CRISIL INFRASTRUCTURE ADVISORY

CRISIL Risk and Infrastructure Solutions Limited

International Finance Corporation

Terminal evaluation
PADGO project
Sri Lanka

Final report

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Abbreviations

Acronym	Description
ASOP	Advisory Services Operation System
CBC	Commercial Bank of Ceylon
CDI	Development Impact Department
CEB	Ceylon Electricity Board
CRIS	CRISIL Risk & Infrastructure Solutions Ltd
DSM	Demand-side management
ECF	Energy Conservation Fund
EE	Energy efficiency
EPC	Engineering, procurement and construction
ESD	Energy services delivery
GDP	Gross domestic product
GEF	Global Environment Facility
GHG	Greenhouse gas
GoSL	Government of Sri Lanka
HEP	Hydro-electric power plant
IBRD	International Bank for Reconstruction & Development
IEG	Independent evaluation group
IFC	International Finance Corporation
JAAF	Joint Apparel Association Forum
LECO	Lanka Electricity Company Ltd
LKR	Sri Lankan rupee
M&E	Monitoring and evaluation
MPE	Ministry of Power and Energy
NCRE	Non-conventional renewable energy
NDB	National Development Bank
NEPS	National energy policy and strategies
NREL	National Renewable Energy Laboratory
PADGO	Portfolio Approach to Distributed Generation Opportunities
PL	Project leader
PUCSL	The Public Utilities Commission of Sri Lanka
RERED	Rural Electrification and Renewable Energy Development
RMS	Results' measurement system
RSF	Risk-sharing facility

Acronym	Description
SLSEA	Sri Lanka Sustainable Energy Authority
SEDF	South Asia Enterprise Development Facility
SEF	Sustainable energy finance
SHP	Small hydro project
SPP	Small power producer
SPPA	Standardised power purchase agreement
TOR	Terms of reference

1. Executive summary

Evaluating the performance of a 7-year project

The Portfolio Approach to Distributed Generation Opportunities – or PADGO -- project was launched by the International Finance Corporation (IFC) using the Global Environment Facility (GEF)-supported funds to encourage distributed generation through renewable energy sources among people with very little or no access to electricity. PADGO commenced operations in early 2008 and wound up in 2015. As per the GEF guidelines, a terminal evaluation was carried out to assess how much of its objectives was achieved, and also identify learnings that could be replicated later. The evaluation was done by CRISIL Risk & Infrastructure Solutions Ltd (CRIS). The approach involved reviewing existing literature on PADGO, understanding sector context, interacting with stakeholders and project partners, and rating achievements on a scale specified in the GEF guidelines.

During the first few years of PADGO's implementation, as grid connectivity in Sri Lanka improved rapidly, consumers got opportunities to save energy. And because of its earlier work in renewable energy, PADGO's scope was expanded in 2011 with a mandate to foster energy-efficiency activities. These were to be achieved within the project's implementation timeframe - or by 2015.

The project maintained its focus on supporting distributed generation through renewable energy sources while also additionally supporting energy efficiency initiatives

PADGO used a combination of investment services and advisory services to achieve its objectives. These include:

***Under investment services*:**

- Tying up with two commercial banks – National Development Bank (NDB) and Commercial Bank of Ceylon (CBC) -- for a risk-sharing facility worth $55 million. The banks used this facility to fund 10 renewable energy projects (6 mini-hydro and 4 wind) with a total capacity of 51.9 MW.

Under advisory services:

Sector level engagements

- Gauging Sri Lanka's biofuel potential (leading to a handbook on biomass availability); and,
- Assessing net metering-based rooftop solar PV potential in Sri Lanka

Project development support:

- Assisting in the development of 3 x 10 MW biomass-based projects.

Technical assistance and capacity-building activities for financial institutions:

- Developing software to evaluate risk-framework of renewable energy projects for CBC
- Holding software-training sessions with a focus on biomass projects
- Conducting capacity-building programs for CBC staff and project developers for renewable energy projects

Energy-efficiency activities were also included in advisory services, such as conducting:

Market assessment studies:

- On energy-efficiency potential in the tea, hotel and garment sectors

Investment-grade energy audits:

- For 5 tea factories and 7 garment manufacturing facilities; and,
- Measuring implementation success of energy audits in 4 tea factories

Awareness raising and capacity building:

- Conducted an energy-efficiency awareness program for NDB's tea-sector clients.
- Helped build capacity in energy efficiency in the tea sector along with SLSEA
- Conducted a capacity-building program in energy efficiency for the garments sector, conducted in partnership with JAAF
- Held training programs to create awareness on energy efficiency and disseminate findings of energy audits to factory officials

Risk-sharing facility improved bank appetite for renewable energy projects…

Because of inherent risks, Sri Lankan banks were averse to funding renewable energy projects. But PADGO helped them gain experience in such financing, which increased their confidence and risk appetite. For example, in consortium-lending, the average loan size for a bank soared from 12 per cent to 50 per cent after the introduction of the risk-sharing facility. The increase in risk appetite, along with higher credit supply, led to more investments in newer renewable energy technologies such as bio-mass, waste-to-energy and solar photovoltaic (PV) in the last 3-4 years, while maintaining the investment momentum in traditional technologies such as mini-hydropower projects. PADGO also supported four projects in wind power – which was an emerging technology around the time of PADGO's inception -- through the risk-sharing facility.

… ***complemented by technical assistance and capacity building***

PADGO's investment services synced well with advisory services, which enhanced the effectiveness of its activities and improved the understanding of different stakeholders (banks, developers and manufacturers) on many business and technology issues.

PADGO also improved the due-diligence framework of banks by providing a methodology to evaluate loan applications. This was supported by training sessions on technical, financial and risk aspects of renewable energy technologies, which helped banks improve their risk management skills and catalysed lending.

As for generating electricity from biomass, banks were interested in financing but didn't understand the technology. So PADGO stepped in to prepare a handbook on biomass-fuel availability in Sri Lanka, which became the reference point for lenders. The findings in the book were also disseminated during training programs to improve understanding. As a result, the Ceylon Electricity Board (CEB) signed power purchase agreements for 14 biomass energy projects -- as of January 2015. The developer of one such project, Dendro One, also approached IFC for assistance, which was extended. IFC then hand-held the project right up to commissioning.

Program was able to adjust objectives to suit externalities

When PADGO was being conceived in 2006, less than 80 per cent of Sri Lanka's population had access to electricity. Therefore, one of its objectives was to support distributed generation through renewable energy to serve people with very little – or no -- access to electricity. As implementation progressed, grid coverage increased to 90 per cent. But in 2008-2010, Sri Lanka's electricity sector was jolted by swift changes on the political and economic fronts. By 2011, as grid connectivity improved, opportunities to save energy also increased for consumers. Consequently, in 2011, supporting efficiency initiatives in energy-intensive sectors was added to PADGO's objectives.

Macroeconomic and country-specific situations influenced certain outcomes

While the risk-sharing facility managed to support a number of projects, overall uptake was only 35 per cent of what was initially envisaged. That was because, by the time the facility was launched between 2009 and 2010, Sri Lanka's economy had begun to improve, spawning greater liquidity even as interest rates declined. But the cost and fee structure of the risk-sharing facility could not be modified, which made it uncompetitive.

Project was monitored and evaluated regularly, using institutionalised framework

PADGO's performance was evaluated under a well-established IFC framework known as the Results Measurement System, which outlined the processes and tools to be used. PADGO's project-supervision reports were generated every 6 months, which captured performance on key parameters, showed the activities completed and being planned, risk factors, and lessons learnt. The project also used a robust internal IFC system for the process.

PADGO's performance found to be satisfactory overall, based on various rating criteria

PADGO was found to be relevant to Sri Lanka's priorities. It was able to address important market barriers to increase penetration of renewable energy and boost the risk appetite of banks to fund renewable energy projects. It was also assessed to be effective as outcomes were in line with objectives, excepting the lower uptake of risk-sharing facility. The effectiveness was shown through studies and reports prepared and disseminated among stakeholders, training sessions, and project development support, which either met or exceeded goals. Finally, in terms of efficiency, PADGO was rated satisfactory for using less funds than budgeted.

Takeways from the PADGO experience

One of the most important lessons learnt was that project objectives should be able to adjust to changes in external and internal environment. Further, to develop a market for relatively newer technologies, a rounded offering of investment services and advisory services is necessary.

Also, in terms of energy-efficiency interventions, it is important to address the cost barriers to implementation, where partnering with energy service companies could be an effective solution.

It is also important to have robust processes backed by high-quality data to report project activities and performance. This will help enhance the quality of monitoring and evaluation. It is also essential to assess the cost efficiency in conducting monitoring and evaluation of the project by identifying and determining various direct and indirect costs.

2. Approach & methodology

2.1 Background

(This section gives the background for the terminal evaluation exercise; it covers an overview of the mid-term evaluation and the specific scope of terminal evaluation with reference to GEF guidelines)

The aim of the GEF Monitoring and Evaluation Policy, approved in February 2006, is to "promote accountability for the achievement of GEF objectives through the assessment of results, effectiveness, processes, and performance of the partners involved in GEF activities." GEF's results are also to be monitored and evaluated for their contribution in improving the global environment. The policy mandates that GEF partners will also evaluate projects "at the end of intervention (terminal evaluation)."

2.1.1 Purpose of terminal evaluation

The terminal evaluation must provide a comprehensive and systematic account of the performance of a completed project by assessing its design, implementation process, achievements vis-à-vis GEF-endorsed objectives -- including any agreed-upon changes in objectives during implementation -- and any other result. Terminal evaluations have four complementary purposes:

a. To promote accountability and transparency and assess and disclose accomplishment levels;
b. To synthesise lessons that may improve selection, design and implementation of GEF activities;
c. To provide feedback on recurring issues that need attention, suggest improvements on previously flagged issues; and,
d. To contribute data to the GEF Evaluation Office for aggregation, analysis and reporting on the effectiveness of the project's operations in bettering the global environment, and on the quality of monitoring and evaluation across the GEF system

Terminal evaluations should not be used as an appraisal, preparation, or justification for a follow-up phase of the evaluated project.

2.1.2 Objective of the terminal evaluation

According to PADGO's governance framework, an independent terminal evaluation should be conducted – after the project's completion (January 2008[1] - February 2015) – to assess its progress and results. The terminal evaluation was carried out under the terms of reference and the guidelines[2] for GEF agencies. IFC mandated CRISIL Risk & Infrastructure Solutions Limited to do the terminal evaluation study of the PADGO project.

The mid-term evaluation was initiated towards the middle of the cycle from the project's starting date with the aim of helping IFC improve the delivery of interventions. As IFC is sharpening its focus on renewable energy in the east Asia-Pacific region, this terminal evaluation will provide it with insights and recommendations to improve the design of its future interventions in regional replications of the program.

[1] The IFC / GEF PADGO was approved by the GEF Council in June 2006 as a 7-year program with $3 million partial guarantee facility and $0.6 million for technical/advisory assistance. Apart from that IFC has been able to rope in other donors to finance the technical/advisory component, resulting in a total advisory facility of approximately $1.6 million. Although IFC attempted to begin project implementation soon after that, project implementation was delayed by more than 2 years due to the ongoing civil war in the country at that time and the program effectively started only after the end of the conflict in May 2009
[2] Evaluation Document No. 3, 2008

The terminal evaluation also sought to assess PADGO on the basis of relevance, efficiency, effectiveness, impact and sustainability. In addition, it aimed to analyze and assess the program's achievements and progress made towards achieving its objectives, and document lessons learnt to improve design and delivery of future programs. In brief, the evaluation areas were:

- **Relevance**: The extent to which the program's structure, design, and outcomes were consistent with focal areas/operational program strategies and country priorities.
- **Effectiveness**: The extent to which the actual program outcomes were commensurate with the original or modified program objectives.
- **Efficiency**: The extent to which program results delivered value with the least costly resources possible (without carrying out a full financial audit).
- **Sustainability**: The ability of the program to continue to deliver benefits for an extended period of time after completion.
- **Catalytic impacts**: The extent to which the program contributed to leveraging or catalyzing new investments.
- **Monitoring and evaluation systems**: The extent to which the program met the minimum requirements for design and implementation of such systems.

The results of the evaluation were provided to the management of the PADGO project to improve future decision-making and operational efficiency.

2.1.3 Scope of work of terminal evaluation

The terminal evaluation had to determine the project's overall impact and the extent to which it was able to achieve its original objectives. It also had to examine and assess perspectives of stakeholders affected by the project. The scope of work covered is given below.

1. **Assessment of results**

The evaluators had to conduct quantitative and qualitative assessments of sub-projects/activities; while doing so, they had to focus on achievements in terms of outputs, outcomes and impact. The evaluation mainly assessed relevance, effectiveness, impact and sustainability.

2. **Assessment of risks to sustainability of outcomes**

The project should be sustainable even after completion. However, it may be difficult to make a realistic prior assessment of its sustainability due to the risks involved. Four risks -- financial, socio-political, institutional framework and governance, and environmental -- and their impact on sustainability had to be addressed. The consultant was also expected to highlight any other relevant risks.

3. **Assessment of catalytic or replication effect**

The evaluation had to describe any direct or indirect catalytic role or any replication effect of the project.

4. **Assessment of monitoring and evaluation system**

A comprehensive assessment of the project's monitoring and evaluation system, its suitability and appropriateness in terms of design, its facilitation of timely tracking of results and assessment of progress of the project, and budgeting and funding for relevant activities was needed.

5. **Monitoring of long-term changes**

Monitoring and evaluation of long-term changes was to be covered separately, describing project actions and accomplishments towards the setting up of a long-term monitoring system.

6. **Assessment of processes affecting attainment of project results**

The following issues, affecting project implementation and results, were to be specifically considered:

- Preparedness and readiness
- Country ownership/drive
- Stakeholder involvement
- Financial planning
- GEF agency supervision and backstopping
- Co-financing and project outcome and sustainability
- Delays and project outcomes and sustainability

7. Lessons and recommendations

The evaluation had to cover not just lessons that could be applied to other projects both also takeaways specific to Sri Lanka. It also had to assess and give recommendations on how to improve (in terms of product strategy and delivery) IFC's sustainable energy finance (SEF) product.

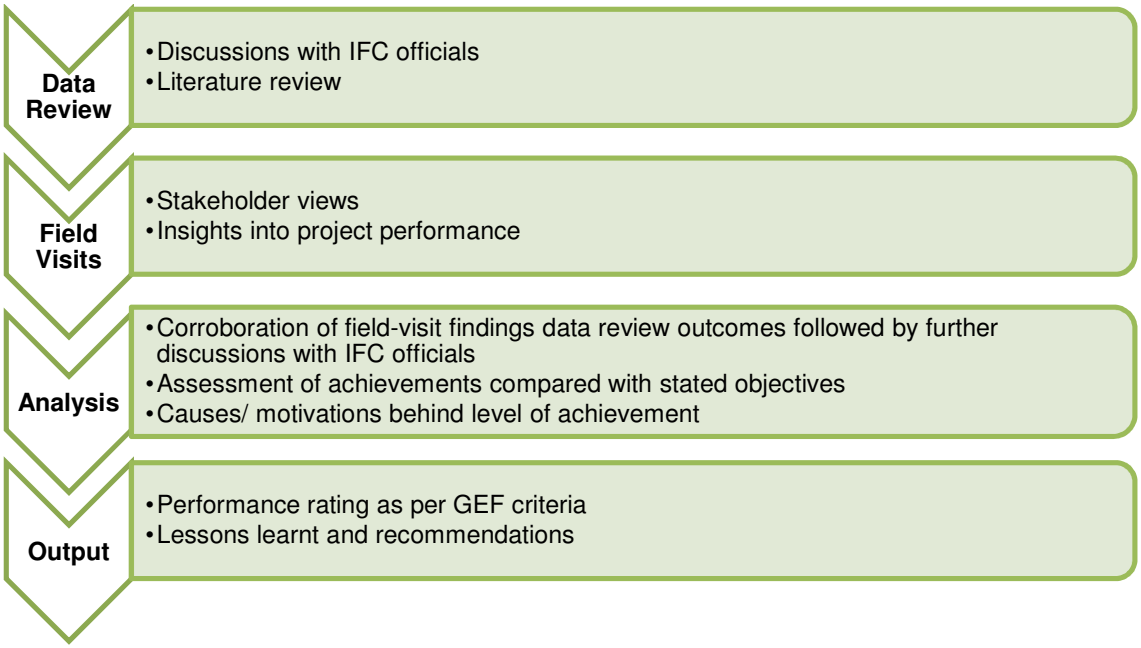
8. Case studies – success stories

The consultant had to identify a case study illustrating the success of the PADGO project. The selection of the study had to be done in consultation with IFC.

2.2 Methodology

The terminal evaluation combined the classic tools of data collection along with the performance ratings framework provided by GEF to derive key insights into PADGO's performance vis-à-vis its objectives. The guidelines specified by GEF for agencies conducting terminal evaluations of its projects[3] have been fully complied with. The methodology is represented in the flow chart below and detailed in the next few sections .

Figure 1: Approach used for terminal evaluation



[3] Guidelines for GEF Agencies in Conducting Terminal Evaluations, Evaluation Document no. 3, 2008

2.2.1 Data review

The terminal evaluation began with discussions with key IFC officials managing the PADGO project to get first-hand insights on the program. The officials with whom meetings were held are:

- Mr Victor Navaranjan Antonypillai, Operations Officer - Financial Institutions Group
- Mr Nishantha Jayasooriya, Associate Operations Officer – Financial Institutions Group –(Project Leader – PADGO)
- Mr Hasan Shahriar, Results Measurement Specialist – (Monitoring and Evaluation Officer)
- Ms Surangi Anupama Wijayapala, Finance Officer
- Mr Dinesh Warusavitana – Investment Officer – Financial Institutions Group

Key literature (a comprehensive list is provided in *Annexure 3* of this report) was also reviewed, including:

- Project implementation plan submitted to GEF (GEF Project Document, January 23, 2008) and approval received from GEF (CEO Endorsement/ Project Approval Document)
- Revision made to the project implementation plan dated 2011 (Advisory Services PDS Approval)
- Project supervision report generated over the entire tenure of the project
- Risk-sharing facility agreements executed with financial institutions
- Sector-specific potential studies/ reports
- Country and sector overview

2.2.2 Field visits

The primary aim of field visits was to obtain crucial insights into PADGO's performance from stakeholders, including sector issues, challenges faced, and impact and effectiveness of activities. Meetings were conducted with:

- Senior officials of CBC and NDB, the two commercial banks of Sri Lanka who were the key recipients of PADGO's investment services and advisory services.
- Senior officials of Sri Lanka Sustainable Energy Authority (SLSEA), mandated by Government of Sri Lanka (GoSL) to promote renewable energy development and energy use management initiatives in the country.
- Representatives of Joint Apparel Association Forum (JAAF), the association body for garment manufacturers in the country.
- Officials of tea and garment factories to understand how energy-efficiency recommendations made under PADGO were being implemented.

