
Component 4:							150
Monitoring & Evaluation			150				150
Component 5:							20
Project Management					20		20
TOTAL	17,000	262	3,600	750	20	750	22,382

* IFC funds used for second loss from Global Financial Markets Department - Subject to Change and for discussion only

** IFC Sustainability Business Innovator budget allocation

Annex 5: Implementation Arrangements

The program term for Phase 1 of the initiative is 84 months or 7 years from the date of GEF CEO Endorsement. During this period all three objectives of the program will be pursued and are expected to reach logical conclusions. In the seventh year, the team will focus on evaluation or possible extension, as well as putting in place lessons learned so as to exit successfully from the market.

Table 5.1: Indicative Implementation Schedule

Components	Start Date*	Completion Date*
Component 1:		
Risk Participation Facility**	Jan-08	Jul-14
Component 2:		
Task 1 - Technology Performance Standard Report	Nov-07	Apr-08
Task 2 - Standard Contracts and Agreements	Nov-07	Apr-08
Task 3 - Market Study (Sri Lanka)***	Feb-07	Aug-07
Task 4 - Pilot Project Development	Nov-07	Apr-08
Task 5 - Market Study for Replication (SE Asia)	Jan-08	Jun-08
Component 3:		
Capacity Building	Jan-08	Jun-08
Knowledge Management	Jan-08	Jun-08
TOTAL		

* Estimate

** Subject to due diligence by Global Financial Markets Dept. and negotiation with participating FIs

*** Completed

Program Term and Phase 2

This framework and the performance benchmarks being developed will inform Phase 2 of the initiative, which will focus on building transaction volumes for a diverse portfolio of different technologies, applications and perhaps even off-taker risks. We believe that once sufficient experience has been gained in the risk sharing product (with the mini-hydro portfolio) and one or more of the pilots have progressed sufficiently towards financing, it will be appropriate for the Task Manager to initiate activities towards Phase 2. This will be done only after an evaluation report on Phase 1 has been completed, as required under GEF policies. For this purpose, funds have been procured for market study for replication in Southeast Asia, namely in Philippines, Indonesia and Thailand. (see Annex 3 and 4)

Management of GEF Funds

As a member of the World Bank Group and an Executing Agency of GEF, IFC has the appropriate systems set up to deal with GEF funded projects in a host of countries. Funds for project implementation and for the risk sharing facility would be routed through the normal Trust Funds managed by the World Bank. In Sri Lanka this process is expected to be quite smooth since there is a history of GEF funded initiatives implemented by the World Bank Group.

GEF funds for TA and capacity building activities will be expended and are hence non-returnable. Therefore GEF exit strategy, in effect refers to the final disposition of the unexpended portion of GEF's US\$3 million of funds being used to guarantee non-payment in the risk

participation facility (GEF's "Risk Participation Funds"). At the end of the program life, the unused portion of GEF funds would be returned to GEF, per the prevailing rules.

Institutional Coordination and Support

There is significant history in the area of mini-hydro projects and PV for rural electrification within Sri Lanka. The Ministry of Power and Energy, the Ministry of Environment, as well as the Ceylon Energy Board (CEB) are important stakeholders for the RERED and ESD project implementation. We expect to continue close cooperation with them as PADGO is implemented. In addition, there are two relatively new parties within the Sri Lankan institutional set-up. These are the Public Utility Commission, which will increasingly be at the center of tariff regulation as CEB's operations are deregulated, and the Sustainable Energy Authority that is mandated with improving energy efficiency and introduction of new indigenous generation resources. Close coordination and contact with officials from these institutions will also be an essential part of PADGO implementation.

In addition, we expect to be coordinating closely with IBRD's environmental, regional and sector teams, as project implementation is undertaken.

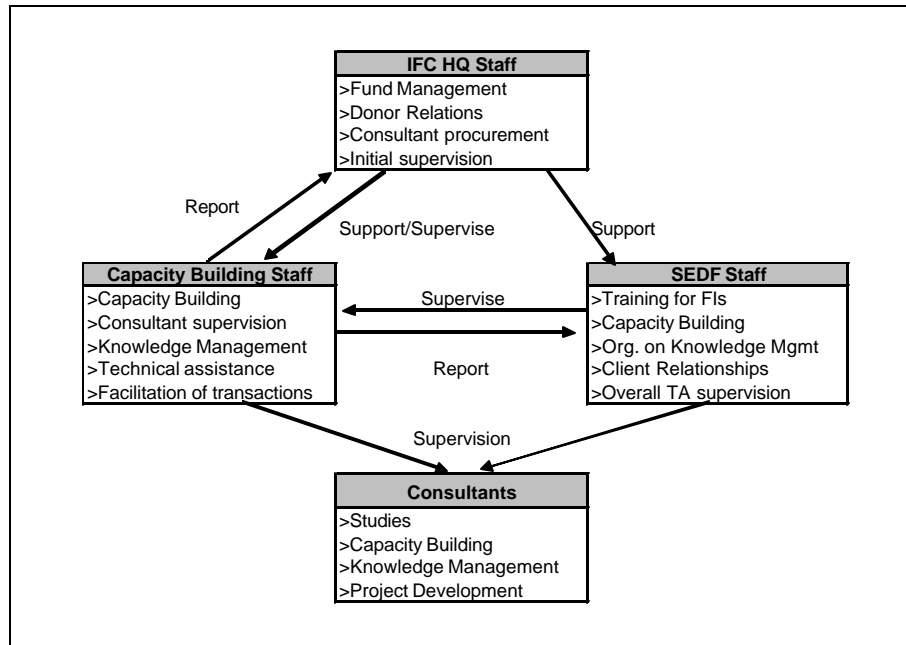
Implementation Arrangement

The Technical Assistance activities will be undertaken by consultants to be hired under procedures laid out in "AMS 15.07: Policies and Procedures for the Selection and Use of Consultants for Operational Purposes", which became effective April 1, 2004. All individual TA tasks in Component 2 and 3 will be tendered as separate consulting assignments. (see table 5.1)

The supervision of the consultants will be conducted by the Project Implementation Unit (PIU) that will consist of the IFC Staff in Washington DC, SEDF Colombo office staff, IFC staff stationed in Colombo office dedicated to the PADGO program. (see Table 5.2)

For preparation and early implementation stage, the Washington based staff will be providing majority of input as well as support on consultant selection, fund management and reporting through out the project period. During implementation however, the local staff in Colombo office and SEDF is expected to provide the majority of input and facilitate the project implementation locally. One new staff is expected to be hired locally under the project, which the Colombo office has agreed to host and support. The new staff will be funded under the project for initial two years (see Table 5.2), but contingent upon sector development and project replication, the staff may be supported further through other sources.

Table 5.2: Implementation Arrangement



- **HQ Staff** – Preparation, structuring and supervision of the project will be conducted by IFC staff in Washington DC Headquarters (HQ). The consultant procurement and fund management will also be implemented by HQ staff. Subsequent financial and project reporting to donors will also be handled from Washington DC.
- **South Asia Enterprise Development Fund (SEDF) Staff** – SEDF is a multi-donor facility managed by the International Finance Corporation (IFC) of the World Bank Group. Launched in 2002, the objective of SEDF is to reduce poverty through SME development in South Asia. SEDF in Sri Lanka will provide some (cash and in kind) contribution to the implementation of the project as well. SEDF staff based in Colombo will provide input on the following, in coordination with IFC HQ staff;
 - Supervision for Staff and Consultants
 - Relationship management with participating FIs
 - Organize and implement training for FIs
 - Support to organize workshop
- **Capacity Building Staff** – One staff with appropriate sector background will be hired locally to;
 - Implement capacity building programs under PADGO
 - Supervise consultants
 - Plan, organize and implement the training/workshop
 - Support project/ sector development

IFC Colombo office has agreed in principle to host. The new staff cost will be funded under the GEF funds for the initial 3 years. If the need continues after three years, the salary funding will also need to be discussed among interested parties (SEDF, SE, CGF). The expected budget requirement for the new staff is provided in Table 5.3.

Table 5.3: Budget for Capacity Building Staffing

Implementation Staff	Total Cost (US\$)
Salary Total (3 yrs)	122,438
Other Expenses	78,366
Total Cost	200,804
Training Program	Total Cost (US\$)
Event Expense (venue, food, invitations, etc)	65,000
Training Material (documents, devices, files, etc)	30,000
Miscellaneous	4,196
Total Expense	99,196
Component Total	300,000

Annex 6: Monitoring and Evaluation/Logical Framework

Monitoring and Evaluation

PADGO envisages detailed evaluation of impacts to establish its effectiveness in meeting its goals and objectives under Stage 1 of this initiative. The M&E program, which is to be managed by the executing agency (IFC), will consist of monitoring the program's outputs identified in the Logical framework in Annex B. In addition, the M&E plan anticipates an evaluation of the program's impacts, especially those directly related to the development of the risk sharing product and the capacity of the financial institutions to develop new projects in the area of distributed energy. The M&E plan will also evaluate the lessons learned from Phase 1 in order to inform Phase 2 of PADGO (Replication).

Activities and Data Gathered Under M&E

Generally, data from PADGO will be collected on the following:

- number of banks that interact with IFC on this program,
- the development of the risk sharing product,
- the number of training hours or TA sessions associated with the TA funds deployed in PADGO,
- the number of pilot projects initiatives,
- the GHG emissions avoided as a result of both the pilot projects and the deployment of the risk-sharing products, and
- the number of unique firms receiving capacity building as a result of the activities in this Program.

This data will be collected on an ongoing basis, and limited monitoring of this data will happen on a yearly basis. A mid-term and final review will be conducted in accordance with GEF procedures. In Phase 1 no baseline study will be needed since baseline emission data can be estimated from published CEB Statistics with respect to the installed generation mix. More details on this are provided in the Incremental Analysis/ Greenhouse Gas Reduction Analysis in Annex 7.

There will be a mid-term review in year 4 of Phase 1 of PADGO. This review will provide a comprehensive analysis of the Program's activities since inception and may be used to make adjustments to Stage 1 of the Program. An evaluation at the end of the project's life will be conducted by an independent consultant, and will look to evaluate the Program's success based on the stated objectives for the project. Information gathered at this stage will be similar to the information gathered at the mid-term review. The final evaluation will also look to track the Program's progress against the mid-term review and the recommendations made at that time. M&E is expected to cost about US\$150,000 for the mid-term review and final report of the project.

Project Management

SEDF has committed to provide US\$ 20,000 of contribution as budget for project management, as well as in-kind contribution by assigning a SEDF staff part-time and hosting the dedicated full-time capacity building implementation staff in their office. Providing input and collecting data from participating parties for M&E of this project will also be supported also by the capacity building staff in Sri Lanka. The budget for this staff is not included in the M&E budget indicated above.

