



Terminal Evaluation Report

UNDP GEF Project

Barrier Removal to the Cost effective Development and Implementation of Energy Efficiency Standards and Labelling

Project Title	Barrier Removal to the Cost effective Development and Implementation of Energy Efficiency Standards and Labelling (BRESL)
GEF Project ID	00071989
UNDP Award ID	00058072
Country	Pakistan
Region	South Asia
Focal Area	Environment & Climate Change
Strategic Program	Promoting adoption of energy-efficient technologies and practices in the country
Time frame	January 2010-31 December 2014
Implementing Partner	ENERCON through Ministry of Water and Power, Government of Pakistan
Other Partners	Regional Project Management Unit, China, PSQCA, PCSIR

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Preface

This Terminal Evaluation of “Barrier Removal to the Cost effective Development and Implementation of Energy Efficiency Standards and Labelling” project sets out findings, recommendations and lessons learnt for UNDP.

The report has been developed in compliance with the Terms of Reference for Terminal Evaluation. The conclusions and recommendations set out in the report are solely those of the Evaluator and are not binding on UNDP.

The author would like to thank all those who assisted in the Terminal Evaluation of BRESL Project, particularly the staff of UNDP, Pakistan Country Team of BRESL, K Electric, PSQCA, PCSIR, Haier, Royal Fan, PEFMA, Bless Electronics, In Consult, Golden Pumps, GIZ, and NED University of Engineering and Technology, Karachi.

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Acronyms and Abbreviations

BRESL	Barrier Removal to the Cost effective Development and Implementation of Energy Efficiency Standards and Labelling
CFLs	Compact Fluorescent Lamps
ENERCON	National Energy Conservation Center
EE	Energy Efficient
ES&L	Energy Efficiency Standards and Labeling
GEF	Global Environment Facility
GHG	Greenhouse Gases
JICA	Japan International Cooperation Agency
KPK	Khyber Pakhtunkhwa
MDGs	Millennium Development Goals
MoST	Ministry of Science & Technology
MoW&P	Ministry of Water & Power
NPC	National Project Coordinator
NIE	National Institute of Electronics
NPD	National Project Director
REESLN	Regional Energy Efficiency Standards & Labeling Network
RPMU	Regional Project Management Unit
TE	Terminal Evaluation
TWG	Technical Working Group
UNDP	United Nations Development Programme
UET	University of Engineering and Technology

Executive Summary

Project Information Table

Project Title	Barrier Removal to the Cost effective Development and Implementation of Energy Efficiency Standards and Labelling (BRESL)		
Project ID	00071989	Financial Update	
PIMS ID	3327	Total Budget of Project (5 years)	US \$ 650,000
Country	Pakistan	GEF Contribution	US \$ 650,000
Region	South Asia		
Focal Area	Environment and Climate Change	Total Expenditure (Jan 2013 - Dec, 2014)	US \$ 632,201
Strategic program	Promoting adoption of energy-efficient technologies and practices in the country		
Executing Agency	ENERCON through Ministry of Water and Power, Government of Pakistan		
Management Arrangements	NIM	Programme period	2010-2014
Other Partners Involved	Regional Project Steering Committee, China, PSQCA, PCSIR		
		Project Timeframe	January 2010-31 December 2014

Project Description

Barrier Removal to the Cost effective Development and Implementation of Energy Efficiency Standards and Labelling (BRESL) project is supported by United Nations Developmental Programme (UNDP) and financed by the Global Environment Facility (GEF).

The proposed project has been implemented for 5 years from 1 January 2010 to 31 December 2014.

The UNDP and the Government of Pakistan (through ENERCON) entered into an Agreement in July, 2009 with a view to:

- Produce and improve Energy Efficient Home Appliances.
- Set Standards and Labels for the six targeted home appliances i.e. Fans, CFLs, Ballasts, Motors, Refrigerators and Air-conditioners.