Comprehensive details of the field visits that were conducted and stakeholders who were interviewed are provided in *Annexure 3*.

2.2.3 Analysis

This phase included corroboration of insights gathered from field visits with data reviewed from the earlier phase. For example, the interaction with commercial banks revealed that utilisation of the risk-sharing facility was lower than expected because it was more expensive than other sources of funds. The findings were discussed with IFC officials, and sector data prevalent at that time was reviewed. The result was a more rounded assessment of facts[4].

[4] *This particular instance revealed that the uptake of RSF facility was lower due to higher extent of funds available in the market at that time at low interest rates. Also, PADGO's objective was to increase appetite of financial institutions to lend to the RE sector, which had been already achieved.*

PADGO's achievements were also assessed; a crucial input for this was a review of all project supervision reports generated since inception, including output, outcome and impact indicators. The causes/motivations for achievement/under-achievement were also identified.

2.2.4 Output

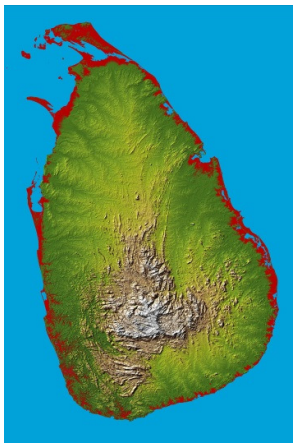
In this phase, various criteria were rated as per GEF guidelines for terminal evaluation, supported by appropriate justification and evidence gathered during the preceding phases. The key takeaways of the project were identified, and recommendations made for future projects.

3. Introduction

(This section provides an overview of Sri Lanka and then describes the country's electricity sector in terms of the institutional and governance structure, consumption aspects and sources of electricity generation. It then describes the increasing role of renewable energy in electricity generation in Sri Lanka and how the PADGO project fits into the landscape.)

3.1 Country overview

Sri Lanka is an island country, located near India's southeastern coast, in South Asia with an approximate land area of 65,000 square kilometers (sq km) and a long coastline (over 1,300 km). The island consists mostly of flat to rolling coastal plains, with mountains rising only in the south-central part. The climate is tropical and warm due to the moderating effects of ocean winds. The rainfall pattern is influenced by monsoon winds from the Indian Ocean and Bay of Bengal and varies widely across different parts of the country. The southwestern and central parts of the country receive high amounts of rainfall whereas the north, northeast, east and southeast parts of the country are relatively drier and arid.



Sri Lanka has a population of about 20 million and a population density of about 325 per sq km. The density is highest in the southwest where Colombo, the country's capital and its main port and industrial center, is located. Despite this, almost 3/4th of population lives in rural areas.

Sri Lanka is ethnically, linguistically, and religiously diverse. Sinhalese are the largest ethnic group in the country (almost 75 per cent of the total population) followed by Sri Lankan Tamils (11 per cent) and Sri Lankan Moors (9 per cent). Sinhalese and Tamil are the two official languages; English is widely used for education, scientific and commercial purposes. The country is multi-religious; 70 per cent of the population is Buddhist followed by Hindus (13 per cent), Muslims (10 per cent) and Christians (7 per cent).

Sri Lanka's economy is primarily dependent on tourism, tea export, textiles and agriculture. The services sector (58 per cent of GDP) is the biggest contributor to the economy, followed by industry (32 per cent) and agriculture (10 per cent). The country is a free market economy with the private sector accounting for 85 per cent of GDP. Economic disparities exist between the nine Sri Lankan provinces, with the Western province alone contributing 45 per cent of GDP.

The country's economy has grown strongly in recent years. Between 2010 and 2014, annual GDP growth was between 6 per cent and 8 per cent driven by industry (11.4 per cent) and services (6.5 per cent). With a GDP per capita of $3,625[5] in 2014, Sri Lanka is ahead of other countries in South Asia such as India ($1,499), Pakistan ($1,275) and Bangladesh ($958).

The country's population, its economy and the environment were severely affected by a civil war that raged for nearly 25 years and ended in May 2009. Nearly 100,000 people were killed in the war, an armed conflict in the Northern and Eastern provinces between the Liberation Tigers of Tamil Eelam (LTTE) and the Government of Sri Lanka.

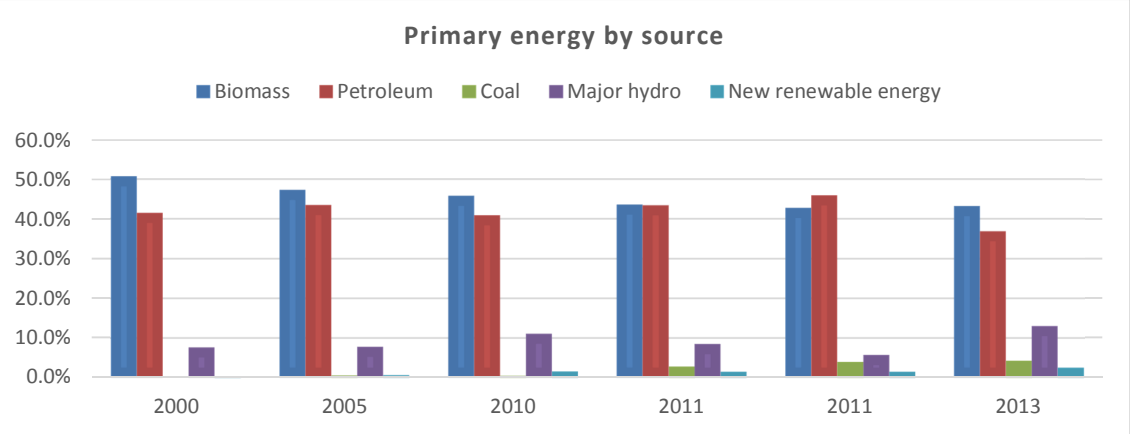
[5] http://www.cbsl.gov.lk/pics_n_docs/10_pub/_docs/efr/annual_report/AR2014/English/3_KEI.pdf

3.2 Electricity sector in Sri Lanka

3.2.1 Role of electricity in the energy mix

Sri Lanka's primary energy needs are largely met through biomass and petroleum sources. Of the overall energy mix, biomass contributes 43 per cent, petroleum 37 per cent, major hydro 13 per cent, coal 4 per cent and new renewable energy 3 per cent. However, over the last decade, the contribution from coal, major hydro and new renewable energy has gone up. From 2000 to 2013, the share of coal, major hydro and new renewable energy rose from 8 per cent to 20 per cent, indicating a shift from primary energy usage to secondary energy (such as electricity) usage and the increasing role of electricity in the country's overall energy mix. Though biomass has a large share in the energy mix, it is being used mainly for other energy uses and its share in electricity generation is insignificant.

Figure 2: Share of various sources in primary energy mix



Source: http://www.info.energy.gov.lk/

3.2.2 Institutional and governance structure

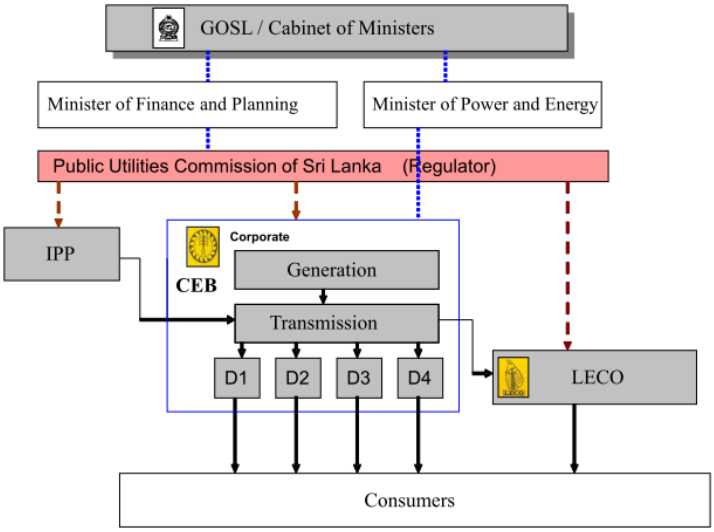
The electricity sector in Sri Lanka is governed by the Sri Lanka Electricity Act, 2009 (further amended in 2013). The objective of the Act is to regulate generation, transmission, distribution, supply and use of electricity in the country. The Act repealed the erstwhile Electricity Reform Act, 2002 and the Electricity Act (Chapter 205). The Public Utilities Commission of Sri Lanka (PUCSL) established under the Public Utilities Commission of Sri Lanka Act, 2002 is responsible for the Act's implementation. The commission regulates tariffs, determines and monitors various commercial and technical parameters in the sector, gives licenses, and advises the government on policy matters.

The Ceylon Electricity Board is the key player in Sri Lanka's electricity sector. It is a state-owned integrated utility that is responsible for generation, power purchase, transmission, bulk supply, distribution and retail supply. In addition to CEB, Lanka Electricity Company (Pvt) Ltd (LECO) was established to distribute electricity in areas previously served by local authorities. LECO receives electricity from CEB at 11 kV and distributes it in LECO-franchise areas. LECO serves about 10 per cent of the electricity consumers in the country.

Both CEB and private producers generate electricity and supply to the national grid. According to the latest available figures, CEB generates about 52 per cent of the electrical energy supplied through the national grid while the balance is generated by private power plants. In addition, CEB, as the sole buyer,

purchases electricity for the national grid from private independent power producers (IPPs) who have entered into power sale contracts with CEB. CEB also purchases power from small renewable energy producers with individual capacities up to 10 MW under a standardized power purchase agreement (SPPA). With increasing demand for electricity and delays in construction of CEB's power plants, the contribution from private power plants has risen significantly in recent years.

Figure 3: Institutional structure of Sri Lanka's electricity sector

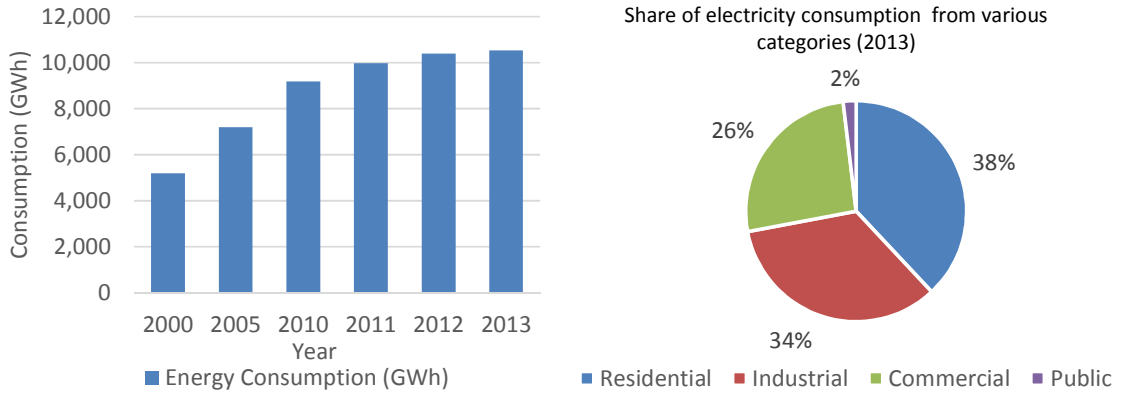


In addition, the Sri Lanka Sustainable Energy Authority Act was enacted in 2007 to promote the development of renewable energy and energy efficiency measures. The Sri Lanka Sustainable Energy Authority (SLSEA) was set up under the Act as an apex institution to promote sustainable energy generation and use by increasing the contribution of renewable energy and promoting energy efficiency within the country. The Act tasked SLSEA with identifying areas of energy development, promoting energy security, implementing energy efficiency measures and conservation programmes and increasing reliability and cost-effectiveness in energy delivery.

3.2.3 Electricity consumption – predominance of residential consumption

Sri Lanka consumed 10,554 GWh of electricity in 2013 of which the residential category accounted for nearly 38 per cent, industrial 34 per cent and commercial 26 per cent. Due to increased industrial and commercial activity, the demand for electricity in Sri Lanka grew at a compounded annual growth rate (CAGR) of 5.6 per cent during 2000 to 2013.

Figure 4: Growth in total electricity consumption and share of consumption from various categories



Source: Sri Lanka Energy Balance, 2013 – SLSEA

The growth in electricity consumption vis-à-vis primary energy consumption indicates that electricity is gradually replacing other forms of energy in the country. Electrification in Sri Lanka, which was around 8 per cent in 1970, reached 98 per cent by the end of 2014 due to aggressive grid expansion.

3.2.4 Electricity generation mix – increasing share of renewables

Until the mid-1990s, Sri Lanka's demand for electricity was mostly met by hydropower generation. Since then, with the major hydropower resources already exploited, most of the incremental demand for electricity has been met through thermal-generation capacity additions. During 2002 to 2013, only 224 MW of hydropower capacity was added compared with 842 MW of while thermal capacity (of which 542 MW operated on petroleum fuels and 300 MW on coal). As of November 2014, the total commissioned coal power plant capacity is 900 MW. The capacity of power plants based on new renewable energy sources increased by 331 MW during the same period.

Table 1: Installed electricity generation capacity of Sri Lanka

Type of power plant	Installed generation capacity (MW)								
	2002	2004	2006	2008	2010	2011	2012	2013	2014
Large hydro	1,137	1,207	1,207	1,207	1,207	1,207	1,357	1,361	1,361
Petroleum fuels	793	1,073	1,115	1,285	1,390	1,390	1,395	1,335	1,335
Coal						300	300	300	900
New renewable	35	76	108	146	218	241	312	366	386
Total	**1,965**	**2,356**	**2,437**	**2,638**	**2,815**	**3,138**	**3,364**	**3,362**	**3,982**

Source: Sri Lanka Energy Data Base 2013, extended to include 2014.

Generation capacity of 2014 is as of May 2014.

The highest ever renewable energy contribution of 7,183 GWh to the grid was recorded in 2013, led by favorable rainfall (which caused generation from large hydropower plants to be the highest ever) and the growing contribution from small renewable energy power plants.

Table 2: Historical generation mix

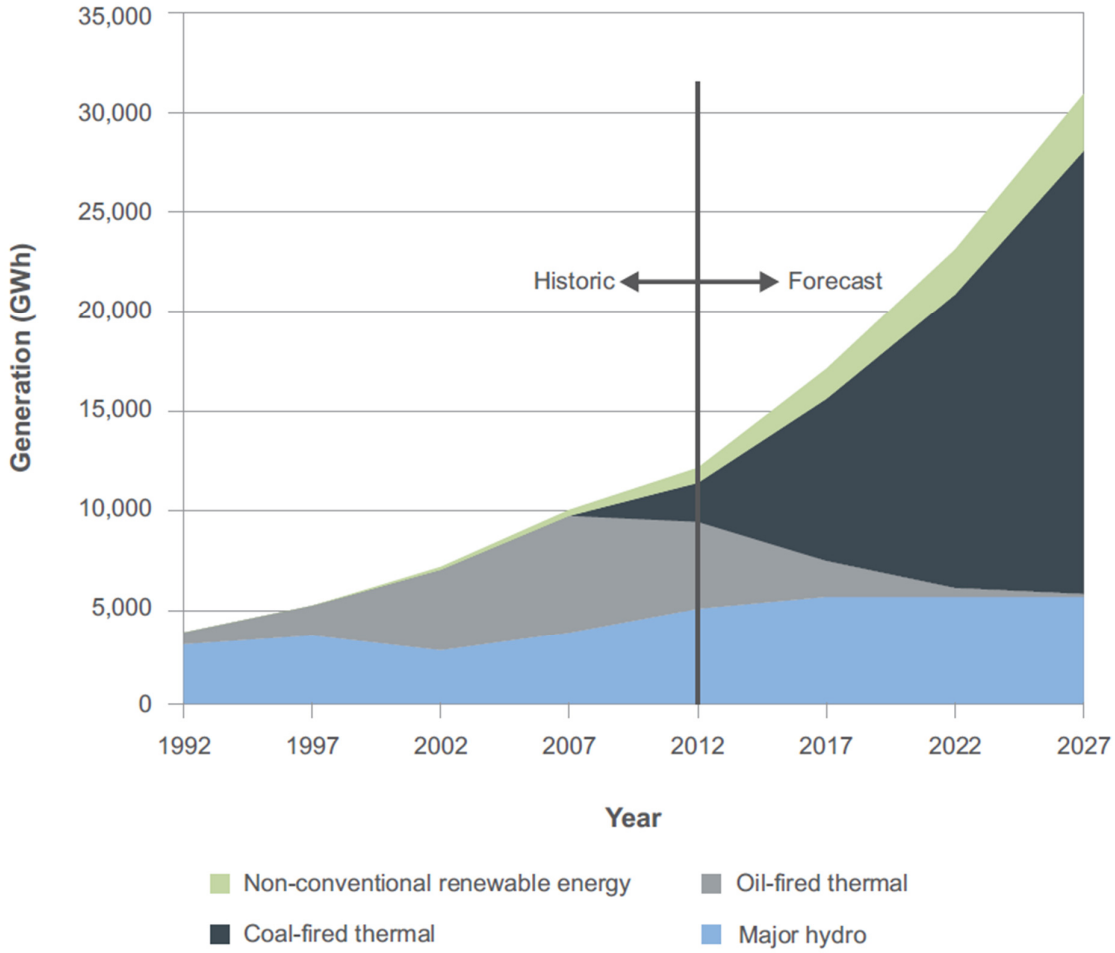
Type of power plant	Electricity generation (GWh)							
	2002	2004	2006	2008	2010	2011	2012	2013
Large hydro	2,589	2,455	4,290	3,701	4,989	4,018	2,727	6,010
Oil	4,135	5,103	4,805	5,849	5,063	5,858	7,017	3,357
Coal						1,028	1,399	1,465
Mini hydro	104	206	345	429	646	601	565	908
Wind	4	3	2	3	53	92	147	232
Biomass		0	2	6	33	32	22	26
Solar						1	2	2
Net-metered solar PV								5
Total	**6,831**	**8,068**	**9,443**	**9,987**	**10,783**	**11,628**	**11,879**	**12,006**
Renewable energy excluding large hydro	107	208	349	438	732	725	736	1,174
Share of total generation (%)	**1.6**	**2.6**	**3.7**	**4.4**	**6.8**	**6.2**	**6.2**	**9.8**
Large hydro	2,589	2,455	4,290	3,701	4,989	4,018	2,727	6,010
Total renewable energy	**2,696**	**2,663**	**4,638**	**4,138**	**5,720**	**4,743**	**3,463**	**7,184**
Share of renewable energy on the grid (%)	40	33	49	41	53	41	29	60

Source: Sri Lanka Energy Data Base 2013

Due to the successful small power development program – which benefitted from suitable feed-in-tariffs and favorable weather with an above-average rainfall – the contribution of new renewable energy in total energy generation reached 9.8 per cent by 2013, two years ahead of the 10 per cent target set in the National Energy Policy of 2008.

Clearly, Sri Lanka's electricity generation mix has undergone a structural change. Up to about 1995, the generating system was predominantly hydroelectric but since then much of the growth in demand has been met by new oil-fired generation, and a few newly-built hydroelectric power plants; post 2011, Sri Lanka has used coal for power generation (*see figure below)*. In the long term, Sri Lanka expects the generation mix to be coal-dominant, largely driven by the objective to minimum costs.

