

スリランカ民主社会主義共和国
省エネルギー普及促進プロジェクト
終了時評価調査報告書

平成23年5月
(2011年)

独立行政法人国際協力機構
スリランカ事務所

スリ事

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序 文

独立行政法人国際協力機構は、スリランカ民主社会主義共和国と締結した討議議事録（R/D）に基づき「省エネルギー普及促進プロジェクト」を2008年5月から3年間の予定で実施してまいりました。

このたび、当機構は期間中の活動実績等について総合的な評価を行うとともに、今後の対応策等を協議するために、2011年1月12日から同月28日まで終了時評価調査を実施しました。

本報告書は、同調査によるプロジェクト関係者との協議及び評価調査結果等を取りまとめたものであり、本プロジェクト並びに関連する国際協力の推進に活用されることを願うものです。

終わりに、本調査にご協力とご支援を頂いた内外の関係者に対し、心からの感謝の意を表します。

平成23年5月19日

独立行政法人国際協力機構
スリランカ事務所長 志村 哲

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プロジェクト対象地域位置図



写 真



合同調整委員会（JCC）での調査結果報告、意見交換

略 語 表

CDM	クリーン開発メカニズム (Clean Development Mechanism)
CEB	セイロン電力庁 (Ceylon Electricity Board)
CFLs	省エネ電球、小型蛍光灯 (Compact Fluorescent Lamps)
E-Friends I	有償資金協力事業 環境対策支援事業 I (Environment Friendly Solution Fund Project I)
E-Friends II	有償資金協力事業 環境対策支援事業 II (Environment Friendly Solution Fund Project II)
ERD	財務計画省対外援助局 (Department of External Resources, Ministry of Finance and Planning)
ESCOs	エネルギー・サービス会社 (Energy Service Companies)
JCC	合同調整委員会 (Joint Coordination Committee)
JICA	独立行政法人国際協力機構 (Japan International Cooperation Agency)
LECO	ランカ電力会社 (Lanka Electricity Company)
MoPE	電力・エネルギー省 (Ministry of Power and Energy)
ODA	政府開発援助 (Official Development Assistance)
PDM	プロジェクト・デザイン・マトリックス (Project Design Matrix)
SLSEA	スリランカ持続可能エネルギー推進機構 (Sri Lanka Sustainable Energy Authority)
SLEMA	スリランカ・エネルギー管理士協会 (Sri Lanka Energy Managers' Association)
SLSI	スリランカ標準協会 (Sri Lanka Standard Institution)

終了時評価調査結果要約表

1. 案件の概要	
国名：スリランカ民主社会主義共和国	案件名： スリランカ民主社会主義共和国 省エネルギー普及促進計画プロジェクト
分野：エネルギー	援助形態：技術協力プロジェクト
所轄部署：JICA スリランカ事務所	協力金額（評価時点）：3億4,728万7,000円
協力期間 (R/D): 2008年2月11日 3年（2008年5月1日～ 2011年5月30日まで）	先方関係機関：スリランカ持続可能エネルギー推進機構（SLSEA）
	日本側協力機関：電源開発株式会社
	他の関連協力：なし
1-1 協力の背景と概要	
<p>スリランカ民主社会主義共和国（以下、「スリランカ」と記す）の電力供給は、発電電力量の62%を輸入石油に依存しており¹、電気料金が他のアジア諸国に比べて高く、特に海外市場において他のアジア諸国と競合する輸出産業の競争力を阻害する原因となっている。また、新規の発電所開発にも限界があることから、将来深刻な電力供給不足に直面する可能性がある。このような背景から、今後もスリランカが経済成長を続けるためには省エネルギー（以下、「省エネ」と記す）の推進は緊急の課題であった。そのため同国では2007年9月に「スリランカ持続可能エネルギー推進機構法」（以下、「SLSEA法」と記す）が制定され、続いて省エネ対策機関として「スリランカ持続可能エネルギー推進機構（Sri Lanka Sustainable Energy Authority：SLSEA）」が設立された。</p> <p>このような政策的背景を受け、同国は省エネに関するわが国の進んだ技術及び知見を導入したいとして、技術協力「省エネルギー普及促進プロジェクト」の実施を要請した。要請は採択され、2008年5月より3年間の計画で当プロジェクトが実施されている。</p>	
1-2 協力内容	
<p>本プロジェクトは、SLSEAをカウンターパート（C/P）機関として、省エネ活動を促進するために必要な基盤（政策、人材、奨励制度、省エネ意識）を整備するためのプロジェクトである。</p> <p>(1) 上位目標 エネルギー消費効率の高い社会が実現する。</p> <p>(2) プロジェクト目標 省エネ活動を促進するために必要な基盤（政策、人材、奨励制度、省エネ意識）が整備される。</p> <p>(3) 成果</p> <p>1) SLSEA法施行に必要な資源（政策、人材、機材、資料）が整備される。</p> <p>2) 省エネを促進させるためのインセンティブ制度が整備される。</p>	

¹ Sri Lanka Energy Balance, 2007年

3) 一般家庭、私企業、公共セクターの省エネに関する意識が向上する。

(4) 投入（評価時点）

日本側：総投入額 3 億 4,728 万 7,000 円

専門家派遣：13 名 機材供与 : 3,300 万円

研修員受入：合計 26 名 ローカルコスト負担：4,000 万円²

相手国側：

カウンターパート配置：15 名

土地・施設提供： 専門家執務室

ローカル・コスト負担： 1 億 5,700 万スリランカルピー³

2. 評価調査団の概要

調査者

団 長 大塚 卓哉 JICA スリランカ事務所 次長

協力企画 橋本 玄 JICA スリランカ事務所員

協力企画 プリヤンタ・セーラシンハ JICA スリランカ事務所 現地職員

評価分析 田村 智子 株式会社かいはつマネジメント・コンサルティング

調査期間

2011 年 1 月 12～28 日

評価種類：終了時評価

3. 評価結果の概要

3-1 実績の確認

(1) 成果の発現状況

成果 1：エネルギー消費量報告義務などに関する法制度の運用に必要な技術移転はほぼ終了しており、制度運用の準備も整っている。省エネ電球、小型蛍光灯（Compact Fluorescent Lamps：CFLs）のラベリング制度、機材バンクの拡張、IT インフラの充実などは計画どおり成果を上げた。一方、同制度の法案がいまだ内閣の承認を受ける過程にあり施行に至っていないため、法制度関連の成果の発現が計画より遅れている。

成果 2：融資制度の改善が検討され、融資の対象となるモデル事業の準備も、パイロット事業を実施するなどして進んでいるが、新しい融資制度は導入には至っていない。CFLs の普及と上下水道庁のポンプ交換を目的とするパイロット事業が実施されたことは評価に値する。

成果 3：省エネ普及啓発素材（小学生向け教材、リーフレット等）の作成、第 1 回国家省エネ表彰式の実施協力など期待以上の成果が発現した。啓発活動の実施方法についてはより効果的で持続可能な形へと改善がみられた。

(2) プロジェクト目標達成の見込み

SLSEA 職員が、省エネの法制度の運用や診断機材の活用に必要な技術力・ノウハウを身に着けたこと、インセンティブ制度の本格実施の先駆けとなるパイロット事業が成果を上げたこと、啓発活動の質や量に大幅な改善がみられたことなどから、特に技術移転の観点から、プロジェクトは期待した効果を生み出したといえる。

² 2010 年 12 月末現在

³ SLSEA 省エネ部の 2008、2009、2010 年の支出実績の合計。

しかし上述のように、法制度が施行に至っておらず、融資制度の導入が未実施のため、これらに関するプロジェクト目標の指標については、プロジェクト期間終了までに達成される見込みが立っていない。指標4の「CFLの一般家庭への普及率」については、目標が40%であったのに対し、最近の調査結果は約80%を示しており、目標を大きく上回る進捗であった。指標5の「省エネ10年計画」は、SLSEAの役員会の承認を経て、プロジェクト終了までに省の承認を受けるべく取り組まれている。

3-2 評価結果の要約

(1) 妥当性—非常に高い

プロジェクト目標は、省エネを優先課題とするスリランカの開発政策「マヒンダ・チンタナ(2006~2016年)」と合致しており、また、省エネを含むエネルギー分野への支援を重視している日本の政府開発援助(Official Development Assistance: ODA)政策やJICAの国別援助方針との整合性も高い。スリランカではエネルギー源の多くを石油に頼っており、省エネの推進により、エネルギー消費効率の高い社会経済構造をつくりだすことは経済開発を進めるうえで急務であることから、当プロジェクトには必要性和緊急性が認められる。

なお、プロジェクトで導入される予定の法制度は日本では省エネ法により既に導入済みであり、JICAはこれまで多くの国で省エネプロジェクトを実施してきた。これらの蓄積された知識や経験を活用できることから、日本及びJICAは当分野の支援において優位性をもつといえる。

(2) 有効性—中程度

前述のように、SLSEA職員の技術習得度、啓発活動の質や量の大幅な改善などから、特に技術移転の観点より、プロジェクトは大きな効果を生み出した。しかし、法制度の施行に関しては、法的整合性を確保し、産業界の理解を十分に得て、よりスムーズに導入すべく、現在、電力・エネルギー省(Ministry of Power and Energy: MoPE)が法案の最終チェックを行っている段階であり、施行に至っていない。融資制度の改善についても、さまざまな検討が行われたが、同国の財務計画省対外援助局(Department of External Resources, Ministry of Finance and Planning: ERD)は、SLSEAの資金運用管理能力の向上がまず必要という観点から、省エネ事業用の融資制度の導入に慎重な姿勢を示している。このように、法制度の施行や融資制度の改善が未実施のため、プロジェクト目標を達成するにはまだ時間がかかる見込みである。

(3) 効率性—中程度

日本側からの投入はタイミングや量などすべて計画どおりであった。SLSEAの省エネ部に欠員があった以外は、スリランカ側からの投入も予定どおりであった。SLSEAはJICA専門家チームのアドバイスを受けながら、限られた人員で最大限の成果を生み出したといえる。しかし上述のとおり、現時点において、幾つかの活動はまだ成果の発現につながっていない状態である。

(4) インパクトー高い（予測）

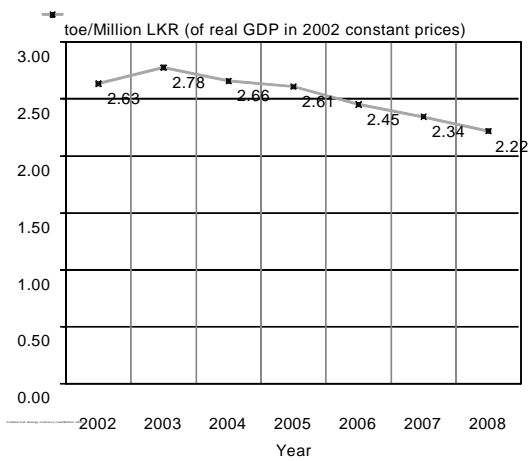
プロジェクトは今後、上位目標達成に貢献する可能性があり、また副次的な成果も生み出した。以下は成果の指標に関する現状を示す。

1) 商業エネルギー原単位が 2017 年に 1.8 tow/100 万ルピー以下に向上する

商業エネルギー原単位は一国における商業エネルギーの使用効率の標準測定値である。図 1 によればこの値は確実に向上しており、これは、現在の省エネ諸施策の効果を示している。また、この傾向が続けば、2017 年に 1.8 tow/100 万ルピー以下という目標を達成する見込みがある。

2) 電力負荷率が年 1% 向上する

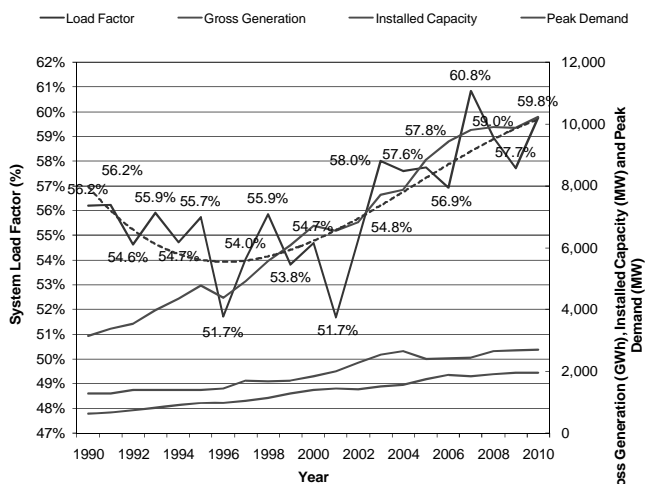
電力負荷率は電力消費者が電力システムを最適に使っているかどうかを測る数値である⁴。図 2 が示すように、年 1% という目標には達していないものの、電力負荷率は改善の傾向にある。



注：2008 年は暫定値

出所：Draft Baseline Survey Report of the Project, 2011 年 1 月

図 1 商業エネルギー原単位の推移



注：2010 年は暫定値

出所：Draft Baseline Survey Report of the Project, 2011 年 1 月

図 2 電力負荷率の推移

なお、当プロジェクトは、プログラムクリーン開発メカニズム（Clean Development Mechanism : CDM）の形成や、CDM 事業の形成に重要なグリッド・エミッション・ファクターの制定に貢献した。後者の成果については同国で実施されている技術協力プロジェクト「CDM 事業推進能力強化プロジェクト」に引き継がれる予定である。

また、全国省エネ賞の実施やフォローアップ、私企業からのスポンサーシップを募った省エネ展示会の開催、ラベリング制度導入の際のキャンペーン実施など、当プロジェクトで採用された啓発活動の手法は他国における類似のプロジェクトにおいてモデルとして活用することができる。

⁴ この数値が大きいほど、消費者は電力システムを合理的に使っていることになり、電力供給コストの削減につながる。スリランカではこの数値が大きく、これは、一般家庭の照明に対する需要の高さと産業によるベース負荷の欠如が主な原因である。そのため、電力の需要管理が電力負荷率の改善に大きく貢献すると考えられている

(5) 自立発展性—教訓が速やかに実施されれば自立発展性が見込まれる

1) 政策や組織への支援

MoPE や SLSEA 幹部は当プロジェクトを強く支持しており、プロジェクト終了後の効果の持続発展に関しても積極的である。また、SLSEA は当プロジェクトで導入予定の法制度の施行と省エネ 10 年計画を実施するために十分な規制権力を有している。

2) 組織面

前述のとおり SLSEA の省エネ部には欠員があり、特にディピューティー・ディレクター・ジェネラルとシニア・スペシャリストの不在は懸念される。また、「モニタリング・検証課」の責任者が欠員であり、今後、さまざまな制度が施行された際に不都合が生じる可能性がある。

3) 財政面

SLSEA の省エネ部の年間予算は、当プロジェクトで導入される諸制度の運用管理に足りるものであり、今後予算配分に大きな変更がない限り財政面の問題は特段ないと考えられる。また、SLSEA が機材バンクのレンタル料や展示会のスポンサー料などにより、自主財源を生み出しているのも自立発展性の面から好ましいことである。なお、プロジェクトの効果の持続のために、省エネ事業用の金融制度の改善が急がれる。

4) 技術面

SLSEA の職員は計画どおり、省エネ推進のために必要なノウハウを取得しつつあり、その技術水準は満足できるものである。供与機材は、品質の適切性や、維持管理の便宜性も考慮して購入されており、SLSEA の職員が維持管理を継続するのに特に技術的な問題はない。また、スリランカ・エネルギー管理士協会（Sri Lanka Energy Managers' Association : SLEMA）や省エネ・IT 分野のコンサルタント会社など、協力機関の職員の技術水準も高い。ただし、省エネ分野の技術は日進月歩であるため、今後も SLSEA や協力機関の職員の技術力を引き続き向上させていく必要がある。

5) その他

CFLs 普及と国家上水排水庁のポンプ交換を目的とするパイロット事業の結果を分析し、有効活用していくことが今後重要となる。また、ラベリング制度やエネルギー消費量の報告義務づけなど新しく導入される法制度の施行状況についてモニタリングと検証を行っていくこと、省エネ普及の効果測定を継続することが今後重要と考えられる。

3-3 効果発現に貢献した要因

(1) 計画内容に関すること

スリランカのように、省エネへの取り組みを国家的なレベルで開始した国において、省エネ普及促進に必要な資源の整備、インセンティブ制度、省エネ意識の向上という 3 つは、いずれも欠かすことのできない分野であり、同時並行して取り組むべき課題である。当プロジェクトでもこの 3 分野を成果として設定したため、総合的な取り組みがなされ、今後の省エネ推進の基礎を効果的に築くことができた。

(2) 実施プロセスに関すること

1) MoPE のプロジェクトへの支援とモニタリング、SLSEA 職員の前向きな姿勢と努力、

JICA 専門家チームの豊かな経験が、プロジェクト活動の効果的な実施に大きく貢献した。

- 2) 本邦研修に関し、実施のタイミング、参加者の選定、研修内容、調整などいずれも適切であり、その効果的な実施が技術移転の進捗に大きく貢献した。
- 3) スリランカ標準協会（Sri Lanka Standard Institution : SLSI）、セイロン電力庁（Ceylon Electricity Board : CEB）、ランカ電力会社（Lanka Electricity Company : LECO）、SLEMA、エネルギー・サービス会社（Energy Service Companies : ESCOs）、モラトウワ大学などの協力機関をプロジェクト形成時から巻き込むことにより、これら機関からの協力が得られたことは、成果の発現を促進した要因であった。