Logical Framework

Objectives	Indicators	Data Sources	Assumptions
<p>Project Objectives Reduce CO2 emissions through displacing central fossil fuel based generation and to improve access to cleaner and more reliable source of energy for underserved population.</p>	<ul style="list-style-type: none"> ▪ Tons of GHG reductions attributable to projects financed under the project 	<ul style="list-style-type: none"> ▪ CEB statistics ▪ Data and Project Documents from Banks 	<ul style="list-style-type: none"> ▪ The current policy on displacing Diesel generation with coal and renewable energy will continue, ▪ The current interest in biomass, wind and other DG projects will continue, ▪ The banks will continue to be interested in this sector, ▪ No deterioration in CEB credit, ▪ No deterioration of security issues in Sri Lanka
<p>Component One Risk Participation Facility Increased lending capacity of participating banks to lend into the DG sector</p>	<ul style="list-style-type: none"> ▪ \$ amount of loan assets that the risk sharing product is covering 	<ul style="list-style-type: none"> ▪ Lending data and documentation from participating banks, ▪ Project developers getting financing, ▪ CEB statistics 	<ul style="list-style-type: none"> ▪ Current policy to diversify DG technologies will continue, ▪ The banks will continue to be interested in this sector, ▪ Sufficient volume of transactions will be generated
<p>Component Three Capacity Building for FIs FI's will expand and diversify the DG technology in their lending portfolio</p>	<ul style="list-style-type: none"> ▪ # of loans made to new DG projects 	<ul style="list-style-type: none"> ▪ Staff report, ▪ Survey of participants 	<ul style="list-style-type: none"> ▪ Dissemination of information will lead to increased interest in DG and Sri Lanka, ▪ Introduction of OEM and technology will lead to diversification of energy technologies ▪
<p>Knowledge Management TA/Training and workshop for local FI partners and dissemination of information on DG projects</p>	<ul style="list-style-type: none"> ▪ # of companies and entities that received information on DG 	<ul style="list-style-type: none"> ▪ Consultant Report, ▪ Survey to Participants 	<ul style="list-style-type: none"> ▪ By increasing the institutional capacity, the FIs will increase their lending to DG sector

Project Outcome Indicators	Baseline	Target Values							Data Collection and Reporting		
		YR1	YR2	YR3	YR4	YR5	YR6	YR7	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
Project Objectives Tons of GHG reductions attributable to projects financed under the project	0	-	-	-	Support capacity to displace 30,000ton /MWh emission	-	-	Support capacity to displace 72,000ton/ MWh emission	Mid-term, Final report	Bank report, Project Sponsor	Banks, IFC CES
Component 1: Risk Shairng Facility \$ amount of loan assets that the risk sharing product is covering (\$ million)	0	2.5 - 4	2.5 - 4.5	2.5 - 4.5	2 - 4	2.5 - 4.5	1.5 - 2	1.5 - 2	Annual	Bank reports, IFC	Banks, IFC CGF/CES
Component 3: Capacity Building # of loans made to new DG projects by participating FIs	0	+1 - 3	+1 - 3	+2 - 7	+1 - 4	+3 - 8	+2 - 8	+2 - 7	Annual	consultant reports, bank reports, survey	Banks, IFC CGF/CES, consultant
Knowledge Management # of companies and entities that received information on DG	0	10 - 20	10 - 20	10 - 20	5 - 10	5 - 10	5 - 10	5 - 10	Annual	consultant reports, survey	SEDF, consultant

Annex 7: Project Appraisal and Rationale

Economic/Financial Rationale

Renewable Energy Projects in Sri Lanka

The mini-hydro projects, in some cases even at the low US\$1 million, were shared among the 12 participating banks. These banks were active in this market and therefore have diversified portfolio of 12 – 15 projects with total amount of US\$15 – 25 million each. According to the discussion with commercial banks, the performance of the Mini-hydro projects has been very strong, thus providing them with good returns.

The government recently established new feed-in tariffs based on the RE technology, the tariffs will be paid for 15 years, however, the rates are decreased significantly after 6 years. Obviously, the high initial tariff for the years 1-6 is designed finance constructions costs. (see Table 1.5 in Annex 1) The new tariff for Mini-Hydro remains attractive while tariffs for wind and biomass are expected to attract interest from investors.

Risk Sharing Facility

Based on the strong cash flows, loans are usually repaid within 5 years of operation, i.e. loan tenors are typically around 7 years. The banks typically charge risk margins of approximately 4% p.a. for financing SHP projects. As banks calculate that about 50% of their interest margin is taxed, the banks' margin is around 2% p.a. This factor makes interventions through RSF not only attractive to the FIs, but an effective product to free up their lending capacity to the sector.

Participating Banks

Detailed financial analysis of the participating banks will be conducted, once IFC has signed a mandate letter with candidate bank for the Risk Sharing product portion of the project.

Here, corporate and financial summary of the banks that have shown interest as per their support letter (see Annex 9) are provided for reference;

Commercial Bank of Ceylon

CBC was established in 1969, with Standard Chartered Bank holding a 40% stake in CBC until its exit in 1997. CBC has a relatively wide, fully linked network of 144 branches and customer service points and over 250 ATMs. In 2003, CBC started operations in Bangladesh by acquiring the business of Credit Agricole. The Bank has a rating of AA+(local) from Fitch Ratings, for its implied long term unsecured debt (reaffirmed on 26 Jan, 2007).

Key shareholders of the Bank, apart from IFC which holds a 15% stake, include Development Finance Corporation of Ceylon (DFCC), 29.8%; Sri Lanka Insurance Corporation (SLIC) 9.9% and the Al Mashal Group (AIG) of Saudi Arabia which has taken a 5% stake. IFC's investment in CBC was made in March 2003 at a cost of US\$12.85 mn. In May 2007, IFC made an additional investment of US\$7.4 million in a capital increase to maintain its 15% stake. IFC is also actively involved in the investment by providing Advisory services to the Bank. CBC is among the best performing private sector banks in Sri Lanka and IFC has supported the management in improving its position in the market.

Sampath Bank

Sampath Bank Limited is the sixth largest Licensed Commercial Bank (LCB) among 22 private and public, domestic and foreign banks, and has about 6% market shares of the total banking market. It was set up in 1987, and trades actively on the Colombo stock exchange. The Bank is not associated with any sponsor groups or families. The Bank's network comprised of 85 on-line branches and 96 ATMs across the country, supplemented by other delivery channels such as tele-banking and internet banking. It has a plan to expand its branch network to about 100 by the end of this year. As at the end of 2005, the Bank has acquired 700,000 corporate and individual accounts, with a loan portfolio of LKR 56 bln (US\$510 mln) and total assets of LKR 88 bln (US\$790 mln). About 65% of the portfolio is consumer finance, SMEs and trade. It has 24% stake in another small bank, Union Bank of Colombo, 31% stake in a merchant bank, LankaBangla Finance, in Bangladesh, 15% stake in Asian Alliance, a small insurance company. Sampath is known for being IT savvy and pioneered the use of technology as a leading edge in competing with other banks. It is well-recognized by the expatriates living and working in the GCC region through its E-Remittance schemes. The Bank's rating has recently been upgraded from "A+" to "AA-," the second highest rating assigned to the commercial banks by FitchRatings, a resident rating agency currently partially owned by IFC.

Fiduciary

Procurement

The project and all procurement will be conducted by the PIU consisting of IFC staff. The IFC staff in Washington will be responsible for all procurement. It will be carried out in the manner that is consistent with WBG/IFC procurement guidelines and procedures.

Financial Management

Financial management and reporting will be the responsibility of the PIU, with support from Resource Management Team in IFC. IFC has experience in managing GEF funds and familiar with the requirements and procedures of GEF. Therefore, no issues are foreseen in the financial management.

Safeguard Policy

This project has been classified as a Category FI project according to IFC's Environmental and Social Review Procedure.

During appraisal for Risk Sharing Facility portion by Global Financial Markets Department after signing of the mandate letter with the FIs, IFC will further analyze the participating banks' portfolios and the activities proposed to be supported with IFC financing for types of transactions, size, tenor and industry sectors and determine the Applicable Performance Requirements, if any, that would include a combination of:

- The IFC FI Exclusion List and/or
- The applicable Sri Lankan social and environmental Laws and regulations and/or
- The IFC Performance Standards

IFC will also review, if required, the capacity of the participating banks to manage social and environmental risks and to establish and maintain a Social & Environmental Management System (SEMS). If required, IFC will suggest Supplemental Actions to address any gaps in each participating bank's SEMS.

Based on the review, the participating banks will be required to:

- Develop an, or upgrade, if necessary, any existing SEMS, prior to disbursement to the satisfaction of IFC
- Identify responsible, qualified persons to manage and implement the SEMS
- Commit to implement the SEMS, to ensure that the investments/activities supported by IFC financing are in compliance with the Applicable Performance Requirements
- Submit a periodic report to IFC as per a format to be provided by IFC

Annex 8: Incremental Cost/ Greenhouse Gas Reduction Analysis

Baseline Scenario

The Baseline Scenario used in the analysis will be that a) the supplemental financing of US\$40 million to the RERED project will not be enough to entirely displace 618 MW of thermal power generation using diesel¹⁹, b) any additional capacity will be used to displace diesel which has high marginal generation cost due to high fuel prices and will be increasingly used as marginal peaking load.

Under this scenario, the assumptions used to estimate the CO2 emissions from diesel generation capacities are as follows;

Table 8.1: Assumptions on Emissions from Diesel Power Plant

DIESEL	
Capacity	30 MW
Capacity Factor:	80%
Electricity generated:	210,240 MWh
Plant Life:	20 yrs
Emissions Factor:*	650.000 kg/ MWh
Annual CO2 Emission:	136,656 tons
CO2 Emission over Plant Life:	2,733,120 tons

***Technical and Economic Assessment: Off-grid, Mini-Grid and Grid Electrification Technologies", The World Bank, November 2005

Assumptions on Incremental Cost and Greenhouse Gas (GHG) reduction

The Assumptions used in the incremental cost and GHG reduction analysis will be based will be as follows;

1) *Displaced Generation Capacities* - "Ten Year Horizon Development Framework from 2006 to 2016" (TYDF) proposed by the Government of Sri Lanka (GoSL) in November 2006, as described in Annex 1. Indicates the electricity generation targets as below;

Table 8. 2: % of Generation projection by fuel type – TYDF

	Hydro	Oil	Coal	NCRE*
Present - 2006	37.7%	58.2%	0.0%	4.1%
Interim - 2011	21.4%	3.3%	65.2%	10.0%
Target - 2016	19.9%	2.2%	67.3%	10.7%

* NCRE - Non-Conventional Renewable Energy

Source: Market assessment of Distributed Generation in Sri Lanka, DFCC Consulting

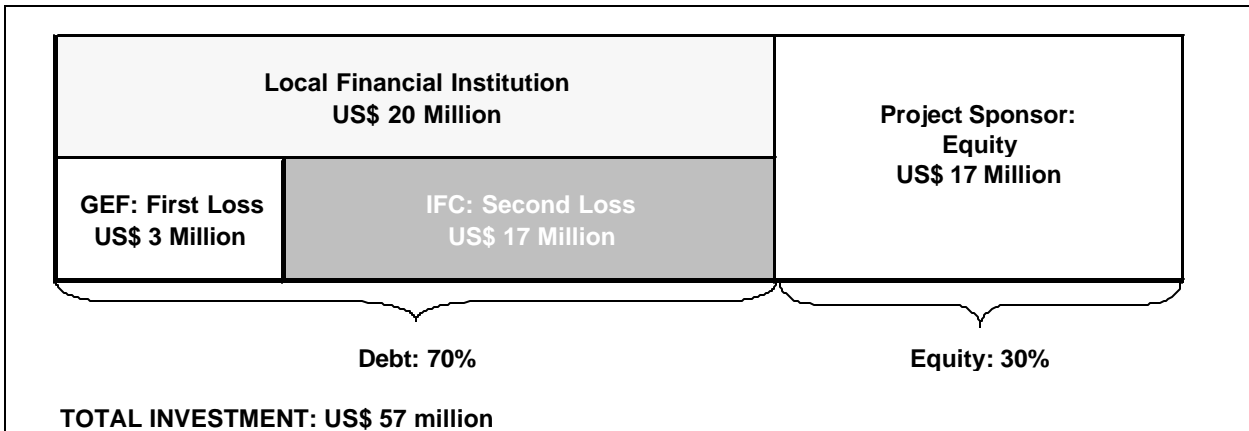
The table indicates that Renewable energy will indeed contribute to the decrease in generation using Diesel Oil, but that the base-load generation by coal will not be displaced by the new investments in NCRE. Therefore, the assumption will be that the investments under PADGO framework will be displacing Diesel Oil generation.