Figure 5: The evolving generation mix



Source: Long-term Generation Expansion Plan, CEB, 2011, adapted to reflect national policy targets for new renewable energy. Ongoing studies under the Renewable Energy Master Plan and subsequent decisions may alter the planned renewable energy input to the system.

Note: This assumes that the RE scenario meets the national policy target of 10 per cent by 2015 set by the Government, and retains approximately 10 per cent share into the future.

The cost of generation is lower in coal-fired power plants, so Sri Lanka's cost of electricity production is expected to decline in real terms as expensive oil-fired generation gets replaced by coal-fired generation and, possibly, renewable energy.

3.2.5 Development of renewable energy – key drivers

3.2.5.1 Small power development program

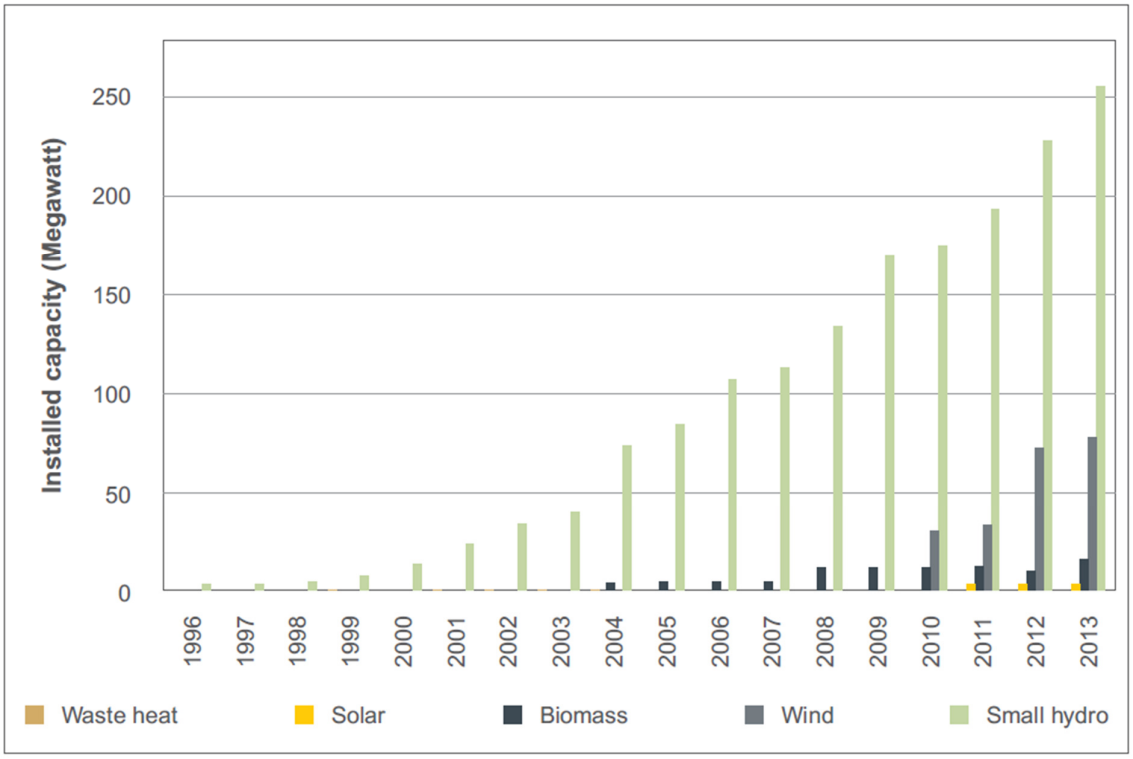
Grid-connected operation of renewable energy-based power plants commenced in 1997 with the publication of a standardised small power-purchase agreement. This included a methodology to calculate the purchase price (the feed-in tariff) based on the principle of avoided costs of fossil-based generation on the grid. This feed-in tariff was offered to all renewable energy-based power plants of capacity less than 10 MW. Projects were selected by private investors and letters of intent for a specific site were issued on a first-come, first-served basis, subject to capacity being available in the local grid

to absorb the output. Also, all such generators were embedded in the distribution system, which optimised the capital outlay of private investors on new transmission lines to reach the grid.

This policy, together with a rapid rise in oil-fired generation and increases in the international price of oil (which, in turn, increased the feed-in tariff) led to rapid growth of grid-connected small hydro-power plants. However, there was no significant development of other resources such as wind and biomass because investors felt that the feed-in tariff based on avoided cost (offered from 1996 to 2007) was insufficient to make such technologies viable.

The introduction of cost-reflective, technology-specific feed-in tariffs in 2008 paved the way for rapid development of wind power. Biomass-based power generation too started gathering momentum. But solar PV-based electricity generation did not take off because it was not offered a specific feed-in tariff at the outset in 2008 (due to the high levelised cost of energy of solar PV compared with other forms of generation). However, in the feed-in tariff announcement of 2011, solar PV was placed under the "other technologies" category, and offered the same feed-in tariff as biomass-based generation.

Figure 6: Capacity build-up of renewable energy power plants on feed-in-tariff



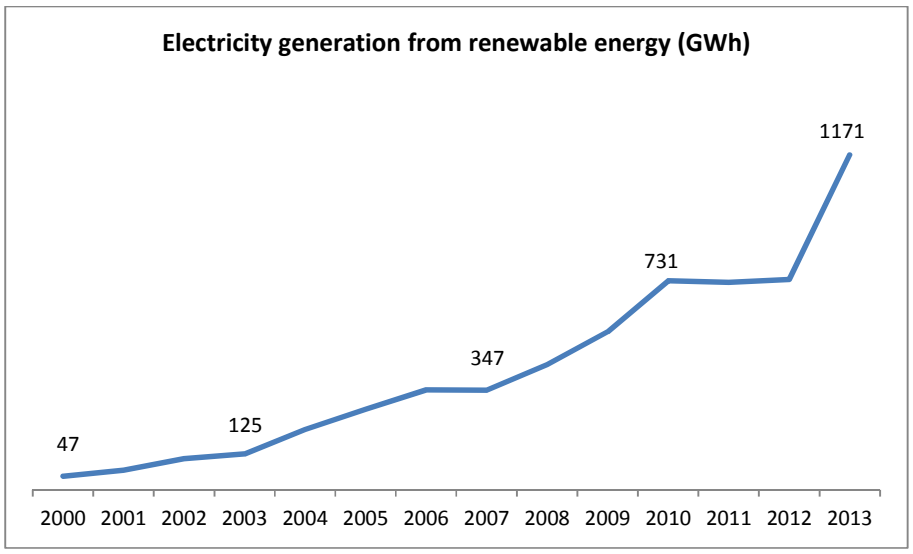
Source: CEB publication

3.2.5.2 Role of development projects

Until the early years of the last decade, hydro and thermal were the largest contributors to Sri Lanka's electricity generation mix. Electricity generation through grid-connected and off-grid hydro plants were popularised under the Energy Service Delivery (ESD) project assisted by the World Bank and Global Environment Facility and implemented by the Government of Sri Lanka from 1997 to 2002. When the project ended, the installed capacity under hydro was almost 60 per cent. Buoyed by the success of the ESD project, a follow-on project called Renewable Energy for Rural Economic Development (RERED) was formulated in 2003 and successfully concluded in 2007. The RERED project extended term loans

through participating credit institutions to commercially viable renewable energy projects. It was instrumental in boosting generation from renewable energy projects in the country.

Figure 7: Trend in electricity generation from renewable energy sources: 2000 to 2013



Source: http://www.info.energy.gov.lk/

The RERED project lifted the share of renewable energy in electricity generation from 2 per cent in 2003 to 4 per cent by 2007. However, the share of fossil fuel-based generation also reached 60 per cent[6] by then. As fossil fuels were imported, CEB's cost of generation went up, so it was decided to rapidly set up projects based on more sustainable and indigenous sources of electricity generation such as renewable energy. As of 2007, renewable energy projects were largely mini-hydro based, which posed a risk in terms of non-availability of water during periods of drought. A strong need was, therefore, felt to explore other sources of renewable energy such as wind, biomass and solar. As banks in Sri Lanka did not have experience in financing wind, biomass and solar projects, it was also crucial to increase their risk appetite and lending capacity to finance such projects. It was during this time that IFC conceived the PADGO project.

3.3 Conceptualisation and evolution of PADGO

3.3.1 Conceptualisation of PADGO

IFC conceptualised the PADGO project in 2006 to help develop small-scale distributed electricity generation as an alternative to large-scale fossil fuel-based energy generation. The project design took into account lessons learnt from earlier technology-driven projects and also sought to address the impediments identified by previous projects. PADGO's framework was kept flexible so that it could be adapted to local energy needs, available energy resources and various operating constraints. The framework allowed stakeholders (manufacturers, developers, operating companies and commercial banks) to come together and implement energy generation projects from renewable energy sources. Implementation began in 2008 and the objective was to improve access to cleaner, more affordable,

[6] *Based on figures obtained from http://www.info.energy.gov.lk/*

reliable and environmentally sustainable electricity services in areas not currently served by a reliable electricity grid.

The project was designed to achieve its objectives through two components, i.e., investment services and advisory services. Through its investment services, PADGO assisted commercial banks with a risk-sharing facility to free up their capital and consider funding renewable energy projects involving technologies hitherto unavailable in the country. This was to be complemented by advisory services, which entailed technical assistance including capacity building. The program was financed using a $3 million partial guarantee facility for investment services and $1.6 million for advisory services.

Soon after implementation of PADGO began, IFC started formal discussions with key stakeholders on sector level interventions. Discussions were also held with local banks to increase their exposure to distributed generation projects. IFC signed the first agreement in May 2009 for the investment services product (risk-sharing facility) with CBC with the objective of sharing the commercial risk of financing distributed generation projects. Subsequently, a cooperation agreement was signed with CBC in September 2009 for comprehensive advisory services to help finance projects and build institutional capacity. Later on, in June 2010, IFC signed an agreement with NDB also for the risk-sharing facility.

3.3.2 Evolution of PADGO's objectives

In 2006, when the PADGO project was being envisaged, the access rate of Sri Lanka's population to electricity was below 80 per cent. Accordingly, the project was conceived with the objective of supporting distributed generation through renewable energy sources to serve people who had no or very little access to electricity. However, as implementation progressed, grid coverage went up and the country's access rate reached nearly 90 per cent[7]. Then, during 2008-2010, changes in the political and economic environment jolted the electricity sector. Banks began to favor financing grid-connected renewable energy projects because of the feed-in-tariffs introduced earlier for renewable energy projects up to 10 MW. So, to stay relevant, PADGO's design was suitably modified to support grid-connected renewable energy-based projects. PADGO's objective was also redefined: it would develop the market for electricity generation from renewable energy sources as an alternative to fossil fuels.

During 2011, as grid connectivity in the country began to improve, grid-connected customers got more opportunities to save energy. Due to the overall increase in electricity tariffs, there was greater demand from consumers to implement measures to lower electricity bills, and from energy-intensive industries to decrease their production costs and improve competitiveness. Sector regulator PUCSL supported this and introduced the demand-side management framework to encourage efficient use of energy in the economy. The PADGO project was also well placed to carry out energy-efficiency programs due to its work in renewable energy; in 2011, the aim of supporting energy-efficiency activities was, therefore, added to its original objectives. This was to be achieved within the existing implementation timeframe of the project, i.e., by 2015.

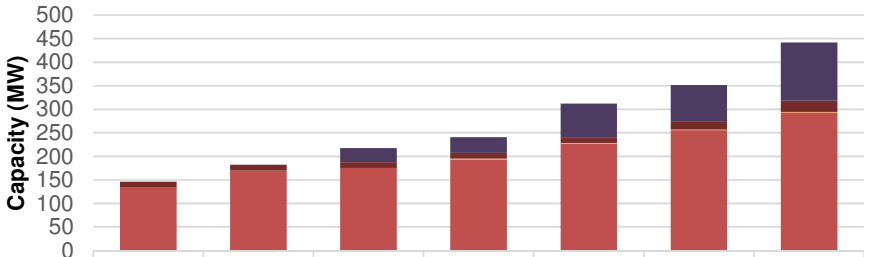
3.3.3 Development of renewable energy during PADGO's tenure

The PADGO project was able to substantially achieve its objective of supporting generation projects from renewable energy sources and facilitating commercial financing of such projects. During the time when PADGO's risk-sharing facility was operational, Sri Lanka's renewable energy installed capacity rose from 182 MW by end of 2009 to 441 MW by end of 2014, an increase of almost 260 MW. Also, sufficient diversification was achieved in terms of sources (from large hydro to wind, biomass, solar power and mini hydro). Figure 7 also shows that energy generation from renewable energy surged from

[7] *Based on figures obtained from the website of Ministry of Power & Energy, Government of Sri Lanka*

347 GWh in 2007 to 1,171 GWh in 2013, implying an annual growth rate of over 22 per cent. Of the added capacity of 260 MW, around 114 MW was directly on account of PADGO's risk-sharing facility.

Figure 8: Installed capacity in renewable energy -- 2008 to 2014 (MW)



	2008	2009	2010	2011	2012	2013	2014
Wind	0	0	30	33	73	78	124
Biomass	12	12	12	13	11	16	24
Solar Power	0	0	0	1	1	1	1
Combined Heat and Power	0	0	0	0	0	0	0
Hydro	134	170	175	194	227	256	293

Source: Based on figures obtained from http://www.info.energy.gov.lk/

In the next chapter, we look at the interventions and activities carried out under the project. PADGO's performance has also been evaluated and rated on a satisfaction scale.

4. Terminal evaluation

This chapter provides the evaluator's assessment of various performance aspects of the PADGO project. The assessment covers the following modules as mandated by Global Environment Facility (GEF) guidelines:

1. Assessment of project results
2. Assessment of risks to sustainability of project outcomes
3. Assessment of the project's catalytic or replication effect
4. Assessment of monitoring and evaluation system
5. Monitoring of long-term changes
6. Assessment of processes affecting attainment of project results
7. Lessons and recommendations

4.1 Assessment of project results

The PADGO project was expected to achieve the following outcomes:

1. Greater diversity in renewable energy technology;
2. Increased power supply by project developers with minimised environmental impacts; and
3. Rise in diligence capacity of financial institutions to appraise renewable energy projects and market the renewable energy sector as an investment opportunity.

To actuate the above goals, the project was divided into two components, investment-services and advisory-services. The broad objectives of these components are discussed below.

1. **Investment-services component:** This component was aimed to heighten the capacity of participating financial institutions, to lend to renewable-energy projects. The broader target was to increase diversity in Sri Lanka's generation capacity while lowering environmental impact. The component focused on a risk-sharing facility as an investment product, to act as a catalyst in expanding capacity of participating financial institutions to lend to renewable-energy projects.
2. **Advisory-services component:** This component was designed to provide technical assistance through interventions and activities such as market assessment, project-specific development support, capacity-building and awareness-raising. This component would also help disseminate information, pertaining to renewable energy technologies and energy efficiency, through training programs and workshops organised for participating financial institutions, developers and relevant stakeholders.

Several output, outcome and impact indicators were specified to gauge PADGO's performance on the parameters mentioned above. The evaluator has assessed PADGO's performance against each of these indicators. Assessment for the investment-services and advisory-services components is presented separately. Discussion under each component is patterned on the following structure:

- Description of interventions and activities carried out
- Performance on output indicators
- Performance on outcome indicators
- Effects on participating banks, stakeholders and the sector as a whole

Apart from output and outcome indicators that are discussed under each component of the PADGO project, there are also certain impact indicators which are common across the two components.

Assessment on the impact indicators has been described separately. Finally, this section ends with an overall rating of results achieved under PADGO on the basis of their relevance, effectiveness and efficiency, following GEF guidelines.

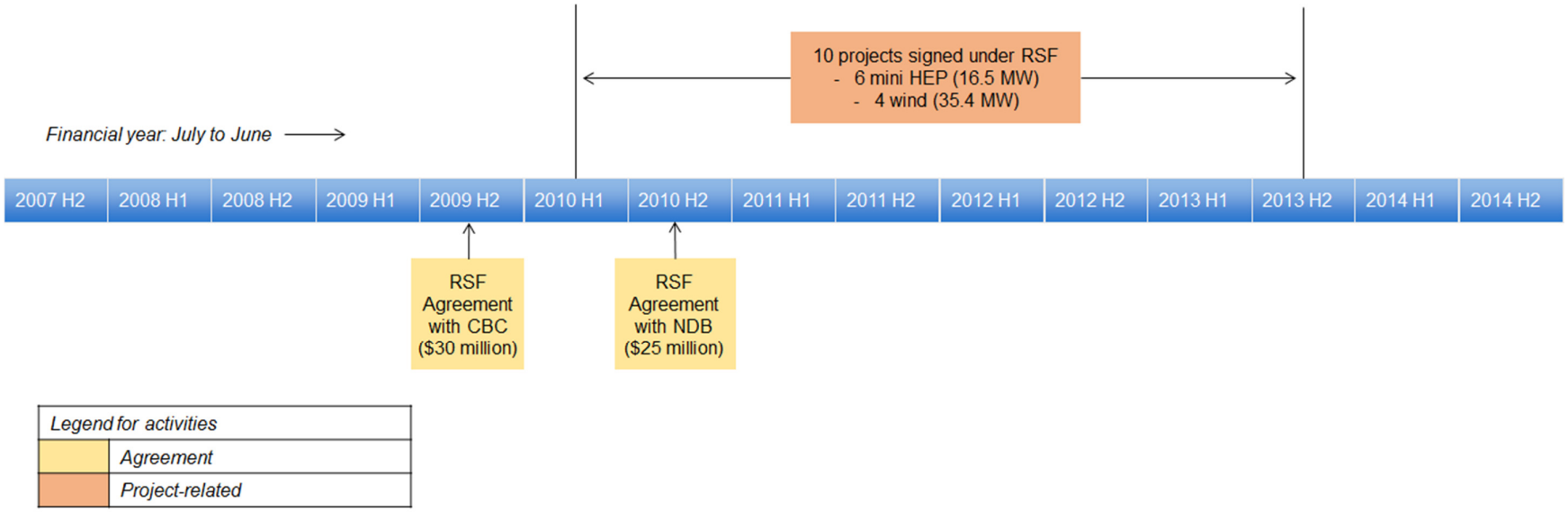
4.1.1 Investment-services component

A risk-sharing facility was introduced in the Sri Lankan market as an investment-services product, to expand the capacity of participating financial institutions to lend to the renewable-energy sector.

Key activities and achievements

The key activities and achievements under the investment-services component of the PADGO project are shown in the figure below.

Figure 9: Key activities and achievements under the investment-services component



Legend: H 1 – July to December and H2 – December to June

Source: Project-supervision reports of PADGO

Outputs

The table below presents performance on output indicators for the investment-services component.