3-4 問題点及び問題を惹起した要因

- (1) 計画内容に関すること
特になし

- (2) 実施プロセスに関すること

前述のように、SLSEA の省エネ部の重要な職位に欠員があったことは、プロジェクト活動を計画どおり実施するうえでマイナスの影響を及ぼした。

3-5 結論

省エネ普及促進においては、上述の3つの分野（必要な資源の整備、インセンティブ制度、省エネ意識の向上）のいずれかが遅れても不都合が生じる。例えばエネルギー消費量の報告義務づけの法制度が施行されても、適切な融資制度がなければ、産業界が積極的に省エネを推進することは難しいであろう。ラベリング制度についても、法制度の導入と同時に、製造者、輸入者、消費者などの同制度に関する意識が向上してこそ適切に機能する。このようなことから、省エネの効果的な普及促進のためには、現在予定よりも実施が遅れている法制度及び融資制度の早期の整備が大変重要と思われる。

SLSEA 職員、JICA 専門家チーム及び関係者の当プロジェクト推進に関する献身的な努力を高く評価するとともに、下記の提言を十分考慮し、今後より良い効果が生み出されるよう期待する。

3-6 提言（当該プロジェクトに関する具体的な措置、提案、助言）

<早急な対応が必要とされるもの>

- (1) 準備中の法制度（エネルギー消費量報告制度、エネルギー管理士・診断士制度）の法的整合性の精査と内閣の承認手続きを早期に完了させ、早期の施行を図る。
- (2) SLSEA 省エネ部のディピューティー・ディレクター・ジェネラル、シニア・スペシャリスト、モニタリング・検証課長の欠員を解消する。特に IT インフラの開発を統括するシニア・スペシャリストは JICA 専門家チームのアサイメント中に配置し、技術移転を図る。
- (3) CFLs の普及と国家上水排水庁のポンプ交換を目的としたパイロット事業の結果を関係者間で共有し、今後の計画について同意する。

(4) SLSEA の資金運用管理部の能力向上を下記のような方法で図りつつ、省エネ事業用の融資制度の改善を早急を実施する。

- 1) 2011 年中に少なくとも 10 件の省エネ事業への融資を促進し、資金運用に関する経験を蓄積する。
- 2) 資金運用管理部に融資運用の専門性をもつ職員を配置するよう検討する。

<継続的な取り組みが必要とされるもの>

- (5) ラベリング制度、エネルギー消費量報告制度など新しく導入される制度に関するモニタリングや検証を確実に実施する。
- (6) 省エネ普及促進の効果測定を毎年実施する。
- (7) MoPE の指導により、省エネ 10 年計画を定期的に見直し、ローリングプランとして活用するとともに、同計画に基づく中期の財政計画を策定する。

3-7 教訓（当該プロジェクトから導き出された他の類似プロジェクトの発掘・形成、実施、運営管理に参考となる事柄）

当案件は、法制度の施行を前提に成果が設定されていた。専門家チームとしては、法制度の運用の準備と、運用にかかわるノウハウの移転に活動の重点を置いており、こういった面では非常に効果的な技術移転が行われた。一方、法案が実施主体である SLSEA から省に提出されたあと、専門家チームは承認の進捗を確認する程度しか関与しなかった。こういった法制度の承認を含め成果が設定されている案件の場合、産業界等利害関係人との折衝、法案文書の練り直し、省や大臣といった上位機関の説得といった、法案承認のための最後の段階を含めて専門家が支援することが望ましく、その段階も含めてプロジェクトを監理していくことが必要である。

3-8 フォローアップ状況

フォローアップが必要な主な項目は、上記提言の実施状況、及びプロジェクト目標と上位目標の指標の達成度である。

Summary of Terminal Evaluation

I. Outline of the Project			
Country : Sri Lanka		Project title : Project of Promoting Energy Efficiency Improvement in Sri Lanka	
Issue/Sector : Energy		Cooperation scheme : Technical Cooperation Project	
Division in charge : JICA Sri Lanka Office		Total cost (as of January 28, 2011) : 347,287 Thousand JPY	
Period of Cooperation	(R/D): Feb. 11th, 2008 3 years (from May 1 st , 2008 to May 30 th , 2011)	Partner Country's Implementing Organization : Sri Lanka Sustainable Energy Authority (SLSEA)	
		Supporting Organization in Japan : J-Power	
Related Cooperation : Not available			
1. Background of the Project			
<p>Sri Lanka depends on 62% of its electricity generation on imported oil¹. Therefore, electricity prices are much higher than those of neighbouring countries; thus hinder the competitiveness of export industries among the Asian countries. Due to the limitation of generation expansion, it is believed that there is a risk for the country to face serious power shortage in the near future. Therefore, promotion of energy efficiency and conservation (hereinafter referred to as EE&C) is an urgent task for the country to continue economic growth in the future. In September 2007, Sri Lanka Sustainable Energy Authority Act became effective and SLSEA was established as an institution to regulate and promote EE&C.</p> <p>Under these circumstances, the Government of Sri Lanka requested a project on EE&C to the Government of Japan. The proposal was accepted by JICA and the Project was commenced in May 2008 for the period of three years.</p>			
2. Project Overview			
(1) Overall Goal : To achieve high efficiency in energy consumption.			
(2) Project Purpose			
Infrastructure necessary for materializing energy efficiency activities in the country is enhanced.			
(3) Outputs			
Output 1: Necessary resources (rules and regulations, human resources, equipment and materials) for implementing SLSEA Act are prepared.			
Output 2: Incentive/disincentive mechanism for promoting energy efficiency is repaired.			
Output 3: Mass consciousness is created among general public, private and public sectors on energy efficiency improvement.			
(4) Inputs			
Japanese side :			
JICA Experts: 13 persons		Equipment : 32.7 million JP yen	
Trainees received : 26 persons		Local cost: 40.2 million JP yen ²	
Sri Lankan side :			
Counterpart personnel: 15 persons		Local Cost : SL Rs.156,828,750 ³	
Land and Facilities : An office room for JICA Expert Team			
II. Evaluation Team			
Members of Evaluation Team			
Mr. Takuya Otsuka		Senior Representative, JICA Sri Lanka Office	
Mr. Gen Hashimoto		Representative, JICA Sri Lanka Office	
Dr. Priyantha Serasinghe		Project Specialist, JICA Sri Lanka Office	
Ms. Tomoko Tamura		Kaihatsu Management Consulting Inc.	

¹ Sri Lanka Energy Balance, 2007

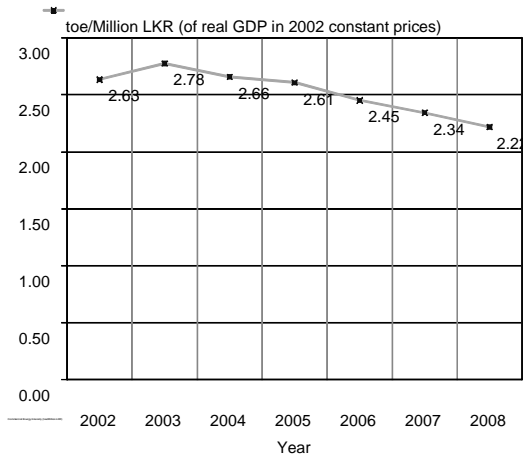
² As of the end of December 2010.

³ Budget of the Energy Management Division of SLSEA for the years 2008, 2009 and 2010.

Period of Evaluation	From 12.01.2011 to 28.01.2011	Type of Evaluation : Terminal
III. Results of Evaluation		
1. Summary of Evaluation Results		
(1) Relevance – Very High		
<p>The Project Purpose is consistent with development policies of Sri Lanka “Mahinda Chintana (2006-2016)”, which prioritizes EE&C. Japanese ODA Country Policy and Country Strategy of JICA for Sri Lanka highlighted an importance to assist power sector, including EE&C.</p> <p>In order to attain further economic development, it is an urgent task for the country to realize a socio-economic structure of high energy intensity by promoting EE&C programme, as the country is highly depends on petroleum for its energy source. Therefore, there are urgency and needs for the Project. JICA and JICA has superiority in assisting EE&C, because most of the proposed legislations under the Project were already established in Japan under the Rationalization in Energy Use Law and JICA has implemented EE&C projects in various countries and is enable to use its accumulated knowledge and experience in the Project.</p>		
(2) Effectiveness - Moderate		
<p>The counterpart officers of SLSEA have (i) gained necessary skills and know-how to implement the proposed EE&C legislations and to utilize the instrument introduced by the Project, (ii) successfully implemented several pilot projects which will pave the way for full-scale introduction of the incentive/disincentive scheme and (iii) remarkably improved the quality and quantity of the awareness creation programme. In this manner, the Project has been created an expected level of effect especially in terms of technical transfer.</p> <p>However, it is likely to take some mote time for SLSEA to achieve the Project Purpose completely, due to the delay in the enforcement of the proposed regulation and the finance schemes, although the delay was caused as a result of the careful and prudent decisions of Ministry of Power and Energy (MoPE) and Department of External Resources in order to implement the proposals more successfully.</p>		
(3) Efficiency - Moderate		
<p>All the planned input from Japanese side has been made on time and as scheduled. Input from Sri Lankan side has been made adequately, although it is regretful that the vacancies in the important positions in SLSEA have not filled. With the limited number of human resources, SLSEA counterpart officers created the expected Outputs to the maximum level with the support of the JICA Expert Team. However, at this moment, several activities are still on the way to create the expected outputs.</p> <p>With regard to Output 1, the necessary technical transfer for implementation of the proposed EE&C legislation has been almost completed and SLSEA is ready for the operation of the scheme. Labeling scheme for compact fluorescent lamps (CFL), expansion of the instrument bank and IT infrastructure were implemented as planned. With regard to Output 2, there are several actions taken for improvement of the financial schemes and potential projects are being ready for finance, however, improvement of the finance schemes has not been realized yet due to the various reasons. It is positive that the pilot projects on CFL distribution and replacement of the water pumps of National Water Supply and Drainage Board have been implemented successfully. The level of creation of Output 3 was more than expected. The methodology of awareness creation programme was also improved to be more effective and sustainable.</p>		
(4) Impact – High (Forecast)		
<p>There is a prospect that the Project would contribute to achieve the Overall Goal. The Project also created extra outputs with regard to CDM (clean development mechanism). The following figures show the recent status with regard to the two indicators for the Overall Goal.</p> <p>(i) Commercial energy intensity is reduced below 1.8 tow/Million Rs. by 2017</p> <p>Commercial energy intensity is a standard measure of efficient use of commercial energy in a country. The Figure 1 shows a steady reduction of the intensity, which confirms the effect of the present EE&C activities and a good prospect that the intensity will become below 1.8 tow/Million Rs. by 2017.</p>		

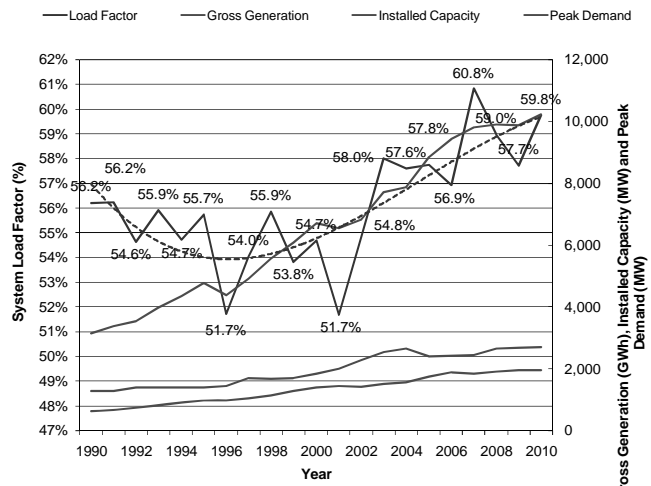
(ii) Electricity load factor is increased annually by 1%.

Load factor is a measure of optimal use of power system resources by the electricity consumers⁴. Figure 2 shows the general tendency of increase, although the recent increment rate is slightly less than the annual target figure of 1%.



Note: The figure of 2008 is provisional
(Source: Draft Baseline Survey Report of the Project, January 2011)

Figure 1: Commercial Energy Intensity



Note: The figure of 2010 is provisional
(Source: Draft Baseline Survey Report of the Project, January 2011)

Figure 2: Electricity Load Factor

Contribution to the preparatory work for formulation of a programmatic CDM and establishment of a common base for the “grid emission factor” in the country, which is important in formulating CDM programme in the country, are extra outputs created by the Project. The latter is handed over to the Technical Cooperation Project of JICA named “The Project for Capacity Development of CDM Promotion in Sri Lanka”.

The methodology for awareness creation has a potential to be utilized in the similar technical cooperation projects of JICA in other countries. For example, the way to plan and conduct national EE&C award as well as the follow-up for the award winners, the way to hold the EE&C exhibition with private and public partnership and campaigns conducted at the time of introduction of CFL labeling scheme could be model to others.

(5) Sustainability : High

(a) Policy and institutional support

Commitment and support of the senior officials of MoPE and SLSEA is a positive factor to maintain effects of the project even after the Project period. SLSEA has an adequate regulatory powers to maintain the introduced and proposed schemes as well as to facilitate implementation of the 10-year plan.

(b) Organizational aspect

As mentioned earlier, there are several vacancies for the approved cadre of the Energy Management Division of SLSEA. Especially, the vacancies of the Deputy Director General and the Senior Specialist could be a shortcoming for the sustainability of the effect of the Project. The absence of “head- monitoring and vilification” will be a serious concern when all the proposed schemes are enforced.

(c) Financial aspect

The annual budget for recurrent cost for the Energy Efficient Division of SLSEA would be sufficient for the time being to cover administration cost to maintain and expand systems and schemes introduced by the

⁴ Larger the load factor, better the system usage resulting in lower electricity supply costs. Sri Lanka has a low system load factor, largely due to the dominant domestic lighting demand and the lack of base load industries. Therefore, Demand Side Management is an immediate remedial action in improving load factor.

Project. There would be no particular issue with regard to the finance of the division, unless there would be a drastic reduction of the allocation. It is a positive sign for financial sustainability that SLSEA is raising fund by the renting fee of the instrument bank and finding sponsorships for exhibition. Introduction of an improved financial scheme is urgently needed to sustain the effect of the Project.

(d) Technological aspect

SLSEA officers have gained most of the necessary know-how to promote EE&C up to the planned level and their technical level is satisfactory. All the instruments were purchased with careful consideration of the appropriate quality standard as well as the convenience of maintenance. Therefore, SLSEA officers are capable of maintain and operate the instrument in the future, too. Technical capacities of partner organizations, such as SLEMA and local consultant companies on EE&C and IT are also satisfactory. However, in the future, too, periodical update of the technical and knowledge level of the SLSEA officers and staff of the partner organizations will be needed because EE&C is the constantly advancing subject.

(e) Others

It is important to analyze and utilize the result of the pilot projects for CFL promotion and pump replacement of National Water Supply and Drainage Board. It is also important to make sure the implementation of the monitoring and verification of the newly introduced schemes, such as labelling and reporting as well as impact assessment of the level of EE&C promotion continuously.

2. Factors that promoted realization of effects

(1) Factors concerning to Planning

It was successful to have the three components, resource preparation, incentive/ disincentive scheme and awareness creation in the Project. These three were indispensable and need to be developed in parallel for promotion of EE&C in a country like Sri Lanka, where its government started full-fledged initiatives of EE&C.

(2) Factors concerning to the Implementation Process

- (a) Sincere support and close monitoring of the MoPE, keen interest and commitment of the SLSEA counterpart officers and rich experience of the JICA Expert Team contributed remarkably to the implementation of the Project.
- (b) Effective implementation of the Training in Japan, including timing, selection of the participants, training programme and coordination, enhanced the efficiency of the technical transfer.
- (c) Close cooperation of the partner organizations, such as SLSI (Sri Lanka Standard Institution), CEB (Ceylon Electricity Board), LECO (Lanka Electricity Company), SLEMA (Sri Lanka Energy Managers' Association), ESCO (Energy Services Company) and Moratuwa University, facilitated significantly to produce the planned Outputs.

3. Factors that impeded realization of effects

(1) Factors concerning to Planning: Not available.

(2) Factors concerning to the Implementation Process

As mentioned earlier, vacancies of the key staff of the Energy Management Division of SLSEA gave negative influence to the timely implementation of the planned activities, although the staff in office worked hard to compensate it.

4. Conclusion

EE&C is promoted effectively, only when the three components of the Project, resource preparation, introduction of incentive/ disincentive scheme and awareness creation are implemented effectively in parallel. For example, even the proposed legislation on mandatory energy reporting, management and audit will be enforced, the industries cannot react positively if an attractive finance schemes is not available. Labeling schemes will not function if manufactures, importers and consumers do not have proper awareness. Therefore, early enforcement of the proposed regulation and introduction of an appropriate finance scheme are very much important to promote EE&C.

While appreciating commitment and keen effort the staff of SLSEA, JICA Expert Team and other stakeholders of the Project made so far, the Terminal Evaluation Team expects some more actions to be taken to produce more successful result, by taking due considerations of the Recommendations stated hereinafter.