The BRESL Project goal is the reduction of GHG from thermal power generation in selected Asian Countries. The objective of the project is removal of barriers to the

successful implementation of energy standards and labeling policies and programs in Asia. The five main outputs of the project are as follow:

Project Output 1: Energy standards and labelling (ES&L) Policy making program provides a legal basis for prescribing and enforcing energy efficiency standards and labeling regime

Project Output 2: To facilitate awareness and implementation of ES&L Regime and to enhance the support mechanism

Project Output 3: To put in place manufacturers support program with reference to the six BRESL targeted appliances;

Project Output 4: Development/ updating of a regional website and sharing of reports,

Project Output 5: Pilot projects to create awareness among consumers.

The project was funded by GEF with a total budget of US\$ 0.65 million.

Project Achievement Summary

There have been substantial achievements on the planned activities of all the five components of the project.

Project Achievement Summary

Outputs	Achievement Description
Project Output-I: ES&L Policy making program provides a legal basis for prescribing and enforcing energy efficiency (EE) standards and labeling regime	<ul style="list-style-type: none"> ▪ Pakistan Energy Efficiency Conservation (PEEC) Bill has been submitted to MoW&P for processing with Council of Common Interests and passage by Parliament. ▪ The ES&L Policy Summary has been submitted to MoW&P for approval of Cabinet.
Project Output-II: To facilitate awareness and implementation of ES&L Regime and to enhance the support mechanism	<ul style="list-style-type: none"> ▪ Energy Efficiency Testing Protocols have been adopted for all the six targeted appliances. ▪ Minimum Efficiency Performance Standards (MEPS) have been formulated/ adopted/ notified for CFLs, Electronic & Magnetic Ballasts, Fans, Motors and Air conditioners. ▪ EE Endorsement Labeling Procedure and Label has been launched in the country for Fans, Motors and CFLs.
Project Output-III: To put in place manufacturers support program with reference to the six BRESL targeted appliances	<ul style="list-style-type: none"> ▪ EE Endorsement Labeling Procedure and Label has been launched in the country for Fans, Motors and CFLs

Project Output-IV: Development/ updating of a regional website and sharing of reports	<ul style="list-style-type: none"> ▪ MEPS for fans and CFLs have been revised to harmonize with the participating countries. ▪ Feasibility Study Report for fans and CFLs has been harmonized. ▪ Energy Performance Rating Criteria has been harmonized with other participating countries.
Project Output-V: Pilot projects to create awareness among consumers	<ul style="list-style-type: none"> ▪ The manufacturers and consumers are now aware of the benefits of energy efficient products.

Project Rating

The project is highly relevant in meeting the objectives of removal of barriers to the successful implementation of energy standards and labelling policy in Pakistan. Moreover, it was able to meet the needs of targeted beneficiaries so its relevance is rated as Highly Satisfactory. The project design was satisfactory and the project document contains a convincing approach to address the existing barriers.

The project was successful in achieving most of its expected outputs; its effectiveness is rated as Moderately Satisfactory. The project succeeded in establishing ES&L Regime for fans, motors and CFL. However, no energy efficient fan, motor or CFL are developed by the manufacturers, pending promulgation of PEEC Bill by the Parliament and approval of ES&L Regime by the Cabinet.

The project was satisfactorily managed and the resources utilized efficiently; its efficiency is rated as Moderately Satisfactory. The Pakistan Country Team of BRESL managed to secure project outputs despite frequent transfers of NPD and NPC.

The project achievements is dependent upon passage of PEEC Bill by the Parliament and approval of ES&L Regime by the cabinet: its sustainability is rated as Moderately Unlikely.

The demand for energy efficient appliances and equipment will increase with the passage of time due to new technological advancements in home appliances and local manufacturers have to develop energy efficient appliances, the impacts of the project is rated as Significant.

Summary of Conclusions

The project has achieved most of its outputs. The PEEC Bill has to be passed by the parliament and promulgated and ES&L Regime has to be approved by the Cabinet.

Once the PEEC Bill has been promulgated and ES&L Regime is approved then the voluntary phase of adaptation of Pakistan Energy Efficiency Conservation will commence.

The manufactures of targeted appliances and equipment will commence. The usage of energy efficient equipment will lead to reduction of CO₂ and hence the goal of the project will be achieved.