Table 3: Performance on output indicators for investment-services component

Component	Indicator	Target	Achievement	Remark
Set up risk-sharing facility with bank	Number of entities receiving concessional investments	2	2	The concessional investments were disbursed under the risk-sharing facility. Separate agreements were signed with two commercial banks – Commercial Bank of Ceylon (CBC) in May 2009 and National Development Bank (NDB) in June 2010. Each agreement has been considered as a new financial product.
	Number of new financial products designed	2	2	

Source: Latest project supervision report of PADGO

Outcomes

The table below shows performance on outcome indicators for the investment-services component

Table 4: Performance on outcome indicators for investment-services component

Component	Indicator	Target	Achievement	Remark
Financing of distributed-generation projects by project finance institutions using risk-sharing facility	Number of distributed generation projects financed by banks using the risk-sharing facility	6	10	The project has clearly exceeded the target for number of projects financed using the risk-sharing facility. Of the 10 projects financed, 6 were mini-hydro and 4 were wind. On the indicator of new financial products launched, the risk-sharing facility agreement executed with each bank has been considered as a new financial product launched.
	Number of new financial products launched	2	2	

Source: Latest project supervision report of PADGO

Although PADGO exceeded expectations in case of a number of projects financed under the risk-sharing facility, the facility itself was utilised lesser than expected. A ramp-up period of three years was given to each bank to build their risk-sharing facility (RSF) portfolio. Of the $55 million worth of risk-sharing facility expected to be availed of, only $18.5 million, i.e., 34.5 per cent was utilised. The lower off-take of the facility was primarily on account of macroeconomic factors existing in Sri Lanka's financial markets at the time when the risk-sharing facility was launched. The civil war, an armed conflict in the Northern and Eastern provinces between the Liberation Tigers of Tamil Eelam (LTTE) and the Government of Sri Lanka, that raged for nearly 25 years ended in May 2009. This sparked off economic revival and consequently increased liquidity in Sri Lanka's financial markets. This led to lowering of interest rates; however, the risk-sharing facility's fees were not proportionately reduced. This rendered the risk-sharing product less competitive than other sources of financing available to banks. Moreover, macro-economic challenges in the renewable energy sector reduced investments in new renewable-energy projects – an example would be the long-drawn dispute (2011–2013) between Ceylon Electricity Board (CEB) and Public Utilities Commission of Sri Lanka (PUCSL) over level of feed-in tariffs for

renewable energy. A detailed description of these factors is provided in the section titled 'Assessment of processes affecting project results'.

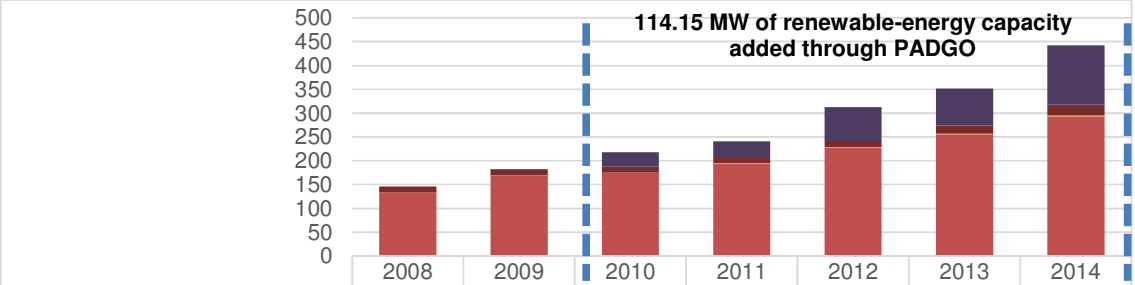
Effects on participating financial institutions and renewable-energy sector

Introduction of the risk-sharing facility under PADGO helped participating financial institutions to increase their risk appetite for renewable-energy technologies. From following a risk-averse, consortium-lending approach, banks have started taking on larger share of risk. Average size of a debt exposure in a typical wind project has increased from 12% in 2010 to 50% after 2011.

Ramp-up period (time period to build a portfolio) of each RSF agreement was three years. The ramp-up period for CBC and National Development Bank (NDB) ended in 2012 and 2013 respectively. After this period, increase in risk appetite, along with other factors such as higher credit availability, spurred investments in newer renewable-energy technologies such as biomass, waste-to-energy and solar photovoltaic.

Renewable-energy project developers were more benefitted from increased liquidity and competition in the market, which gave them several least-cost options for project financing. This further spiked investments in traditional technologies such as mini-hydro and newer technologies such as wind-energy, as demonstrated below.

Figure 10: Installed capacity across renewable-energy technologies during 2008 to 2014



	2008	2009	2010	2011	2012	2013	2014
Wind	0	0	30	33	73	78	124
Biomass	12	12	12	13	11	16	24
Solar power	0	0	0	1	1	1	1
Combined heat and power	0	0	0	0	0	0	0
Hydro	134	170	175	194	227	256	293

Source: http://www.info.energy.gov.lk/ and http://www.ceb.lk/sub/db/op_presentstatus.html

Of the nearly ~260 MW renewable-energy capacity added during PADGO's tenure (2009-2015), ~114 MW, i.e., almost 44 per cent, was facilitated by both banks under RSF and outside RSF.

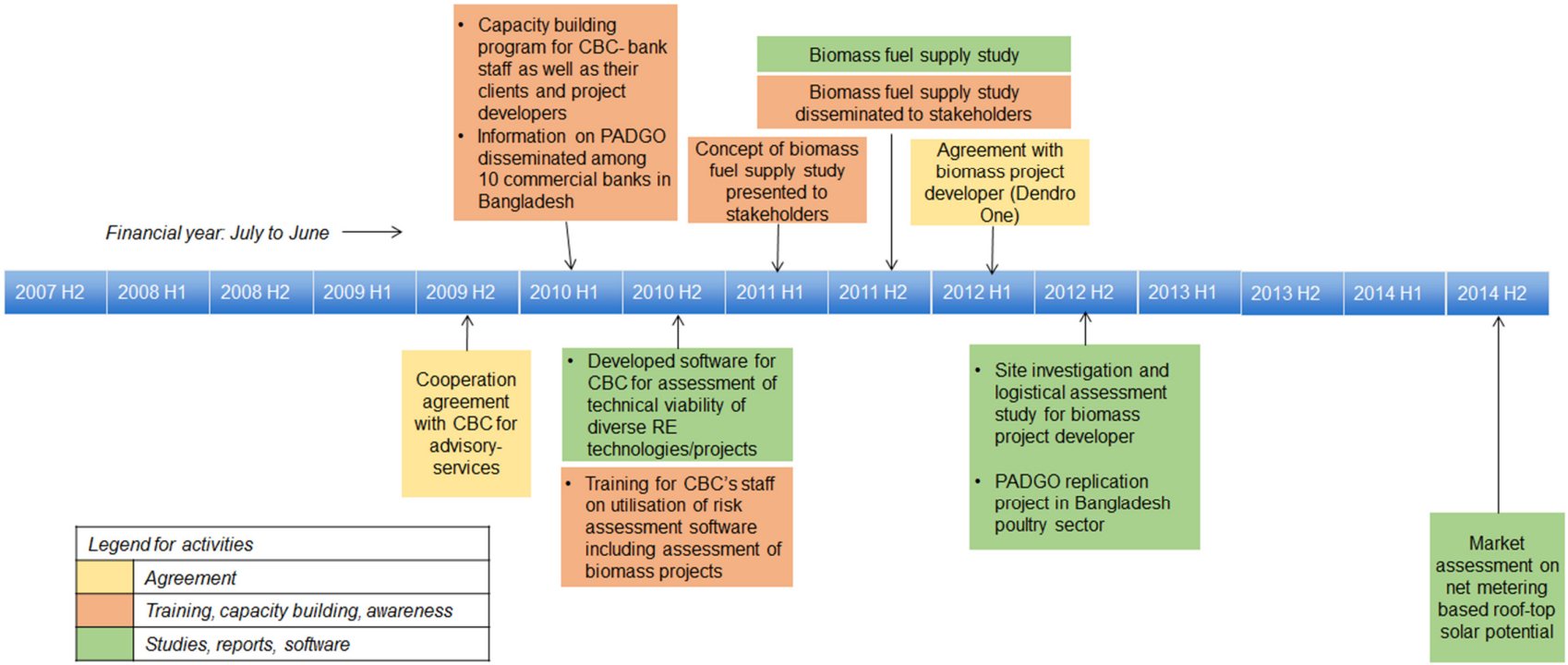
Under PADGO, International Finance Corporation (IFC) also provided banks with a methodology to evaluate loan applications, which facilitated improvement in the due-diligence framework of participating financial institutions. The comprehensive due-diligence framework helped project-finance institutions to alleviate risks (technical, social and environmental) that were discouraging local banks from offering longer-tenure loans for risky, especially wind-based projects. Also, being IFC partners, the local banks could introduce robust environmental and social risk management systems, to appraise renewable energy projects.

4.1.2 Advisory-services component

4.1.2.1 Advisory services provided for renewable energy sector

The advisory-services component helped stakeholders to identify opportunities to diversify the country's power-generation mix with minimum environment impact through a number of activities which are presented in Figure 11.

Figure 11: Key activities and achievements under advisory-services component



Source: Project supervision reports pf PADGO

Outputs

The table below presents performance on output indicators for the advisory-services component.

Table 5: Performance on output indicators for advisory-services component

Component	Indicator	Target	Achievement	Remark
Market need assessment (renewable-energy manuals)	Number of reports (assessment, surveys, manuals, Phase I/strategic option reports) completed	3	6	Historically, Sri Lanka was heavily dependent on thermal energy and large hydro for electricity. Acceptability of emerging renewable-energy projects was limited due to lack of awareness and experience. Further, understanding of risk framework of such projects was limited. Technical assistance activities such as risk-assessment software for CBC, biomass fuel supply study, and net metering-based solar photovoltaic, supported diversification in generation mix of the country. These activities increased understanding of stakeholders (banks, project developers, manufacturers) about various aspects and issues of emerging renewable-energy projects. A detailed description of these is provided in the section titled 'Assessment of processes affecting project results'.
Financial institutions receiving capacity-building support	Number of entities receiving advisory services	2	2	PADGO has met all its targets under the capacity-building component. Commercial banks, developers and other stakeholders were trained on technical, financial and risk aspects of renewable-energy technologies. Several awareness-raising sessions were also conducted, wherein findings of market assessment studies were disseminated among stakeholders. A detailed description of these is provided in the section titled 'Assessment of processes affecting project results'.
Capacity-building, training, seminar, conferences	Number of workshops, training events, seminars, conferences, etc.	3	3	
	Number of participants in workshops, training sessions, seminars, conferences, etc.	60	73	
	Number of participants providing feedback	16	16	
	Number of participants satisfied or very satisfied with workshops, training,	11	11	

Component	Indicator	Target	Achievement	Remark
	seminars, conferences, etc.			

Source: Latest project supervision report of PADGO

Outcomes

The table below presents performance on outcome indicators for the advisory-services component.

Table 6: Performance on outcome indicators for advisory-services component

Component	Indicator	Target	Achievement	Remark
Financing of distributed-generation projects by project-finance institutions	Number of entities that implemented recommended changes	2	2	Training sessions helped banks strengthen internal systems to better manage credit risk of diverse renewable energy technologies. This increased comfort level among banks to finance such projects and catalysed lending. Both CBC and NDB were able to institutionalise the framework to evaluate riskier renewable-energy projects. Increased risk appetite, coupled with knowledge gained through market assessment studies, helped banks to finance renewable-energy projects beyond risk-sharing facility. Further, a buoyant wind-power market had boosted confidence of investors. As a result, amount of sustainable-energy finance loans disbursed exceeded expectations. Increase in loans disbursed indicates positive impact of advisory-services provided under PADGO. A detailed description of the above is provided in the section titled 'Assessment of processes affecting project results'.
	Number of loans disbursed	10	19	
	Total number of distributed-generation projects financed by banks receiving advisory services	10	20	
	Value of sustainable energy finance loans disbursed	$50 million	$81.5 million	

Source: Latest project supervision report of PADGO

Effects on participating financial institutions and stakeholders

Activities conducted under the advisory-services component of PADGO have facilitated development of renewable-energy projects. The participating banks were offered technical assistance to conduct evaluation and due diligence of loan applications for renewable-energy projects. This boosted their confidence to lend. Further, capacity-building activities for operations staff of banks helped strengthen banks' ability to manage credit, appraisals, risk and technical aspects of renewable-energy projects. Consequently, there was improvement in the appraisal framework of participating financial institutions,

which are now in a position to absorb greater risks in financing renewable-energy projects including waste-to-energy, biomass, solar photovoltaic, etc.

Amongst other activities, market assessment studies and awareness-raising sessions enabled development of new renewable-energy technologies such as biomass and solar PV in Sri Lanka. It is also noteworthy that the banks have adopted the biomass fuel supply study as a reference tool for evaluating biomass projects. Further, a net metering-based roof-top solar photovoltaic potential study has been completed recently. IFC has started discussions with the government and other stakeholders including banks to design suitable programs to promote net metering-based roof-top solar[8].

PADGO facilitated a Sri Lanka-based biomass project developer named Dendro One to conduct a project-specific biomass fuel-supply study for three projects of 10 MW each. Reports prepared under PADGO covering site investigation and logistics assessment have helped the developer understand the project's risks. The developer is ready to start developing the project as soon as financial closure is achieved. Further, CEB has executed standardised power purchase agreements with 14 biomass energy based projects, indicating that investors are evaluating riskier renewable-energy technologies. All this shows that PADGO's activities have indeed created an enabling environment for increasing use of renewable energy and diversification of the power generation mix of the country for sustainable future.

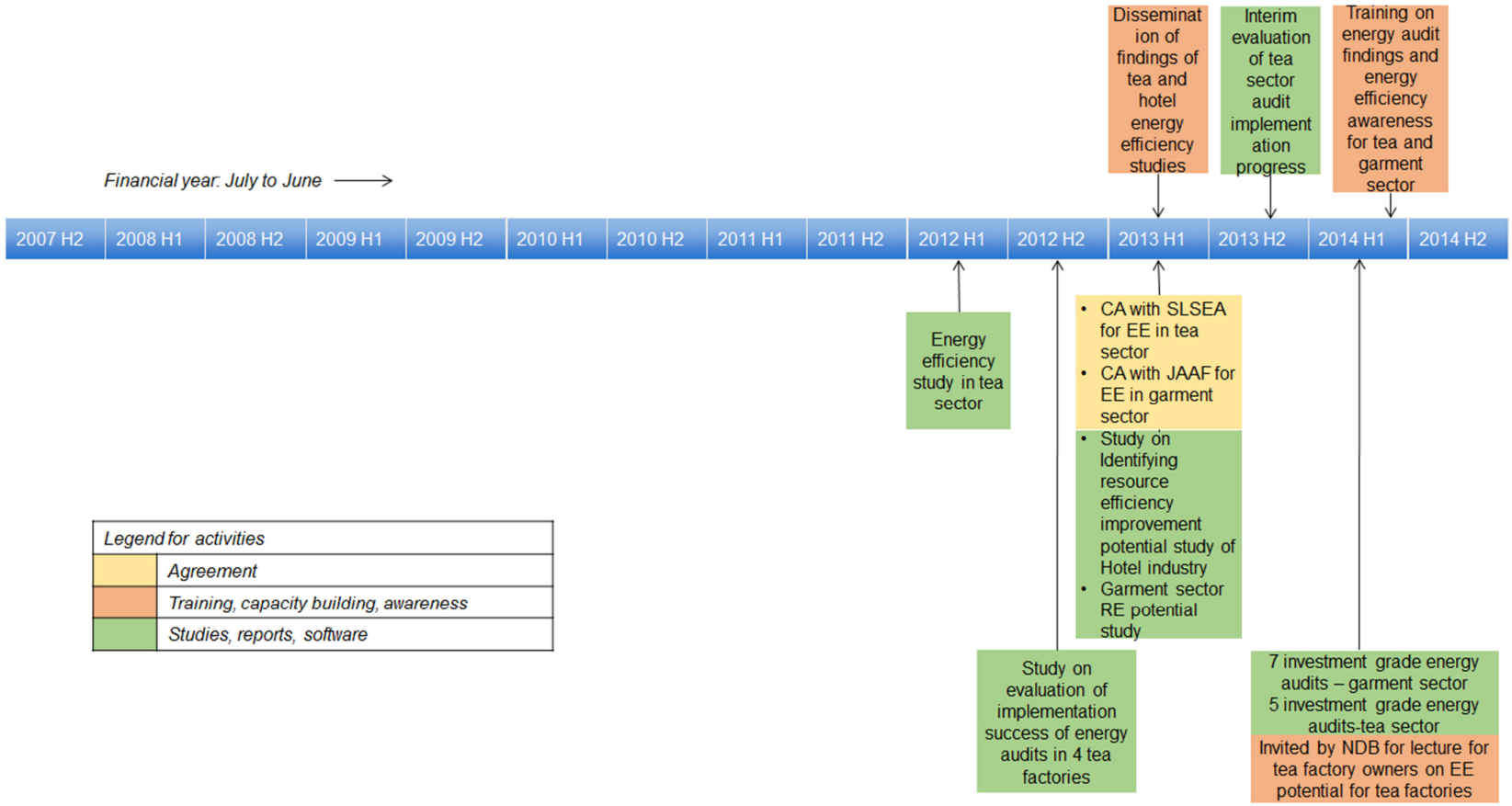
4.1.2.2 Advisory services extended to promote energy-efficiency initiatives in energy-intensive sectors

While the advisory-services component was primarily focused on building institutional capacity to stimulate investments in renewable energy projects, advisory assistance was also extended to promote and facilitate development of market for energy-efficiency projects in Sri Lanka. Stakeholders were supported in three identified energy-intensive sectors through market assessment, capacity-building, awareness-raising and investment-grade energy audit programs. Findings of relevant studies/ audits were shared with the stakeholders. All of these activities were carried out using funding from co-financing sources, with the prior consent of donors.

Key activities and achievements

[8] *This will be considered as a new project outside PADGO.*

Figure 12: Key activities and achievements for energy-efficiency initiatives in energy-intensive sectors under the advisory-services component



Source: Project supervision reports of PADGO

Outputs

The table below presents performance on output indicators under the advisory-services component for energy-efficiency initiatives in energy-intensive sectors.

Table 7: Performance on output indicators for energy-efficiency initiatives in energy-intensive sectors

Component	Indicator	Target	Achievement	Remark
Advisory services for the development of energy efficiency market	Number of reports (assessment, surveys, manuals, Phase I/strategic option reports) completed	2	22	The focus of PADGO was expanded to develop an energy-efficiency market in Sri Lanka. The project benefited more stakeholders than expected through market assessment studies, awareness-raising sessions, capacity building and investment-grade energy audits. A detailed description of these activities is provided in the section titled 'Assessment of processes affecting project results'.
	Number of new financial products designed	1	-	
	Number of entities receiving advisory services	10	18	
	Number of workshops, training events, seminars, conferences, etc.	2	13	
	Number of participants in workshops, training events, seminars, conferences etc.	100	290	
	Number of participants providing feedback on satisfaction	85	54	
	Number of participants reporting satisfied or very satisfied with workshops, training, seminars, conferences, etc.	70	43	
	Number of procedures/policies/ practices/standards proposed for improvement or elimination	30	188	

Source: Latest project supervision report of PADGO

Outcomes

The table below presents performance on outcome indicators under the advisory-services component for the energy-efficiency sector.