5. Recommendations

Immediate actions are requested to:

- (1) Early enforcement of the regulation on mandatory energy reporting, accreditation of energy managers and energy auditors by scrutinizing the legal compliance and obtaining a cabinet approval as soon as possible.
- (2) Fill the post of the "Deputy Director General – Strategy", "Head – monitoring and verification" and "Senior Specialist" for the Energy Management Division of SLSEA. Especially the position of the Senior Specialist, who is in-charge of development of IT infrastructure, should be filled well before the JICA Expert Team leaves Sri Lanka in April 2011, so that they can transfer their know-how to the Specialist.
- (3) Share the results of the pilot projects on CFL promotion and pump replacement of NWSDB among the stakeholders and reach consensus about the future actions to be taken.
- (4) Develop an improved financial scheme for EE&C as soon as possible while enhancing the capacity of the Project Management Unit of SLSEA by implementing the followings:
 - (a) Adding experience in fund management and project implementation by facilitating at least 10 showcase projects in 2011.
 - (b) Positively consider adding a staff to the Project Management Unit, who has expertise on loan operations.

Continuous actions are important to:

- (5) Make sure to implement monitoring and verification of the newly introduced schemes, such as labeling and energy consumption reporting.
- (6) Conduct impact assessment of EE&C promotion annually.
- (7) Review the 10 year EE&C plan periodically in a form of rolling plan system while formulating middle-term financial plan under the supervision of the MoPE.

6. Lessons Learned:

Enforcement of the new legislations on EE&C was a prerequisite to realize the Outcomes of the Project. In this regard, the JICA Expert Team mainly concentrated on technical transfer to the counterpart officers in preparation and operation of the legislation. The technical transfer has been conducted successfully; however, with regard to the process of enforcement of the legislation, the JICA Expert Team has not play significant role but only checked the progress of the procedure, especially after the draft document of the legislation was submitted to the Ministry from SLSEA. In a project like this, of which Outcomes are subject to the enforcement of legislations, it is advisable for the JICA Expert Team to conduct not only technical transfer in preparation and operation of the legislation, but also to support the whole procedure of the enforcement of the legislation, in ways to persuade industrial sector, participate in perusal and modification of the draft document of legislation, convince higher authorities in the Ministry and others. Furthermore, JICA needs to monitor such a project including the support to the enforcement of the legislation.

7. Follow-up Situation

It is necessary to follow-up the above-mentioned recommendations and progress with regard to the indicators for the Project Purpose and Overall Goal of the Project.

第1章 終了時評価調査の概要

1-1 評価団派遣の経緯と目的

スリランカ民主社会主義共和国（以下、「スリランカ」と記す）における「Sri Lanka Sustainable Energy Authority Act, No.35 of 2007（以下、「SLSEA 法」と記す）」の施行に必要な資源（資源：政策、人材、資材、資料）の整備、省エネルギー（以下、「省エネ」と記す）普及促進のためのインセンティブ制度の整備、一般家庭、私企業、公共セクターの省エネに関する意識向上を目的として、2008年5月～2011年5月の3年間の計画で「省エネルギー普及促進プロジェクト」を実施している。本プロジェクトは、SLSEA をカウンターパート機関として実施しており、専門家10名（統括・省エネ政策・行政、省エネ普及促進・資金検討、省エネ監査・管理技術・機材、ラベリング・ESCOs、IT・技術、電力分野・需要側マネジメント、省エネ政策・カウンターパート研修、エネルギー管理メカニズム、CDM 開発支援）を派遣してきた。

今回実施する終了時評価調査は、プロジェクト活動の実績、成果を評価、確認するとともに、今後のプロジェクト活動に対する提言及び今後の類似事業の実施にあたっての教訓を導くことを目的とした。

1-2 調査団の構成と調査期間

調査団の構成と調査期間は以下のとおりである。

担当業務	氏名	所属	調査期間
団長	大塚 卓哉	JICA スリランカ事務所 次長	現地参团
協力企画	橋本 玄	JICA スリランカ事務所員	現地参团
協力企画	プリヤンタ・セーラ シンハ	JICA スリランカ事務所現地 職員	現地参团
評価分析	田村 智子	株式会社かいはつマネジメン ト・コンサルティング	2011年1月12～16日、20 ～28日

1-3 対象プロジェクトの概要

1-3-1 協力の背景

スリランカの一次エネルギー供給は、約9,359.5Ktoe（2004年）であり、その内訳はバイオマス48.2%、石油44.2%、水力7.6%となっている。スリランカは石油を産出しないことから年間約400万tを輸入しており、輸入総額に占める石油の割合は2005年において約19%（16億6,000万ドル）に達している。また、年間の総発電量は、水力39%（3,450GWh）、火力61%（5,314GWh）であり、既存の火力発電所は石油（軽油等）を燃料としていることから、その年間消費量は約100万tである。スリランカの今後の一次エネルギーの伸びは年平均3%と予想されており、2020年までに1万5,000Ktoeに達すると見込まれている。

以上の状況を踏まえ、2006年10月に制定された「National Energy Policy and Strategies of Sri Lanka」では、一次エネルギーの供給能力増強と多様化に加え、省エネの普及がスリランカエネルギーセクターにおける重要課題として認識されている。また、2007年9月にはSLSEA法の制定により、省エネ対策機関として、SLSEAが設立された。SLSEA法では、省エネ政策の立

案・普及、エネルギー需要管理、省エネに資する技術革新、ラベリングの実施、ベンチマークの制定、一般住民への啓発活動等に加え、エネルギー管理士・エネルギー監査人・エネルギーサービス供給者の認定が義務づけられている。

こうした状況の下、スリランカにおける持続的な省エネ対策を目的とした技術協力プロジェクトがスリランカ政府により要請され、この要請は2006年8月に日本政府により承認された。本プロジェクトは2007年の事前調査を経て2008年5月より3年間の計画で実施している。

1-3-2 協力内容

本プロジェクトの概要は以下のとおりである。

(1) 上位目標

エネルギー消費効率の高い社会が実現する。

(2) プロジェクト目標

省エネ活動を促進するために必要な基盤（政策、人材、奨励制度、省エネ意識）が整備される。

(3) 成果

- 1) SLSEA 法施行に必要な資源（政策、人材、機材、資料）が整備される。
- 2) 省エネを促進させるためのインセンティブ制度が整備される。
- 3) 一般家庭、私企業、公共セクターの省エネに関する意識が向上する。

(4) 活動

1) SLSEA 法施行に必要な資源（政策、人材、機材、資料）の整備

- 1)–1 省エネの長期計画（10年間）を立案する。
- 1)–2 特定業者に関するエネルギー消費基準値が開発され、毎年アップデートされる。
- 1)–3 エネルギー監査人、エネルギー管理者の認定制度を導入する。
- 1)–4 主な機器に省エネ表示の義務づけを導入する（CFLs、バラスト、天井扇風機など）。
- 1)–5 モニタリングとデータ解析のための IT インフラを開発する。
- 1)–6 エネルギー監査人のための SLSEA の機材バンクを充実させる。

2) インセンティブ制度の整備

- 2)–1 省エネ投資を奨励するための融資制度を開発または改善する〔スリランカ・サステイナブル・エネルギー基金、有償資金協力事業 環境対策支援事業 II (Environment Friendly Solution Fund Project II : E-Friends II) など〕。
- 2)–2 エネルギー効率の高い CFLs に関するインセンティブ制度及びパイロット・プロジェクトを開発する。

3) 省エネ意識の向上

- 3)–1 一般市民、私企業、公共団体向けの啓発キャンペーンを実施する。

(5) 外部条件

- 1) 活動実施のための外部条件
 - ・SLSEA に適切な規模の予算と職員が配置される。
- 2) 成果達成のための外部条件
 - ・スリランカ政府の省エネに関する継続したコミットメント
 - ・カウンターパートの多くが異動しない。
- 3) プロジェクト目標達成のための外部条件
 - ・安定した経済成長
- 4) 上位目標達成のための外部条件
 - ・安定した経済成長

第2章 評価の方法

2-1 評価調査の手法

当評価調査は、以下の手法を用いて実施した。

(1) 既存報告書類のレビュー

レビューした主な報告書類は以下のとおり。

- Project Progress Reports
- Minutes of the JCC Meetings
- Presentation materials documented by SLSEA and JICA Expert Team
- Joint Evaluation Report of the Mid-Term Evaluation
- 10 year Road Map, SLSEA
- Action Plan for 2011, SLSEA
- Budget Breakdown 2011, SLSEA
- Presentation Materials, Project Review Meeting on October 26, 2010
- 事業完了報告書（各契約年次）

(2) インタビュー、ディスカッション

主なインタビュー、ディスカッション先は以下のとおり。

- Director General, ERD
- Minister, MoPE
- Additional Secretary of MOPE/ Deputy General Manager (Strategy)
- Chairman, SLSEA
- Deputy General Manager (Operation), SLSEA
- Director (Energy Management), SLSEA
- Staff of Energy Management Division of SLSEA
- Members of the JICA Expert Team
- Assistant General Manager, Distribution – Region 3, CEB
- Director General, SLSI
- Project Manager/ Vice President, and members of SLEMA
- Electric Engineer- System Operation and Branch Manager – Operations, LECO

(3) 評価は以下の5項目の観点から実施した。

- 妥当性
- 有効性
- 効率性
- インパクト
- 持続発展性

2-2 主な調査項目と情報・データ収集方法

活動進捗状況については、既存の報告書類及び JICA 専門家チームとスリランカ側カウンター

パートへのインタビューを基に確認した。成果達成状況及びプロジェクト目標達成の見込みについては、プロジェクト・デザイン・マトリックス（Project Design Matrix：PDM）の指標に沿って情報・データを収集し分析を行った。実施プロセスに関しては、チームワーク、コミュニケーション、意思決定過程、進捗モニタリング、上位機関の参加度、合同調整委員会（Joint Coordination Committee：JCC）の機能などに関する情報を JICA 専門家チーム及びスリランカ側カウンターパートから収集し分析した。

第3章 プロジェクトの実績

3-1 投入の実績

3-1-1 日本側

(1) 専門家派遣（詳細は付属資料1の「Annex-1」を参照のこと）

専門家の派遣は計画どおり行われ、その経験と知識をもってプロジェクトの効果的な実施に貢献した。

(2) 本邦研修（詳細は付属資料1の「Annex-3」を参照のこと）

本邦研修にはSLSEAをはじめ、MoPE、CEB、LECO、SLSI、SLEMAといった協力機関より合計26名が参加した。参加者は、省エネ技術、ラベリング制度、ダイヤモンド・サイド・マネジメント、省エネ政策などに関するノウハウを習得し、習得事項や研修で入手した教材や参考資料などを日常業務で広く活用している。また、政策立案の立場にあるシニアレベルの参加者は、政策・計画の立案や省エネ技術の普及の際に研修内容を生かしている。また、本邦研修への参加によって、協力機関の当プロジェクトに対する理解が深まり、より良い協力体制が築かれた。一方、2010年12月の研修の参加者のなかには、セミナー形式の研修項目をやや減らし、省エネの現場訪問を増やしてほしいという声も聞かれた。

また、スリランカからの研修参加者の熱心な態度は日本の研修受入れ機関に高く評価された。JICA 専門家チームは、適切な計画策定とコーディネーションにより研修の効果的な実施に貢献した。

当プロジェクトでは、研修参加者のほぼ全員が、研修で学んだことの多くをそのまま実務に活用できるという意見をもっていた。これから途上国が導入しようとしている省エネの諸制度、例えばラベリング制度、エネルギー管理士制度などが日本では既に実施されており、若干の変更を加えるだけで当該国への導入を検討することができることが、このような意見の背景であると考えられる。省エネ用のITインフラ、ベンチマーク制度、トップランナー制度、クリーン・テクノロジーなども、参加者が帰国後まもなく当該国への導入を検討することのできる項目である。

(3) 機材供与（詳細は付属資料1の「Annex-4」を参照のこと）

機材の購入と供与はすべて計画どおり完了している。機材はスリランカの省エネ普及において最もニーズや緊急性の高いものが選定された。質や数量の面での問題も起こっていない。機材はすべて、スリランカにおいて取り扱い業者のいるものが購入されており、部品の追加購入などに関する問題が今後起こらないよう配慮されている。製品付属のマニュアルに加え、専門家の指導の下カウンターパートが各機材のマニュアルを独自に作成している。これはカウンターパートの技術の習得に効果的であったとともに貸し出しの際の便宜性を確保するのに有意義であった。供与された機材は、その貸し出し頻度が年々増加していることから、有効活用されているといえる。維持管理の状況も良く、貸し出し料金をもって維持管理費用を賄う仕組みが整っており、維持管理上の懸念もない。

(4) ローカル・コスト負担（詳細は付属資料 1 の「Annex-5」を参照のこと）

ベースライン調査やパイロット・プロジェクトなどの現地再委託費、セミナー開催費、補助要員の備人費などの日本側のローカル・コスト負担は合計約 4,000 万円であった（2010 年 12 月末現在）。

3-1-2 スリランカ側

(1) カウンターパートの配置（カウンターパートのリストは付属資料 1 の「Annex-2」を参照のこと）

SLSEA のカウンターパートが熱心かつ誠実にプロジェクト活動に関与し貢献したことは高く評価できる。彼らの技術や知識も、プロジェクト活動を実施するのに適切なレベルであった。一方、図 3-1 が示すように、SLSEA の省エネ部には現在 3 職位に欠員があり、プロジェクト活動の計画どおりの進捗における制約となった。

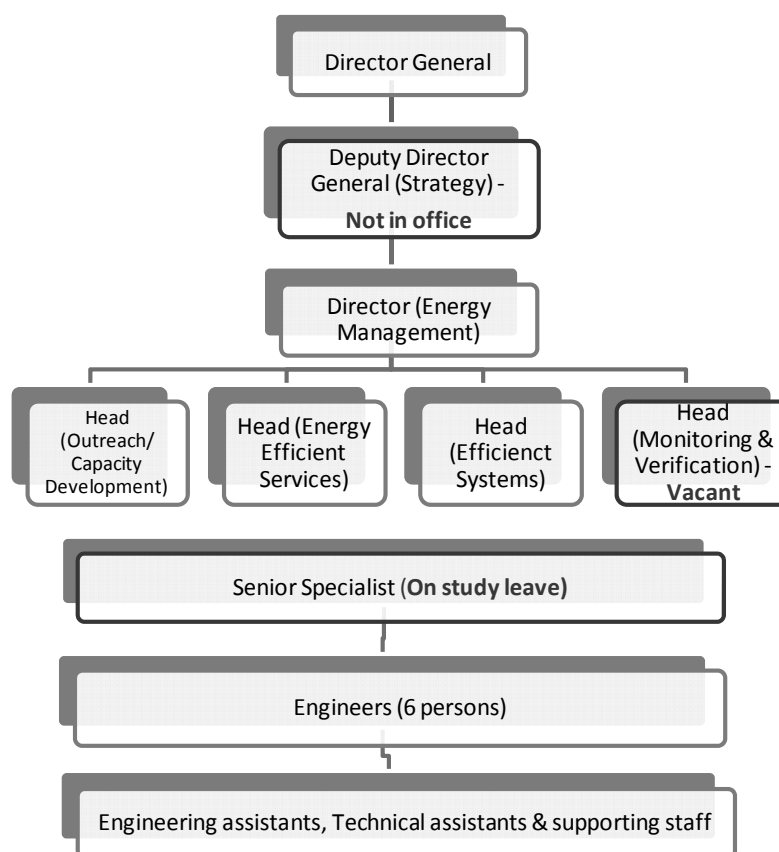


図 3-1 SLSEA 省エネ部人員配置図

省エネ部の局長代理（ストラテジー）は、2009 年 3 月より MoPE の次官補を兼務しており、同部に席は置いているものの実質的には不在の状態である。モニタリング・検証課の責任者は SLSEA 発足当時より欠員であった。シニア・スペシャリストは 2009 年 7 月より 3 年間、留学のため休職している。現在、在職の職員が手分けをして業務に支障がでないようにこれらの欠員による不足を補完しているため、それら在職の職員の業務負担が非常

に大きい状態である。

(2) ローカル・コスト負担（詳細は付属資料1の「Annex-6」を参照のこと）

スリランカ側のプロジェクト実施への財政面での貢献は、タイミング、量ともに問題のないものであった。また、SLSEAの省エネ部は、省エネ展示会開催の際のスポンサーの獲得や、機材バンクのレンタル料により自己財源を確保していることも評価できる。

3-2 活動の実施状況

予定された活動はほぼ計画どおりに実施されており、CFLsのラベリング制度、CFLs普及パイロット事業、啓発活動などは期待以上に効果を上げた。しかし、主に法制度（エネルギー消費量報告義務づけ、エネルギー管理士・診断士制度）の施行の遅れにより、進捗が予定より遅れている活動もある。詳細は付属資料1の8～12ページを参照のこと。

3-3 成果の達成状況

成果1：エネルギー消費量報告義務づけなどに関する法制度の運用に必要な技術移転はほぼ完了しており、マニュアルの整備など制度運用の準備も整っている。また、CFLsのラベリング制度、機材バンクの拡張、ITインフラの充実などは計画どおり成果を上げた。一方、同制度の法案の内閣承認が遅れており、制度が施行に至っていないため、これに関連する成果〔下表の指標では(1)～(4)〕の発現が計画より遅れている。

成果1の指標	達成の見込み
(1) A mandatory annual energy consumption reporting scheme is introduced to industries and commercial consumers, of which electricity consumption is larger than 250,000 kwh/ month.	The target has not been met as of January 2011, however the target will be met by the end of the Project if the proposed regulation will be approved by the Cabinet very soon.
(2) Report on "energy consumption baseline analysis" is documented and updated every year.	Same the above.
(3) 6 number of energy auditors are accredited.	Same the above.
(4) Accredited energy managers are appointed in 150 organizations in public and private sectors.	Same the above.
(5) Mandatory labelling systems are introduced for 3 prioritized appliances (CFLs, ballasts and fans).	Partly achieved with additional output. It will be achieved fully by mid. 2011 if the regulation for the scheme will be approved without delay.