Recommendation Summary Table

Rec #	Recommendations	Entity Responsible
R 1	Ensure that the Pakistan Energy and Conservation Bill is passed by the Parliament and ES&L Regime is approved by the Cabinet.	ENERCON/ MoW&P
R 2	Institutional Strengthening and Capacity Building of ENERCON and PSQCA to enforce PEEC bill and ES&L Regime.	
R 3	Development of Network of accredited laboratories at Gujrat and Gujranwala for testing of electric fans and motors.	
R 4	ENERCON should launch aggressive awareness campaign in electronics and print media about energy efficient appliances and equipment when PEEC Bill is promulgated and ES&L Regime is approved.	
R 5	Include energy efficient appliances and equipment in all public procurement of goods and works being undertaken by the Federal and Provincial Governments in Pakistan.	
R 6	ES&L Regime once enforced will be in voluntary phase for three years and thereafter it will be move towards mandatory phase. The present design of energy efficient label is comprised of three star rating system. The design and number of stars rating system varies from one country to another. The existing 3 star rating system needs to be reviewed, at the time when ES&L Regime moves from voluntary phase to mandatory phase, and be converted to 5 stars rating system in order to humanize with majority of countries.	
R 7	There should be a smooth transition from BRESL project to ENERCON.	
Specific Recommendations for BRESL II Project		
R 8	Consolidate with existing six targeted energy efficient products and include additional products i.e., LED, UPS, Iron and washing Machines in BRESL II.	ENERCON/Mo W&P
R 9	BRESL II should develop standards for raw material used in targeted six products like standards for 99.99% copper wire used in manufacturing of fans and motors.	
R 10	Expand Pakistan Energy Efficiency Conservation Board having representation from all the stakeholders for overseeing performance of the project and implementation of its decisions.	
R 11	All relevant Technical Reports/Drawings produced by BRESL I and II should be translated into Urdu and distributed to the manufactures.	
R 12	BRESL II should have a robust energy efficiency products and equipment awareness component with advocacy, training and mass communication.	

Rec #	Recommendations	Entity Responsible
R 13	Regional Component including REESLN should be expanded and new component for collaboration between the research institutions, industry and manufacturing associations should be added.	
R 14	Support Establishment of Electrical Appliance Testing Laboartory at NED University of Engineering and Technology, Karachi.	
R 15	The PCT must include Technical Staff including Monitoring and Evalaution Expert. All the Technical Staff must meet the minimum educational and professional qualification.	

1 Introduction

1.1 Purpose and Objectives of Terminal Evaluation

Barrier Removal to the Cost effective Development and Implementation of Energy Efficiency Standards and Labelling project was scheduled for completion on 31 December 2014. UNDP policy requires an independent terminal evaluation to take place. The evaluation will focus on the delivery of the Project's results as originally planned.

The evaluation assesses achievement of the Project's objective, outcomes and outputs, and presents ratings for the targeted objective and outcomes.

The main stakeholders of the evaluation include: Ministry of Water and Power, ENERCON, Pakistan Country Team for BRESL, PSQCA, PCSIR, and other relevant stakeholders. The Terms of Reference of the evaluation is provided in **Annexure-A**.

The present Terminal Evaluation has been conducted in accordance with the TOR and the "Guidance for Conducting Terminal Evaluation of UNDP supported, GEF Financed Projects".

1.2 Scope & Methodology

The approach and methodology adopted for Terminal Evaluation is based on the criteria of credibility, reliability and usefulness. It used the following guidelines:

- Term of Reference for UNDP-GEF Terminal Evaluation of BRESL Project
- Guidance for Conducting Terminal Evaluation of UNDP-Supported, GEF-Financed Projects.

The Terminal Evaluation was conducted by a single independent Evaluator from 25th December 2014 to 25th January 2015.

The Terminal Evaluation of BRESL project has been conducted as per following tools:

- Documentation reviews: A review of BRESL project documents was carried out including quarterly and annual progress reports. The list of documents reviewed during the terminal evaluation has been provided in **Annexure-B**.
- Meetings with stakeholder: The Evaluator met with the key stakeholders of BRESL project comprising of UNDP, Pakistan Country Team of BRESL, K-Electric, PSQCA, PCSIR, Haier, Royal Fan, PEFMA, Bless Electronics, In Consult, Golden Pumps, GIZ, and NED University of Engineering and Technology, Karachi. The list of stakeholders met during the Terminal Evaluation of BRESL has been provided in **Annexure-C**.