Table 8: Performance on outcome indicators for the energy-efficiency sector

Component	Indicator	Target	Achievement	Remark
Advisory services for the development of energy efficiency market	Number of new financial products launched	1	-	Based on the final evaluation report of implementation success of energy audit in tea & garment factories, the entities implemented low-cost or no-cost interventions. However, due to capital constraints, the costlier interventions were not implemented. Further, large banks did not view energy-efficiency as a potential business opportunity because of small investment size. A detailed description of these factors is provided in the section titled 'Assessment of processes affecting project results'
	Number of entities that implemented recommended changes	15	18[9]	
	Number of recommended procedures/policies/practices/standards that were improved/eliminated	20	80	
	Number of loans disbursed	20	0	
	Value of sustainable energy finance loans disbursed	10,000,000	0	

Source: Latest project supervision report of PADGO

Effects on stakeholders and sector

A number of initiatives were undertaken for development of the energy-efficiency market in Sri Lanka. These included market assessment studies for tea, garment and hotel sectors, awareness sessions on energy-efficiency market, and capacity-building sessions that were conducted to disseminate findings of some of these studies among stakeholders. These initiatives helped to create awareness of the importance of energy-efficiency measures.

Further, assistance was given to two specific sectors (tea and garment) to assess energy-saving potential of selected factories through investment-grade energy audits. These sectors were selected based on findings emanating from the report assessing potential for energy saving through energy efficiency initiatives. The investment-grade energy audit helped augment institutional capabilities to utilise existing energy resources more efficiently. Factories have adopted investment-grade energy audits as a reference tool while undertaking energy-efficiency interventions. It has also been found that some factory owners were already incorporating certain recommendations across their other group companies as well.

The evaluation of implementation progress of energy audits shows that factories were able to implement low-cost or no-cost interventions. Further, these factories are considering implementing more expensive interventions, too. Overall, factories have implemented or are implementing 66% of the recommended interventions. However, some recommendations such as installation of solar photovoltaic and replacement of boilers were found to be non-remunerative. Involving energy service companies would have been more impactful because of their ability to bring in required investment.

[9] *Five tea factories, seven garment factories, two in-depth advisory firms i.e. SEA and JAAF, and four tea factories in which PADGO assessed the implementation success*

4.1.3 Assessment of impact indicators of PADGO project

Having assessed PADGO's performance on various output and outcome indicators within each component of the project, the next step is to assess its performance on impact indicators. These indicators are common across components and hence are discussed together for the investment-services and advisory-services components.

Table 9: Performance on impact indicators of the PADGO project

Indicator	Target	Achievement[10]	Percent achieve-ment	Remark
Renewable energy expected to be produced (MWh/year)	351,000	350,133	~100%	Even though uptake of the risk-sharing facility was lesser-than-expected, the project's impact was commensurate with its objective. On the basis of discussions with CBC and NDB, it can be concluded that achievement is due to the capacity-building initiatives conducted under PADGO that strengthened risk appetite and internal systems of banks to better manage credit and project appraisals. Both banks have now expressed greater comfort to finance riskier renewable-energy technologies such as wind, biomass, waste-to-energy and solar PV under their portfolio.
Greenhouse-gas emissions expected to be avoided (metric tonnes/year)	227,000	227,026	~100%	
Value of financing facilitated ($) - RE	100,000,000	228,427,965	~228%	
Energy use expected to be avoided (MWh/year)	70	80	~114%	The final evaluation report of implementation success of energy audit in tea and garment factories shows that the entities implemented low-cost or no-cost interventions. Due to capital constraints, costly interventions were not undertaken. Discussions with CBC, NDB, Sri Lanka Sustainable Energy Authority (SLSEA) and Joint Apparel Association Forum (JAAF) revealed that large banks did not view energy efficiency as a potential business opportunity because of small investment size. However, deployment of clean energy and energy-efficiency projects in new townships, campuses and multi-storey buildings, could bring scalability and expand the size of investments.
Value of financing facilitated ($) - EE	20,000,000	-	~0%	

Source: Latest project supervision report of PADGO

Here are some key conclusions regarding PADGO's performance and the sectors in which it operates:

- Building upon the experiences of earlier projects such as Energy Services Delivery (ESD) and Rural Electrification and Renewable Energy Development (RERED), the PADGO project improved diversification in the generation mix of Sri Lanka in a sustainable manner.
- The renewable-energy sector moved from development-financing mode towards commercial-financing mode during PADGO's tenure.

[10] Calculation is based on the information available in latest project supervision report of PADGO and renewable-energy portfolio details maintained by IFC

- The energy-efficiency sector on the other hand is still nascent and needs support from manufacturers, energy-service companies and banks to become sustainable.

4.1.4 Evaluator's ratings of project outcomes

The preceding sections assessed activities carried out under various components of PADGO and analysed performance of the project for each output, outcome and impact indicator. In accordance with GEF guidelines, the project outcomes have been rated on the criteria of relevance, effectiveness and efficiency following a satisfaction scale, as shown below.

Table 10: Evaluator's ratings of project outcomes

Project rating criteria	Level of achievement and rating
Relevance (Were the project's outcomes consistent with focal areas/operational project strategies and country priorities?)	***Satisfactory*** ▪ PADGO, through its investment services and advisory services, addressed three market barriers – technical, financial, and market – to foster development of renewable-energy technologies in Sri Lanka. ▪ Banks have moved from traditional risk-averse, consortium-lending to more riskier, sole-lending in wind-power projects. ▪ PADGO's investment services helped banks to increase their risk appetite, expand their lending capacity, and diversify offerings among various renewable-energy technologies.
Effectiveness (Do actual project outcomes match the original or modified project objectives?)	***Satisfactory*** ▪ Uptake of the investment-services product by financial institutions was less than expected since it was perceived to be expensive by them[11] . Despite this major drawback, participating financial institutions and other stakeholders did benefit from PADGO's other activities as described below. ▪ Training sessions for financial institutions strengthened their internal systems to better manage credit and risk of diverse renewable-energy technologies. ▪ Initiatives implemented under Advisory-services' such as biomass fuel supply handbook, helped stakeholders to understand technical aspects and issues in renewable-energy investments, especially bio-mass. Further, the specific advisory-services engagement with the project developer Dendro One contributed to development of biomass projects in the country. Following recent completion of the net metering-based, roof-top solar photovoltaic potential study, IFC has started discussions with the Government and other stakeholders including banks to design suitable programs to promote the technology. All of these initiatives have created an enabling environment to foster implementation of new renewable energy-based projects; around 14[12] standardised power purchase agreements (SPPA) were signed with CEB for biomass-based projects and 5 for solar energy-based projects. ▪ The specific advisory-services engagement with one of the participating financial institutions (CBC) on development of risk-assessment software enabled their staff to understand risk-framework of renewable-energy projects. This improved the appraisal framework of the bank and helped it to better identify and manage risks in

[11] *When the risk sharing facility was launched, interest rates in the financial markets had fallen; however the cost and fee structure of the risk sharing facility was not adjusted downward accordingly. This made the facility appear more expensive than other source of financing for the participating financial institutions.*

[12] *As on January 10, 2015*

Project rating criteria	Level of achievement and rating
	financing renewable-energy projects including waste-to-energy, biomass, solar photovoltaic, etc. ▪ The training and capacity-building conducted under advisory services enabled stakeholders to identify opportunities in diversifying the generation mix of the country. This support deepened the understanding of different stakeholders (banks, project developers, manufacturers) on a number of technical aspects and issues and added momentum to renewable-energy investments. ▪ Advisory services were also extended to development of the energy-efficiency market. It was helpful in creating first-level awareness of the energy-saving potential of the energy-intensive sector. The studies conducted spotlighted the best energy-saving practices for factory officials. PADGO supported investment-grade energy audits in a difficult market for two specific sectors, namely tea and garments. Investment-grade energy audits conducted in seven garment and five tea factories provided energy-efficiency opportunities for industries. This is expected to yield results and will continue to reduce greenhouse gas emissions.
Efficiency (Was the project cost effective? Was the project the least-cost option? Was project implementation delayed, and, if it was, did that affect cost-effectiveness?)	***Satisfactory*** ▪ PADGO has utilised lesser funds than budgeted indicating that the project was indeed cost-effective.

4.2 Assessment of risk to sustainability of project outcomes

(This section assesses the likelihood of sustainability of project outcomes based on assessment of financial, socio-political, institutional and environmental risks. The assessment is in terms of likelihood and magnitude of risks).

Table 11: Description of risks to sustainability of project outcomes

Dimension of risk	Description of likelihood and magnitude of potential effect of the risks	Rating
Financial (Likelihood of financial resources not being available)	▪ Availability of financial resources to fund any project is a function of availability of financial resources in Sri Lanka's financial markets. ▪ Since January 2013, benchmark interest rates of Sri Lanka have been steadily reducing, indicating increasing availability of financial resources. The monthly average weighted prime lending rate (AWPR) as published by the Central Bank of Sri Lanka, reduced from 14.29% in January 2013 to 6.36% in January 2015. This is the lowest value achieved during the last decade (see Figure 13). Hence, presently, availability of financial resources in Sri Lanka is strong. ▪ However, flow of financial resources in any financial market fluctuates over a period of time based on various internal and external factors with respect to the country's economy such as GDP growth and liquidity in global markets. Considering this, availability of financial resources is inherently uncertain over a period of time. This is also demonstrated in Figure 13 which	Although present availability of financial resources is strong, it is uncertain whether this state would continue. Considering this, financial risk is assessed to be **moderately likely (ML)** i.e., there are moderate risks to sustainability.

Dimension of risk	Description of likelihood and magnitude of potential effect of the risks	Rating
	shows fluctuations of the benchmark interest rate over the past decade.	
Socio-political (Level of ownership by stakeholders such as the Government, CEB and general public)	Policy support The Government has undertaken various policy measures towards promotion of renewable energy and energy efficiency. These measures are described below: ▪ In 2010, the development policy framework document of the Government, known as *Mahinda Chintana,* was issued by the Department of National Planning. It provides a target of 20 percent share of non-conventional renewable energy (NCRE) in the country's total electricity generation by 2020. It further provides for up-gradation of the transmission system to facilitate absorption of renewable energy generation into the national grid. The *Mahinda Chintana* document also identifies Ceylon Electricity Board as implementer of an aggressive renewable energy generation program to generate 10 per cent of its power from renewable sources. ▪ In 2012, the Government adopted the National Climate Change Policy of Sri Lanka, which provides for steps to explore the potential of clean and renewable energy sources and enhance their production, accessibility, and affordability. The policy further encourages utilisation of clean and renewable energy sources. In terms of energy efficiency, the policy encourages action to improve demand-side management to maximise the efficiency of energy utilisation. It also provides for introduction of economic incentives for less carbon-intensive fuels and energy-efficient technologies. ▪ The Sri Lanka Sustainable Energy Authority is implementing a national Energy Management Plan (EnMAP) from 2012-2016. This project aims to achieve an energy saving equivalent to 20% of the total energy consumption of year 2010, by 2020. The main components of the plan are: (1) regulatory interventions, (2) energy-efficiency services, (3) enhancing awareness on energy conservation, and (4) facilitating funding schemes for energy-efficiency improvement. The plan encompasses activities supporting energy-efficiency improvement and conservation in all sectors, namely industrial, commercial and domestic consumer categories. Institutional support ▪ In 2007, the Government established the Sri Lanka Sustainable Energy Authority (SLSEA) through an Act of parliament (Act 35 of 2007) to plan, promote, facilitate and coordinate development of non-conventional renewable energy sources. Commercial support ▪ For projects up to 10 MW, SLSEA and CEB offer a standardised power purchase agreement (SPPA) for approved renewable energy projects. SPPA is standardised and non-negotiable, and is valid for 20 years from the commercial operations' date. ▪ Projects eligible for SPPA are also eligible to be paid under the small power purchase tariff (SPPT) scheme. These tariffs are reviewed and determined by the independent regulator, Public Utilities Commission of Sri Lanka (PUCSL) once each year.	The Government is providing comprehensive support for renewable energy and energy-efficiency projects. Considering this, the rating for this parameter is provided as **likely (L),** i.e., there are no or negligible risks that affect sustainability.
Institutional framework	▪ The preceding assessment of socio-political risks describes policy, institutional and commercial support provided by the	Institutional framework and

Dimension of risk	Description of likelihood and magnitude of potential effect of the risks	Rating
and governance (legal frameworks, policies, governance structures)	Government to the renewable energy and energy-efficiency sectors. This support will evolve as investments in these sectors ratchet up, going forward. ▪ As stated in the preceding sections, in terms of policy, the Government has given importance to renewable energy in the future energy mix. It is likely that as renewable-energy investments increase, required institutional framework and governance structure will be set up. ▪ The framework should include a comprehensive and detailed policy for promoting renewable-energy investments. Such a policy should specify the expected contribution in terms of installed capacity and future targets for each technology, specific incentive measures required and sources of funds to make state support sustainable.	governance is well in place and will evolve in future as investments increase. Considering this, the rating for this parameter is provided as **likely (L)** i.e., there are no or negligible risks affecting sustainability.
Environmental (environmental activities which could impact renewable-energy investments)	▪ Sri Lanka being a small island in the Indian Ocean is mostly affected by weather-related hazards. Floods, mostly due to monsoonal rain or effects of low pressure systems, and droughts due to failure of monsoonal rain are the commonest hazards experienced in Sri Lanka. Sri Lanka is also prone to hazards such as landslides, lightning strikes and coastal erosion. In 2004, almost two-thirds of the Sri Lankan coast was affected by the Indian Ocean tsunami highlighting the country's vulnerability to low-frequency but high-impact events[13]. ▪ The prevalence of drought may be surprising given that Sri Lanka receives an average of 1,800 mm of rainfall annually. However, a large part of the island is drought-prone from February to April and, if the subsidiary rainy season from May to June is deficient, drought may continue into September[14]. ▪ Mini-hydro, which is one of the most prevalent forms of renewable energy projects in Sri Lanka, is highly impacted by drought. Also, most of the wind projects in the country are located in coastal areas and hence can get affected by tsunamis, cyclones and coastal erosion.	**Moderately unlikely (MU)** Significant risks affect this dimension of sustainability.
Overall rating: Ownership by key stakeholders like the Government is strong for renewable energy sector. Also, required governance framework is well in place. However, availability of financial resources is uncertain over a period of time which could affect investments in these sectors. Further, environmental risks to renewable-energy projects are significant. Considering this, the overall risk rating provided to likelihood of sustainability of project outcomes is **moderately likely (ML),** i.e., moderate risks affect this dimension of sustainability.		

4.3 Catalytic role

(The PADGO project may have played a catalytic role in inducing either positive or negative developments in other projects or may have directly facilitated such developments in other projects. Further, the project's design may have been replicated in other projects on account of its positive results. This section describes such catalytic or replication effects of the PADGO project.)

Catalyzing banks' confidence in offering risk-sharing facility product

Discussions carried out by the evaluation team with participating banks in the PADGO project have revealed that owing to the learning and experience gained from implementing the risk-sharing facility

[13] *Source: Website of Ministry of Disaster Management, Government of Sri Lanka*
[14] *Natural Disaster Risks in Sri Lanka: Mapping Hazards and Risk Hotspots; Lareef Zubair et al.*

offered under PADGO, banks have become more confident and are positively looking at funding projects outside Sri Lanka. One such bank – NDB -- is now contemplating funding renewable energy projects outside Sri Lanka, particularly in Bangladesh, Maldives and a few countries in Africa, and is eager to tie up with IFC programs in these countries.

Replicating the risk-sharing facility in other countries

Observing the positive results of the PADGO project, especially in terms of increasing the risk appetite of banks, IFC can consider replicating the risk-sharing facility product in other countries. The criteria for selection of a country could be large untapped renewable-energy potential, high risk perception of renewable energy, and a well-developed banking sector.

Catalyzing sustainable energy financing-based projects in Bangladesh

During early stages of the PADGO project, IFC conducted an awareness program about PADGO with senior management staff of 10 commercial banks in Bangladesh, informing them about the project's objectives, design and activities. IFC received encouraging response to the project from the staff. Encouraged, IFC decided to divert funds from its Bangladesh projects to PADGO to fund two sustainable energy financing-based projects in Bangladesh: sustainable energy finance (SEF) Bangladesh and poultry biogas. Thus PADGO was able to directly catalyze sustainable energy financing-based projects in Bangladesh.

Replicating energy-efficiency activities/ projects in Sri Lanka

Energy-efficiency activities/ projects carried out under PADGO were replicated in other energy-intensive establishments across Sri Lanka.

4.4 Assessment of PADGO's monitoring and evaluation system

PADGO's monitoring and evaluation system is based on IFC's result measurement system. IFC follows a standardised approach with a set of processes, procedures, frameworks and tools to monitor and evaluate any IFC project. Before describing this system, it is important to understand the lifecycle stages of IFC projects, to better appreciate the role of monitoring and evaluation.

4.4.1 Project lifecycle

Any IFC advisory-services project typically undergoes the following four sequential stages:

1. Concept development
2. Pre-implementation
3. Implementation
    a. Preparation
    b. Execution
    c. Completion
4. Post-implementation

These four stages are detailed below.

4.4.1.1 Concept development

This is the first stage in which a project concept note is generated, evaluated and if deemed suitable, approved for the next stage. The concept note describes in detail the market need for the project, the project concept, key objectives and proposed funding sources. The note is evaluated by either regional or global teams depending on the project's scope. Evaluation is carried out on multiple parameters, the most important of which are whether:

- The project generates high overall development outcomes;
- The project concept is sound in terms of market need;
- The objectives are 'SMART' which is an acronym for specific, measurable, achievable, realistic and time-framed; and
- Whether the proposed sources of funds are sufficient.

Finally, in a concept review meeting, the note is discussed by the project's regional and global teams and a decision is taken on whether to move to the next stage or not.

4.4.1.2 Pre-implementation

Once a project's concept note is approved, an implementation plan is prepared. This is a more detailed and specific version of the concept note. The plan describes in specific detail:

- Project design
- Monitoring and evaluation arrangement, specifically performance indicators to be tracked, their baselines and target values
- Clients – at least one client needs to be identified for the implementation plan to be approved
- Budget for the project – sources of funds (secured/ unsecured) and uses of funds

The implementation plan document also goes through a process flow for approval like the concept note. Once the implementation plan is approved, the project commences.

4.4.1.3 Implementation

This is the actual implementation phase and consists of three sub-phases:

- Preparation
- Execution
- Completion

Under the preparation phase, the start date for implementation/ execution of the project is decided. The project's execution phase begins on the implementation/ execution start date.