成果 2：融資制度の改善が検討され、融資の対象となるモデル事業の準備も進んだが、制度の改善は実施に至っていない。一方、CFLs の普及と国家上水排水庁のポンプ交換を目的とするパイロット事業が実施されたことは評価に値する。

成果2の指標	達成の見込み
(1) Number of projects on energy efficiency improvement approved for finance, is increased by 10%	Difficult to meet the target on time.
(2) More than one incentive/ disincentive schemes for appliances with energy efficiency labels are introduced.	Target has been met successfully.

成果 3：啓発活動に関しては、省エネ普及啓発素材（小学生向け教材、リーフレット等）の作成、第 1 回国家省エネ表彰式の実施協力など期待以上の成果が発現した。啓発活動の実施方法についてはより効果的で持続可能な形へと改善がみられた。

成果3の指標	達成の見込み
(1) 5 different types of education materials are prepared and utilized (posters, leaflets, booklets, CDs and Videos).	10 posters, 5 leaflets, 2 booklets and 2 CDs/videos were prepared. The target has been met to levels exceeding expectation.
(2) Number of applications for the existing national energy award is increased by 10% in each year.	The number of applicants was increased by 70% in 2010. Target has been met to levels exceeding expectation.
(3) Penetration rate (at least one bulb per a household) of CFLs becomes more than 40% in every sub-sector, namely urban, rural and estate.	Target has been met to levels exceeding expectation. See the indicator for “project purpose” shown below.

3-4 プロジェクト目標の達成見込み

SLSEA 職員が、省エネの法制度の運用や診断機材の活用に必要な技術力・ノウハウを身に着けたこと、インセンティブ制度の本格実施の先駆けとなるパイロット事業が成果を上げたこと、啓発活動の質や量に改善がみられたことなどから、特に技術移転の観点から、プロジェクトは期待した効果を生み出したといえる。

しかし上述のように、法制度が施行に至っておらず、融資制度の改善が未実施のため、下表が示すように、プロジェクト目標の指標のうち、これらに関係する 3 つについては、プロジェクト期間終了までに達成される見込みが立っていない。一般家庭の省エネ意識の浸透を測る指標 4 の「CFL の普及率」については、目標が 40%であったのに対し、最近の調査結果は約 80%を示しており、目標を大きく上回る結果となった。指標 5 の「省エネ 10 年計画」は、SLSEA の役員会の承認を得ている。

プロジェクト目標指標	2011年1月現在の進捗	達成の見込み																						
(1) Mandatory energy audit, monitoring and follow-up are conducted annually at least in 150 organization in private & public sectors.	The mandatory energy audit will be conducted as the following sequence. (i) Approval of the mandatory reporting scheme →(ii) Submission of the reports →(iii) Analysis of the report and setting of the benchmark →(iv) instruction of the mandatory energy audit to the institutions which have unacceptable energy consumption →(v) Audits are conducted. A guideline for the audit was documented and ready to use once implemented.	Likely to be completed in 2013.																						
(2) Amount of investment to Energy Efficiency and Conservation is increased at least by 10%.	The baseline data for the period from 15.08.2008 to 15.08.2009 was Rs. 298 million. The recent figure for the same during the period from January 2010 to the end of December 2010 was around 300 million. There was a little increase of amount; however, it was less than 10% so far.	Slightly increased, but less than the target.																						
(3) All the CFLs, ballasts and fans in markets have energy efficiency labels.	The CFLs in the market were labelled in 2010. Ballasts and fans are expected to have labels by end. 2011.	Partly achieved. Can be fully achieved in by the end of 2011																						
(4) Penetration rate (at least one bulb per household) of CFLs in household sector becomes more than 40% in every sub-sector, namely urban, rural and estate Penetration rate of CFLs in household sector becomes at least 40%	<ul style="list-style-type: none"> A survey conducted by SLSEA in 2007 and in 2010 shows that the penetration rates of CFL were increased drastically as shown in the following figure: <div data-bbox="528 1294 1158 1653" data-label="Figure"> <table border="1"> <caption>CFL Penetration Rates (Estimated from Chart)</caption> <thead> <tr> <th>Year</th> <th>Area</th> <th>Household with CFL (%)</th> <th>Household without CFL (%)</th> </tr> </thead> <tbody> <tr> <td rowspan="2">2007</td> <td>Urban</td> <td>~55</td> <td>~45</td> </tr> <tr> <td>Rural</td> <td>~35</td> <td>~65</td> </tr> <tr> <td rowspan="2">2010</td> <td>Urban</td> <td>~90</td> <td>~10</td> </tr> <tr> <td>Rural</td> <td>~75</td> <td>~25</td> </tr> </tbody> </table> </div> The sales of a reputed brand CFL in the estate area shows that the popularity of CFL in the estate area (Bandarawela, Passara, Nuwara Eliya and Hatton) was increased rapidly in 2010. <div data-bbox="587 1883 1102 1980" data-label="Table"> <table border="1"> <thead> <tr> <th>CFL sales in 2009</th> <th>CFL sales in 2010</th> </tr> </thead> <tbody> <tr> <td>157,882</td> <td>184,550</td> </tr> </tbody> </table> </div> 	Year	Area	Household with CFL (%)	Household without CFL (%)	2007	Urban	~55	~45	Rural	~35	~65	2010	Urban	~90	~10	Rural	~75	~25	CFL sales in 2009	CFL sales in 2010	157,882	184,550	Achieved to the levels exceeding the expectation.
Year	Area	Household with CFL (%)	Household without CFL (%)																					
2007	Urban	~55	~45																					
	Rural	~35	~65																					
2010	Urban	~90	~10																					
	Rural	~75	~25																					
CFL sales in 2009	CFL sales in 2010																							
157,882	184,550																							

(source: SLSEA)

(source: SLSI)

	<ul style="list-style-type: none"> The number of CFL imported to the country was also increased by 40% in 2010 after the introduction of the star labelling scheme. <div data-bbox="525 362 1158 736" style="border: 1px solid black; padding: 5px; text-align: center;"> <p>CFL importend (units/year)</p> <table border="1" style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th>Year</th> <th>Units/year</th> </tr> </thead> <tbody> <tr> <td>2007</td> <td>8,618,999</td> </tr> <tr> <td>2008</td> <td>12,262,144</td> </tr> <tr> <td>2009</td> <td>12,360,163</td> </tr> <tr> <td>2010*</td> <td>17,284,711</td> </tr> </tbody> </table> </div> <p style="text-align: center;">Note: the figure of 2010 is provisional. (Source: Sri Lanka Customs)</p>	Year	Units/year	2007	8,618,999	2008	12,262,144	2009	12,360,163	2010*	17,284,711	
Year	Units/year											
2007	8,618,999											
2008	12,262,144											
2009	12,360,163											
2010*	17,284,711											
<p>(5) 10 year plan for EE&C has been authorized by the ministry.</p>	<p>10 year plan was approved by the Board meeting of SLSEA. Based on the 10-year plan, SLSEA is working on formulating 5 year implementation plan with financial proposal, which will be sought an approval of the ministry.</p>	<p>Being in progress. Can be completed by the end of the Project.</p>										

3-5 実施プロセスにおける特記事項

実施プロセスに関して、チームワーク、コミュニケーション、意思決定、進捗モニタリング、上位機関・協力機関・JICA のプロジェクトへの関与と支援といった項目について調査したところ、特段の問題は認められなかった。(詳細は付属資料 1 の「Annex-8」を参照)

第4章 評価結果

4-1 評価5項目による評価

(1) 妥当性—非常に高い

プロジェクト目標は、省エネを優先課題とするスリランカの開発政策「マヒンダ・チンタナ（2006～2016年）」と合致しており、また、省エネを含むエネルギー分野への支援を重視している日本のODA政策やJICAの国別援助方針との整合性も高い。スリランカではエネルギー源の多くを石油に頼っており、省エネの推進により、エネルギー消費効率の高い社会経済構造をつくりだすことは経済開発を進めるうえで急務であることから、当プロジェクトには必要性和緊急性が認められる。

なお、プロジェクトで導入される予定の法制度は日本では省エネ法により既に導入済みであり、JICAもこれまで多くの国で省エネプロジェクトを実施してきた。これらの蓄積された知識や経験を活用できることから、日本及びJICAは当分野の支援において優位性をもつといえる。

(2) 有効性—中程度

前述のように、SLSEA職員の技術習得度、啓発活動の質や量の大幅な改善などから、特に技術移転の観点より、プロジェクトは大きな効果を生み出した。しかし、法制度の施行に関しては、既存の法令との法的整合性も確保しつつ、産業界などの利害関係者の理解も十分に得ながらスムーズに導入するため、MoPEによる法案の最終化に時間を要しており、施行に至っていない。融資制度の改善についても、さまざまな検討が行われ、新規円借款案件として、MoPEがERDに提案書を提出したが、ERDはSLSEAの資金運用管理能力の向上がまず必要という観点から、省エネ事業用の融資制度の導入に慎重な姿勢を示している。このように、法制度の施行や融資制度の改善が未実施のため、プロジェクト目標を達成するにはまだ時間がかかる見込みである。

(3) 効率性—中程度

日本側からの投入はタイミングや量などすべて計画どおりであった。SLSEAの省エネ部に欠員があった以外は、スリランカ側からの投入も予定どおりであった。また、SLSEAはJICA専門家チームのアドバイスを受けながら、限られた人員で最大限の成果を生み出したといえる。しかし上述のとおり、現時点において、幾つかの活動はまだ成果の発現につながっていない。

(4) インパクト—高い（予測）

プロジェクトは今後、上位目標達成に貢献する可能性があり、また、下記のとおり副次的な成果も生み出した。以下は成果の指標に関する現状を示す。

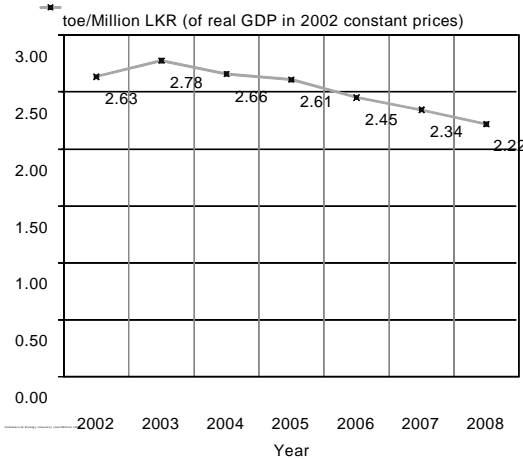
1) 商業エネルギー原単位が2017年に1.8 tow/100万ルピー以下に向上する。

商業エネルギー原単位は一国における商業エネルギーの使用効率の標準測定値である。表4-1が示すとおりこの値は確実に向上しており、これは、現在の省エネ諸施策の効果を示している。また、この傾向が続けば、2017年に1.8 tow/100万ルピー以下という目標を

達成する見込みがある。

2) 電力負荷率が年1%向上する

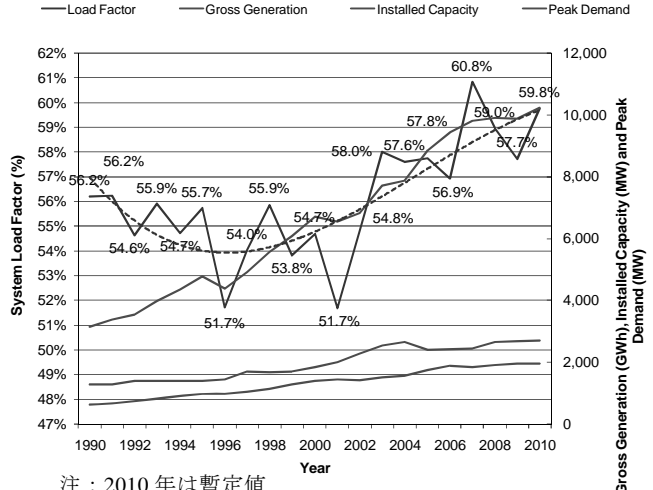
電力負荷率は電力消費者が電力システムを最適に使っているかどうかを測る数値である。図4-2が示すように、年1%という目標には達していないものの、電力負荷率は改善の傾向にある。



注：2008年は暫定値

出所：Draft Baseline Survey Report of the Project, 2011年1月

図4-1 商業エネルギー原単位の推移



注：2010年は暫定値

出所：Draft Baseline Survey Report of the Project, 2011年1月

図4-2 電力負荷率の推移

なお、副次的な効果としては、当プロジェクトは、プログラム CDM の形成や、CDM 事業の形成に重要なグリッド・エミッション・ファクターの制定に貢献した。後者の成果については同国で実施されている技術協力プロジェクト「CDM 事業推進能力強化プロジェクト」に引継ぎ継がれる予定である。また、全国省エネ賞の実施やフォローアップ、私企業からのスポンサーシップを募った省エネ展示会の開催、ラベリング制度導入の際のキャンペーン実施など、当プロジェクトで採用された啓発活動の手法は他国における類似のプロジェクトにおいてモデルとして活用することができる。

(5) 自立発展性—教訓が速やかに実施されれば自立発展性が見込まれる

1) 政策や組織への支援

MoPE や SLSEA 幹部は当プロジェクトを強く支持しており、プロジェクト終了後の効果の持続発展に関しても積極的である。また、SLSEA は当プロジェクトで導入予定の法制度の施行と省エネ 10 年計画を実施するために十分な規制権力を有している。

2) 組織面

前述のとおり SLSEA の省エネ部には欠員があり、特にディピューティー・ディレクター・ジェネラルとシニア・スペシャリストの不在は懸念される。また、「モニタリング・検証課」の責任者が欠員であり、今後、さまざまな制度が施行された際に不都合が生じる可能性がある。

3) 財政面

SLSEA の省エネ部の年間予算は、当プロジェクトで導入される諸制度の運用管理に足り

るものであり、今後予算配分に大きな変更がない限り財政面の問題は特段ないと考えられる。また、SLSEA が機材バンクのレンタル料や展示会のスポンサー料などにより、自主財源を生み出しているのも自立発展性の面から好ましいことである。なお、プロジェクトの効果の持続のために、省エネ事業用の融資制度の改善が急がれる。

4) 技術面

SLSEA の職員は計画どおり、省エネ推進のために必要なノウハウを取得しつつあり、その技術水準は満足できるものである。供与機材は、品質の適切性や、維持管理の便宜性も考慮して購入されており、SLSEA の職員が維持管理を継続するのに特に技術的な問題はない。また、SLEMA や省エネ・IT 分野のコンサルタント会社など、協力機関の職員の技術水準も高い。ただし、省エネ分野の技術は日進月歩であるため、今後も SLSEA や協力機関の職員の技術力を引き続き向上させていく必要がある。

5) その他

CFLs 普及と国家上水排水庁のポンプ交換を目的とするパイロット事業の結果を分析し、有効活用していくことが今後重要となる。また、ラベリング制度やエネルギー消費量の報告義務づけなど新しく導入される法制度の施行状況についてモニタリングと検証を行っていくこと、省エネ普及の効果測定を継続することが今後重要と考えられる。

4-2 効果発現に貢献した要因

(1) 計画内容に関すること

スリランカのように、省エネへの取り組みを国家的なレベルで開始した国において、省エネ普及促進に必要な資源の整備、インセンティブ制度、省エネ意識の向上という3つは、いずれも欠かすことのできない分野であり、同時並行して取り組むべき課題である。当プロジェクトでもこの3分野を成果として設定したため、総合的な取り組みがなされ、今後の省エネ推進の基礎を効果的に築くことができた。

(2) 実施プロセスに関すること

- 1) MoPE のプロジェクトへの支援とモニタリング、SLSEA 職員の前向きな姿勢と努力、JICA 専門家チームの豊かな経験が、プロジェクト活動の効果的な実施に大きく貢献した。
- 2) 本邦研修に関し、実施のタイミング、参加者の選定、研修内容、調整などいずれも適切であり、その効果的な実施が技術移転の進捗に大きく貢献した。
- 3) SLSI、CEB、LECO、SLEMA、ESCOs、モラトゥワ大学など、直接のカウンターパート機関ではない機関をプロジェクト形成時から巻き込むことにより、これら機関から協力が得られたことは成果の発現を促進した要因であった。

4-3 問題点及び問題を惹起した要因

(1) 計画内容に関すること

特になし

(2) 実施プロセスに関すること

前述のように、SLSEA の省エネ部の重要な職位に欠員があったことは、プロジェクト活動

を計画どおり実施するうえでマイナスの影響を及ぼした。

4-4 結 論

省エネ普及促進においては、上述の3つの分野（必要な資源の整備、インセンティブ制度、省エネ意識の向上）のいずれかが遅れても最大限の効果発揮に支障をきたす。例えばエネルギー消費量の報告義務づけの法制度が施行されても、適切な融資制度がなければ、産業界が積極的に省エネを推進することは難しいであろう。ラベリング制度についても、法制度の導入と同時に、製造者、輸入者、消費者などの同制度に関する意識が向上してこそ適切に機能する。このようなことから、省エネの効果的な普及促進のためには、現在予定よりも実施が遅れている法制度及び融資制度の早期の実現が大変重要と思われる。