¹⁹ CEB owned thermal power plant capacity (Ceylon Electricity Board Annual Report 2005)

2) *Investment Amount promoted under PADGO risk sharing product*– Below are the assumptions used to estimate the investments that would be encouraged by risk sharing product under the PADGO framework (see Table 7.2);

- GEF 1st loss coverage: US\$3 million
- IFC 2nd loss coverage: US\$17 million
- Portfolio Risk Coverage ratio: 50/50
- Debt-Equity Ratio of projects: 70/30
- Total Investment Amount under PADGO: US\$57 million

Table 8. 3: Investment Amount under PADGO



*IFC Second Loss – only for discussion purpose; subject to change

Investments Implemented under PADGO

As new investments, it is assumed that projects in mini-hydro, wind and biomass are going to be implemented. This is consistent with a) the new tariff regime, b) interview that we had with banks and project developers, c) government policy on promotion of these technologies.

Under this assumption, from the investment amount from the previous section, we are expecting \$ 86 million of investments to be made in the NCRE projects. Using the capital costs and load factor estimates, the assumption was made that 10 MW of Wind, 4 MW of Biomass, 15 MW of mini-hydro electricity generating capacities can be financed. The total installed capacity to be financed will total 29MW. (See Table 7.3)

The Biomass used in this calculation is direct combustion plant, using only wood or wood based agri-waste without additives or accelerants. The wood or wood based material also must come from forests that are sustainably reforested, as we have assumed carbon neutrality (i.e. CO2 emission factor as zero) for Biomass.

Table 8. 4: Expected Investments under PADGO Project

WIND	
# of plants to be financed:	1
capacity per plant:	10 MW
Capital Cost per plant:	14,000 000 \$
Total Capacity:	10 MW
Total Investment to Wind:	14 million \$
Capacity Factor:	30%
Annual electricity generation:	26,280 M W h
Plant Life:	20 yrs
BIOMASS (wood, wood based agri waste)*	
Capital Cost	2,150 \$/KW
Capacity to be Financed	4 MW
Total Project Cost	9 million \$
Capacity Factor:	75%
Annual electricity generation:	26,280 M W h
Plant Life:	20 yrs
MINIHYDRO	
Capital Cost	2,300 \$/KW
Capacity to be Financed	15 MW
Total Project Cost	35 million \$
Capacity Factor	45%
Annual electricity generation:	59,130 M W h
Plant Life:	30 yrs
Total Investments:	
	57 million \$
Total Installed Capacity:	
	29 MW
Total Annual Electricity Generated:	
	111,690 M W h
Total Electricity Generated over life of plant:	
	2,825,100 M W h

* Assumed to use no additives or accelerants and is sustainably reforested
Source: "Technical and Economic Assessment: Off-grid, Mini-Grid and Grid Electrification Technologies", The World Bank, November 2005

GHG Reduction Calculation

Based on the above assumptions, the avoided GHG reduction is calculated as below. There are key assumptions made in the calculations;

- GEF project cost of US\$3.6 million,
- Emission Factor of 650 kg of CO₂/ MWh
- Diesel Plant life of 20 yrs

Table 8.5: Avoided GHG Emissions Calculation

Displaced Electricity Generation	
Annual	111,690 MWh
Plant Life	2,825,100 MWh
Displaced Diesel Capacity	
Load Factor	80%
Displaced Capacity	15.9 MW
Avoided Emissions Calculation	
Emissions Factor:*	650.000 kg/ MWh
Avoided Emissions (Annual)	72,599 ton
Avoided Emissions (Plant Life)	1,836,315 ton
GEF Leverage	
Plant Life	1.96 \$/ton

*"Technical and Economic Assessment: Off-grid, Mini-Grid and Grid Electrification Technologies", The World Bank, November 2005

Incremental Cost on Component 3

Component 3, which comprises of capacity building and knowledge management, has been allocated US\$450,000. The component aims to provide information and training that was not previously available in Sri Lanka. The component objective is;

1. Disseminate the information and knowledge that were acquired through the TA studies,
2. Promote diversity of DG technologies,
3. Provide venue to showcase technologies and potential projects,
4. Provide venue to introduce the investment opportunities for investors and financiers,
5. Provide training to the participating FIs on assessment of DG projects using new technologies,

Annex 9: Responses to STAP Report/ Comments

RESPONSES TO GEF SECRETARIAT COMMENTS

Please find below responses to the comments from the GEF Secretariat relating to the PADGO Project Document (GEF Comments dated April 12, 2006). The responses refer in serial order to comments titled “AT WP INCLUSION” in the GEF Secretariat document. Comments titled “AT PIPELINE INCLUSION” have been answered only where a fresh reference was made to them at WP inclusion stage. Before delving into the detailed responses, we have a few comments by way of an overview.

The IFC team has worked very hard to address the Secretariat’s comments from the Pipeline Entry stage in preparation for the work program entry inclusion. The proposed approach and project design evolved from a very intense and thorough due diligence exercise in Sri Lanka, India and the US. We met with the most important stakeholders in Sri Lanka and also had significant discussions at GE’s research facilities in Bangalore prior to making this latest submission. At each stage in this process we had strong support from local and international stakeholders and were impressed with the level of professionalism displayed by the different parties in Sri Lanka. We also extensively discussed the technical and design issues of the proposal with the STAP Reviewer – Dr. Eric Larson and have his sign-off (his queries, our responses, and his final endorsement are all a part of the submission).

Post the team’s visit to the country, we are convinced that that Sri Lanka is the right geography for the first phase of the Distributed Generation initiative, and the support letters and endorsements we have attached (a total of 7 letters including the endorsement) are an indication of the level of interest our proposal has generated. We were therefore surprised by comments about the appropriateness of Sri Lanka for the project and particularly the issue of market size, which we believe had already been discussed and resolved with the GEF Secretariat at Pipeline Entry stage, prior to IFC undertaking the intensive exercise required to prepare the current document. The concept approval did not indicate the need for further justification of the country selected – an issue fundamental for us to proceed with further development of the project. Moreover, the project also indicates explicit plans to expand the market within the region, building on the Sri Lanka experience (much as fast food restaurants regularly try out new products in smaller markets before entering larger ones).

We remain eager to work closely with the GEF team to understand and respond to your concerns. Your questions and our detailed responses are provided below.

1) AT WP INCLUSION: Sri Lankan banks and the public utility commission seem to be interested and engaged in the scheme. The support from the utility seems to be weak to non-existent. Their support has been lacking in past projects which has led to problems in them. Please comment.

The endorsement from GEF Focal Point (the Ministry of Environment and Forests – MOE&F) in Sri Lanka should largely address the concern with respect to utility support. The Focal Point letter from MOE&F has attached to it a letter from Ministry of Power and Energy (MOP&E)

(duly signed by the Secretary, MOP&E, Mr. M.M.C. Ferdinando) endorsing the Project. CEB is governed by MOP&E and prior to issuing such a letter, MOP&E holds consultations with appropriate officials including CEB officials. Hence an endorsement by the MOP&E is of higher political order within the Sri Lanka government and is de facto an indicator of CEB support. Additionally, as you have already noted, we have a support letter from the Director General of the Public Utility Commission (PUC) of Sri Lanka, Dr. Priyantha Wijayatunga. The PUC is the key body in Sri Lanka that will be determining power tariffs, dispatch, and transmission and distribution rates in the future. The Director General's letter strongly endorses all three stated objectives of our initiative. Finally, while CEB has been the source of some issues with past renewable energy projects, it should be emphasized that these concerns were successfully addressed as the projects were successful (ESD and RERED) – a key factor in the selection of Sri Lanka.

2) AT WP INCLUSION: The project supports barrier removal both for renewable and fossil technologies. As mentioned earlier, at this stage the project needs to define how efficient the fossil technologies need to be in order to receive support under the project. It is suggested to define e.g. 400 g CO₂ / kWh as the cutoff.

Further, please take note that biomass projects supported by the GEF should restrict themselves to waste biomass, or sustainably produced biomass.

We note and agree that the biomass projects that would be eligible for support under this initiative would restrict themselves to waste biomass or sustainably produced biomass as suggested by you. With respect to the suggested benchmark of 400 g CO₂ / kWh or some other cut off for support under the initiative, we take your suggestion under advisement and would work with the various stakeholders to come up with appropriate cut off benchmarks consistent with the characteristics of the technology.

3) AT PIPELINE INCLUSION: In order to determine the potential of the approach for Sri Lanka, market assessment studies need to demonstrate that the market in terms of demand and supply for the targeted technologies is large enough to warrant the approach.

Further, for WP inclusion the project brief needs to comply to the prerequisites as defined in the "General Recommendations" section.

AT WP INCLUSION: On the points raised above, see sections "replicability" and "response to review".

- Buy-in from CEB: A lack of buy-in from CEB has significantly slowed down progress on ESD and RERED. This project runs the same risk. Please provide proof of CEB buy-in.
- Risk-sharing arrangements: It seems that the main risks are the risks of drought and the off-take risks. In the case of Sri Lanka, with CEB as the single off-taker, the off-take risk has to be seen as a purely political risk, IFC and the WBG are in a much better position to influence it than the GEF. Along these lines, as well as along the lines of the distribution between global and local benefits, it would be more than appropriate if IFC shared the first-loss risk with the GEF. Further, it is not evident why the IFC contribution needs to be "capped" at 9 mUSD, please explain.