During the execution phase, a project's performance is supervised at regular intervals and inputs are provided for any course correction. The process of supervision involves generation of periodic supervision reports (PSR) in half-year periods during the course of project execution. The PSRs are vital for undertaking regular monitoring and evaluation as they capture the following data points:

- Project objectives and updates to the objectives
- Activities completed and planned next
- Performance of a project on various indicators
- Risk factors and mitigation plans
- Sources of funds and utilisation under various cost heads
- Lessons learnt

Additionally, PSRs also show rating for a project's performance on some key data points. Performance on various indicators is compared with targets and rating for achievement of targets is provided based on a predefined scale. Likewise, the probability of various risks is rated based on a predefined scale.

The process of supervision begins after the completion of each tracking period of a project. The project leader collects data on various parameters and prepares the PSR for the period. This is reviewed by regional/ global teams; review comments are incorporated and then finalised.

The date on which the project's tenure is completed is known as the implementation/ execution end date. The project's completion phase starts from this date. The purpose during this phase is to evaluate

outcome and impact, and identify lessons learnt – to feed these back into strategy and operational decision-making and also to archive for future reference.

The completion stage begins with preparation of project completion report (PCR) by the project leader. The project's terminal evaluation report serves as a key input for the PCR. The PCR is completed within three months of project completion and shared with regional/ global teams for review and comments. The process for finalisation of the PCR is similar to the previous stages. However, there is one important addition in the terminal evaluation process of the completion stage which sets it apart from other stages – the PCR is also evaluated by two independent entities which do not have any past association with the project[15].

4.4.1.4 Post implementation

Once the completion phase ends, the post-implementation budget is prepared for the project and the project is financially closed. This phase also involves archival of key documents related to the project.

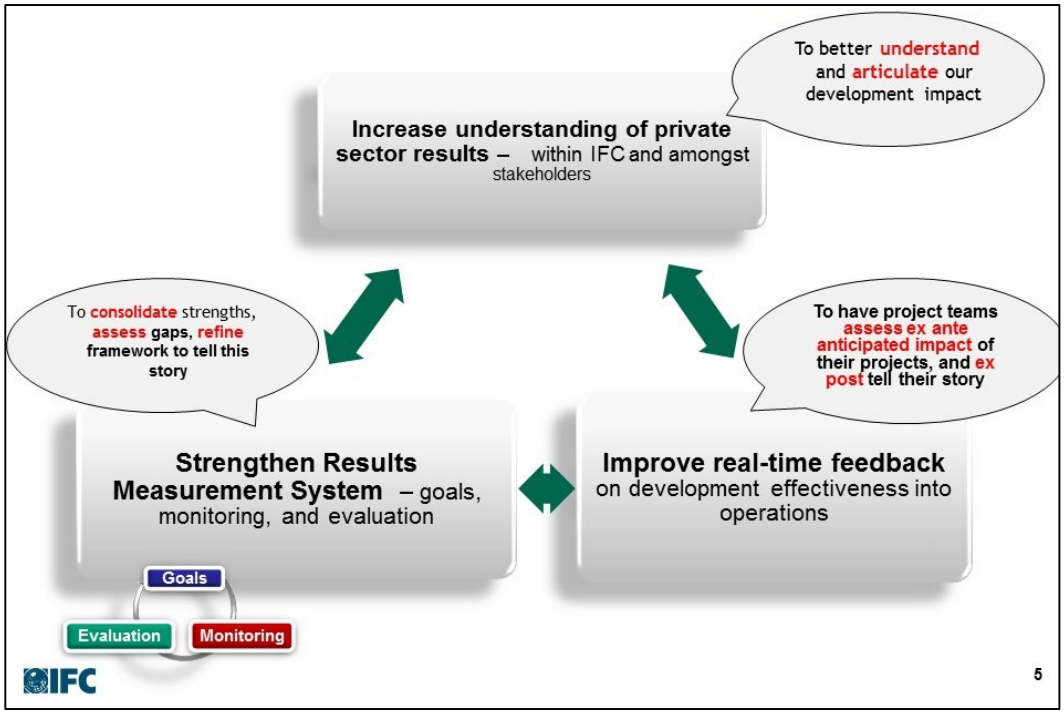
4.4.2 IFC's results' measurement system

The previous section elaborated the lifecycle stages through which any IFC advisory services project passes. In each of these stages, the role of monitoring and evaluation is crucial to increase understanding of outcomes and impact of IFC's activities; infuse feedback on lessons learnt into IFC's future strategies and operations; and strengthen the monitoring and evaluation system further. The following figure depicts the importance of monitoring and evaluation.

[15] *These two entities are:*

1. *Development Impact Department (CDI): The department oversees IFC's results measurement system for both its investment and advisory businesses. Further, it oversees research that is designed to deepen IFC's understanding of the development results of its activities, tests and implements additional monitoring instruments and evaluative approaches, and also tracks the 'value-add' of IFC's investments.*
2. *Independent Evaluation Group (IEG): The group is charged with evaluating the activities of the International Bank for Reconstruction and Development (IBRD) and International Development Association (the World Bank), the work of International Finance Corporation (IFC) in private sector development, and the Multilateral Investment Guarantee Agency's (MIGA) guarantee projects and services. The goals of evaluation are to provide an objective assessment of the results of the World Bank Group's work and to identify and disseminate lessons learned from experience.*

Figure 13: Importance of monitoring and evaluation in IFC's projects



Source: IFC

The PADGO project's monitoring and evaluation system is based on IFC's results' measurement system (RMS) whose features are described below.

> ***Feature 1: Articulating development results of the project***
>
> *At the outset, development results of the program are well articulated, detailing the story on how project interventions contribute to better outcomes. Further, external factors, context and assumptions that may affect or influence a project's results are also described. This serves as the foundation of the results' measurement system framework. In cases where relevant, component-level development results are also articulated. Further, as a program progresses, it is periodically reviewed to assess viability of the development results based on realities and performance.*

The outcome and impact of the PADGO project's activities have been well-articulated throughout the project term. Internal and external risk factors that could impact results have also been described adequately. Further, viability of results has been reviewed and modified at crucial junctures based on operating environment and program realities.

Development results – Outcomes

The implementation plan (GEF Project Document, January 23, 2008) describes the specific outcomes that a project is expected to achieve under each component. The document specifies the outcome indicators to be tracked, their baselines, and target values for each of the seven years of the project. These indicators are listed below:

- Risk-sharing facility component: Loan assets that the risk-sharing product is covering (in $ million)
- Capacity-building component: Number of loans made to new distributed-generation projects by participating financial institutions

- Knowledge-management component: Number of companies and entities that received information on distributed generation

Performance on these indicators has been tracked and evaluated in each of the PSRs generated throughout the project.

Development results – Impact

PADGO's implementation plan computes the renewable energy expected to be produced and quantum of greenhouse gas emission expected to be avoided because of activities carried out under PADGO. The numerical assumptions used to compute these indicators have been well-articulated. In the implementation phase, these indicators have been regularly computed and tracked in the PSRs.

Risk factors

The implementation plan identifies up to four risks that could impact achievement of targets, and describes a mitigation plan for each. The risk factors identified are:

- Poor coordination between World Bank and IFC
- Lack of interest/uptake from local stakeholders
- Financing technology that does not promote greenhouse gas reduction
- Renewable energy becoming non-competitive

Each PSR of the PADGO project also identifies risk factors on an ongoing basis.

Review of viability of results achieved

The PADGO project has been able to review viability of results achieved. An example of this is when the program's objectives were modified in 2010 to cover grids connected to renewable-energy projects. At that time, grid connectivity in the country was improving and banks were more inclined to finance grid-connected projects. Therefore, the PADGO project's objectives were altered to ensure it achieved desired reduction in greenhouse gas emission.

Feature 2: Employing standardised monitoring and evaluation framework and indicators

Following its global framework, IFC programs align their results' measurement framework to facilitate aggregation and benchmarking of development results. The most-prevalent practice is to adopt relevant standard indicators that measure development effectiveness of programs. Clear guidelines, methodology and units of computation for these indicators are in place and used.

The PADGO project's monitoring and evaluation framework incorporates indicators from IFC's standardised indicator framework, thus ensuring alignment with a global results' measurement framework. The list of indicators to be tracked was decided during PADGO's implementation plan stage itself. While finalising the implementation plan document, it was ensured that the indicators were picked from IFC's standard indicator list while allowing for minor customisation, to align with the project context.

Feature 3: Monitoring and reporting of results at regular intervals

Reporting on IFC's development effectiveness is part of its accountability as a public development institution. Tracking and articulating results helps IFC to improve its future performance. All projects report development results through a six-month project supervision reporting cycle.

Further, process, activity and output-level monitoring are done by the project team using alternative methods and standard monitoring and compliance procedures set by IFC. Data on each indicator is regularly captured using a comprehensive online tracking tool which provides verifiable data points such as sources of information and dates of recommendation and implementation. Data on key outcomes and impact indicators are collected from clients and stakeholders. For selected projects, data from the results' measurement system activities serve as inputs to the evaluation team that IFC will engage as an independent contractor.

In addition, learning from lessons is an integral component of the whole IFC project cycle. At the project-design stage, teams utilise learnings from past and ongoing projects to set the strategy and approach for new projects. During implementation, projects identify lessons learnt in the design, start-up and implementation phases. Ditto the project completion phase.

Regularity in monitoring and evaluation

The PADGO project has regularly monitored and reported results throughout its tenure. In all, 15 PSRs were generated on a half-yearly basis during the seven-year project. These were finalised within one–two months from the end of each half-yearly reporting cycle.

Validated data

Data used in PADGO's monitoring and evaluation has been of high quality. Performance data has been maintained on an ongoing basis in IFC's online system during the supervision stage. This data is automatically extracted while generating PSRs. The data is populated in the system from verifiable sources such as audited reports of banks (for loan asset data).

Lessons learnt

Lessons learnt have been an integral part of all stages of the PADGO project. The project's design has been finalised after incorporating lessons learned from earlier technology-driven projects undertaken by IFC using GEF and other donor funds for over a decade. However, the renewable-energy initiative was relatively new to Sri Lanka; at the time of PADGO's conception, not many renewable-energy projects had been installed. Hence, scope for learning was limited. But it cannot be denied that as the project progressed, significant lessons were gained and incorporated into the program's design, such as the focus on grid-connected renewable-energy projects in 2010.

PSRs have played a crucial role in identifying and incorporating lessons learnt. As the project progressed, key lessons learnt during the tracking period were captured as a part of each PSR.

Feature 4: Undertaking systematic evaluations based on research and impact assessment

Systematic evaluation is essential to enhance development impact of IFC's investment and advisory services by feeding lessons learnt, back into projects and strategy. By revealing factors for success or failure, evaluations can help explain what needs to be done more — or less — to achieve the overall goal. IFC's evaluation strategy has four primary objectives: (1) credibly articulate IFC's development impact; (2) learn how to maximise effectiveness of IFC interventions; (3) provide useful business intelligence to clients and partners; and (4) exchange knowledge with external actors.

IFC has been conducting formal self-evaluations across its operations since 2005, and investment in evaluation has been growing steadily ever since. Evaluations are undertaken at project, programmatic, and/or thematic levels, as well as at the level of donor-funded facilities, countries, and regions. Most evaluations are led by external evaluation experts, supervised by IFC evaluation specialists, and draw on best practices. Evaluations are planned and implemented in partnership with staff across IFC and integrated into project and program design, early in the project lifecycle, whenever possible.

Upon completion, the PADGO project will have undergone two formal processes of evaluation, including a mid-term one in early 2012 and terminal evaluation in 2015 – both by external entities. Approach and methodology for this will be based on GEF's guidelines to ensure that results are evaluated using the standardised approach and lessons learnt are effectively identified.

Feature 5: Utilising consistent work processes and systems

IFC has a well-established and operational system called advisory services operation system (ASOP) which facilitates collection, storage and analysis of project results and performance and where the project teams create, update and maintain development results' information.

PADGO has used the ASOP system extensively to collect, store and analyze project results. ASOP has been used in all stages of the project lifecycle. The system has been employed as a workflow tool to provide various levels of approvals for key reports related to the project. It has also facilitated teams across geographies and departments to collaborate and finalise key project documents. Review and evaluation comments related to reports are archived in ASOP and documented in PSRs.

4.4.3 Assessment of PADGO's monitoring and evaluation system on the basis of GEF rating guidelines

The previous sections described in detail the monitoring and evaluation system in place for the PADGO project. This section assesses and evaluates the monitoring and evaluation system in terms of design and implementation.

4.4.3.1 Assessment of monitoring and evaluation design

The GEF Monitoring and Evaluation Policy specifies certain criteria for evaluation of a project's monitoring and evaluation design. The following table summarises assessment of those aspects.

Table 12: Assessment of PADGO's monitoring and evaluation design

No.	GEF assessment criteria	Performance against criteria	Ratings provided	Rationale for rating
1	Inclusion of baseline data supported by methodology in the project's monitoring and evaluation plan	The impact indicators where baseline data is relevant are 'greenhouse gas emission avoided' and 'renewable-energy installed capacity'. The baseline data for such indicators is provided in the implementation plan along with source of data and computation methodology. For other indicators like number of loans disbursed under risk-sharing facility and number of training programs conducted, the baseline data is not relevant.	Satisfactory	Baseline data along with methodology has been specified in PADGO's monitoring and evaluation design.
2	Use of SMART indicators in the monitoring and evaluation framework			
A	*Specific*	The indicator set consists of indicators which are defined as number of projects, value of loans, number of entities, number of participants, etc. Indicators for any IFC project are selected at the time of project conception from a list of standard IFC key performance indicators, while allowing certain customisations to be incorporated.	Highly satisfactory	All the indicators are highly specific and leave no room for ambiguities.
B	*Measureable*	The indicators are quantitative and data sources are specified in the implementation plan. The majority of data sources include audited reports from banks and feedback from training programs.	Highly satisfactory	The indicators are easy to measure and proposed data sources are well-established. Hence, the indicators can be considered to be easily measureable.
C	*Achievable*	The year-wise targets set in the implementation plan are nominal considering the scope and size of the project.	Satisfactory	The indicators are assessed as achievable.
D	*Relevant*	Some of the key PADGO project objectives include increasing lending capacity of financial institutions, increasing the number of projects being financed under the risk-sharing facility and so on. The set of indicators under the monitoring and evaluation plan include indicators on number of capacity-building programs being provided,	Satisfactory	The indicators chosen are relevant to ascertaining achievement of the project objectives. Hence, they can be considered to be relevant.

No.	GEF assessment criteria	Performance against criteria	Ratings provided	Rationale for rating
		feedback of participants, number of projects being financed under the program, etc.		
E	Time-framed	Targets to be achieved against each indicator have been specified for all half-yearly time-periods of the project.	Highly satisfactory	The indicators have been well time-framed.
3	Evaluation studies at specific times	The implementation plan specifies that a mid-term review should be carried out in the fourth year of the project and a terminal evaluation should be carried out after completion of last year of the project.	Highly satisfactory	Timely evaluation studies have been provided for in the implementation plan
4	Adequate funding for monitoring and evaluation activities	The implementation plan proposed a budget of $150,000 to cover costs of mid-term evaluation and terminal evaluation (to be conducted by an external entity). Further, day-to-day monitoring and evaluation activities were supposed to be carried out by existing IFC staff and accounted to the project on man-hours basis. Regional M&E staff cost is paid from IFC's own central fund. Such costs are not charged to projects and are part of IFC's contribution to the overall advisory services program.	Moderately satisfactory	The budget for day-to-day monitoring and evaluation activities and estimate of costs spent has not been computed for the project, thus restricting computation of monitoring and evaluation of cost efficiency. However, the project has been able to conduct the evaluation studies well within the budget.
5	**OVERALL**		**SATISFACTORY**	

Source: CRIS analysis

4.4.3.2 Assessment of monitoring and evaluation implementation

The GEF Monitoring and Evaluation Policy also specifies certain criteria for evaluation of monitoring and evaluation implementation of a project. Specific assessment of the PADGO project on all these criteria is given below.

Table 13: Assessment of PADGO's monitoring and evaluation implementation

No.	GEF assessment criteria	Performance against criteria	Ratings provided	Rationale for rating
1	Availability of a monitoring and evaluation system	The PADGO project was monitored and evaluated under a well-established IFC framework known as results' measurement system. The system provides standardised indicators, tracking tool and workflow to conduct monitoring and evaluation.	Highly satisfactory	A well-established monitoring and evaluation system was in place for the PADGO project.
2	Timely tracking	The project's progress was tracked on half-yearly basis through the implementation period and no gaps were observed in either the frequency or timing of tracking.	Highly satisfactory	PADGO project's monitoring and evaluation tracking was conducted on a timely basis
3	Completeness and accuracy	The PSRs largely covered all aspects of project monitoring including key performance indicators, performance rating, risk factors, lessons learnt, etc. The multiple levels of internal and external approvals of the PSRs ensured accuracy of information.	Moderately satisfactory	A moderately satisfactory rating has been provided since the accuracy part cannot be ascertained as CRIS has not carried out an audit of the data reported.
4	Well-justified performance ratings	Justification has been provided in the PSRs for performance ratings given in all areas of the project	Satisfactory	Justification has been provided to a satisfactory extent.
5	Continuous improvement and adaption	Lessons learnt based on actual project implementation were captured in each PSR. This helped the project continuously improve and adapt.	Highly satisfactory	Monitoring and evaluation played a vital role in helping the project to improve and adapt.
6	Well-trained evaluators	Monitoring and evaluation experts were utilised in evaluating the PSRs.	Satisfactory	Well-trained evaluators were used.
7	**OVERALL**		**SATISFACTORY**	

Source: CRIS analysis

4.4.4 Lessons learnt and recommendations

Some of the key lessons learnt from the PADGO monitoring and evaluation design and implementation are described below.

4.4.4.1 Cost estimation of day-to-day monitoring and evaluation activities

Monitoring and evaluation is a continuous process and not restricted to specific evaluation studies. Attempt should be made to identify man-hours spent in undertaking activities pertaining to creation, evaluation and finalisation of PSRs, and allocating the manpower costs to the relevant project.

4.4.4.2 Providing raw data for review

The raw data used to compute indicator values must be provided along with the PSRs to enable evaluators to review computation of the indicator value.

4.5 Monitoring of long-term changes

This section assesses project actions and accomplishments towards establishing a long-term monitoring system. Such a system includes determination of environmental baselines, specification of indicators, and provisioning of equipment and capacity-building for data gathering, analysis and use.

The PADGO project provides an indicator framework for monitoring of long-term changes. The impact indicators included in the project supervision report are ideal for monitoring long-term impact of the project's activities. These include 'greenhouse gas emissions avoided' and 'renewable-energy capacity installed'. While monitoring long-term change, it would be essential to establish baseline values for these indicators at the end of the PADGO project. These may be taken from the project completion report.

The project's monitoring and evaluation system is based on a well-institutionalised system of IFC -- the Results Measurement System. This would ensure that processes, tools and human resources required for long-term monitoring are in place.