SLSEA 職員、JICA 専門家チーム及び関係者の当プロジェクト推進に関する献身的な努力を高く評価するとともに、下記の提言を十分考慮し、今後より良い効果が生み出されるよう期待する。

第5章 提言と教訓

5-1 提言

<早急な対応が必要とされるもの>

- (1) 準備中の法制度（エネルギー消費量報告制度、エネルギー管理士・診断士制度）の法的整合性の精査と内閣の承認手続きを早期に完了させ、早期の施行を図る。
- (2) SLSEA 省エネ部のディピューティー・ディレクター・ジェネラル、シニア・スペシャリスト、モニタリング・検証課長の欠員を解消する。特に IT インフラの開発を統括するシニア・スペシャリストは JICA 専門家チームのアサイメント中に配置し、技術移転を図る。
- (3) CFLs の普及と国家上水排水庁のポンプ交換を目的としたパイロット事業の結果を関係者間で共有し、今後の計画について同意する。
- (4) SLSEA の資金運用管理部の能力向上を下記のような方法で図りつつ、省エネ事業用の融資制度の改善を早急に実施する。
 - 1) 2011 年中に少なくとも 10 件の省エネ事業への融資を促進し、資金運用に関する経験を蓄積する。
 - 2) 資金運用管理部に融資運用の専門性をもつ職員を配置するよう検討する。

<継続的な取り組みが必要とされるもの>

- (5) ラベリング制度、エネルギー消費量報告制度など新しく導入される制度に関するモニタリングや検証を確実に実施する。
- (6) 省エネ普及促進の効果測定を毎年実施する。
- (7) MoPE の指導により、省エネ 10 年計画を定期的に見直し、ローリングプランとして活用するとともに、同計画に基づく中期の財政計画を策定する。

5-2 教訓

当案件は、法制度の施行を前提に成果が設定されていた。一方、MoPE が法案の承認過程に予想以上の時間をかけたため、現時点では成果の発現が遅延している。予想以上に時間がかかったのは、産業界の反対や訴訟問題などを避けるため、産業界への説明会などを実施したこと、また法案の法的合理性を確保するため法案文書の練り直しに時間がかかったことなどが背景である。

専門家チームとしては、法制度の運用の準備と、運用にかかわるノウハウの移転に活動の重点を置いており、こういった面では非常に効果的な技術移転が行われた。一方、法案が実施主体である SLSEA から省に提出されたあと、専門家チームは承認の進捗を確認する程度しか関与しなかった。法律の専門家ではないこと、1 回のアサイメントが 1~2 週間という短期間であり、丁寧な進捗フォローがしにくい事情もあったとは思われるが、こういった法制度の承認を含め成果が設定されている案件の場合、上述の産業界との折衝、法案文書の練り直し、省や大臣といった上位機関の説得といった、法案承認のための最後の段階を含めて専門家が支援することが望ましく、その段階も含めてプロジェクトを監理していくことが必要である。

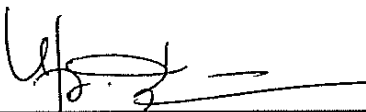
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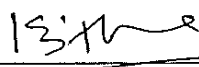
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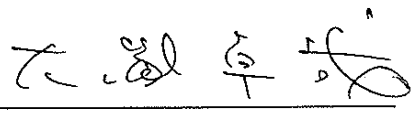
Report on
Joint Terminal Evaluation
for
The Japanese Technical Cooperation of
The Project for Promoting Energy Efficiency Improvement
in Sri Lanka

On
January 27th, 2011


for Mr. M.M.C. Ferdinando
Secretary
Ministry of Power & Energy
Sri Lanka


Mr. M. P. D. U. K. Mapa Pathirana
Director General
Department of External Resources
Ministry of Finance and Planning
Sri Lanka


Dr. Kithsiri Dissanayake
Chairman
Sri Lanka Sustainable Authority
Sri Lanka


Mr. Takuya Otsuka
Senior Representative
Japan International Cooperation Agency
Sri Lanka Office

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ANNEXES

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List of Abbreviations and Acronyms

CDM	Clean Development Mechanism
CEB	Ceylon Electricity Board
CFLs	Compact fluorescent lamps
E-Friends I	Environment Friendly Solution Fund Project I
E-Friends II	Environment Friendly Solution Fund Project II
EE&C	Energy efficiency and conservation
ERD	Department of External Resources
ESCOs	Energy Service Companies
GoJ	Government of Japan
GoSL	Government of Sri Lanka
JCC	Joint Coordination Committee
JICA	Japan International Cooperation Agency
LECO	Lanka Electricity Company
MoPE	Ministry of Power and Energy
NERD Centre	National Engineering Research and Development Centre
ODA	Official Development Assistance
PDM	Project Design Matrix
SLSEA	Sri Lanka Sustainable Energy Authority
SLEMA	Sri Lanka Energy Managers' Association
SLSI	Sri Lanka Standard Institution

1. Introduction

1.1. Background and Objective of the Terminal Evaluation

Background:

Sri Lanka heavily depends on imported oil among various energy sources. For example, 45% of primary energy sources are from imported oil; 62% of electric power is generated from imported oil in 2005. Therefore, electricity prices are much higher than those of neighbouring countries. Sri Lanka is vulnerable in terms of stable energy supply and oil price hikes.

The electric demand in 2025 is estimated at 36,843 GWh of generated energy, and 7,610MW of peak power as a result of annual 7.8% growth of peak power. In order to meet these growing demand, it is required add 300MW new power generating facility every year.

In order to tackle high electricity cost rapidly growing energy demand, the Government decided to adopt National Program on Energy Conservation, and set a target of reducing 20% energy consumption of year 2010 by 2020. Several concrete measures of demand side management (DMS) such as efficiency improvement of electricity appliances, bench marking of energy consumption of specific industries, revision of building energy efficiency standards, higher market share of CFLs are clearly spelled out in its National Development Plan.

In October 2007, Sri Lanka Sustainable Energy Authority Act became effective which intends to promote (i) energy efficiency improvement, and (ii) renewable energy development. Sri Lanka Sustainable Energy Authority (SLSEA), among other matters, is given authority to regulate energy efficiency through

- (i) Mandatory energy consumption benchmarks of specific industries and buildings
- (ii) Mandatory labelling on energy consumption limits or performance of specific appliances.
- (iii) Accreditation and ranking of energy managers, energy auditors and energy service providers.

It is urgent necessity for SLSEA to develop 10-year Energy Efficiency Improvement Program, and to take concrete measures for every requirement specified in SLSEA Act. The SLSEA needs to improve institutional capability to carry out these important assignments, especially in the areas of designing policy measures, and their implementation. Incentives/disincentives are also to be introduced for energy efficiency in private sector, energy audit by ESCOs, and financial schemes etc. General public, too, had very limited energy consciousness and needed to create more awareness.

Under these circumstances, the Government of Sri Lanka (GoSL) requested the Project Promoting Energy Efficiency Improvement to Government of Japan (GoJ) in August 2004 with particular interest on Japan's advanced technologies, and GoJ made its decision to

implement this Technical Cooperation Project in August 2006. The Project has been formulated based on two-phase studies; the first project identification study in March 2007, and the second study in October 2007. During this period, the Project framework, implementation organization, responsibilities of both parties are discussed and agreed in the Minutes of Meeting. The Record of Discussion was signed by GoSL and JICA in February 2008. The Project for Promoting Energy Efficiency Improvement in Sri Lanka has then commenced 1 May 2008 for three years.

This is the report of the Terminal Evaluation of the Project, which was conducted from January 12th to January 28th, 2010.

Objectives of the Terminal Evaluation

- (1) Confirm the level of production of planned Outputs and achievement of the Project Purpose,
- (2) Review the appropriateness of the inputs and implementation process,
- (3) Evaluate the achievement result with the five criteria,
- (4) Discuss the overall direction of the Project during the remaining cooperation period and after the termination of the Project,
- (5) Recommend necessary measures to be taken during the remaining cooperation period and after the termination of the Project and
- (6) Obtain lessons from the result of the evaluation, which will be utilized for the similar kinds of projects.

1.2. Method of Evaluation

1.2.1. Evaluation Criteria

The Evaluation was conducted with the aspects of the following five criteria.

(1) Relevance

This is to question whether the outputs, Project purpose and overall goal are still in keeping with the national and sector policy of both Sri Lanka and Japan and priority needs and concerns at the time of evaluation.

(2) Effectiveness

This concerns the extent to which the Project purpose has been achieved, in relation to the outputs produced by the Project.

(3) Efficiency

This is the productivity of the implementation process. How efficiently the various inputs were converted into outputs.

(4) Impact

This is changes, intended and unintended, direct and indirect, positive and negative, which were made as a result of the Project, as well as prospect for the Project to contribute to

realize the Overall Goal.

(5) Sustainability

This is to question whether the Project benefits are likely to continue after the external aid has come to an end.

1.2.2. Data Collection Method

(1) Review of the relevant documents

The following reports and other related documents were mainly reviewed:

- Project Progress Reports
- Minutes of the JCC Meetings
- Work completion report documented by JICA Expert Team
- Presentation materials documented by SLSEA and JICA Expert Team
- Joint Evaluation Report of the Mid-Term Evaluation
- 10 year Road Map, SLSEA
- Energy Management Scorecard, 2010, SLSEA
- Action Plan for 2011, SLSEA
- Budget Breakdown 2011, SLSEA
- Presentation Materials, Project Review Meeting on October 26, 2010
- Others

(2) Interviews and discussions conducted

The Review Mission conducted interviews and discussions with the following stakeholders of the Project:

- Minister, MoPE
- Director General, ERD
- Additional Secretary of MOPE/ Deputy General Manager (Strategy)
- Chairman, SLSEA
- Deputy General Manager (Operation), SLSEA
- Director (Energy Management), SLSEA
- Staff of Energy Management Division of SLSEA
- Members of the JICA Expert Team
- Assistant General Manager, Distribution – Region 3, CEB
- Director General, SLSI
- Project Manager/ Vice President, and members of SLEMA
- Electric Engineer- System Operation and Branch Manager – Operations, LECO

1.3. Members of the Review Team

1.3.1. Japanese side

Mr. Takuya Otsuka	Senior Representative, JICA Sri Lanka Office
Mr. Gen Hashimoto	Representative, JICA Sri Lanka Office
Dr. Priyantha Serasinghe	Project Specialist, JICA Sri Lanka Office
Ms. Tomoko Tamura	Kaihatsu Management Consulting Inc.

1.3.2. Sri Lankan side

Mr. M. P. D. U. K. Mapa Pathirana	Director General, ERD
Mr. Upali Daranagama	Additional Secretary of MOPE cum Deputy General Manager (Operation)
Dr. Kithsiri Dissanayake	Chairman, SLSEA

1.4. Schedule of the Review

Date	Day	Schedule
12-Jan	Wed	Meeting with Chairman, SLSEA Kick off Meeting Discussion with staff of SLSEA & JICA Experts
13-Jan	Thu	Discussion with staff of SLSEA & JICA Experts
14-Jan	Fri	
15-Jan	Sat	Draft Joint Evaluation Report
16-Jan	Sun	Discussion with Director, SLSEA
17-Jan	Mon	Senior staff of SLSEA was not available
18-Jan	Tue	
19-Jan	Wed	
20-Jan	Thu	Internal Discussion at JICA Sri Lanka Office. Discussion with Director, SLSEA
21-Jan	Fri	Discussion with Chairman, SLSEA
22-Jan	Sat	Draft Joint Evaluation Report
23-Jan	Sun	
24-Jan	Mon	Interview with CEB, LECO, SLSI, SLEMA
25-Jan	Tue	Discussion with Additional Secretary, MoPE & Director, Director General, ERD
26-Jan	Wed	Discussion with Chief Representative, JICA Sri Lanka Office & Minister, MoPE
27-Jan	Thu	Project Review Meeting, Joint Coordination Committee Meeting
28-Jan	Fri	Signing of the Minutes of Discussion on JCC

2. Outline of the Project

2.1. Background

The Project for Promoting Energy Efficiency Improvement in Sri Lanka was initiated as a Technical Cooperation Project of JICA under the scheme of Japanese ODA in May 2008 for the period of three years. J-power was assigned as Japanese Knowledge Partner while MoPE served as an executing agency and SLSEA served as an implementing agency. The Project Director is the Secretary of MoPE and the Project Manager is the Director (EM) of SLSEA in charge of Energy Management Division.

2.2. Overall Goal

Overall Goal of the Project is to achieve 'High Efficiency in energy consumption'. The indicators for the Overall Goal are "Commercial energy intensity is reduced to 1.8toe/million-SDR by 2017" and "Electricity load factor is increased annually by 1%".

2.3. Project Purpose

The Project Purpose is "Infrastructure necessary for materializing energy efficiency activities in the country is enhanced". The indicators for the Project Purpose are as follows;

- (1) Mandatory energy audit, monitoring and follow-up are conducted annually at least in 150 organization in private & public sectors.
- (2) Amount of investment to Energy Efficiency and Conservation is increased at least by 10%.
- (3) All the CFLs, ballasts and fans in markets have energy efficiency labels.
- (4) Penetration rate (at least one bulb per household) of CFLs in household sector becomes more than 40% in every sub-sector, namely urban, rural and estate Penetration rate of CFLs in household sector becomes at least 40%
- (5) 10 year plan for EE&C has been authorized by the ministry.

2.4. Outputs

There are three Outputs for the Project as follows:

- Output 1: Necessary resources (rules and regulations, human resources, equipment and materials) for implementing SLSEA Act are prepared.
- Output 2: Incentive/disincentive mechanism for promoting energy efficiency is repaired.
- Output 3: Mass consciousness is created among general public, private and public sectors on energy efficiency improvement.

3. Progress of the Project

3.1. Inputs

3.1.1. Japanese side

(1) Human resources

JICA Experts were assigned as planned. Expertise of the Experts in energy efficiency and conservation (EE&C) and their rich experience of implementing technical cooperation projects in other Asian countries were some of the contributing factors for the Project to create the planned Outputs in time. See ANNEX-1 for placement record of JICA Experts.

(2) Training

As shown in the ANNEX 3, Sri Lankan counterparts total in 26 numbers, from MoPE, SLSEA, CEB, LECO, SLSI and SLEMA, participated in the counterpart training in Japan. The participants gained practical experience and know-how on EE&C technologies, labeling, DSM, EE&C policy and others. The staff of SLSEA utilized the knowledge, experience and materials they have obtained in Japan very often in their daily work. For the senior officials, knowledge and experience gained during the visit were utilized at the time of policy level decision makings, establishment of strategies and dissemination of energy management technologies. The understanding and cooperation of the superior authorities and partner organizations to the Project became further enhanced after the visit. Several participants of the last training course mentioned that they preferred to have more field visits instead of the lectures.

Keen interest and sincere attitude of the Sri Lankan officials were very much appreciated in Japan at the time of their visit. It should also be noted that a timely planning and close coordination made by the JICA Expert Team for the training contributed much to make the programme a success.

EE&C is one of the fields that the counterpart training in Japan would contribute to the enhancement of the technology and knowledge of the counterpart personnel most effectively, because most of the legislations on EE&C to be enforced in the developing countries, such as mandatory labelling and accreditation of energy managers, were already established in Japan. Therefore, the participants of the training can adopt the system of legislations to their own country with minimum adjustment. IT infrastructure, benchmark index, Top Runner programme and clean technology are also some of the exact fields that the counterpart

personnel can consider introduction to their own country as soon as their return.

(3) Equipment

All the planned items were purchased as planned and on schedule. Selection of the equipment was appropriate and met the urgent needs in Sri Lanka. There is no particular problem with quantity and quality of the equipment. Spare parts and accessories of the equipments are available with local agents in Sri Lanka. See Annex-4 for the equipment provided under the Project.

3.1.2. Sri Lankan side

(1) Human resources:

Counterpart officers in SLSEA involved in the project activities with keen interest and commitment. Their technical level and knowledge were high enough to implement the planned activities effectively. They have contributed significantly to produce the planned Outputs.