Lastly, as you know there is always discomfort if GEF takes risk off IFC, which is what is suggested here. Even without the considerations above, it would be much more palatable to the GEF if IFC could share the first-loss risk with GEF, and/or if another partner from the private sector could be found to cooperate in the secondary loan market.

-Envisioned link with Carbon Finance?

Detailed comments:

-take the M&E budget out of component 2 and put it either in component 3, or a separate component.

-Why is the threshold for DG set at 50 MW? The only DG technology that can be so big are combustion turbines, which are not very innovative. It is recommended to set the threshold at 10MW which is a typical threshold for mini-hydro (outside of the WB system, even for "small hydro")

-The ICA assumes that the current Diesel generation is more efficient than it probably is. IEA statistics put it at 744 g/kWh.

-For the CO2 assessment for component 2, it is recommended to use the least efficient technology that might be supported under the project. This means you should use the efficiency cut-off that you are asked to define for eligibility purposes (e.g. 400 g CO2/kWh)

-Resource information for biomass and wind should be available from RERED. Wind maps are available from SWERA.

We agree with your comment regarding the need for assessment studies to demonstrate market demand and supply for targeted technologies. The same issue was raised by the STAP Reviewer, and duly addressed by including in the work plan provisions for such studies. Please note that under objective 2 listed on page 11 of the Project Executive Summary, we have budgeted market assessment under line item 2. This activity will involve proving demand and supply characteristics for targeted technologies. With respect to “replicability” and “response to review” we will address these in the appropriate sections.

Responses to “additional big issues.”

Our responses are provided in serial order below:

- Incrementality: One expectation of the project is expectation of significant local benefits from the large scale adoption of clean distributed generation options in Sri Lanka. This is a source of country-drivenness and provides an additional rationale for replication. The analysis of incremental costs was done consistent with our understanding of consistent GEF practice in preparation of renewable energy projects, and recognizes all quantifiable benefits in the calculation of the net costs attributable to *global* environmental benefits attributable to the project.

We also point out that GEF is not being asked to pay for all the incremental costs of the alternative scenario under the PADGO proposal. To the contrary, all of the stakeholders –

including customers, equipment providers, developers, local banks, and service companies - would all have to shoulder some of the costs from the introduction of the alternate scenario. As an example, the off take price for power from biomass based RE projects is expected to be SLRs. 8.5/kWh, which is 42% higher than the current off take for mini-hydro projects at approximately SLRs. 6/kWh. The higher cost is deemed an appropriate charge for off-taker/consumers by the government, and this margin is therefore not being passed on to GEF. As an attachment to this response we have separately provided GEF with a simple calculation based on capital cost increments as a rough indication of the total incremental cost for the alternate scenario. The GEF funding of US\$4 million represents between 6.8% and 8% of this, the rest to be paid by other stakeholders.

- Buy-in from CEB: Please note our previous response to the same query
- Risk-sharing arrangements and appropriateness of inclusion of CEB risks: This is a misinterpretation of the illustration of the risk-sharing product provided on page 20 of the GEF Project Document. This was intended solely as an illustration – there is no cap. The actual risk-sharing product will be developed as a result of detailed discussions between the different stakeholders including the banks and IFC. We do agree with your concern with respect to GEF being the sole first loss taker, and will revise the document to make clear that this objective will be addressed when designing the risk-sharing product.
- Envisioned link with Carbon Finance?: We were uncertain whether you were simply making a suggestion or expressing a concern about avoiding the use of GEF funds to subsidize carbon finance in a manner contrary to GEF policy. We will revise the Project Document to make clear the need to be consistent with this GEF policy – please clarify if more than this is required.
- Detailed comments: We will comply with putting the M&E budget where the Secretariat deems appropriate.
- Why is the threshold for DG set at 50 MW: We expect that a majority of the projects will fall in the less than 10 MW category. In addition to combustion turbines you can also have wind farms which can go all the way to 100 MW and beyond. Sri Lanka has significant wind potential and very little of it has currently been exploited. That is one reason for including a threshold of 50 MW.
- The ICA assumes that the current Diesel generation is more efficient than it probably is as IEA ratings show it at 744 g/kWh: The set of numbers included in our proposal were the result of discussions with the STAP Reviewer. While these may not agree with the IEA figures (we do not know the year you are quoting), we believe that our numbers present a conservative picture with respect to GHG emissions. We are happy to discuss and modify further based on more specific references and supporting materials.
- CO2 assessment for component 2: Please note our comments with respect to a cut off benchmark in our earlier response.

- Resource information for biomass and wind: Thank you for the information, which we take into account as we develop more detailed technology specific plans.

4) AT PIPELINE ENTRY: In order to make the approach sustainable in Sri Lanka, it is necessary that the market is large enough for interest to be sustained. I.e. participating manufacturers need to be sufficiently motivated by future sales prospects to set up long-term business establishments and relationships. This should be demonstrated by WP inclusion through statements from the prospective participants that the number of transactions that they expect through the project will be sufficient to incentivize them for a long-term engagement in the market, with the corresponding delivery of maintenance services, warranties etc.

Furthermore, a mechanism for the sustained strengthening ("ratcheting up") of the environmental standards should be proposed.

AT WP INCLUSION: neither of the requirements from pipeline entry have been satisfied in the project brief.

We believe that the comments from pipeline entry have been addressed in our most recent submission. In an initial demonstration phase, a geography like Sri Lanka is ideally suited since it has the right enabling environment, a relatively open economy to imports, and local experience with setting up, servicing and financing mini-hydro projects. Hence the country has several of the key pre-requisites for private sector companies to service the market. Indeed, it was in keeping with GEF's previous comments that we settled on the choice of Sri Lanka as a target country for the demonstration. You will also note that we have mentioned the close trade links between Sri Lanka and neighboring countries as a key consideration, so that the "market" may be viewed in a regional rather than national basis. Additionally, please note that local small project developers, banks and even government agencies have enthusiastically supported our efforts in the country, and have worked with us to make this submission possible in a very short turnaround time. GE has also provided a letter of support for the project indicating its interest in participating in the market in Sri Lanka based on their independent assessment of the commercial prospects and its role in the regional market.

Regarding the "ratcheting up" mechanism, we acknowledge that such ratcheting up of standards will be built into the framework and that over time, the benchmark for GHG emissions will be made increasingly stringent. Without final choice of technologies and projects, proposing a formula for ratcheting of GHG emissions would be premature. We agree however, that ratcheting up of the standards should be clearly noted in the Project Document as a key element of our framework approach.

5) AT WP INCLUSION:

1: While the replicability section contains some good thinking, it would be important to better explain how the "master agreements" can lead to more lending - in particular as the limiting factor for lending currently seems to be the willingness of the banks to expose themselves to CEB, rather than to go into new technologies.

As mentioned previously, the perceived risks by banks need to be understood in detail before we can conclude with a level of certainty how to structure the “master agreements” and the risk sharing product. The basic premise, however, is to provide risk amelioration whether that is in the form of new technologies, credit risk of CEB, or simply reaching a sector exposure cap. We will be happy to provide additional clarifications and details.

2: It seems that a major replication strategy is to find buyers other than IFC to enter the secondary loan market. However, none of these potential banks are currently involved in the scheme, even though IFC seems to want to limit its exposure to 9 mUSD. Please include other financial sector players in the project.

Please note that the example provided in the Project Document is only for illustrative purposes (as mentioned earlier). You are correct that the institutions (and they may not necessarily be banks) who are to be involved in the guarantee of risks are not currently included in the proposal. This has been done after significant consideration being given to this issue. In discussions within IFC we determined that significant volume needs to be achieved before it would be pertinent to involve such players in the discussion. As a first step therefore, we are looking at a Risk Sharing product that will form the blueprint for discussions with such institutions. Please also note the language in the letter of support from the Commercial Bank of Ceylon. The letter clearly points to a phased approach of moving from a risk sharing products to a later stage where securitization may be possible. This phased approach is necessary to prove the concept before it can be scaled up. We are happy to engage in further discussions on this as you deem appropriate, so that our approach can be better understood.

3: The word "exit strategy" also implies that there will be a sustainable situation after the project without any further GEF support, i.e. even if GEF support for a second phase does not materialize, the market should have been promoted, and be able to develop further. Please include this in the discussion.

We will be happy to include language that describes our approach at the end of this phase. Please note however, that we are seeking GEF commitment only for Phase 1, and the proposal has been designed keeping that in mind.

6) AT PIPELINE ENTRY: Further collaboration with the local stakeholders should lead to a clearer focus with respect to the target market (consumer groups, technologies / application packages).

Letters of interest should be obtained from a sufficient number of systems suppliers and financial intermediaries. For more details on what can be considered "sufficient" please refer to the project design, sustainability and general comments sections of this review sheet.

AT WP INCLUSION: The document provides an excellent discussion of all the relevant stakeholders, and significant consultations have already taken place, and led to a number of LOIs.

However, it seems that an important stakeholder, the utility CEB as the sole off taker of the generated power, has been underconsulted in project preparation. As their buy-in is crucial, proof of their commitment should be provided ASAP.

Further, only one financial intermediary, and General Electric have supplied LOIs. This seems insufficient to demonstrate a sufficient market size and sufficiently competitive conditions.

Please note the endorsement letter from MOP&E attached to our endorsement letter from GEF Focal Point. MOP&E is the governing Ministry for CEB. Additionally please also note the more detailed response to the same question earlier in the document.

With respect to obtaining more LOIs, we respectfully submit that our current proposal already has 7 letters of support from representatives of all significant stakeholders – banks, project developers, manufacturers and suppliers, and even from the Director of the PUC. We did not elicit more letters since we assumed it was overkill at this stage of the project (and beyond what we have seen in other GEF projects). We can secure additional letters from equipment suppliers and banks prior to GEF CEO endorsement.

7) AT PIPELINE INCLUSION: rough description of M&E plan incl some indicators and targets

. AT WP INCLUSION:

- please clarify: the M&E section describes that the full M&E budget of 150 k will be used for MTR and TR, but the line budget also specifies awareness raising activities and outreach?

- please include an indicator that measures energy generation and energy savings in the RBM

- identify targets in the RBM (see new M&E policy)

- include a reference to the annual reporting in the PIR in the M&E framework

- please note that phase II can only be taken into considerations when an evaluation of phase I has been provided. Currently, the plan is to submit phase II after 3 years, but conduct an MTR only after 4 years. That's inconsistent with GEF procedures (but of course we appreciate if phase II can be done without GEF support)

- please also correct the responsibilities for monitoring on page 37 (they lie fully with IFC)

- M&E Section: The M&E budget of US\$150k will be used for the mid-term review and the terminal report. Certain line item expenses such as awareness raising activities are required in order to improve uptake of the DG concept in the local market and are essential for increasing market penetration.

- Request for the full form of RBM as part of the M&E plan. We are open to this but would like to address these in discussion to be sure that we completely understand what is being requested.