4.6 Assessment of processes affecting results

(This section presents an assessment of factors such as preparation and readiness, and country ownership/ drive, which could have affected the attainment of project results.)

4.6.1 Preparation and readiness

Robust initial preparations

Before the project began, enabling regulations including the National Electricity Policy, 2006, and technology-specific feed-in tariffs were introduced in the market. The Sri Lanka Sustainable Energy Authority (SLSEA) was also established during 2007. Thus, a foundation was in place to increase renewable-energy investments. The project was designed on the basis of lessons imbibed from earlier technology-driven projects undertaken by IFC using GEF and other donor funds over a decade. The project was presented to local stakeholders during the pre-implementation stage and several banks and project developers confirmed their interest in it. IFC engaged in discussions with numerous government bodies, apart from private banks and developers in Sri Lanka. It was assured that the proposal would get strong support at the local level from banks and government bodies. The initial group of participating

financial institutions was chosen from among those with pre-existing relationships with IFC. Three banks/financial institutions gave their support letters for the proposal. Their capacities were properly weighed when the project was designed. IFC analyzed the participating banks' portfolios (in terms of types of transactions, size, tenure, industry sector, etc.) and compared with activities proposed to be supported with IFC financing. A detailed financial analysis was conducted and negotiations were held with candidate-banks for the risk-sharing product.

Ability to course-correct

In terms of readiness, it was noteworthy that the project was able to 'course-correct,' to accommodate big changes in the market. The project started in 2008 with the objective to support distributed generation in the backdrop of an 80 per cent access to electricity in Sri Lanka. However, as the project progressed, grid coverage increased to around 90 per cent. It was realised that grid connectivity in Sri Lanka was improving and hence the market for energy efficiency would grow. On account of past work on renewable energy, the PADGO project was favourably placed to carry out energy-efficiency activities; so that component was added to the program. If GEF had allocated its advisory fund for energy-efficiency initiatives, the impact would have been much better

Adequate counterpart resources (funding, shared staff and facilities)

The PADGO project was executed out of the IFC office in Colombo. Colombo being the political and financial capital of the country, the IFC team had easy access to Government officials, key staff at commercial banks and private-sector stakeholders. The project was executed by existing IFC staff on a shared-time basis except for the project leader, which was a dedicated position. During the initial phases, there was a delay in hiring a dedicated project leader. But this did not lead to any noticeable impact on execution.

4.6.2 Country ownership/ drive

Concept was in line with national priorities and plans

The PADGO project's objective was to replace fossil fuel-based generation with cleaner renewable energy sources. Before the introduction of PADGO in 2008, Sri Lanka was dependent on fossil fuels and hydro for energy generation. Non-conventional renewable energy had a share of less than 5 percent in the total energy generation. The country's strategic plans and priorities at the time of commencement of PADGO were to reduce reliance on fossil fuels and attain a more sustainable energy mix. Government legislations and regulations in force during the PADGO tenure provided a favorable environment for implementation of renewable energy projects.

Project received adequate Government support

Among the factors for choosing Sri Lanka as the country to implement PADGO was the existence of a supportive Government regime. IFC received favorable comments from several government organisations on the PADGO proposal document. The inclusion of SLSEA, a key Government body for promoting sustainable energy, as a partner entity of the PADGO project also underscored Government support for the project.

4.6.3 Stakeholder involvement

The project implemented several outreach and public awareness campaigns to disseminate findings of various studies undertaken as part of the technical assistance component. More than 363 officers participated in workshops/ training sessions organised under PADGO. The partner organisations – banks/ financial institutions (CBC, NDB), government institutions (SLSEA) and sector representative

bodies (JAAF) -- also helped raise awareness about PADGO by conducting seminars and disseminating reports prepared under PADGO among their staff, members, etc.

The support of partner organisations such as SLSEA and JAAF was crucial to conducting activities under the energy-efficiency initiative. The initiative involved energy usage studies to be conducted in tea and garment factories. Involvement and influence of SLSEA and JAAF helped complete activities on time.

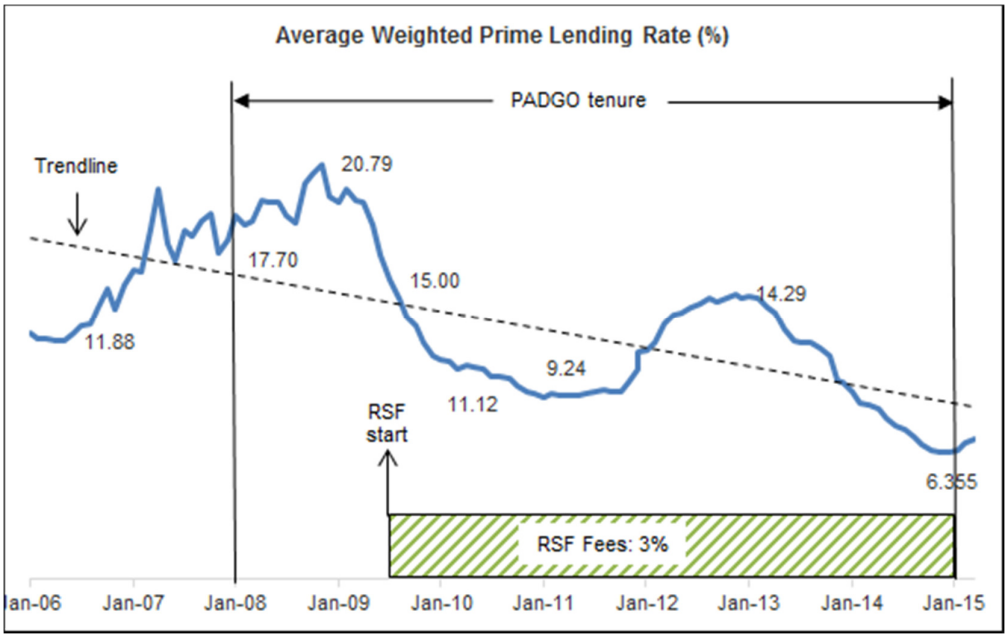
4.6.4 Factors affecting objectives: Uptake of the risk-sharing facility

PADGO was able to achieve portfolio utilisation of only ~35 percent under the risk-sharing facility due to the following reasons:

Changes in macroeconomic situation

As risk-sharing facility was a key component of PADGO, the macroeconomic situation in Sri Lanka had a major role to play in influencing its outcome. At the time of introduction of RSF, liquidity in the country's financial markets started improving significantly and consequently interest rates were reduced. However, IFC's pricing of its risk-sharing facility was fixed since it was based more on global macroeconomic factors. This created a situation where the facility started to become more expensive than traditional sources of financing, leading to a slowdown in its uptake. Trends in interest rates before and during the PADGO project tenure are compared with fees of the risk-sharing facility in Figure 14.

Figure 14: Average weighted prime lending rate (%) and RSF fees of PADGO



Source: Central Bank of Sri Lanka, CRIS analysis

IFC standard procedures

IFC has in place comprehensive eligibility criteria for identification and appraisal of renewable-energy-based projects under its risk-sharing facility. This includes collateral arrangement and documentation requirement. The documentation increased procedural delays and the amount of time taken by banks to evaluate a loan proposal.

Learning curve of banks

Although the uptake of risk-sharing facility was only 35 per cent of the targeted portfolio, the initial number of projects financed under the facility did increase the capacity of banks to appraise renewable-energy projects and their knowledge about relevant technologies. This heightened their risk appetite so that the need for a risk-sharing facility was no longer felt.

4.6.5 Factors affecting project objective: Diversity of generation mix

Projects financed under the PADGO project remained limited to mini-hydro and wind power. PADGO attempted to support biomass projects, with partial success. Under PADGO, a biomass fuel availability study was completed which revealed that there was a severe shortage of biomass in the country. It was decided that PADGO would provide specific project development support to serious biomass player/s. This helped create awareness of the realities of biomass fuel supplies among stakeholders in the biomass industry.

4.6.6 Financial planning

Financial reporting and planning

The finance role is an independent function like monitoring and evaluation (M&E) in the IFC framework. Therefore, IFC's finance officer was responsible for all financial reporting and planning for the PADGO project. The project followed a regular financial reporting cycle of six months. Sources and uses of funds were reported in the project supervision reports, each of which was generated every six months. Cumulated actual utilisation of funds compared with the budget and expenditure under various heads was also reported.

Financial planning for all IFC projects was conducted on an annual basis before the start of the year. The Finance Officer obtained an estimate from each project leader on funds required to carry out various activities. The financial plan for the year got reviewed in each project supervision report, since the project supervision report captured key activities planned for the next period.

The promised amount of co-financing (as mentioned in CEO endorsement note) did not materialise. However, IFC managed to secure funds from Ireland-origin funds for renewable energy activities and from IFC-Earth Fund for development of energy-efficiency activities.

Financial controls

IFC conducts annual external audits for its entire portfolio of funds managed. Project-wise audit is not conducted. However, each donor of funds has its own reporting requirement with which IFC has to comply.

4.6.7 Cost efficiency

The PADGO project was able to achieve its targets well within the budgeted expenditure. Further, the project was able to achieve high utilisation of funds – of 97%.

5. Lessons learnt and recommendations

(This section presents the lessons learnt from implementation of the PADGO project, which could be replicated in other regions/projects.)

Lesson 1: Project objectives need to be flexible to reflect the changing macroeconomic context of the country including the liquidity and interest-rate regime. A robust monitoring and evaluation framework will help monitor market realities and sector developments such as policy and regulatory developments and macroeconomic indicators, and assess the need for course correction. Further, project objectives should be adjusted with timelines and activities.

Lesson 2: A rounded offering of investment services and advisory services is a must to develop markets for newer technologies. High risks associated with newer technologies, and lack of knowledge about such technologies or lack of skills to appraise projects based on such technologies, prevent banks from funding such projects. In this context, along with investment services, advisory services such as project development assistance and capacity-building support become crucial.

Lesson 3: Energy service companies are important to overcome cost barriers for energy-efficiency interventions. Programs such as PADGO should opt for tie-ups with energy service companies, similar to risk-sharing facility agreements with banks. This would increase penetration of energy-efficiency initiatives and help develop the market.

Lesson 4: A robust process for reporting project activities and performance is a must. The quality of data used and reported is also critical. The project should encourage stakeholders and partners to provide more robust and detailed project data, such as actual project progress and actual energy savings. The raw data used to compute indicators must be included in the project supervision report as an annexure, for external evaluators to review the computation.

Lesson 5: Monitoring and evaluation is not a one-time activity, but a continuous process. As such, computation of the cost efficiency of monitoring and evaluation on a continuous basis is crucial. Accordingly, the man-hours spent on monitoring and evaluation, and the infrastructure used should be determined and reported in order to estimate the cost of monitoring and evaluating large-scale programs.

Annexures

Annexure 1: Factual snapshot of PADGO

This section presents details pertaining to project identification, timeframes, actual expenditures and co-financing.

A. Project identification

The table below provides details of the PADGO project.

Table 14: PADGO project details

S. no.	Key indicators	Identification details
1.	GEF project ID	2996
2.	GEF agency project ID	550586
3.	Country	Sri Lanka
4.	Project title	Portfolio Approach to Distributed Generation Opportunities
5.	GEF agency (or agencies)	IFC, a member of the World Bank Group

Source: Request for CEO endorsement/approval document dated January 23, 2008

B. Dates

The table below presents key milestones/achievement dates of the project.

Table 15: Key milestones/achievement dates of the PADGO project

S. no.	Milestone	Expected date	Actual date
1.	CEO endorsement/approval	January 2008	January 2008
2.	Agency approval	February 2008	February 2008
3.	Implementation start	February 2008[16]	May 2009
4.	Mid-term evaluation	February 2012	June 2012
5.	Project completion	February 2015	February 2015
6.	Terminal evaluation completion	April 2015	May 2015
7.	Project closing		

Source: Request for CEO endorsement/approval document dated January 23, 2008

C. Project framework

The table below provides details of framework of the PADGO project.

[16] *Effectively started in May 2009 post conflict period*

Table 16: Framework of the PADGO project

Project component	Activity type	GEF financing (in $)		Co-financing (in $)	
		Approved	Actual	Promised	Actual
Risk-sharing facility	Investment	3,000,000	3,000,000	17,000,000	-
Technical assistance	Technical assistance	-	-	878,224	856,980
Capacity-building/ knowledge management	Technical assistance	450,000	599,996	-	-
Monitoring and evaluation	Technical assistance	150,000	124,930	-	-
Project management	Scientific and technical assistance	-	-	68,003	70,400
Total project cost		**3,600,000**	**3,724,926**	**17,946,227**	**927,380**

Source: Request for CEO endorsement/approval document dated January 23, 2008, and latest project supervision report of PADGO

D. Co-financing

The table below provides co-financing details of the PADGO project.

Table 17: Co-financing details of the PADGO project

Source of co-financing	Classification	Type	Project preparation (in $)		Project implementation (in $)		Total (in $)	
			Expected	Actual	Expected	Actual	Expected	Actual
Japan Trust Fund: TATF for implementation & replication of PADGO: Pooled trust fund	National govt.	Grant	750,000	-		141,526	750,000	**141,526**
Other donors	National govt.	Grant	750,000	-			750,000	-
IFC-CSA-Access to Finance: FMTAAS Regional Envelope	Executing agency	Grant	11,537	-		191,637	11,537	**191,637**
IFC Sustainability Business Innovator	Executing agency	Grant	250,000	-			250,000	-
IFC/Earth Fund Climate Change-SE PADGO Sri Lanka CP facility: FMTAAS Business Line Envelope – SBA	Executing agency	Grant				100,000	-	**100,000**
IFC/Earth Fund Climate Change-SE PADGO Sri Lanka CP facility: Reimbursable	Executing agency	Grant				28,484		**28,484**
IFC FMTAAS for GEF portfolio administration - climate change: Pooled trust fund	Exec agency	Grant				60,281	-	**60,281**

Source of co-financing	Classification	Type	Project preparation (in $)		Project implementation (in $)		Total (in $)	
			Expected	Actual	Expected	Actual	Expected	Actual
SBI RE Ireland Renewable Energy: Pooled trust fund		Grant				294,910	**-**	**294,910**
SBI-NIPP FY 2008: Sustainable energy : Pooled trust fund		Grant				36,390	-	**36,390**
IFC South Asia Enterprise Development Facility - Sri Lanka Trust Fund: FMTAAS Business Line Envelope – SBA	Executing agency	Grant	20,000	-		70,400	20,000	**70,400**
Post implementation								**3,752**
Total co-financing			**1,781,537**	**-**	**-**	**923,628**	**1,781,537**	**927,380**

Source: Request for CEO endorsement/approval document dated January 23, 2008, and latest project supervision report of PADGO

E. Utilisation of funds

The table below provides details of fund utilisation during implementation the PADGO project.

Table 18: Utilisation of funds under PADGO project

Sources of funds	Total (in $)		
	Budget	Expenses	% spent
Imp: Project level	**1,617,405**	**1,616,054**	**100%**
FMTAAS	68,003	70,400	104%
FMTAAS	191,842	191,637	100%
GEF Supervision	74,930	58,430	78%
GEF TA	620,000	599,996	97%
IFC/Earth Fund	129,450	128,484	99%
Irish TF	294,983	294,910	100%
SBI Implementation	36,390	36,390	100%
SBI/GEF Supervision	60,281	60,281	100%
TATF Japan	141,526	141,526	100%
Post implementation	53,752	34,000	63%
Total	**1,671,157**	**1,616,054**	97%

Source: Latest project supervision report of PADGO

F. Application of funds

The table below provides the application of funds during the implementation of the PADGO project.

Table 19: Application of funds under PADGO project

Cost category	Inception to Date (in $)		
	Budget	Expenses	% spent
Staff costs	711,350	675,633	**95%**
Consultant fees	619,986	616,153	**99%**
Travel costs	162,966	159,510	**98%**
Staff representation & hospitality	301	301	**100%**
Contractual services	98,000	98,212	**100%**
Communications & IT chargeback	26,434	23,384	**88%**

Cost category	Inception to Date (in $)		
	Budget	Expenses	% spent
Office rent (office rent/lease/ownership)	32,161	24,502	**76%**
Office equipment & furniture, Other Equipment & Building	8,654	8,654	**100%**
Other expenses	11,305	9,705	**86%**
Total	**1,671,157**	**1,616,054**	**97%**

Source: Latest project supervision report of PADGO

Annexure 2: Project result indicators

A. Renewable energy

The table below presents the indicators tracked, targets and the final score of each indicator tracking the progress of advisory services of the PADGO project for renewable energy.

Table 20: Indicators tracked, targets and final score of each indicator – Renewable energy

S. no.	Type of indicator	Unit	Description of key indicators	Target	Result	Progress
1.	Output	Nos.	Entities receiving concessional investment	2	2	100% achieved in the initial stages of the project
2.	Output	Nos.	Entities receiving advisory services	2	2	100% achieved in the final stages of the project
3.	Output	Nos.	Reports (assessments, surveys, manuals, Phase I/strategic option reports) completed	3	6	100% achieved; completed more reports during the tenure of project
4.	Output	Nos.	Workshops, training events, seminars, conferences, etc.	3	3	100% achieved in the early stages of the project
5.	Output	Nos.	Participants in workshops, training sessions, seminars and conferences	60	73	More than 100% achieved in the early stages of the project
6.	Output	Nos.	New financial products designed	2	2	100% achieved in the middle stage of project
7.	Output	Nos.	Participants providing feedback on satisfaction	16	16	100% achieved, but the total number of participants providing feedback on satisfaction, is small
8.	Output	Nos.	Participants satisfied or very satisfied with workshops, training, seminars, conferences, etc.	11	11	100% achieved, but the number is small compared with the total number of participants
9.	Outcome	Nos.	Loans disbursed	10	19	Over 100% achieved; the portfolio has increased gradually over a period of time
10.	Outcome	Nos.	Entities that implemented recommended changes	2	2	100% achieved in the last stage of the project

S. no.	Type of indicator	Unit	Description of key indicators	Target	Result	Progress
11.	Outcome	Nos.	Distributed-generation projects financed by banks receiving advisory services	10	20	Over 100% achieved in the last stages of the project
12.	Outcome	Nos.	Distributed-generation projects financed by banks using risk-sharing facility	6	10	Over 100% achieved
13.	Outcome	Nos.	New financial products launched	2	2	100% achieved in the last stage of the project
14.	Outcome	$	Value of 'sustainable energy finance' loans disbursed	50,000,000	81,498,397	Over 100% achieved

Source: *Latest project supervision report of PADGO*

B. Energy efficiency

The table below presents the indicators tracked, targets and the final score of each indicator tracking the progress of advisory services of the PADGO project for energy efficiency.