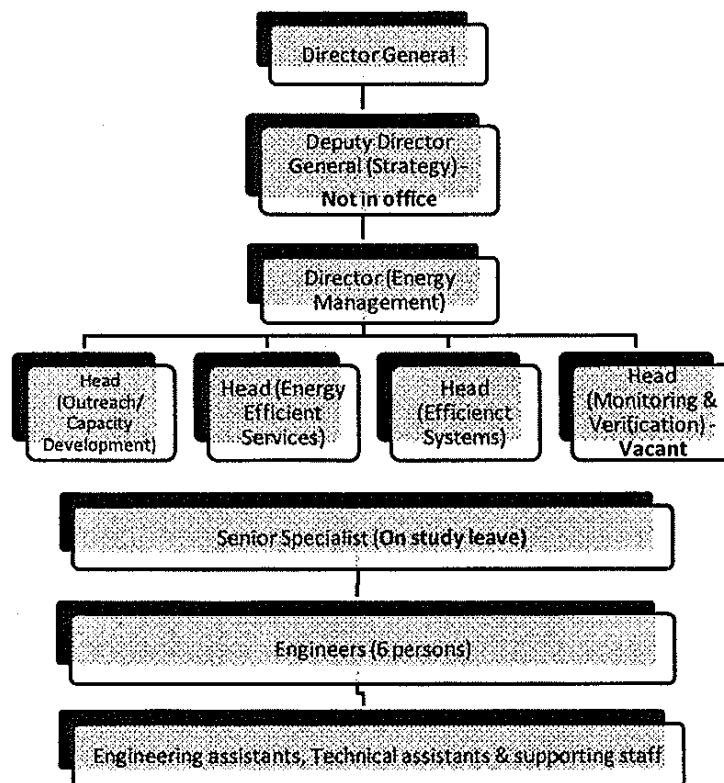


Figure 1 : Organization Chart – SLSEA Energy Management Division

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However, as the above figure shows, there are vacancies in the cadre of Energy Management Division of the SLSEA at the moment. The Deputy General (Strategy) was appointed: however has not been in his office in SLSEA since March 2009, but working full-time in MoPE as an additional secretary. The Head of Monitoring and Verification has been vacant from the commencement of the organization. The Senior Specialist has been on study leave for three years from July 2009 to August 2012. Initiatives were made to recruit personnel to the vacant positions; however, it was possible to make recruitment only for the post of Head (Energy Efficiency Services) due to lack of suitable candidates among applicants. Presently, the staff members in office are sharing and somehow carrying out the tasks of the vacant positions by making an alternative acting arrangement, through sharing the work of Head (Monitoring & Verification) among the Head (Energy Efficient Systems) and Head (Energy Efficiency Services). However, most of staff of the division is working in overload. This shortage of gave a negative influence to the timely implementation of the planned project activities.

(2) Financial resources

There was no issue with regard to the timing and amount of the financial input made by Sri Lankan side. It is worth mentioning that the Energy Management Division of SLSEA generated income by finding sponsorships for the exhibition (Rs. 9 million) and collecting rental fees of the instrument bank (Rs. 1.7 million) in 2010. See Annex 5 and 6 for more detail.

3.2. Activities implemented

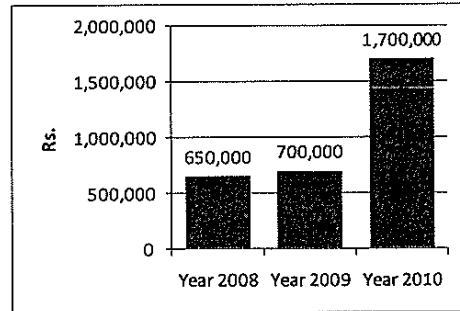
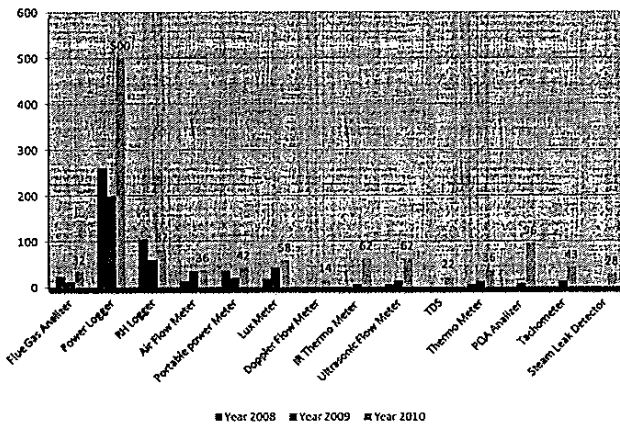
Most of the planned activities were implemented successfully and on schedule. Some of them, such as CFL labelling scheme, CFL promotion pilot projects and awareness creation programme, were conducted to the levels exceeding the expectation. Several activities are behind the schedule at the moment, mainly because the proposed regulation on mandatory reporting and accreditation of energy managers and energy auditors has not been enforced yet. See the following tables for more details.

Activities under the Output 1

Activities	Progress as of middle Jan. 2011	Prospects of completion
(1) Develop 10 year plan for energy efficiency improvement programme	The 10 year plan was developed, authorized in the SLSEA Board Meeting. SLSEA developed the activity plan of 2011 based on the Plan. The activity plan 2011 was approved by the MoPE and in operation.	Conducted successfully
(2) Conduct and	• The energy consumption baseline analysis was	The activity will be

update energy consumption baseline analysis for selected industries.	<p>conducted in 2009 for the seven industries. The result was compiled in a report. SLSEA has been collecting information for updating; however, the volume of information is not adequate enough to update the baseline.</p> <ul style="list-style-type: none"> • SLSEA plans to update the analysis in full-scale by the middle of 2010, after they received an adequate number of reports and analyze the same. 	conducted by the middle of 2012 and the Energy manager, Auditor Regulation will be published by 31 st March.
(3) Introduce mandatory annual energy consumption reporting scheme to large ¹ industries and commercial consumers.	<ul style="list-style-type: none"> • Preparatory work for operation of the scheme has been conducted successfully. SLSEA gained all the know-how for operation. SLSEA has started collection of reports in a small scale. • SLSEA completed the documentation of the regulation of the scheme and submitted it to MoPE in October 2010. Cabinet approval will be sought by the MoPE after making sure the legal compliance. • The scheme will be introduced full-scale as soon as the Cabinet approval is given and the gazette notification will be issued. 	The activity will be completed by the end of the and the Energy manager, Auditor regulation will be published by 31 st March
(4) Introduce accreditation schemes for energy auditor and energy managers	<ul style="list-style-type: none"> • Three national training courses were conducted (2 in 2009 and 1 in 2011). 100 persons were trained in total. • Standard training programme was established. SLSEA has gained all the know-how to conduct the training. • "Energy Manager Guide" was documented and Energy Manager Software was developed. • Other necessary works for accreditation, such as development of curriculum for examination, training of the adequate number of candidates, were already conducted. • Regulation for the scheme is in the above-mentioned process¹ • As soon as the regulation for the scheme is gusseted, SLSEA is ready to conduct the necessary work for accreditation, such as implementation of examinations and interviews. 	The activity will be completed by the middle of 2011.
(5) Introduce mandatory labelling for major appliances	<p><u>CFL</u>- Enforced in 2009. Remarkable awareness among the consumers².</p> <p><u>Ballasts and ceiling fans</u> - Labelling standard was developed and approved by the sectorial committee of SLSI in January 2011. It will be open for public comments and then to be approved by the council of the SLSI in March 2011.</p> <p>A cabinet approval will be sought for the regulations and gazette notifications soon after the regulation is approved by the cabinet.</p>	<u>CFL</u> - Completed <u>Ballasts and ceiling fans</u> - will be completed by middle of 2011 if the approval process will be conducted without delay.
(6) Develop IT infrastructure for monitoring and analysis of data	<ol style="list-style-type: none"> (1) <u>EE Knowledge Database</u>: The system was developed, uploaded and was functioning in early 2010. SLSEA plans to absorb the system to the SLSEA new website³ by the end of Feb. 2011. (2) <u>Energy Manager Software</u>: The system was developed, introduced and functioning well. (3) <u>Instrument Bank management System</u>: The proto type was developed and uploaded in early 2010. SLSEA plans to absorb the system to the SLSEA new website by the end of Feb. 2011. (4) <u>Periodical Reporting System</u>: The system was 	The activity will be completed by the end of the Project if the components (1) and (3) are absorbed to the new website as scheduled.

	<p>developed, tested and is under modification. It will be in operation by end Feb. 2011.</p> <p>(5) <u>Visualization & Tele-metering system</u>: The system was developed, tested and functioning. The ways of effective utilization is under discussion.</p>	
(7) Expand SLSEA's instrument bank for energy auditors.	<ul style="list-style-type: none"> All the planned instruments were purchased. SLSEA Counterpart officers mastered the use of the equipment Instrument bank was given an introduction in every possible occasion, such as trainings, workshops and exhibition. On-line booking system for the instrument bank is under preparation and is planned to be introduced by the end of March 2011. Instrumental Bank of SLSEA is utilized actively. Movements of the instruments were increased remarkably in 2010. Amount of income from the renting doubled in 2010. 	Conducted successfully



Movement of the Instruments

Income from Instrument Renting

Activities under the Output 2

Activities	Progress as of end Dec. 2010	Prospect of completion
(1) Develop/ improve finance schemes to promote energy efficiency investment	<p><History></p> <ul style="list-style-type: none"> Opportunities and weak points of the existing finance schemes were studied and analyzed. SLSEA conducted a series of awareness creation programme to the private and public institutions to utilize existing finance scheme. However, fund for the existing schemes were exhausted one by one during the project period⁴. The Project developed and proposed new JICA loan schemes in 2009 and in 2010, however, due to various reasons⁵, a new loan scheme has not been realized yet. At the moment, the Project is working on improving the E-Friends II revolving fund scheme as well as formulating a new loan scheme. <p><Progress></p>	Still under discussion

	<ul style="list-style-type: none"> • The Project supported formulation of 3 showcase projects and plans to obtain loan approval of the Revolving Fund scheme of E-Friends-II⁶, by the end of the Project⁷. • The Project identified 10 more EE&C projects for future funding. • SLSEA Board has given an approval to establish a Project Management Unit for fund management. 	
(2) Develop incentive/ disincentive schemes and pilot projects to promote high efficient CFLs.	<p>(1) <u>Pilot Projects on CFLs</u></p> <p><u>CFL Project in Keselwatta - Conducted in Feb. 2010</u></p> <ul style="list-style-type: none"> • Only 9% customers responded⁸ <p><u>CFL Project in Mawathagama - Conducted in Sep. 2010</u></p> <ul style="list-style-type: none"> • The distribution system were changed and programme for awareness creation were conducted intensively based on the lessons learned from the first project. • 535 (79%) customers responded. Door to door distribution was a key to the high response • Post measurement and evaluation is being done. <p>(2) Other programme</p> <p><u>NWSDB Pump Replacement pilot project</u> On going. Preliminary analysis has been completed.</p> <p><u>EE Zone (Area specific programme) – Started in Dec. 2010 in Narammala</u></p> <p><u>E² Shop (technical support and awareness creation programme) – started in Anuradhapura</u></p>	Conducted successfully.

3.2.1. Activities under the Output 3

All the planned programmes on awareness creation, as shown in the following list, were implemented as schedule and on time in 2010. The programme has been conducted with specific targets, such as CFL labelling, with close cooperation with on-going programme of SLSEA, such as national award programme and instrument bank, and in a sustainable manner by formulating external resource persons, obtaining sponsorships and with follow-ups.

(a) Development of Awareness Action Plan

- Action Plan for 3 years 2010-2012 was developed. The plan is utilized in daily work and for budget preparation.

(b) Conduct awareness creation campaigns for general public, private and public sectors.

- Production of awareness materials
 - Posters, leaflets, booklets, CDs and videos were developed
 - Quarterly news letter “Sanraksha” was issued.
 - 25,000 copies of “Red Notice” (a booklet including energy conservation tips) were distributed
- Supporting national award activities
- Awareness activities for CFL (particularly CFL labeling) for improvement of market penetration (awareness creation materials, advertisement by newspapers,

- TV and radio)
 - Vidulka: Energy Week in 2010:
 - Exhibition in BMICH (125,000 visitors, 94 stalls and sponsorship of Rs. 9 million)
 - Making past awareness material in PDF and other files
- (c) School programme
 - Curriculum developed: For Grande 7 - 10
 - 9 programs for trainer (in-service officers) training planned and 6 programs completed.
 - 200 in-service officers trained
 - Teachers training in progress
- (d) National Energy Efficiency Award
 - Advertisement in newspapers, TV and radio, leaflet and press conference
 - Remarkable increase in application (15 in 2007, 20 in 2008 and 46 in 2010)
 - Follow-up for the NEA 2010 is under implementation.
 - NEEA 2011 was initiated in Oct. 2010.
- (e) Assessment of the level of awareness of the end users
 - The level of awareness of the end-users was studied in January 2010.
 - SLSEA plans to continue the survey annually. The 2nd survey will be conducted in Feb. 2011

3.3. Achievement of the Outputs

The followings are the present situation with regard to the production of the planned Outputs (See Annex-8 for more details)

3.3.1. Output 1 : “Necessary resources (rules and regulations, human resources, equipment and materials) for implementing SLSEA act are prepared.”

With regard to the Output 1, the necessary technical transfer for implementation of the proposed EE&C legislation for mandatory energy consumption reporting scheme and accreditation scheme of energy managers and energy auditors has been almost completed at the present moment. However, it is regrettable that the schemes have not been in enforced yet, and still in a process of obtaining cabinet approval, although SLSEA is ready for operation. It is significant output that the labelling scheme for CFL was introduced as scheduled and in operation. Expansion of the SLSEA’s Instrument Bank had been realized on time. Expansion of the IT infrastructure will be completed by the end of the Project.

Indicators	Prospects of achievement
(1) A mandatory annual energy consumption reporting scheme is introduced to industries	The target will be met by the end of the Project if the proposed regulation will be approved by the Cabinet very soon. (It has been planned to

and commercial consumers, of which electricity consumption is larger than 250,000 kwh/ month.	published the regulation before 31 st March)
(2) Report on "energy consumption baseline analysis" is documented and updated every year.	The target will be met by Mid 2012 and the Energy Manager, Auditor Regulation will be published by 31 st March
(3) 6 number of energy auditors are accredited.	The target will be met by the end of the Project if the proposed regulation will be approved by the Cabinet very soon. (It has been planned to published the regulation before 31 st March)
(4) Accredited energy managers are appointed in 150 organizations in public and private sectors.	The target will be met by mid. 2011 if the proposed regulation will be approved very soon.(It has been planned to published the regulation before 31 st March)
(5) Mandatory labelling systems are introduced for 3 prioritized appliances (CFLs, ballasts and fans.	Partly achieved with additional output. It will be achieved fully by mid. 2011 if the regulation for the scheme will be approved without delay.

3.3.2. Output 2 : "Incentive/ disincentive mechanism for promoting energy efficiency is prepared"

With regard to the Output 2, the Project has been actively involved in analysing and identifying opportunities and weaknesses of the existing finance schemes and has proposed necessary improvement of the existing schemes as well as introduction of new loan schemes based on the analysis. It is also positive that SLSEA has been established a Project Management Unit and gaining capacity for fund management. However, it is regrettable that improvement of the finance schemes has not been realized within the project period although it was as a result of a careful decision made by the ERD. It is appreciated that two pilot projects on CFL distribution and replacement of the water pumps of NWSDB have been implemented successfully so that they will pave the way for the full-scale implementation of the incentive/ disincentive schemes.

Indicators	Prospects of achievement
(1) Number of projects on energy efficiency improvement approved for finance, is increased by 10%	Difficult to meet the target on time as improvement of the finance schemes has not been realized yet.
(2) More than one incentive/ disincentive schemes for appliances with energy efficiency labels are introduced.	Target has been met successfully.

3.3.3. Output 3 : "Mass consciousness is created among general public, private and public sectors on energy efficiency improvement"

The level of creation of the Output 3 was more than expected. The successful realization of

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the National EE&C Award, implementation of many kinds of awareness creation programme, introduction of EE&C to the school education curriculum are some of the remarkable results. The methodology of awareness creation programme was also improved to be more effective and sustainable. For example, the programme was implemented with specific target, such as the newly introduced labelling scheme. The outreach programme was implemented not directly but the resource persons or TOT (training of trainers) method. The EE&C exhibition was conducted by obtaining sponsorship of the private companies. Assessment of the impact of the programme and level of awareness among the consumers was introduced.

Indicators	Prospects of achievement
(1) 5 different types of education materials are prepared and utilized (posters, leaflets, booklets, CDs and Videos).	10 posters, 5 leaflets, 2 booklets and 2 CDs/videos were prepared. The target has been met to levels exceeding expectation.
(2) Number of applications for the existing national energy award is increased by 10% in each year.	The number of applicants was increased by 70% in 2010. Target has been met to levels exceeding expectation.
(3) Penetration rate (at least one bulb per a household) of CFLs becomes more than 40% in every sub-sector, namely urban, rural and estate.	Target has been met to levels exceeding expectation. See the indicator for "project purpose" shown below.

3.4. Achievement of the Project Purpose

According to the indicators, it is likely to take some more time for SLSEA to achieve the Project Purpose completely, mainly because the proposed legislation on mandatory reporting, accreditation of energy manager and energy auditors is still in the process of approval and improvement of EE&C finance scheme is still under consideration.

However, the Terminal Evaluation Team learned that the delay in enforcement of the legislation was not because of the delay in preparation work of SLSEA. Actually, the regulation was ready in early 2010, but on advice of the MoPE, SLSEA hold a series of meetings with stakeholders before submitting it to MoPE. At the moment, MoPE is scrutinizing the legal compliance of the regulation, mainly with regard to the mandatory benchmark scheme. The Evaluation Team also learnt that the ERD postponed the decision to seek a new JICA loan by due consideration of the need of capacity enhancement of SLSEA on fund management.

Indicators	Progress	Prospects for completion
(1) Mandatory energy audit, monitoring and follow-up are	The mandatory energy audit will be conducted as the following sequence. (i) Approval of the mandatory reporting scheme → (ii) Submission of the reports →	Likely to be completed in 2013.