All qualitative and quantitative data obtained through desk review and meetings with stakeholders was tabulated for analyses.

The Terminal Evaluation report has been prepared as per table of contents described in terms of reference.

1.3 Limitations to the Terminal Evaluation

The meetings with the project stakeholders took considerable time.

1.4 Structure of the Terminal Evaluation Report

The Terminal Evaluation of BRESL project report presents findings and compiles all information under one document as follows;

Chapeter 1 - Introduction describes Purpose and Objectives, as well as Scope & Methodology of Terminal Evaluation, **Chapter 2** the Project description and Development Context, **Chapet 3** describes findings of Terminal Evaluation, **Chapter 4** describes Conclusion, Recommendations and Lessons.

2 Project Description and Development Context

2.1 The Project

BRESL is a regional project with six participating countries, i.e. Bangladesh, China, Indonesia, Pakistan, Thailand and Vietnam.

BRESL is aimed at rapidly accelerating the adoption and implementation of energy standards and labels (ES&L) in Asia, and covers six home appliances i.e. Fans, CFLs, Ballasts, Motors, Refrigerators and Air-conditioners.

The project led to energy savings from the use of energy efficient appliances/equipment, resulting in reduction in GHG emissions.

The United Nations Development Program and the Government of Pakistan (through ENERCON) entered into an Agreement in July, 2009 with a view to:

- Produce and improve Energy Efficient Home Appliances.
- Set Standards and Labels for the six targeted home appliances i.e. Fans, CFLs, Ballasts, Motors, Refrigerators and Air-conditioners.

The project implementation started in January 2010 and completed on 31st December 2014.

2.2 Development context

Despite of having huge exploitable energy resources, Pakistan is facing power shortage of 5,000-6,000 MW during different seasons, which is in fact impeding the economic growth.

Different Governments adopted different inconsistent policies which could not attain the desired aims/objectives, with the passage of time, generation-demand deficit is increasing to an alarming level.

Current energy shortages indicate lack of strategic planning, vision, negligence towards realization of the critical importance of energy to achieve higher economic growth, lack of development of a structure which may facilitate the investment in the energy sector and lack of consistent policies.

Major problems being faced by the crisis-ridden energy sector are unbalanced energy mix which has increased the cost of energy, lack of Government policies which may attract local and foreign investment in the energy sector, inappropriate distribution of the available energy resources, increasing transmission/distribution losses, deteriorating generation capability of the public power houses due to the lack of resources available for the proper maintenance, inefficient operation of power generating units, transmission/distribution network and lack of awareness towards energy efficiency and conservation.

Energy economy is a major and critical part of the country economy as a whole. There are various stakeholders having different conflicting interests. There is a need of

collaboration between all the main stakeholders to sit together and develop an integrated policy, which can address all the major problems and may be implemented with consistent motivation for the sustainable economic development.

Demand side management requires the implementation of advanced techniques to reduce the peak demand. Preferred technique to reduce the demand and supply deficit is to conserve energy by efficient means.

The use of the energy efficient devices reduces energy consumption significantly like LED lights, energy efficient fans and motors at the domestic and industrial sector. Development of standards which lead to optimum performance of equipment with less energy consumption and maximum efficiency is essential for making it efficient. It requires periodic testing which is impossible without advanced and real time monitoring instruments.

2.3 Problems that the project sought to address

The major problems that the project addresses are:

- There are no laws and regulations enabling and establishing equipment standards and labels for energy efficient appliances and equipment in Pakistan,
- There are limited testing laboratories for energy efficient appliances and equipment,
- There is gradual increase in Greenhouse Gas Emission from Pakistan,
- Manufacturing industry of all BRESL Products does not have adequate knowledge and capacity to design and develop energy efficient appliances and equipment, and
- There is no connectivity and harmonization of products with the regional countries for manufacturing of energy efficient appliances and equipment.