- We appreciate the point regarding Phase 2 submission being possible only after Phase 1 evaluation. However between submission and actual funding there is often a time lag of over a

year that we were seeking to avoid. With this in mind we had proposed specific targets which would need to be met before we submit a plan for Phase 2 funding. We are open to a discussion and modifications in line with GEF policies.

- We acknowledge that the responsibilities for monitoring lie exclusively with IFC and will include that in our revised submission.

8) AT PIPELINE ENTRY: please clarify financial contribution or expected size of engagement by IFC please clarify "other donor"

AT WP INCLUSION: proposed financing: GEF 4 m IFC (loan) 8 m local banks (loans) 8 m local operators (equity) 8m anonymous donor (grant) 50k

The cofinancing and how it is applied is not linked to the distribution of local vs. global benefits (see project design section)

The direct impact on capacity additions and availability of finance seems rather limited, i.e. we are potentially looking at a solution too big for the problem, and ensuing low cost-effectiveness. This was already discussed at pipeline entry, when the question of the market size has been raised. A solution could be to decrease the GEF contribution, which would also increase the chances that the project could potentially be funded in this work program.

It is unclear why the IFC contribution needs to be "capped". (page 20)

Issues of Co-financing, Local vs. Global Benefits, Market Size and IFC "risk cap": These have been addressed in previous responses and we are open to a further discussion before or at the bilateral. Please note, however, that we have already significantly reduced our funding request to GEF since the earlier submission, and further reductions would call into question the feasibility of undertaking the project.

9) AT PIPELINE ENTRY: The response to comments at the pipeline entry stage state that there is interest in IFC to invest in this project. This interest should be indicated in the WP submission in a stronger fashion, for example with a cofinancing target that is to be achieved during project implementation.

AT WP INCLUSION: The interest of (mainstream) IFC seems limited to very good business opportunity with little to no risk, and GEF-subsidized income to IFC. It is however appreciated that IFC is willing to indicate this interest with a LOI at this stage.

We note your comment with respect to IFC's interest in good business opportunities, and would respectfully submit that even the best business opportunities come with risks. Furthermore, IFC "mainstream" participation is something that GEF has called for in the past, and we are therefore happy to acknowledge the positive element in your comment regarding the LOI at this stage.

10) Expected at Work Program inclusion: the following aspects of previous reviews have not been responded to:

- **demonstration of market size for hydro is not convincing.**
- **market assessment for all other technologies has been put off into the project implementation. That is not in line with GEF policies and procedures.**

Responses to Previous Reviews:

- **Demonstration of market Size for Hydro:** We are happy to provide additional details on the hydro market size. We went through these numbers in a great level of detail with the STAP reviewer prior to including these in the Project Document. The figures we used were obtained from CEB Statistics as well as from discussions with DFCC Bank that administers the RERED project. We believe the numbers are as sound as can be at this stage. We did obtain STAP sign-off on the market projections, and will be happy to walk through the details with you.
- **Market assessment of other technologies** has been put off to a later stage precisely because the level of data that we can get currently will not be sufficient. For mini- hydro projects we have a built base of 80 MW and hence a certain level of confidence in the projections. For biomass, in contrast, Sri Lanka has a sum total of 1.3 MW with very little operating history. For wind projects the corresponding figure is 1 MW. Hence, for these “new-to-Sri Lanka” technologies we will need to conduct a much more detailed analysis of the market, and this correctly belongs in project implementation.

11) AT WP SUBMISSION: please note that there is no commitment from GEF to support any follow-up phases

We acknowledge and clarify that our current submission is seeking funding only for Phase 1. We also note that GEF through its support of Phase 1, is not committing itself to supporting the follow-on phase.

12) FINAL WP INCLUSION RESPONSES: AT WP INCLUSION: Currently, the project cannot be recommended for WP inclusion.

Reasons:

- **big issues raised in project design section**
 - **uncertainties over market size and cost-effectiveness**
 - **related: lack of reasonable cost sharing**
 - **lack of commitment by key stakeholder CEB**
- *Project Design Issues:* We have addressed in our response the project design issues highlighted, and will be happy to have further discussions of the same. Also, please note the broad points made in the preface to our detailed responses.
- *Market Size and Cost Effectiveness:* The market size targeted in Phase 1 has been clearly outlined in the Project Document and on a dollar per ton of CO₂ alleviated we believe our numbers are comparable and perhaps even better than many recently approved GEF projects.
- *Lack of Reasonable Cost Sharing:* We will need a better understanding of what “reasonable

cost sharing” in this context means before we can respond. If this refers to the illustrative risk sharing product described in the Project Document, please understand that this was meant only for illustrative purposes, and the document clearly states the same.

- The issue of CEB sign-off is effectively addressed in the earlier responses. Please review the MOP&E letter attached to the endorsement letter from the GEF Focal Point.

Attachment:
Incremental Cost Analysis

The table below provides a very simple incremental cost calculation using the target ranges for the PADGO project, and assuming only the capital cost elements of the Baseline BAU and Alternative Scenarios. In reality the factors that would go into such a calculation would be far more complex and involved, but as a thumb-nail sketch, these numbers should give us a very basic idea of incremental costs for the project.

The project impacts have been divided into direct and indirect, using the same target figures as discussed and used in the Project Document.

Case	Description
Baseline (BAU)	Use very basic diesel based generation
Alternatives	New mini hydro generation
	New biomass based generation
Baseline (BAU) Cost	Unit capital cost for installation: US\$600/kW
Alternative Cost	Unit capital cost for mini-hydro generation: US\$1000/kW
	Unit capital cost for biomass generation: US\$ 2000/kW
Direct Impact of the Program	17-35 MW of new mini hydro
	1-2 MW of bio mass
Indirect Impact of the PADGO	70 MW of new mini hydro
	10 MW of biomass based generation
Incremental Cost for Direct Impact	Mini hydro (lower case): 17000X(1000-600)=US\$6.8MM
	Bio mass (lower case): 1000X(2000-600)=US\$1.4MM
	Mini hydro (higher case): 35000X(1000-600)=US\$14MM
	Bio mass (lower case): 2000X(2000-600)=US\$2.8MM
	Total Incremental Cost for Direct Impact: US\$ 8.2 MM – 16.8 MM
Incremental Cost for Indirect Impact	Mini hydro: 70000X(1000-600)=US\$28MM
	Bio mass: 10000X(2000-600)=US\$14MM
	Total Incremental Cost for Indirect Impact: US\$ 42 MM
Total Incremental Cost	US\$ 50.2 – 58.8 MM
Proposed GEF Funding	US\$ 4 MM (6.8% - 8%)

RESPONSES TO STAP COMMENTS (Reviewer: Eric D. Larson)

Portfolio Approach to Distributed Generation Opportunity (PADGO) (Phase 1), Sri Lanka

by
Eric D. Larson

- 1. Cover sheet indicates co-financing from IFC, local FIs, Other Donors, and Project Sponsors. What is the nature of financing commitments obtained so far from the latter 3 sources? Do you have firm commitments? Do you have tentative commitments?**

Currently the commitments we have on the cover sheet are estimates. I am providing below the basis for those estimates. Please note that we have built in an additional layer of conservatism into the numbers shown on the financing plan. We will be working to firm these up post Work Program Entry (WPE). The period of time from WPE to application for GEF CEO Endorsement is to be used for the purpose of finalizing these.

PADGO focuses on three sets of activities listed here: (1) the refinancing of existing local bank mini-hydro assets that will lead to new investments in mini-hydro projects, and (2) co-financing for the 1-2 pilot projects that we are proposing to set up using dendro or other technologies that are “new” for Sri Lanka, and (3) undertaking a preliminary review of grid dispatch issues as they relate to a large portion of small DG assets connected to the grid. GEF funds to be used for activities 1, 2, and 3 respectively are US\$ 2.5 million, US\$ 1.3 million, and US\$ 200,000 respectively.

Our co-financing numbers for the cover page table come mostly from the risk sharing facility assumptions which we believe will result in financing of 17-35 MW of new mini-hydro generation which would otherwise not happen. Aside from this, some co-financing will also occur in the other two distinct set of activities (2 and 3), and where possible we are looking to collaborate with the existing RERED initiatives. The sections below lay out our detailed estimates on co-financing for activity 1, while for activities 2 and 3 our estimates are more tentative.

(1) Refinancing Existing Mini-Hydro Assets: From RERED’s weblink data (<http://www.energyservices.lk/statistics/disbursement.htm>) as of Dec. 31, 2005 there are 82 MW of mini-hydro projects in operation in Sri Lanka, of which 31 MW²⁰ are estimated to have their debt fully repaid before the formal launch of our initiative. In addition, there are 63 MW approved by RERED and under active development and there is an additional 154 MW that are at a very early stage of development and for which letters of intent (LOIs) have been issued by CEB. Only a small fraction of these may be realized, especially if the lending capacity of local banks is constrained due to reaching counterparty and sector limits. PADGO’s risk sharing product is trying to increase the amount of new generation by releasing lending capacity of banks.

Per our estimates, projects that will still have over 6 years of debt outstanding in 2007-2008 timeframe (and can hence participate in PADGO’s proposed risk sharing product) will have a cumulative capacity of between 114-140 MW²¹. There are between 103–129 MW of new generation in mini-hydro plants that may not occur, unless the risk sharing product proposed is successful in releasing lending capacity at the local bank level. Assuming a market penetration of 15% of 114 MW, we came up with 17 MW.

We believe that the maximum capacity we will be able to refinance will be 35 MW or 25% market share

²⁰ These 31 MW were developed under the Energy Services Delivery (ESD) scheme which ended in 2002.

²¹ This assumes that between 1/3rd to half of the 154 MW of early stage projects will be developed.

of a 140 MW universe available for the risk sharing product. This is the upper limit or the optimistic scenario of what we can achieve. While our target is the lower estimate of 17 MW, our planning and the figures on the cover sheet are based on building some cushion between the most optimistic 35 MW scenario and the target of 17 MW.

The illustration below is based on estimated financing of 35 MW of new generation (as a result of releasing about 60% of US\$ 35 million or US\$ 21 million of debt capital) is that Local Financial Institutions (FIs) will release capital for new loans of US\$ 11 million, IFC Investment Department’s risk in the product will be capped at US\$ 9 million, and GEF will provide US\$ 2 million of “first loss²²” risk capital²³. Additionally, US\$ 35 million of new generation will be financed with an additional US\$ 14 million of equity (35-21 = 14). This is displayed in the illustrative diagram below. Please note that the actual risk sharing product may differ significantly from the one in Figure 1, and its structure will be the result of detailed discussions with FIs and IFC. In order to be conservative, for the table on the cover page, we ascribe only US\$ 8 million each to the Project Sponsors, IFC and Local FIs, though the corresponding estimates in Figure 1 below are US\$ 14 million, US\$ 9 million and US\$ 11 million (US\$ 2 million + US\$ 9 million) respectively.