Table 21: Indicators tracked, targets and final score of each indicator – Energy efficiency

S. no.	Type of indicator	Unit	Description of key indicators	Target	Result	Progress
1.	Output	Nos.	Entities receiving advisory services	10	18	Over 100% achieved in a later stage of the project
2.	Output	Nos.	Reports (assessments, surveys, manuals, Phase I/strategic option reports) completed	2	22	Over 100% achieved in a later stage of the project
3.	Output	Nos.	Workshops, training events, seminars, conferences, etc.	2	13	Over 100% achieved in a later stage of the project
4.	Output	Nos.	Participants in workshops, training events, seminars, conferences, etc.	100	290	Over 100% achieved in a later stage of the project
5.	Output	Nos.	New financial products designed	1	0	Not achieved
6.	Output	Nos.	Participants providing feedback on satisfaction	85	54	60% achieved, but the number is small compared with the total number of participants

S. no.	Type of indicator	Unit	Description of key indicators	Target	Result	Progress
7.	Output	Nos.	Participants satisfied or very satisfied with workshops, training, seminars, conferences, etc.	70	43	60% achieved, but the number is small compared with the total number of participants
8.	Output	Nos.	Procedures/policies/practices/standards proposed for improvement or elimination	30	188	More than 100% achieved, but those actually implemented are not accounted
9.	Outcome	Nos.	Entities that implemented recommended changes	15	12	50% achieved
10.	Outcome	Nos.	Recommended procedures/policies/practices/standards that were improved/eliminated	20	76	35% achieved
11.	Outcome	Nos.	Loans disbursed	20	0	Not achieved
12.	Outcome	$	Value of SEF loans disbursed	10,000,000	0	Not achieved

Source: *Latest project supervision report of PADGO*

Table 22: Indicators tracked, targets and final score of impact indicators

S. no.	Type of indicator	Unit	Description of key indicators	Target	Result
1.	Impact	MWh /year	Renewable energy expected to be produced	351,000	350,133
2.	Impact	$	Value of financing facilitated (renewable energy and energy efficiency)	120,000,000	228,427,965
3.	Impact	MT /year	Greenhouse gas emissions expected to be avoided	227,000	227,026
4.	Impact	MWh/ year	Energy use expected to be avoided	70	80

Source: *Latest project supervision report of PADGO*

Annexure 3: Research methodology

A. Literature reviewed

The following documents were reviewed to objectively evaluate the level of achievement vis-a-vis targets specified.

PADGO project documents

- Guidelines for GEF agencies in conducting terminal evaluations, Evaluation document no. 3, GEF, 2008;
- Mid-term evaluation report, 2012;
- Project supervision reports of PADGO (June 2008 to February 2015);
- Sri Lanka: Portfolio Approach to Distributed Generation Opportunity (Phase I) GEF project document, IFC, 2006 and 2008;
- Request for CEO endorsement/approval document, IFC, January 23, 2008;
- Advisory services PDS approval version, IFC, July 14, 2011;
- Risk-sharing agreement between CBC and IFC, June 05, 2009;
- Cooperation agreement between IFC and SLSEA, 2013;
- Cooperation agreement between IFC and JAAF, 2013;
- Investment-grade energy audit reports of 7 garment factories and 5 tea factories, IFC, 2013;
- Identifying resource efficiency improvement potential to enhance competitiveness of Sri Lanka's hotel industry, IFC, 2013

Sector documents

- Sri Lanka Energy Balance, SLSEA, 2013;
- Statistical Digest, Ceylon Electricity Board, 2013;
- Economic and Social Statistics of Sri Lanka, Central Bank of Sri Lanka, 2014;
- Energy management project in tea sector, SLSEA, 2013;
- Promoting energy efficiency improvement in Sri Lanka, SLSEA, 2008;
- Information available on the public domain (Central Electricity Board, Central Bank of Sri Lanka, Department of Census & Statistics, Public Utilities Commission, SLSEA and JAAF)

B. Stakeholders interviewed

Meetings were conducted with the following stakeholders of the PADGO project.

Table 23: Meeting with stakeholders of the PADGO project

Date	Stakeholder	Agenda
February 23, 2015	JAAF	▪ Status of progress on implementation of energy audit recommendations ▪ Challenges for garment sector in implementing energy-efficiency measures ▪ Inputs on energy audit exercise
February 23, 2015	SLSEA	▪ Potential of renewable-energy technologies and outlook for renewable energy in Sri Lanka ▪ Energy-efficiency potential in Sri Lanka ▪ Policy, regulatory and institutional issues ▪ Challenges in project implementation ▪ Inputs on energy audit

Date	Stakeholder	Agenda
February 25, 2015	Orit Apparels Lanka Private Limited	▪ Implementation status (including physical verification) ▪ Implementation constraints faced by the stakeholders ▪ Overall perspective of energy audit
February 25, 2015	Star Fashion Clothing Private Limited	
February 25, 2015	New Nivitigala Tea Factory	
February 26, 2015	Fascination Exports Pvt. Ltd.	
February 26, 2015	Lanka Garments Manufacturing Co. Limited	
February 26, 2015	Texwin Clothing Private Limited	
February 27, 2015	Hela Clothing Private Limited	
February 28, 2015	Duliella Tea Factory	
February 28, 2015	Ruhuna Tea Factory	
March 01, 2015	Batuwangala Tea Factory	
March 02, 2015	Wanarajah Tea Processing Center	
March 03, 2015	SGI Lanka Private Limited	
March 09, 2015	Chief Executive Officer, NDB	▪ Projects financed under PADGO project ▪ Capacity built up and requirement going forward ▪ Risk perceived and challenges at present in renewable-energy financing ▪ Issues with present PADGO framework, if any ▪ Suggestions for improvement
March 09, 2015	Senior officials of CBC	
March 12, 2015	Senior officials of NDB	
March 11, 2015	Director Finance, SENOK Group	▪ Challenges faced by stakeholders ▪ View on current investment environment for development of renewable-energy projects ▪ Financing arrangements for wind power projects ▪ Outcomes of the first wind power project in country ▪ Review of various types of risks prevailing in the market that are faced by the developers in developing renewable-energy projects

Date	Stakeholder	Agenda
March 11, 2015	Deputy Director General, SLSEA	▪ Perspectives on policy instruments ▪ Financing available in the country to promote renewable energy and energy efficiency

C. Questionnaire for stakeholder interviews

The broad discussion points for meetings with stakeholders are mentioned in the table below.

Table 24: Broad discussion points for meetings with participating financial institutions – NDB and CBC

S. no.	Queries
1.	We understand your bank funds renewable energy projects using the IFC risk-sharing facility scheme. However, we would like to understand whether you finance such projects beyond the risk-sharing facility. If yes, please let us know the size of the project, location, power sale arrangements, interest rates, size of investments, debt component, etc.
2.	Do you believe PADGO has played a catalytic role in promoting renewable energy technologies in Sri Lanka?
3.	What do you believe are the strengths of PADGO?
4.	What do you believe are the weaknesses of PADGO? How can these be overcome?
5.	Is there any opportunity PADGO has failed to capitalise on? What can it do now?
6.	Do you believe the issue the project has sought to address has been clearly identified and the approach soundly conceived?
7.	Do you think services under PADGO had adequate resources (financial, physical and manpower) in terms of both quantity and quality?
8.	How relevant has PADGO been to the development priorities of the country?
9.	Who all are the developers/beneficiaries of the project?
10.	Was the project cost-effective? Was it the least-cost option?
11.	Is there any financial risk that could jeopardise desirable project outcomes, say financial risks that may emerge from the payment structure between the developers and CEB?
12.	Are there social or political risks that could jeopardise sustainability of project outcomes, say events such as change of government or policies?
13.	What are your monitoring mechanisms to evaluate environmental risks in the project, including visual impact, effects on natural habitat due to blades of wind power plant?
14.	Has the project helped in building institutional capacity in the organisation?

S. no.	Queries
15.	How do you monitor and evaluate the progress on project development? What are the likely indicators to assess performance on the asset financed?
16.	Did the PADGO project contribute to establishment of a long-term monitoring system? If it did not, should the project have included such a component?
17.	Were the partnership arrangements properly identified and roles and the responsibilities negotiated prior to project approval? Were counterpart resources (funding, staff and facilities), enabling legislation and adequate project management arrangements in place at project entry?

Table 25: Broad discussion points for meeting with partner institutions for energy efficiency – SLSEA and JAAF

S. no.	Queries
SLSEA	
1.	In your view, what are the issues or constraints being faced by the renewable-energy and energy-efficiency sector, key issues including regulatory, development, financial, policy, and socio-political?
2.	What is the likely potential of each of the renewable-energy technologies in Sri Lanka? Have you conducted any study to ascertain the potential?
3.	Are the projects financed under PADGO scheme more risky than other renewable-energy projects being developed in the country?
4.	What is your view on solar, biomass and waste-to-energy projects in the country? What is the likely roadmap to harness the untapped potential?
SLSEA and JAAF	
5.	Which are the key energy-intensive industries in Sri Lanka? What is the level of electricity consumption in these industries? What is total electricity consumption in tea/garment industries? How did you select these particular companies – was it based on their overall consumption or voluntary participation process? At a broad level, how much energy saving did you envisage by implementing these efficiency measures? Do you feel the contour of this exercise can be extended to other companies/industries as well?
6.	What has been the experience till now – positive/ negative – of various parties which implemented energy-efficiency projects?
7.	What has been the level of implementation till now? Have the project outcomes been satisfactory in terms of achievement expected (specific to tea/garment industry)?
8.	Have you found any implementation challenges faced by the selected companies? If yes, what are those issues – financial challenges, technological challenges, regulatory challenges, and other implementation challenges?
9.	What has been the overall experience with the PADGO project? Has the project design been effective in achieving the objectives that has been set forth? Do you find any issues in terms of project design which could have been crafted otherwise to achieve better outcomes?

S. no.	Queries
10.	Does the monitoring framework of PADGO project help in efficiently tracking the implementation level by the companies (selected for the project)?
11.	Can the PADGO project (as it is) be replicated across the sector or other industries? Do you think the project needs to be suitably modified to address concerns of other industries? If yes, what would you want to be modified?

Table 26: Broad discussion points for meeting with factory managers/relevant officers

S. no.	Queries
1.	What has been your production growth rate since the energy audit activity was carried out in the factory? Did any new development in your sector affect growth?
2.	Can you implement any of the energy audit recommendations? If yes, what would these be?
3.	What were the challenges faced during the implementation of recommendations? What were your financing arrangements? What is the present outcome of implementation? How do you monitor the progress on each of the implemented recommendations? What are your key performance indicators? Is there any resource allocated for monitoring & evaluation?
4.	If some of the recommendations were not taken-up for implementation, what are the key constraints?
5.	What is your overall experience on energy audit project (strength and weakness)?
6.	In your view, what role this project has played in improving the efficiency of the organisation?
7.	In your view, what is the likely potential of energy-efficiency projects in similar energy-intensive industries?
8.	What should be the project structure if the energy-efficiency recommendation is to be implemented?
9.	Besides interventions suggested in the energy audit report, have you taken up any other energy-efficiency intervention before or after the energy audit?

Table 27: Broad discussion points for meeting with a project-developer pioneer for setting up a wind-power project

S. no.	Queries
1.	We understand your group (as part of corporate diversification) had set up the first commercial wind power project (30 MW) in Sri Lanka. What were the key barriers faced by developers during those days?
2.	What is your view on the current investment environment for development of renewable-energy projects and the key barriers faced by developers now?

S. no.	Queries
3.	What were the financing arrangements for the wind power project? How does the financing from NDB, CBC, World Bank and others support it?
4.	What are the outcomes of this project, including generation (greenhouse gas reduction), awareness/capacity building, risk perception and demonstration for future investments?
5.	What are the risks that could jeopardise the renewable-energy investment climate in Sri Lanka – financial, socio-political, environmental, etc.?

D. Field locations visited

A field visit was conducted to the first commercial wind park set up by the SENOK Group in Sri Lanka.

Table 28: Meeting with stakeholders of the PADGO project

Date	Stakeholder	Agenda	Consultant team attendees
March 10, 2015	SENOK Wind Park	Site visit to wind parks of gross capacity of 30 MW	Vivek Sharma SMG Samarakoon Vivek Aggarwal

Further, field visits were made to 12 factories for structured interaction with factory officers followed by physical verification of energy-efficiency interventions.

Table 29: Details of field visits carried out for energy audit

S. no.	Name of the factory	Date of visit	Key person	Location of the factory
Tea sector				
1.	New Nivitigala Tea Factory	February 25, 2015	Mr. Nimal Gunasinghe	Madara Estate, Nivitigala
2.	Duliella Tea Factory	February 28, 2015	Mr. M D Premachandra	Kosmilla, Neluwa, Galle
3.	Ruhuna Tea factory	February 28, 2015	Mr. Nalin Priyadarshana Abeywikrama	Porawagama, Elpitiya
4.	Batuwangala Tea Factory	March 1, 2015	Mr. W Gunarathne	Morawaka Road, Lellawala, Neluwa
5.	Wanarajah Tea Processing Factory	March 2, 2015	Mr. Y M T K Bandara	Dickoya, Hatton
Garment sector				
6.	Orit Apparels Lanka Private Limited	February 25, 2015	Mr. Thushan Aththuduwe	Seethawaka Industrial Park, Colombo

S. no.	Name of the factory	Date of visit	Key person	Location of the factory
7.	Star Fashion Clothing Private Limited	February 25, 2015	Mr. Sarath Jayakody	Nawagamuwa, Ranala, Colombo
8.	Fascination Exports Pvt. Ltd.	February 26, 2015	Mr. Mahesh D'Alwis Sandarasekera	Kahapola, Piliyandala, Colombo
9.	Lanka Garments Manufacturing Co. Limited	February 26, 2015	Mr. Maithree Jayasekara	Plot no. 105, St. Joseph Street, Colombo 14
10.	Texwin Clothing Private Limited	February 26, 2015	Mr. Saman Jayasinghe	Abeypura, Polonnaruwa
11.	Hela Clothing Private Limited	February 27, 2015	Mr. Ananda Weerasekera	Welisara, Gampaha
12.	SGI Lanka Private Limited	March 03, 2015	Mr. Sarath Jayakody	Katunayake, Gamapha District

Annexure 4: Evaluation team

Details regarding the composition and expertise of the evaluation team are provided in the table below.

Table 30: Composition and expertise of the evaluation team

Name of staff	Area of expertise relevant to the assignment	Designation for this assignment
Vivek Sharma *CRISIL Risk & Infrastructure Solutions Limited*	Mr. Sharma is the Head of Energy Practice at CRISIL Infrastructure Advisory. He is a postgraduate in business economics (MBE) from the University of Delhi. He has over 10 years' experience in infrastructure development with key involvement in power sector (including conventional and renewable energy), looking into subjects such as policy and regulatory reforms, electric tariffs, financial due-diligence, financial appraisal, commercial agreements, project finance and strategic advice.	Team Leader
Satnam Singh *CRISIL Risk & Infrastructure Solutions Limited*	Mr. Singh holds a master's degree in business economics (finance and econometrics). He has 12 years of research and consulting experience in domains such as policy and regulatory reforms, tariffs, financial appraisal of projects, contract structuring, performance evaluation of utilities, bid-process management and business-process improvement.	Financial Expert
SMG Samarakoon *Associate with CRISIL Risk & Infrastructure Solutions Limited*	Mr. Samarakoon has a Master of Science degree in mechanical engineering. He has more than 43 years of experience in renewable energy and energy efficiency.	Local Renewable Energy Expert
Vivek Aggarwal *CRISIL Risk & Infrastructure Solutions Limited*	Mr. Aggarwal is qualified in business administration with specialisation in the power sector. He has more than eight years of professional experience in the power (thermal and renewable) sector, specifically strategy, regulations, project finance, risk management and process formulation and business plan preparation.	Techno-Commercial Specialist (Support Staff)
Rohan Jadhav *CRISIL Risk & Infrastructure Solutions Limited*	Mr. Jadhav holds a masters' degree in business administration (MBA) with specialisation in finance. He has more than more than 8 years in consulting assignments involving government, institutional, multilateral development and private-sector clients. He has worked in both conventional and renewable energy space. He has worked in all areas of power sector consulting including policy and regulatory matters, tariff determination, performance evaluation, business and financial planning, commercial due-diligence, capacity building, risk management strategies and bid-process management.	Monitoring & Evaluation Specialist (Support Staff)

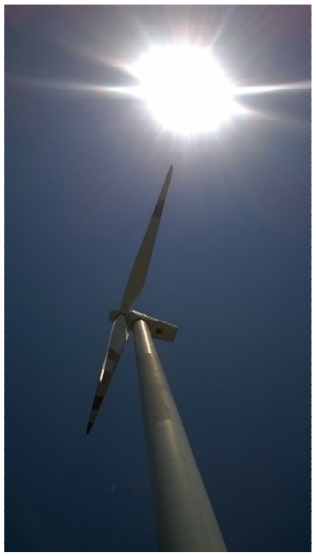
Annexure 5: Case study

Lending coverage of local banks improves with risk appetite

Historically, renewable energy financing in Sri Lanka was limited to mini hydropower projects. A few projects were set up with the support of donor agencies on a pilot basis to test their commercial viability and gain experience. With the introduction of cost-based technology-specific tariffs for renewable-energy projects by SLSEA in 2008, the market opened up and provided opportunities for new investments in renewable-energy technologies. However, financiers, original equipment manufacturers and project developers were hesitant due to concerns over technology, financing, maintenance and grid constraints.

A risk-sharing facility was introduced in the Sri Lankan market as an investment-services product. The risk sharing facility was proposed to expand the capacity of participating financial institutions to lend to the renewable-energy sector. Separate agreements were signed with two commercial banks – Commercial Bank of Ceylon (CBC) in May 2009 and National Development Bank (NDB) in June 2010.

In 2010, CBC, along with three local banks, funded Sri Lanka's first private sector commercial wind farm. This 10 MW power plant, located at Mampuri, Kalpitiya, was successfully commissioned in 2010 by SENOK Wind Power. The plant generated 28.3 GWh[17] of energy in 2013 from 8 wind turbines, each of 1.25 MWh capacity and installed 80 m above ground.



From following a risk-averse, consortium-lending approach, banks have started arrogating larger share of risk. Average size of a debt exposure in a typical wind project has increased from 12% in 2010 to 50% after 2011. Of the nearly ~260 MW renewable-energy capacity added during PADGO's tenure (2009-2015), ~114 MW, i.e., almost 44 per cent, was facilitated by both banks under RSF and outside RSF.

Activities conducted under the advisory-services component of PADGO have facilitated development of renewable-energy projects. The participating financial institutions were offered technical assistance to conduct evaluation and due diligence of loan applications for renewable-energy projects. This boosted their confidence to lend. Further, capacity-building activities for operational staff helped strengthen banks' ability to manage credit, appraisals, risk and technical aspects of renewable-energy projects. Consequently, there was improvement in the appraisal framework of participating financial institutions, which are now in a position

[17] *Source: Sri Lanka Energy Balance 2013*

to absorb greater risks in financing renewable-energy projects including waste-to-energy, biomass, solar photovoltaic, etc.

The PADGO project has resulted in prevention of 227,026 metric tons of greenhouse-gas emissions per year. The banks have facilitated lending to 20 projects during PADGO project, of which 10 are using risk-sharing facilities.

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