<p>conducted annually at least in 150 organization in private & public sectors.</p>	<p>(iii) Analysis of the report and setting of the benchmark →(iv) instruction of the mandatory energy audit to the institutions which have unacceptable energy consumption →(v) audits are conducted. A guideline for the audit was documented and ready to use once implemented.</p>																							
<p>(2) Amount of investment to Energy Efficiency and Conservation is increased at least by 10%.</p>	<p>The baseline data for the period from 15.08.2008 to 15.08.2009 was Rs. 298 million. The recent figure for the same during the period from January 2010 to the end of December 2010 was around 300 million. There was a little increase of amount; however, it was less than 10% so far.</p>	<p>Slightly increased (around 0.7%), but less than the target.</p>																						
<p>(3) All the CFLs, ballasts and fans in markets have energy efficiency labels.</p>	<p>The CFLs in the market were labelled in 2010. Ballasts and fans are expected to have labels by end. 2011.</p>	<p>Partly achieved. Can be fully achieved in by the end of 2011</p>																						
<p>(4) Penetration rate (at least one bulb per household) of CFLs in household sector becomes more than 40% in every sub-sector, namely urban, rural and estate Penetration rate of CFLs in household sector becomes at least 40%</p>	<ul style="list-style-type: none"> A survey conducted by SLSEA in 2007 and in 2010 shows that the penetration rates of CFL were increased drastically as shown in the following figure: <div data-bbox="598 985 1173 1310" data-label="Figure"> <table border="1"> <caption>CFL Penetration Data (Estimated from Chart)</caption> <thead> <tr> <th>Year</th> <th>Area</th> <th>Household with CFL (%)</th> <th>Household without CFL (%)</th> </tr> </thead> <tbody> <tr> <td rowspan="2">2007</td> <td>Urban</td> <td>55</td> <td>45</td> </tr> <tr> <td>Rural</td> <td>35</td> <td>65</td> </tr> <tr> <td rowspan="2">2010</td> <td>Urban</td> <td>85</td> <td>15</td> </tr> <tr> <td>Rural</td> <td>75</td> <td>25</td> </tr> </tbody> </table> </div> <p>(source: SLSEA)</p> <ul style="list-style-type: none"> The sales of a reputed brand CFL⁹ in the estate area shows that the popularity of CFL in the estate area was increased rapidly in 2010. <table border="1" data-bbox="654 1467 1125 1556"> <thead> <tr> <th>CFL sales in 2009</th> <th>CFL sales in 2010</th> </tr> </thead> <tbody> <tr> <td>157,882</td> <td>184,550</td> </tr> </tbody> </table> <p>(source: SLSI)</p> The number of CFL imported to the country was also increased by 40% in 2010 after the introduction of the star labelling scheme. 	Year	Area	Household with CFL (%)	Household without CFL (%)	2007	Urban	55	45	Rural	35	65	2010	Urban	85	15	Rural	75	25	CFL sales in 2009	CFL sales in 2010	157,882	184,550	<p>Achieved to the levels exceeding the expectation.</p>
Year	Area	Household with CFL (%)	Household without CFL (%)																					
2007	Urban	55	45																					
	Rural	35	65																					
2010	Urban	85	15																					
	Rural	75	25																					
CFL sales in 2009	CFL sales in 2010																							
157,882	184,550																							

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CFL importend (units/year)												
<table border="1"> <thead> <tr> <th>Year</th> <th>CFL importend (units/year)</th> </tr> </thead> <tbody> <tr> <td>2007</td> <td>8,618,999</td> </tr> <tr> <td>2008</td> <td>12,262,144</td> </tr> <tr> <td>2009</td> <td>12,360,163</td> </tr> <tr> <td>2010*</td> <td>17,284,711</td> </tr> </tbody> </table>			Year	CFL importend (units/year)	2007	8,618,999	2008	12,262,144	2009	12,360,163	2010*	17,284,711
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2010*	17,284,711											
<p>Note: the figure of 2010 is provisional. (Source: Sri Lanka Customs)</p>												
(5) 10 year plan for EE&C has been authorized by the ministry.	10 year plan was approved by the Board meeting of SLSEA. Based on the 10-year plan, SLSEA is working on formulating 5 year implementation plan with financial proposal, which will be sought an approval of the ministry.	Being in progress. Can be completed by the end of the Project.										

3.5. Implementation Process

The Evaluation Mission studied the implementation process of the Project, such as team work, communication, decision making, progress monitoring, participation and support of MOPE, SLSEA, partner organizations and JICA to the Project and function of JCC. The Evaluation Team found that the Project Team has implemented the Project with a good team work and commitment and by obtaining sufficient support of higher authorities and partner organizations. (See Annex-8 for more details)

4. Evaluation by Five Criteria

4.1. Relevance

The Project Purpose is consistent with development policies of Sri Lanka and Japan. Energy conservation is identified as a high priority issue in the National Development Policy of GOSL. GOJ stressed the necessity to actively promote international cooperation on energy efficiency programme, especially to the Asian countries in the “Basic plan of Energy” in 2007. Japanese ODA Country Policy and Country Strategy of JICA for Sri Lanka highlighted an importance to assist power sector, including EE&C.

Last few years, annual growth rates of GDP of Sri Lanka were more than 6%. In order to attain further economic development, it is an urgent task for the country to realize a socio-economic structure of high energy intensity by promoting EE&C programme, as the

country is highly depends on petroleum for its energy source.

Most of the proposed legislations under the Project were already established in Japan under the Rationalization in Energy Use Law. JICA has implemented EE&C projects in China, Argentine, Bulgaria, Turkey, Thailand, Poland, Iran, Cambodia and Indonesia. Accumulated knowledge and experience of Japan and JICA has been utilized in the Project.

Taking the above factors into consideration, the Terminal Evaluation Mission concluded that the relevance of the Project remains to be very high.

4.2. Effectiveness

The counterpart officers of SLSEA have (i) gained necessary skills and know-how to implement the proposed EE&C legislations and to utilize the instrument introduced by the Project, (ii) successfully implemented several pilot projects which will pave the way for full-scale introduction of the incentive/disincentive scheme and (iii) remarkably improved the quality and quantity of the awareness creation programme. In this manner, the Project has been created an expected level of effect especially in terms of technical transfer.

As mentioned above, it is likely to take some mote time for SLSEA to achieve the Project Purpose completely. However, the delay is as a result of the careful and prudent decisions of MoPE and ERD in order for SLSEA to implement the proposals more successfully. At the moment, the MoPE is working out to ensure legal compliance and obtain a cabinet approval very soon.

Therefore, the Terminal Evaluation Mission considers that the effectiveness of the Project is moderate.

4.3. Efficiency

All the planned input from Japanese side has been made on time and as scheduled. Input from Sri Lankan side has been made adequately in terms of technical level and commitment of the counterpart officers and provision of local cost for the Project; however it is regretful that the vacancies in the important position in SLSEA have not filled so far as mentioned earlier.

With regard to the Output 1, the necessary technical transfer for implementation of the proposed EE&C legislation has been almost completed. It is also appreciated that SLSEA is ready for the implementation of the schemes as soon as the regulation is approved. Labelling

scheme for CFL, expansion for the instrument bank and IT infrastructure were implemented successfully.

With regard to the Output 2, there are several actions taken for improvement of the financial schemes and potential projects are being ready for finance. However, it is unfortunate that the improvement of the finance schemes has not been realized yet due to the various reasons mentioned earlier. It is very positive that the pilot projects on CFL distribution and replacement of the water pumps of NWSDB have been implemented successfully so that they will pave the way for the full-scale implementation of the incentive/ disincentive schemes.

The level of creation of the Output 3 was more than expected. The methodology of awareness creation programme was also improved to be more effective and sustainable.

With the limited number of human resources¹⁰, SLSEA counterpart officers created the expected Outputs to the maximum level with the support of the JICA Expert Team. However, as mentioned above, several activities are still on the way to create the expected outputs. Therefore, the Terminal Evaluation Team concluded that the efficiency of the Project is moderate.

4.4. Impact

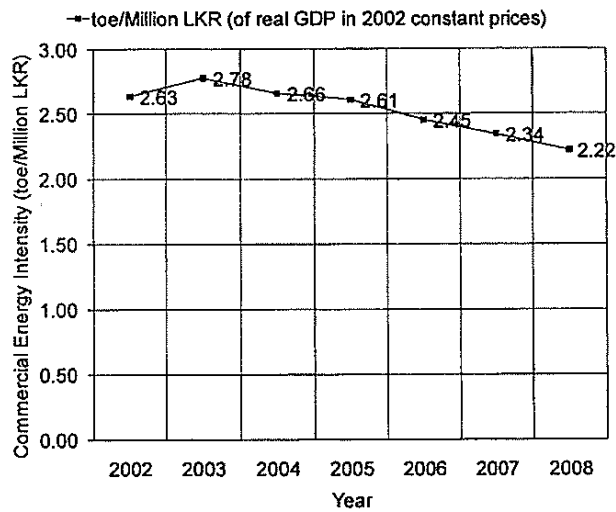
There is a high potential that the effects of the Project would contribute to attain the Overall Goal “achieve high efficiency in energy consumption”, as infrastructure currently being enhanced by the Project is already a contributing factor to achieve higher efficiency in energy consumption. The following figures show the recent status with regard to the two indicators for the Overall Goal.

(i) Commercial energy intensity is reduced below 1.8 tow/Million Rs. by 2017

Commercial energy intensity is a standard measure of efficient use of commercial energy in a country. The following figure shows a steady reduction of the intensity, which confirms the effect of the present EE&C activities. The prospect is good that the figure will become below 1.8 tow/Million Rs. by 2017.

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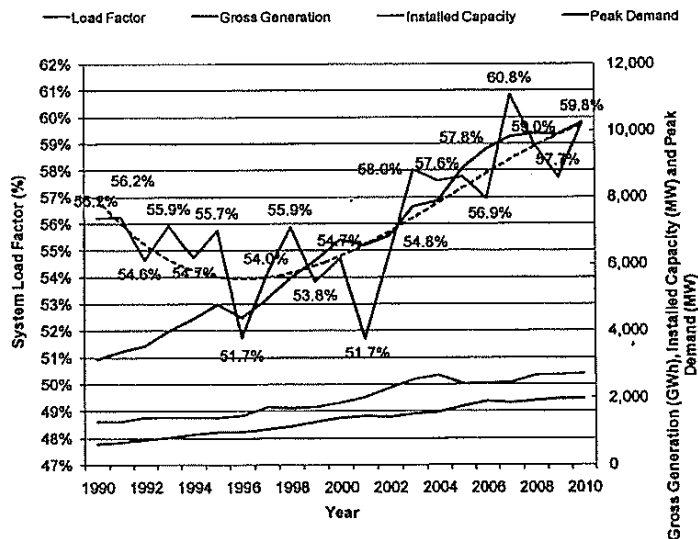


Note: The figure of 2008 is provisional

(Source: Baseline Survey of the Project, March 2010)

(ii) Electricity load factor is increased annually by 1%.

Load factor is a measure of optimal use of power system resources by the electricity consumers. Larger the load factor, better the system usage resulting in lower electricity supply costs. Sri Lanka has a low system load factor, largely due to the dominant domestic lighting demand and the lack of base load industries. Therefore, Demand Side Management (DSM) is an immediate remedial action in improving load factor.



Note: The figure of 2010 is provisional

(Source: Baseline Survey of the Project, March 2010)

The above figure shows the general tendency of increase, although the recent increment rate is slightly less than the annual target figure of 1%.

Contribution to the formulation of the programme CDM in the country is an extra output

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created by the Project. With the keen interest of SLSEA and technical assistance of JICA Expert team, necessary papers to formulate a programme CDM has been documented. The Project has also started establishing a common base for the “grid emission factor” in the country, which is important in formulating CDM programmes. The result of the initial work conducted by the Project is planned to be hand over to another Technical Cooperation Project of JICA named “The Project for Capacity Development of CDM Promotion in Sri Lanka”.

The methodology for awareness creation has a potential to be utilized in the similar technical cooperation projects of JICA in other countries. For example, the way to plan and conduct national EE&C award as well as the follow-up for the award winners, the way to hold the EE&C exhibition with private and public partnership and successful introduction of CFL labelling scheme could be model to others.

Taking the prospect of contribution to the Overall Goal and extra impact into consideration, the Terminal Evaluation Mission concluded that the Impact of the Project is high.

4.5. Sustainability

(1) Policy and institutional support

Commitment and support of the senior officials of MoPE and SLSEA is a positive factor to maintain effects of the project even after the Project period. SLSEA has an adequate authorities and regulatory powers to maintain systems and schemes introduced by the Project as well as facilitate implementation of the proposed 10-year plan.

(2) Organizational aspect

As mentioned earlier, there are several vacancies for the cadre of the Energy Management Division of SLSEA. Especially, the vacancies of the Deputy Director General and the Senior Specialist could be a shortcoming for the sustainability of the effect of the Project. The post of “head- monitoring and vilification” will become more crucial when all the proposed scheme will be enforced very soon.

Absence of the Deputy Director General in his office is a negative factor, especially in terms of timely decision making of the policy level matters. It is a serious concern that the post of the Senior Specialist, who in in-charge of development of IT infrastructure, is vacant. Unless the vacancy is filled by a suitable person urgently, the IT infrastructure developed by the Project will not be utilized effectively. For example, EE Knowledge Database, which has around 720 EE&C samples, should be updated with latest samples of Sri Lanka or overseas (So far, it has not been updated for the past two years). The visualization and tele-metering system should be utilized effectively with a proper planning.

The system for the periodical reporting system and Energy manager software both have data of consumers, and can be linked and be analyzed to produce evidences for strategic planning or to convince policy makers.

It is timely that SLSEA is developing a strategy on organizational development including necessary staffing with a help of a consultant and is planning to propose the same to the Carder and Salary Commission through MoPE very soon.

(3) Financial aspect

The annual budget for recurrent cost for the Energy Efficient Division of SLSEA would be sufficient for the time being to cover administration cost to maintain and expand systems and schemes introduced by the Project, unless there would be a drastic reduction of the allocation. It is a positive sign for financial sustainability that SLSEA is raising fund by the renting fee of the instrument bank and finding sponsorships for exhibition.

However, annual budget for capital cost would not be sufficient in the future to expand facility for testing of appliances and purchasing of additional instrument for instrument bank. Taking the financial situation of the country into consideration, SLSEA might need to seek external assistance in this regard. It is also a positive sign that SLSEA is negotiating with ADB to seek a fund for facility for testing appliances.

Introduction of an improved financial scheme is urgently needed to sustain the effect of the Project as mentioned earlier.

(4) Technological aspect

So far, SLSEA officers have gained most of the necessary know-how to promote EE&C up to the planned level. All the instruments were purchased with careful consideration of the appropriate quality standard as well as the convenience of maintenance, such as availability of local agent in Sri Lanka. Therefore, SLSEA officers are capable of maintain and operate the instrument in the future, too.

Technical capacities of partner organizations, such as SLEMA and local consultant companies on EEI and IT have been improved through participating and implementing activities of the Project. However, in the future, too, periodical update of the technical and knowledge level of the SLSEA officers and staff of the partner organizations will be needed because EE&C is the constantly advancing subject. Meanwhile in-house capacities and awareness level should be developed in the industry, public sector as well as financial institutions to attend EE&C activities more actively.

(5) Others

It is important to analyze and utilize the result of the pilot projects for CFL promotion and pump replacement of NWSDB. It is also important to make sure the implementation of the monitoring and verification of the newly introduced schemes, such as labelling and reporting as well as impact assessment of the level of EE&C promotion continuously.

Taking the above factors into consideration, the Terminal Evaluation Team concluded that the sustainability of the Project could be high, if necessary actions, which are recommended in this report, will be taken in time.

5. Factors that promoted realization of effects

5.1. Factors concerning to Planning

It was successful to have the three components, resource preparation, incentive/disincentive scheme and awareness creation in the Project. These three were indispensable and need to be developed in parallel for promotion of EE&C in a country like Sri Lanka, where its government started full-fledged initiatives of EE&C.

5.2. Factors concerning to the Implementation Process

- (1) Sincere support and close monitoring of the MoPE, keen interest and commitment of the SLSEA counterpart officers and rich experience of the JICA Expert Team contributed remarkably to the implementation of the Project.
- (2) Effective implementation of the Training in Japan, including timing, selection of the participants, training programme and coordination, enhanced the efficiency of the technical transfer.
- (3) Close cooperation of the partner organizations, such as SLSI, CEB, LECO, SLEMA, NERD Center, ESCO and universities, facilitated significantly to produce the planned Outputs.

6. Factors that impeded realization of effects

6.1. Factors concerning to Planning

Nothing particularly

6.2. Factors concerning to the Implementation Process

As mentioned earlier, vacancies of the key staff of the Energy Management Division of SLSEA gave negative influence to the timely implementation of the planned activities, although the staff in office worked hard to compensate it.

7. Conclusion and Recommendations

7.1. Conclusion

EE&C is promoted effectively, only when the three components of the Project, resource preparation, introduction of incentive/ disincentive scheme and awareness creation are implemented effectively in parallel. For example, even the proposed legislation on mandatory energy reporting, management and audit will be enforced, the industries cannot react positively if an attractive finance schemes is not available. Labelling schemes will not function if manufactures, importers and consumers do not have proper awareness. Therefore, early enforcement of the proposed regulation and introduction of an appropriate finance scheme are very much important to promote EE&C, one of the most urgent tasks of the country.

While appreciating commitment and keen effort the staff of SLSEA, JICA Expert Team and other stakeholders of the Project made so far, the Terminal Evaluation Team expects some more actions to be taken to produce more successful result, by taking due considerations of the Recommendations stated hereinafter.