**Figure 1: Typical Structure for 35 MW of Risk Sharing Product:
For Illustrative Purposes Only**

Local FI: First Loss US\$ 1 MM	Local FI – Second Loss US\$ 9 MM	Equity from Project Sponsors US\$ 14 MM
GEF: First Loss US\$ 2 MM	IFC Second Loan Guarantee US\$9 MM	

²² “First Loss,” refers to the initial X% of non-payment from a pool of receivables. The “X” can be defined, and in Figure 1, X is 3 million out of 21 million, or about 14%. Please note that this first tranche will have the highest risk of non-payment associated with it.

²³ Please note from Section 7.1 of the project brief that US\$ 500K of additional GEF funding will be expended in TA and related costs under activity 1.

(2) Pilot Project Co-Financing: Under this heading, we are expecting about 1-2 MW of new generation to demonstrate CHP and/or dendro²⁴ or other technologies that are new to Sri Lanka, but are commercial elsewhere. At approximately US\$ 2 million/MW installed, we expect to spend about US\$ 1.3 million of GEF funds for technical assistance activities as outlined in Section 7.1 of the proposal. The entire project outlay of US\$ 2-4 million will be financed commercially, and hence should be treated as co-financing. While the TA component may appear excessive as a percentage of total project outlay, it should be noted that introducing a new technology will encounter significant hurdles. TA funds will need to cover market assessment, training workshops, as well as information dissemination costs as shown in Section 7.1. Please note that for purposes of being conservative, not knowing at this stage what the total installed capacity is likely to be, we have not added this figure to the numbers on the cover page table.

(3) Preliminary Exploration of Grid Issues w.r.t DG Generation: We expect to spend US\$ 200,000 of GEF funds in consulting and technical assistance under activity 3. We will be supplementing this with IFC's own development costs, as well as about US\$ 100,000 of other donor funds. We do not have commitments for these as yet, but believe that these funds should be available given the high level of interest in Sri Lanka after the tsunami.

Nature of Commitments: To date we have had discussions with four local FIs in Sri Lanka, one trade body for mini-hydro development, two developers, and representatives from the Public Utility Commission, Ministry of Power, Ministry of Environment, Energy Conservation Fund, and the Ceylon Electricity Board. In addition, we have also had discussions with General Electric (GE) as a potential participant in a pilot project. We will be getting letters of support from GE, Renewable Energy Partnership, a Local FI, as well as IFC's Global Finance Department. While these do not measure up to a financial commitment, these are the first step towards their participation, and during the implementation phase, we hope to be able to interest these parties in participating.

2. Cover sheet indicates your estimate of additional indirect GHG reductions of 7 million metric tons over 20 year period. I didn't see explanation of this estimate in body of proposal.

As indicated in response to Q1, there are between 103 to 129 MW of mini-hydro projects that may not get developed. Additionally, there is only 1 MW of biomass based generation in Sri Lanka, and negligible wind based generation. We are hoping that by successfully implementing activities 1, 2 and 3 as described in response to question 1, we will be able to indirectly influence 70 MW of new mini-hydro generation, and an additional 10 MW of biomass and other new technologies. Based on the same assumptions for calculation, as for the direct case, we expect that these additional 80 MW (10 MW biomass, and 70 MW of mini-hydro) will result in approximately 7.4 million tons of CO2 reductions over 20 years. We believe these assumptions of penetration are reasonable, since barrier reduction in the past through Energy Services Delivery (ESD) and RERED has resulted in the creation of a basic enabling environment, and it is clear that the potential for mini-hydro plants and resources for biomass exist in Sri Lanka to make possible the achievement of the indicated installed capacities.

²⁴ In choice of pilot projects we will try to choose applications where combined heat and power is needed. We know that the maximum efficiency will be obtained in a CHP configuration, but the technologies are being left open – dendro (this is the generic term for biomass being commonly used in Sri Lanka), or even fossil based generation could be proposed.

1. Section 3.2, regarding country-drivenness:

- a. What level of demonstrated interest is there from financial institutions in PADGO? REP seems to be the only specific local organization mentioned. **This gives the appearance of the proposal not being very country-driven.**

As pointed out in the response to question 1, IFC has engaged in discussions with several govt. bodies as well as private banks and developers in Sri Lanka. We expect to get support letters from these local organizations, and assure you that the proposal has strong support at the local level, from banks as well as government bodies.

- b. REP is mentioned only early and briefly in the proposal. What is the expected interaction with REP if the project goes ahead? What type of organization is it? How effective have they been in promoting RE in Sri Lanka?

The Renewable Energy Partnership (REP) is engaged with the Sri Lanka government in representing the case for renewable energy in Sri Lanka. They represent the interests of small to medium sized developers who are looking to increase the contribution of renewable energy to the grid by engaging in active project development. The role they will play if the project goes ahead will need to be negotiated at that stage.

2. Section 3.3

- a. **It would be nice to see what the overall estimated potentials are for electricity in Sri Lanka from small hydro, biomass, solar, CHP (fossil or otherwise) and any other applicable renewable.** This would help give some perspective on why hydro and CHP are being targeted by PADGO.

The response to question 1 lays out in some detail, the potential for mini-hydro projects in Sri Lanka. More details on status and scope for wind, mini-hydro and biomass resources can be found on the website www.energyservices.lk. However, no firm figure for potential for biomass or wind appears to be stated. Based on our own initial view is that for biomass, we believe that the potential is very significant, since only 1 MW has been set up to date, and the country due to its tropical vegetation and focus on tea and coffee plantations has significant biomass resources. Similarly, regarding wind, there is a significant coastline with a lot of wind potential, most of it currently not realized. More detailed knowledge of the potential will emerge as a result of working on the implementation of PADGO. As part of implementation, we will prepare a more detailed estimate of potential, especially in the CHP and biomass areas. This information will be very important to attract the attention of potential private sector developers and investors in Sri Lanka to these new types of projects.

- a. Indicates that “economically exploitable hydropower capacity is nearing saturation”. Should this say “economically exploitable *large-scale* hydropower”, since PADGO is focusing on new mini-hydro?

We agree with the comment, and the text will be changed to read, “large-scale hydropower.”

- b. Indicates that all electric-grid customers pay subsidized rates. Is that correct? Isn't this a problem for DG generators if they are trying to compete?

We should re-phase this. All customers in Sri Lanka do not receive subsidized rates. This was mentioned in the context of rural domestic consumers who have very low monthly consumption rates. Per the 2004 Statistical Digest prepared by the Ceylon Electricity Board, the average domestic tariff for the year was Rs. 5.53/kWh or roughly 5.5 US cents/kWh. However, domestic tariff in Sri Lanka has an increasing price slab i.e. in 2004, the first 30 kWh in a month are priced at Rs. 3.00/kWh (3.0 US cents/kWh). This rate increases to Rs. 15.80/kWh (15.8 US cents/kWh) if you consume more than 180 kWh/month. Thus the larger domestic consumers are paying above production and delivery cost, while smaller domestic customers are being cross-subsidized.

- c. Average electricity price (retail?) was about 6.6 c/kWh in 2004, but this did not cover CEB costs. With 2/3 of kWh in SL being generated from petroleum, CEB losses should be even higher now, unless rates have been increased. **What plans does GoSL have for bringing CEB revenues in line with costs?** Without a plan in sight, it is very understandable why banks are reluctant to finance further projects that depend on CEB payments.

Current GoSL plans include pushing for higher renewables, CEB restructuring, as well as construction of Sri Lanka's first coal fired power plant.

- d. End of this section mentions energy efficiency and biomass are getting attention from GoSL. Are there lessons (in financing) from these programs that are relevant to PADGO goals?

These initiatives by the Sri Lanka government are still in very early stages. As the response to previous questions indicates, there is only 1 MW of biomass generation that has been set up, and the number for wind powered generation is also very insignificant. Hence it is too early to get financing lessons from these initiatives.

3. Section 3.4

- a. Mentions PPA off-take prices. Will PADGO-related mini-hydro projects receive the standard offer of 6.0 c/kWh. How will PADGO CHP project off-take price be determined? Is there a standard mechanism that will determine this? If not, is part of the PADGO effort to develop "standard offer" type contracts as a way of speeding up project implementations?

There is a standard offer price for mini-hydro plants. For biomass based plants there are ongoing discussions, but these have not as yet resulted in formal standard contracts. We expect therefore that some of that work will need to be undertaken.

4. Section 3.5

- a. Numbered item 1 and 3 seem to contradict each other. One says wheeling is not allowed. The other says wheeling is allowed.

1 and 3 are not contradictory. Wheeling is allowed in the context of micro-hydro and PV in small community based initiatives. Micro-hydro plants account for a sum total of just over 1 MW of capacity at the end of 2004. However, for mini-hydro projects, all of which are over 500 kW each, no wheeling is currently allowed.

5. Section 4.1.1

- a. Termination of RERED backed loan is mentioned. What is the termination date? How does this interact with the timetable for PADGO getting new financing framework in place and running.

The RERED initiative is due to expire in 2008. This means that if we begin our initiative in mid-2007, we may be in a position to get a framework in place by mid to late 2008. However, for new projects to be financed once on-lending capacity of local banks is released, access to long term funds may still be needed as an interim measure. There are ongoing negotiations for a new line of IDA for new credit as well as for continuing disbursements from the existing loan amount after the end of the RERED period. This we believe will be important in our initiative.

- b. Some SL banks may “soon reach their capacity in terms of exposure to CEB”. Given the condition of financial condition of CEB, is it reasonable for IFC/GEF to take on exposure to CEB? Is there some indication from GoSL that condition of CEB will improve, which could help justify such risk sharing?

A detailed analysis on CEB credit will need to be undertaken as part of the implementation of the initiative. The nature of the risk sharing will be the result of detailed assessment of what type of risks the bank does not want to own. This could be CEB risk, or it could be the tail end tenure risk. Some additional details on the thinking behind the risk sharing product is provided in the response to Q1.

6. Section 4.1.2

- a. Mentions DG technologies are available to meet “specific customer application requirements”. **Has there been an assessment by the PADGO team of “specific customer application requirements”**. For example, how many potential MW of CHP electric capacity can industrial heat loads plausibly support in Sri Lanka, and what is the size distribution of these loads? This is important from the perspective of understanding what replication potential there is for CHP in Sri Lanka.

The assessment by the PADGO team has been only an initial one, and is based on discussions with our consultants and with the different stakeholders in Sri Lanka. As mentioned previously, a more detailed study of Sri Lanka’s resource base will be undertaken as part of project implementation. However, some initial ideas include CHP at tea plantations where there is available biomass, and also a need for heat for drying and roasting of tea leaves. Need for cooling and refrigeration for a fishing community or a food product processing hub are some other applications.

- b. End of this section mentions development of “standard contracting documentation” as a unique aspect of the project. If CEB has standard offer off-take price of 6 c/kWh (mentioned earlier), is there already some standard documentation that could provide a starting point?

That is correct. The starting point for the off-take contract will be the standard Power Purchase Agreement (PPA) that is in current use for the mini-hydro sector. This may require some modification for the new technologies, and also for insuring that it contains modifications that maybe needed from the perspective of novation and payment aggregation.

7. Section 4.2

- a. Mentions that many customers do not have access to electric power. What fraction of the population falls in this category? What fraction of villages?

Per CEB statistics, some 75% of the population in Sri Lanka is electrified. The remaining 25% are stated to be in remote villages with little purchasing power and productive means. However, the World Bank Implementation Completion Report (IDA-29380) for the Energy Services Delivery Project in Sri Lanka dated June 4, 2003, states, “Since a sizable part of the

population (about 48%) was without access to the grid, the possibility of their being served in the near future through the conventional system was non-existent”. From this report the number of people without power appear to be much higher.

8. Section 4.5

- a. Mentions several biomass DG technologies that “will be targeted for implementation:.. It is not clear to me where in the proposed project this targeting will take place.

More work will need to be done at the time of implementation on this. As stated previously, however, one location would likely be the tea growing areas which are located in the hill country of central Sri Lanka.

9. Section 5

- a. Mentions (briefly) responses received so far from potential developers and financing institutions. **What has been the response so far from CEB and from regulators and governing bodies?**

The response from the Regulator has been very positive, and his comments on the power sector, and the status of Sri Lanka’s energy sector have been included. With respect to CEB, we have met with only one official, who discussed with us at length his concerns with respect to small mini-hydro plants feeding power into the grid. In order to address these concerns we will be looking at grid dispatch huddles and improvements in activity 3 as described in Q1.

- b. If OEMs are from outside SL, it may well be difficult (costly) for them to “develop a qualified and reliable local service arm”, if it is only to service 1 or 2 PADGO projects. At the same time, reliable local service will be essential to the success of those projects (and to encouraging future replication of projects). How will this issue be approached by PADGO?

Clearly more discussion on this will take place during implementation. However, it is pertinent to mention that the model GE has developed as part of its rural electrification pilots in India, is one that may be relevant to Sri Lanka. While the OEM must commit to the quality of service and performance of its machinery, there is an active local partner who engages with local authorities. Service firms or agents are also hired on either by the OEM or by the developer, but the quality issues for service are to be addressed through the framework that we will be developing as a key part of the initiative.

10. Section 6.1

- a. What, operationally, does “but keeping in mind the larger implications for replication outside Sri Lanka” mean?

The initiative is seeking to promote cleaner distributed generation options in Sri Lanka, and as such must address the specific hurdles within Sri Lanka to the greater penetration of these technologies and business models. However, the framework being developed is sought to be replicated outside Sri Lanka too in subsequent phases of the initiative. Hence, as we work in Sri Lanka we must keep in mind that the plans for the framework are wider than the specific Sri Lanka based issues, and must have more universal applicability.

- b. **Seven years for Phase 1 seems like an awfully long time. Will it really require that much time?**

Since we will be looking to have a risk sharing product that will look to have a tenure of 5-6 years, the initiative will take some 7 years at a minimum to run the course till the end of the payment period. However, once the agreements have been put in place, and the product demonstrated, the remaining function of the initiative will be of a supervisory nature. Hence, it is possible to move to the second phase even though the first phase is still under supervision.

- c. **Phase 2 funding request is anticipated 2-3 years after start of Phase 1. If phase 1 is really a 7-year project, then will it be clear whether Phase 1 will be successful after only 2 or 3 years?**

As mentioned above, we believe that within the first 2-3 years of implementation, it should be clear whether we are in a position to develop the re-financing product. We will be ready to move on to the second phase while keeping on supervisory activities on the first phase, if successful. If the first phase is not successful, we will not need to proceed to the second phase.

11. Section 6.3

- a. Indicates pilot project commissioning within 3 years of commencement, followed by monitoring and evaluation phase of 5 years. That's 8 years total, when overall PADGO project is indicated to be of 7 years duration.

This measure includes the 9-12 months between Council approval and GEF CEO endorsement.

- b. 36 months to do the study of DG grid-integration hurdles with CEB engineers seems like a long time.

We agree. However, actual engagement with CEB engineers on grid issues is likely to be ongoing as RERED is also engaged in similar issues. Our particular focus on integrating large volumes of DG technologies into the grid and looking at remote dispatch and other such options is something that will develop only during the later period of phase 1.

12. Section 7.3

- a. States that Phase 1a funds "will be allocated towards the creation of a favorable financing environment to implement at least 17 MW of small hydro projects". **Will this minimum of 17 MW be installed during Phase 1? How was the target number of MW arrive at? Has any estimate been made of what the economically and environmentally exploitable small hydro capacity of Sri Lanka is?**

We are looking to release lending capacity to make it possible to finance about 17 MW of new mini-hydro projects during phase 1. The basis for these estimates and the exploitable potential in Sri Lanka are provided in the response to Q1.

13. Section 8.0

- a. The GHG calculations assume that a new 250 MW coal plant will use coal with 50% carbon content. Most coal has higher carbon content than this. Lignite is typically 60% (on dry basis). Bituminous is typically 70%. Anthracite is even higher. Also, on what basis is 93% availability assumed (which in your calculations corresponds to 93% capacity factor). This is higher than I would expect – 80-85% may be more reasonable.

Carbon content of 50% was used from a proximate analysis report for Virginia Coal. Actual composition of the coal used in Sri Lanka may vary. However, we are happy to use the numbers you supplied, and our calculations will be revised to indicate 70% carbon content. Coal plant

availability will also be revised to 80%. This represents 73 days of down time due to scheduled and unscheduled outages. Based on these inputs the annual CO₂ emission is estimated at 2.4 million tons. Please note that the plant availability is not a factor in the GHG emission reductions since we are really calculating the MWh of generation that the mini-hydro or CHP unit will displace.

14. Section 11

Under technology risk, mitigating risk through requiring OEMs to provide parts/service within 3-10 days of reported failure is a good idea, but if the OEMs are new to Sri Lanka (as has been suggested earlier), aren't they unlikely to have a network established that will be able to respond this quickly? Under the first financial strategy related risk, it says that "banks will have to be convinced that they are getting value for the spread they will be giving up." Won't they also need to be convinced that future money from GoSL will not be available to them at the favorable rates they have been enjoying? If additional money will be coming from government sources that would enable banks to continue the existing program (and the associated nice spreads), then why would the banks want to consider an alternative financial strategy? This question is pertinent in the context of the response to item 9b (earlier in this doc) that says there are ongoing negotiations for a new line of IDA. If this new line is implemented, then why would the banks wish to pursue an alternative financial strategy? Is this something that should be discussed in the section of the proposal on project risks?

To set up operation in Sri Lanka or a new market for that matter, the OEM will need to maintain sufficient number of spare parts that from experience require replacement. Geographical proximity to other nations such as India and Singapore, where the OEM has a local presence also minimizes time required to ship spare parts if required. Yes, the banks will need to provide financing based on the economic merits of the project/s and as stated previously we are not looking to introduce technologies that are experimental, but rather those that have been successfully deployed elsewhere.

Regarding availability of continued soft funding from IDA, it is pertinent to make the following points. The proposal for risk sharing is based on identifying a specific hurdle, namely that local banks are reaching their sector and counterparty credit limits. Hence even with additional funding coming in from IDA, it may not be possible to finance the capacities for which LOIs have been signed. The PADGO approach would be to gradually wean banks from soft financing, but it is critical that this not be done at one shot, since that will kill the market. Hence, we propose that we will gradually get banks to invest more of their own funds as a percentage of the financings, and offer risk sharing as a means of addressing their concerns. As they get more comfortable with putting in their own funds, the market will move, gradually and incrementally. We understand that this is a huge behavior change, and hence will be working with IDA funds initially, and gradually move by degrees to the next phase. We expect this change to progress substantially in phase 2, though some changes will be initiated in phase 1 through structuring of the Risk Sharing product.

Annex A

- a. It seems appropriate to show calculations for 250 MW coal and 250 MW diesel "business-as-usual" options, since the former is being contemplated in Sri Lanka and the latter perhaps representative of current thermal capacity in the country. **However, in terms of calculated avoided GHG emissions, the appropriate baseline would seem to me to be the diesel option. The renewable and DG options being promoted via PADGO project are unlikely to lead to cancellation of the coal plant, which if built is likely to be run at baseload for economic reasons. On the other hand, it is very conceivable that new mini-hydro or CHP-**

based electricity would displace kWhs that otherwise would have been generated from small or medium-sized stand-alone diesel generators.

The 250MW diesel plant is the BAU case. The coal plant emission numbers are being presented for the sake of comparison. We agree with your comment that the marginal generation mini-hydro plants are likely to replace is diesel, and hence that will be used as the measure for GHG reductions.

- b. Regarding the calculation of GHG emissions from the 250 MW coal plant, see comments above relating to Section 8.

Response provided.

- c. For the 250 MW diesel plant, a capacity factor of 95% seems too high. What are typical capacity factors achieved in existing diesel fired units in Sri Lanka? Also, the calculation of emissions that would be avoided by 17 and 35 MW of hydro states that 100% capacity factor is used for the hydro capacity, but backing out the capacity factor from the total 20-year avoided CO₂ (1.6 million t for 17 MW), I calculate 79%, which is more plausible. Clearly, the capacity factor should be less than 100%. Large hydro typically has a capacity factor of 50% (due to seasonality of rains). I suggest that a typical capacity factor for existing small hydro units in Sri Lanka be used for this GHG calculation.

Revision to calculation:

Individual thermal plant capacity factor is not available. Different thermal plants within the system operate with varying levels of capacity utilization, but the per plant data is not available. For the purposes of this calculation, a capacity factor of 85% will be utilized. As stated previously though, for GHG alleviation purposes, the capacity factor will not be pertinent..

Calculation:

250 MW diesel plant capacity factor = 85%
Annual plant electric output = 1,642,500 GWh
CO₂ emission/hr = 358,248 lb/hr
Annual CO₂ emission ~ 1.3 million tons

However on an energy basis, 1MWhr of energy produced from a diesel plant will result in 1433 lb of CO₂

Sri Lanka experiences two monsoon seasons namely, South West monsoon and North East monsoon, spanning almost 9 months of the year. The hydro plants are expected to operate in near full load condition during this time period. Indications are that these plants generate part load power even during the rest of the year. Hence the use of a year round generation capacity factor of 75% does not appear to be unreasonable.

Over a period of 20 years, 1.6 million tons and 3.4 million tons of CO₂ will be avoided by implementing a 17 MW and 35 MW of run-of-river small hydro plant that operate for approximately 9 months in a year.

d. GEF leverage is expressed in ton/\$ in Table 1, which is an uncommon way of showing cost of carbon emissions reductions. **I suggest showing \$/tCO₂ or \$/tC.**

Utility Plant	Capacity (MW)	Avoided emission in 20 yr period (million tons)	CO ₂ (million tons)	GEF leverage (\$/ton)
Diesel Oil fired plant	17	1.6		1.56
Diesel Oil fired plant	35	3.4		0.76

e. In calculating incremental cost for project component 2, again a very high capacity factor (95%) is used for the RICE-CHP system. I would expect higher capacity factor than for a utility diesel generator because delivery of the thermal energy may be required round-the-clock (or close to it) by the industrial process it serves.