7.2. Recommendations

Immediate actions are requested to:

- (1) Early enforcement of the regulation on mandatory energy reporting, accreditation of energy managers and energy auditors by scrutinizing the legal compliance and obtaining a cabinet approval as soon as possible.
- (2) Fill the post of the "Deputy Director General – Strategy", "Head – monitoring and verification" and "Senior Specialist" for the Energy Management Division of SLSEA. Especially the position of the Senior Specialist, who is in-charge of development of IT infrastructure, should be filled well before the JICA Expert Team leaves Sri Lanka in April 2011, so that they can transfer their know-how to the Specialist.
- (3) Share the results of the pilot projects on CFL promotion and pump replacement of NWSDB among the stakeholders and reach consensus about the future actions to be taken.
- (4) Develop an improved financial scheme for EE&C as soon as possible while enhancing the capacity of PMU of SLSEA by implementing the followings:
 - (a) Adding experience in fund management and project implementation by facilitating at least 10 showcase projects in 2011.
 - (b) Positively consider adding a staff to the PMU, who has expertise on loan operations.

Continuous actions are important to:

- (5) Make sure to implement monitoring and verification of the newly introduced schemes, such as labelling and energy consumption reporting.
- (6) Conduct impact assessment of EE&C promotion annually.
- (7) Review the 10 year EE&C plan periodically in a form of rolling plan system while formulating middle-term financial plan under the supervision of the MoPE.

ANNEX-1 : Placement Records of JICA Experts

Occupation	Name		MM					
			In Sri Lanka			In Japan		
			2008	2009	2010	2008	2009	2010
Leader/Policy	Yoshida Kimio	Plan	2.07	2.03	2.37	1.03	0.83	0.70
		Actual	2.07	2.03	2.37	1.03	0.83	0.70
Promotion/Finance	Iida Hachiro	Plan	4.37	5.93	3.97	0.47	0.53	0.87
		Actual	4.37	5.93	3.97	0.47	0.53	0.87
Instrument/Audit	Tezuka Sakae	Plan	2.37	3.07	1.77	0.53	0.40	0.40
		Actual	2.37	3.07	1.77	0.53	0.40	0.40
Labeling/ ESCO/ Training	Takashima Kiyoshi	Plan	2.77	2.60	2.17	0.53	0.90	0.60
		Actual	2.77	2.60	2.17	0.53	0.90	0.60
IT/Data base	Isobe Yoichi	Plan	1.70	1.73	1.27	0.47	0.40	0.60
		Actual	1.57	1.73	1.27	0.47	0.40	0.60
Electricity DSM/ Organization	Tanabe Koichiro	Plan	1.83	2.97	2.03	0.53	0.40	0.60
		Actual	1.96	3.20	2.03	0.53	0.40	0.60
Procurement/ Policy	Okamoto Niro	Plan	0.00	2.20	1.60	0.00	1.00	0.50
		Actual	0.00	2.03	1.60	0.00	1.00	0.50
Energy Management Mechanism	Omori Hiroshi	Plan	0.00	1.87	1.70	0.00	0.40	0.20
		Actual	0.00	1.80	1.70	0.00	0.40	0.20
CDM Development	Jaap Smink	Plan	0.00	2.73	0.00	0.00	1.47	0.00
		Actual	0.00	2.77	0.00	0.00	1.47	0.00
CDM Development	Jose Roberto Moreira	Plan	0.00	0.57	1.00	0.00	0.83	0.40
		Actual	0.00	0.50	1.00	0.00	0.83	0.40
Coordinator	Kaneko Yoshiyuki	Plan	1.90	2.00	2.07	0.00	0.00	0.00
	Kaneko Yoshiyuki/ Sugimachi Hitomi/ Okamoto Niro/ Wakabayashi Yoshiyuki	Actual	1.67	1.80	2.07	0.00	0.00	0.00
Total			15.11	22.97	17.88	3.56	5.46	4.94
			15.11	22.89	17.88	3.56	5.46	4.94

* Year 2010 : Provisional

Annex-3 : List of Participants to the Counterpart Training in Japan

	Name	Designation/ Organization	Name of the Training Courses	Duration of Training	
				From	To
1	Mr. P. S. Maldeniya	Energy Management, SLSEA	Energy Efficiency & Conservation	08.06.2006	28.07.2008
2	Mr. June Sakaraja	Energy Management, SLSEA	Energy Conservation Technologies	11.01.2009	11.04.2009
3	Mr. Mangala Wijethilake	Renewable Energy, SLSEA	Policy Makers making	15.01.2009	22.01.2009
4	Mr. M. M. C. Fernando	Secretary, MoPE	Policy Makers making	15.01.2009	22.01.2009
5	Dr. Krishan Deheragoda	Chairman, SLSEA	Policy Makers making	15.01.2009	22.01.2009
6	Mr. F. K. Mohideen	AGM, CEB	Policy Makers making	15.01.2009	22.01.2009
7	Mr. Upali Darangama	DDG-Strategy, SLSEA	Policy Makers making	15.01.2009	22.01.2009
8	Mr. Harsha Wickramasinghe	DDG-Operation, SLSEA	Policy Makers making	15.01.2009	22.01.2009
9	Mr. Chamila Jayasekera	Energy Management, SLSEA	Energy Efficiency & Conservation	11.05.2009	27.06.2009
10	Mr. J.M.K Jayasekera	Additional Secretary, MoPE	Policy & Labeling and DSM	11.16.2009	26.11.2009
11	Mr. P. S. Ranasinghe	DGM-Commercial & Cooperate, CEB	Policy & Labeling and DSM	11.16.2009	26.11.2009
12	Mr. M. A. D. N. Gratin	DGM-North-Central Province, CEB	Policy & Labeling and DSM	11.16.2009	26.11.2009
13	Mr. S. Sabaharan	Area Engineer, CEB	Policy & Labeling and DSM	11.16.2009	26.11.2009
14	Mr. H. N. Gunasekara	Head of Operation, LECO	Policy & Labeling and DSM	11.16.2009	26.11.2009
15	Mr. A. Perera	Standard Engineer, SLSI	Policy & Labeling and DSM	11.16.2009	26.11.2009
16	Mr. Chandana Samarasinghe	DG, SLSEA	Policy & Labeling and DSM	11.16.2009	26.11.2009
17	Mr. M. M. Pathmasiri	Director-Energy management, SLSEA	Policy & Labeling and DSM	11.16.2009	26.11.2009
18	Mr. Athula Jajathunga	Director, SLSEA	Policy & Labeling and DSM	11.16.2009	26.11.2009
19	Mr. Amila S. Wickramasinghe	SLEMA	Policy & Labeling and DSM	11.16.2009	26.11.2009
20	Mr. K.G.R.F. Comester	DGM-Human Resources Dept, CEB	EE&C Policy, DSM & Labeling	14.12.2010	23.12.2010
21	Mr. G. Janaka Aluthge	Chief Engineer, Energy Purchase, CEB	EE&C Policy, DSM & Labeling	14.12.2010	23.12.2010
22	Mr. L.N. Senaweera	Director General/ CEO, SLSI	EE&C Policy, DSM & Labeling	14.12.2010	23.12.2010
23	Mr. M.A.D.A. Samaraweera	Branch Manager – Operations, LECO	EE&C Policy, DSM & Labeling	14.12.2010	23.12.2010
24	Mr. K.L.R.C. Wijayasinghe	Assistant Director – Power & Energy Divi., MoPE	EE&C Policy, DSM & Labeling	14.12.2010	23.12.2010
25	Dr. D.M.D.O.K. Dissanayake	Chairman, SLSEA	EE&C Policy, DSM & Labeling	14.12.2010	23.12.2010
26	Mr. K. Sanath Kitsiri	Head – Energy Efficiency Services, SLSEA	EE&C Policy, DSM & Labeling	14.12.2010	23.12.2010

Annex-4 : List of Equipment Provided under the Project

All the equipment is kept in a good condition in the Instrument Bank of SLSEA and utilized well.

	Items	Numbers	Total Price (USD)
1	Elec. Power Meter 6300	25	115,820
2	Elec. Power Quality Analyzer 6310	5	32,938
3	Digital Multi Meter 1009	2	171
4	Midi Logger GL 800 B	2	4,927
5	Digital Thermometer MC 1000	2	2,872
6	IR Radiation Pyrometer IR-TAP	2	2,600
7	Temp. & Humidity Logger 635-2	18	42,545
8	Voltage Logger 175-S2	2	1,654
9	Instrumentation Logger 175-S2	2	1,654
10	Rotation Speed Meter 460	1	300
11	Luminance Meter 545	1	300

Year 2009

	Items	Numbers	Price (USD)
1	Pitot tube/Differential pressure gauges	2	2,192
2	Rotary vane type air flow meter	1	1,694
3	Portable Oxygen meter for gas	1	5,862
4	Telemeter	1	1,120,000 (JP yen)
5	TDS (Electric conductivity meter) & pH meter	3	5,267
6	Lap top computer	5	7,308
7	Ultrasonic flow meter	1	12,047
8	Steam trap Checker	1	4,453
9	Small Current Clamp	90	21,435
10	Power supply adaptor	30	4,309

Year 2010

	Items	Numbers	Price (USD)
1	High CO and CO, CO2, O2 meter	1	26,134
2	Telemeter	2	1,100,000 (JP yen)
3	Standard Gases	7	4,678

Annex-5 : Local Cost for the Project borne by JICA

Item	Yen		
	1st year	2nd year	3rd year*
Employment of assistants	112,250	278,850	498,400
Transportation	917,453	1,063,858	1,248,192
Seminar courses	121,682	87,794	138,131
Local consultant contract	8,245,000	12,764,000	14,736,237
Total	9,396,385	14,194,502	16,620,960

* As of end Dec. 2010

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Annex-6 : Local Cost for the Project borne by SLSEA

2011 (approved budget allocation)

Item	Amount (Rs.)
Regulatory Measures	6,600,000
Energy Efficiency Services	49,100,000
Transport Energy	1,300,000
Awareness	37,200,000
Out Reach	5,000,000
Technology Development	500,000
Impact Assesments	1,000,000
Total	100,700,000

2010 (Actual expenses)

Item	Amount (Rs.)
Energy Efficient Zones	190,000
Knowledgeable Users/Capable Providers (labeling/capacity building)	15,150,000
Awareness Creation	42,000,000
Total	57,340,000

2009 (Actual expenses)

Item	Amount (Rs.)
Energy Efficient Zones	300,000
Knowledgeable Users/Capable Providers (labelling/capacity building)	15,488,750
Efficient Transport (Fleet management and road user awareness)	100,000
Awareness Creation	24,000,000
Total	39,888,750

2008 (Actual expenses)

Item	Amount (Rs.)
Energy Efficiency	39,100,000
Knowledge Management	20,500,000
Mass Media Programmes*	38,000,000
Total	59,600,000

*Including preparation of media content for a documentary video.

Annex-7 : Accomplishment Grid

Output 1

Indicators	Progress	Prospects of achievement
(6) A mandatory annual energy consumption reporting scheme is introduced to industries and commercial consumers, of which electricity consumption is larger than 250,000 kwh/ month.	<ul style="list-style-type: none"> Preparatory work for operation of the scheme has been conducted successfully. SLSEA gained all the know-how for operation. SLSEA completed the documentation of the regulation of the scheme and submitted it to MoPE in October 2010. The scheme will be fully introduced as soon as a concurrence of the Department of Legal Document and an approval of Cabinet he Cabinet approval will be given. 	The target will be met by the end of the Project if the proposed regulation will be approved by the Cabinet very soon. (It has been planned to published the regulation before 31 st March)
(7) Report on "energy consumption baseline analysis" is documented and updated every year.	SLSEA has conducted energy consumption baseline analysis in 2009. However, it was not updated every year, due to the delay in introduction of mandatory energy consumption reporting scheme.	The target will be met by Mid 2012 if the proposed regulation will be approved by the Cabinet very soon. (It has been planned to published the regulation before 31 st March)
(8) 6 number of energy auditors are accredited.	<ul style="list-style-type: none"> Preparatory work for operation of the accreditation scheme for energy auditors has been conducted successfully. SLSEA gained all the know-how for operation. There are more than 6 candidates of accredited energy auditors who have underwent training and have adequate experience. SLSEA is ready to conduct interviews as soon as the regulation is approved. 	The target will be met by the end of the Project if the proposed regulation will be approved by the Cabinet very soon. (It has been planned to published the regulation before 31 st March)
(9) Accredited energy managers are appointed in 150 organizations in public and private sectors.	SLSEA is ready to carry out examination and interview as soon as the regulation is approved. (same as above)	The target will be met by mid. 2011 if the proposed regulation will be approved very soon. (It has been planned to published the regulation before 31 st March)
(10) Mandatory labelling systems are introduced for 3 prioritized appliances (CFLs, ballasts and fans.	<ul style="list-style-type: none"> Mandatory labelling scheme for CFL was introduced. A study in the CFL promotion pilot project has shown that a remarkable awareness was created among the consumers about the label¹¹. The labelling schemes for ballasts and ceiling fans are still under preparation and planned to be introduced around July 2011. Labelling for other prioritized equipments, such as refrigerators, TVs, lighting and A/Cs are also in progress (This is an additional output) 	Partly achieved with additional output. It will be achieved fully by mid. 2011 if the regulation for the scheme will be approved without delay.

Output 2

Indicators	Progress	Prospects of achievement
(3) Number of projects on energy ↓ efficiency improvement (1) approved for finance, is increased by 10%	So far, there was no steady increase in number as the work to improve the loan scheme is still in progress.	Difficult to meet the target on time.
(4) More than one incentive/ ↓ disincentive schemes for appliances with energy (2) efficiency labels are introduced.	<ul style="list-style-type: none"> • Two pilot projects of CFL distribution were conducted. • Pilot project for pump replacement of NWSDB is on going. 	Target has been met successfully.

Output 3

Indicators	Progress	Prospects of achievement
(4) 5 different types of education materials are prepared and utilized (posters, leaflets, booklets, CDs and Videos).	Education materials, i.e., 10 kinds of posters, 5 kinds of leaflets, 2 kinds of booklets and 2 kinds of CDs/video, were prepared and utilized. Some were prepared in three languages.	Target has been met to levels exceeding expectation.
(5) Number of applications for the existing national energy award is increased by 10% in each year.	The number of applicants for the year 2010 was increased by nearly 70% compared to that of in 2008	Target has been met to levels exceeding expectation.
(6) Penetration rate (at least one bulb per a household) of CFLs become more than 40% in every sub-sector, namely urban, rural and estate.	<p>See the indicator for the Project Purpose for more details</p>	The target has been met to levels exceeding expectation.

Annex-8 : Review of the Implementation Process

Item	Evaluation questions	Status as of end Dec, 2010 (to be updated)
1. Team work	Do the project team members share their roles and responsibility appropriately?	Yes. Task-wise small groups were made with members of Japanese Experts and SLSEA counterparts to conduct technical transfer effectively. There are no particular issues in terms of team work.
2. Communication	Communication among the team members or between the Japanese experts and Sri Lankan Counterparts adequate?	The Japanese Experts respect self-initiative of the SLSEA counterparts and SLSEA counterparts respect expertise and experience of the Experts. Team members trust each other. There are no particular issues in terms of communication.
3. Decision making	Does decision making process in the project team efficient, transparent and participatory?	Decisions are mainly made by senior officials of the SLSEA team members. The decisions are shared by the Team members. There are no particular issues in terms of decision making.
4. Progress monitoring	Did the project team monitor progress of the project appropriately?	(1) Progress of daily work is monitored by the Director of SLSEA and the leader of the Expert team. (2) Progress meetings were held approximately once in two months. (3) Progress reports were documented by the Expert Team and submitted to JICA in every six months. (4) Progress of the project activities was monitored properly
5. Participation of MOPE & SLSEA	Were level of participation, contribution and commitment of MoPE and SLSEA to the project satisfactory?	Commitment and support to the Project by the senior officials of MoPE and SLSEA are very much appreciated by the Project Team members. Their contribution in decision making, problem solving and high-level coordination with external institutions, are highly effective for smooth implementation of the project activities.
6. Participation of partner organizations	Were level of participation, collaboration and contribution of partner organizations, such as CEB, LECO, SLSI, SLEMA, NERD Center, Min. of Education, Univ. of Moratuwa, etc. satisfactory?	(1) The Project Team keeps cordial relationships with partner organizations. Especially, SLSI, SLEMA and University of Moratuwa play crucial roles in implementation of Project activities. Local experts and consultants were playing important roles especially in technical research, documentation of strategic papers and software development and maintenance. (2) Attendances of the representatives of the partner organizations to JCC meetings were satisfactory.
7. Function of JCC	Were JCC functioned as expected? (frequency of the meetings, participation of the members, decision making and follow-ups	(1) JCC was held as planned as follows: 1 st on July 23, 2008, 2 nd on Oct. 21, 2008. 3 rd on July 10, 2009 and 4 th on October 13, 2009 and 5 th on June 1, 2010. (2) Attendance of the members, including senior officials of MoPE and SLSEA and representatives of the partner organizations was satisfactory. (3) JCC played an important role for monitoring of progress and follow-up delays and issues, if any.
8. Participation of JICA	Were level of supervision and support made by JICA Sri Lanka Office the Japanese Embassy in Sri Lanka and JICA Headquarters in Japan appropriate?	(1) JICA Sri Lanka Office was very supportive in arrangement of training in Japan and monitoring of progress of the Project activities. (2) JICA Headquarters were supportive by making necessary arrangement in dispatching Japanese Expert without delay.