Revision to calculation:

Utility scale Diesel plant and Diesel CHP plant availability are revised to 85%.

INPUTS AND ASSUMPTIONS:

1. Engine heat rate 10,258 Btu/kWh
2. Plant electrical output 1MW
3. Diesel oil energy content = 139,000 Btu/gallon
4. Diesel oil 7.001 lb/gallon
5. Assuming 85% Carbon in diesel and that all Carbon is released as CO₂
6. Plant capacity factor 85%
7. Boiler Efficiency = 80%

CALCULATION:

Based on the above inputs the following parameters are estimated for a 1 MW CHP facility:

Plant electric output = 7,466 MWh

CO₂ emission/hr = 1,610 lb/hr

Annual CO₂ emission = 5,995 tons/yr

Thermal energy from heat recovery = 5.19 MMBtu/hr

Calculation for 1MW diesel plant with a boiler for thermal energy generation:

Plant electric output = 7,466 MWh

Thermal energy from boiler = 5.19 MMBtu/hr

Annual CO₂ emission from thermal and electric generation = 9,789 tons/yr

Over a period of 20 years approximately 76,000 tons of CO₂ in comparison to the Diesel plant will be avoided by implementing the 1MW RICE CHP project. The avoided CO₂ emissions vary between approximately 61,000 tons and 132,000 tons for a 0.8 MW and 1.5 MW sized facility.

- f. The stand-alone boiler calculation uses a capacity factor (98%) that is not consistent with the capacity factor for the RICE-CHP system (95%) and, in any case, is too high. Also, there seems to be a typo in “Thermal output = 8,322 MWh”. The thermal output should be the same as the thermal output of the RICE-CHP unit.

The typing error will be rectified. The availability of a new boiler in the US is in the 90 to 95% range [a1] . However boiler availability and capacity factor depend on water management and related issues. Water chemistry and quality of water can lead to tube fouling; can cause corrosion and long term deterioration in performance. A boiler capacity factor of 85% will be used in the calculations to account for such boiler issues in Sri Lanka.

- g. Regarding Table 2....same comment as made earlier about Table 1. **If I convert the “GEF leverage” column of numbers from ton/\$ to \$/tC, the numbers would be \$29/tC up to \$70/tC. These are relatively high costs for carbon emissions avoided.**

Utility Plant	Capacity (MW)	Avoided CO ₂ emission in 20 yr period (thousand tons)	GEF leverage (\$/ton)
Diesel Oil fired plant	1	76	17.13
Diesel Oil fired plant	0.8	61	13.71
Diesel Oil fired plant	1.5	132	25.69

Our revised calculations are provided in the table above. It is also important to note that there is a difference between activities 1 and 2 under PADGO. Activity 1 targets the creation of financing environments that will enable banks to finance small hydro projects and technologies that are currently available in Sri Lanka. Activity 2 will focus on implementing technologies that are new to this market and have an environmentally clean signature in comparison to the BAU cases. It is anticipated that additional projects and wide spread technology adoption will occur as a result PADGO implementation. The additional projects, are referred to as the, “indirect impact of PADGO.” As stated previously, we assume 70MW in small hydro projects and 10 MW in new DG generation technology as our projection of the indirect effect of hurdle removal resulting from PADGO implementation. The resulting GHG alleviation is calculated to be approximately 7.4 million tons over 20 years. The following table indicates avoided CO2 emissions as a result of Indirect Impact of PADGO.

Utility Plant	Capacity (MW)	Avoided CO ₂ emission in 20 yr period (million tons)
Small Hydro facilities	70	6.6
Diesel Oil CHP plant	10	0.76
Total Estimate	80	7.4

Final Approval from STAP Reviewer

I've reviewed your last set of responses (and the email below), and I am satisfied with your responses.

Good luck finalizing the proposal!

Regards,
Eric Larson

Annex 10: Support Letters

Attachment 1: Notification of Donor Approval (Japanese Trust Fund)

**TECHNICAL ASSISTANCE TRUST FUND PROGRAMS
NOTIFICATION OF DONOR APPROVAL**

DISTRIBUTION LIST:

Transaction Leader	Sandeep Kohli
Regional Director	Paolo M. Martelli
Specialist Director	Rachel Kyte
Managing Unit Manager	Shilpa Patel

LEAD DEPARTMENT: CESSE - Environment & Social Development/Sustainable Energy

DONOR COUNTRY: JAPAN/IFC COMPREHENSIVE TA TRUST FUND

COUNTRY: Southeast Asia Region

PROJECT NAME: TA for implementation & Replication of the Portfolio Approach to Distributed Generation Opportunity

Date of Approval: 06/29/2007

Amount Approved: US\$ 750,000.00

Nationality Requirement: No

Reciprocal Use of Consultants From Donor Country: No

Restriction on Use of Local Consultants: No

Other Specific Donor Requirements Related to Project: No

NEXT STEP FOR TRANSACTION LEADER/TRANSACTION LEADER RESPONSIBILITIES:

APPOINTING CONSULTANT:

1. Hiring of consultants (Please contact Michael O'Neill on X87976). A copy of the "Blue Form" is available through Lotus Notes "Consultant Management System". If you need the icon, please call ext. 36655 and we will send it to you. A copy of "Task Leader Worksheet" is attached for your information.
2. For Legal assignments, please ensure that prior approval has been obtained from CLE.
3. Signed appointment letter, contract or purchase order (Please ensure that the consultant has signed and returned the contract before commencing work).

DURING IMPLEMENTATION:

4. Managing consultant assignments (Please ensure that the TOR and the provisions specified in the project profile submitted to the donor are met).
5. Provide TATF with periodic updates on progress of project.

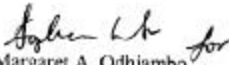
AT END OF TASK:

6. Provide TATF with THREE BOUND copies and diskettes of the Final Report (in English) upon completion of project.
7. Certify to TATF when project is completed (TATF will send you an e-mail for response by you).
8. A Project Completion Report (PCR) will be necessary upon completion of this assignment. Reina Kawaguchi (ext. 82809) or Margaret Ghobadi (ext. 39620) will be in touch with you.

TATF CONTACTS: ACCOUNTING/ADMINISTRATION/GENERAL:
Wai-Keen Wong (x39543)/ Luzviminda Tatlonghari (x82652)

PROJECT OFFICER: Akihiro Tanaka

Date: 07/06/2007


Issued By: Margaret A. Odhiambo

Attachment 2: Support Letter from Sampath Bank



සමුපත බැංකුව
SampathBank

No. 110, Sir James Peiris Mawatha, Colombo 02, Sri Lanka. Tel: 4730630, 2300260
E-mail: mgr@oper.sampath.lk Web: www.sampath.lk

19th July 2007.

Mr Sandeep Kohli
Senior Project Officer
International Finance Corporation

Dear Mr. Kohli,

We understand that the International Finance Corporation (IFC) is developing a project which aims to promote distributed generation using technologies such as mini-hydro, biomass and wind in Sri Lanka, named Portfolio Approach to Distributed Generation Opportunities (PADGO) and is seeking the support of the Global Environmental Facility (GEF) for same.

Our understanding is that the project will provide technical assistance for developing a) assessment guideline for distributed generation (DG)/ Renewable Energy (RE) technologies, b) templates for standard contracts and agreements, c) technical assessments of projects in the pipeline. We also understand that IFC is now in the process of structuring an appropriate financial product to support local bank funding of DG projects.

We believe that supporting a wider range of RE technologies apart from the predominantly small hydro technology, is critical, if Sri Lanka is to build on the success of the existing mini-hydro portfolio in an environmentally sustainable manner. We are interested in participating in the financing of such projects, and would benefit from the said initiative since bio-mass [dendro] and wind energy projects are new to Sri Lanka.

We believe that support to local banks with above technical assistance and financial product is essential to improve the commercial sustainability of the sector and to promote new clean energy projects. We see significant opportunities emerging in this sector, as we develop the knowledge required to finance and operate the wider and newer technologies.

For these reasons, we are of the opinion that the project will be most beneficial for the development of the DG/RE sector in Sri Lanka and would be interested in participating in the project once it is implemented.

Yours Sincerely,

Aravinda Perera
Deputy General Manager-Corporate Banking & Finance

Attachment 3: Support Letter from Commercial Bank of Ceylon



Commercial Bank of Ceylon Limited

FOREIGN BRANCH: Commercial House, 21, Bristol Street, P.O. Box 853, Colombo 01, Sri Lanka
Telegraphic Address: COMBANK Telephone Nos: 2446010-15, 2328193-5, 2430420, 2336700 Fax: 2445889
Telex Nos: 21520 COMEX CE, 21896 COMFEX CE SWIFT CODE: CCEYLK LX
E-Mail: email@combank.net website: http://www.combank.net

August 22, 2007

Mr. Sandeep Kohli
Project Officer
Environmental Finance Group
Environmental and Social Development Department
International Finance Corporation
2121 Pennsylvania Avenue, NW, F 3K-228
Washington DC 20433
USA

Dear Mr. Kohli,

We understand that the International Finance Corporation (IFC) is developing a project which aims to promote distributed generation using technologies such as mini-hydro, biomass and wind in Sri Lanka, named Portfolio Approach to Distributed Generation Opportunities (PADGO) and is seeking the support of the Global Environmental Facility (GEF) for same.

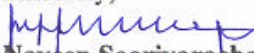
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We believe that support to local banks with above technical assistance and financial product is essential to improve the commercial sustainability of the sector and to promote new clean energy projects. We see significant opportunities emerging in this sector, as we develop the knowledge required to finance and operate the wider and newer technologies.

For these reasons, we are of the opinion that the project will be most beneficial for the development of the DG/RE sector in Sri Lanka and would be interested in participating in the project once it is implemented.

Sincerely,


Naveen Sooriyarachchi
Head of Corporate Finance

Attachment 4: Supporting Letter from Global Financial Markets Department (IFC)



September 14, 2007

Monique Barbut
Chief Executive Officer and Chairperson
Global Environment Facility

Subject: Possible Co-Investment

Dear Madam,

We are writing to you as a part of IFC's application for CEO endorsement of the initiative titled Portfolio Approach to Distributed Generation Opportunities or PADGO, for implementation in Sri Lanka.

As an institutional priority, IFC is committed to financially, socially and environmentally sustainable development, which we expect the project to achieve.

IFC's Global Financial Markets Department has completed a pre-appraisal mission to Sri Lanka, and we have begun our internal approval process for a Risk Sharing Facility to support PADGO's activities. Under the proposed Risk Sharing Facility, IFC is considering sharing in the project risk of small and medium scale power and CHP projects with local banks, effectively increasing the local banks' lending capacity for this sector in conjunction with GEF funds.

Sincerely,

A handwritten signature in black ink that reads 'Ajay Narayanan'.

Ajay Narayanan
Head

Financial Markets Sustainability Group
Global Financial Markets Department