2.4 Project Description and Strategy

According to Centre for sustainable Energy, California **“Energy efficiency is simply the process of doing more with less. The goal is to accomplish the same tasks and functions as before while using less energy”**.

BRESL project aimed at rapidly accelerating the adoption and implementation of energy standards and labels (ES&L) in Asia, and in doing so bring about energy savings from the use of energy efficient appliances/equipment.

The project intended to facilitate harmonization of test procedures, standards and labels among all the six countries. The project is expected to cost-effectively deliver an average 10% reduction in total household and commercial energy use in BRESL participating countries at the time of peak by the year 2030 compared to a baseline scenario, thereby contributing to more environmentally sustainable and economically efficient development.

BRESL will facilitate the transformation of the manufacture and sale of energy-efficient appliances and equipment through: 1) A regional initiative in Asia, with provision for general information, tools and training to all interested developing countries in the

region plus customized efforts, all with a focus on regional cooperation; and, 2) National technical assistance to 5 developing countries in Asia.

The project focused on six targeted products i.e., CFLs, Electronic & Magnetic Ballasts, Fans, Refrigerator, Motors and Air conditioners

The project focuses largely on capacity building and assisting government, manufacturing, distributing, retail, consumer and environmental stakeholders to implement the most cost-effective energy efficiency measure available. In each participating country, priority activities will be carried out to help foster each country's preferred process for developing or expanding its ES&L program.

BRESL Pakistan project is expected to facilitate the reduction of carbon emissions by an estimated 0.38 million metric tons (MMT) per year and a cumulative total of about 1.92 MMT by the end of the project. Ten years after the project end (2023), carbon emissions are projected to be around 2.20 MMT lower each years (cumulative total of about 21.96 MMT).

2.5 Project Budget

The proposed budget for each project component is shown in Table 2.1. In total, the GEF contribution to the Pakistan BRESL budget is US\$ 1,000,000, 65% of which is for national activities, 25% for regional activities; and 10% as contribution to the overall BRESL Project Management.

Table 2.1: Summary Cost of National Activities of BRESL Project

S. No	Project Component	Baseline US\$	Incremental US\$	Total Cost US\$	%
1	ES&L Policy Making Program	282,700	256,200	538,900	36.5
2	ES&L Capacity Building Program	214,800	235,300	450,100	30.4
3	ES&L Manufacturer Support Program	192,200	68,170	260,370	17.6
4	ES&L Regional Cooperation Program	36,000	26,100	62,000	4.2
5	ES&L Pilot Projects	-	64,230	64,300	4.35
6	Project Managwment Unit Support	-	100,000	100,000	6.7
Total		725,000	650,000	1,475,000	100

The co-financing budget (baseline) from Pakistan is US\$ 725,700, which basically is the budget for the Ministry of Water and Power's energy conservation and energy efficiency activities, which include among others ES&L, under the "National Awareness Campaign on Energy and Environment Conservation" program. Some in kind contribution of about US\$ 100,000 in terms of staff time and facility use from the MOE

(Presently Ministry of Climate Change) Appliance Testing Laboratory, is part of the Country's co-financing for BRESL.

2.6 Main stakeholders

The key stakeholders for the BRESL project are Ministry of water and Power, ENERCON, Pakistan Standards and Quality Control Authority (PSQCA), Pakistan Council for Scientific and Industrial Research (PCSIR).

3 Findings of Terminal Evaluation

3.1 Project design and Formulation

3.1.1 Analysis of LFA/Results Framework (Project logic /strategy; Indicators)

BRESL Project has a goal, an objective, 5 outputs, and 12 activities in accordance with the Project Logical Framework. All the indicators set out in the log frame are quantifiable and verifiable. There are targeted indicators that help in determining the activities needed to be carried out in order to achieve the objective and overall goal of the project.

The log frame of the project is reasonably good, well laid down and easy to follow. Furthermore, it has clarity on how the outputs are expected to be achieved.

3.1.2 Assumptions and Risks

During the design, four risks were identified on the experiences of similar projects implemented in Pakistan.

During implementation phase of the Project, four additional risks were identified and their mitigation measures were elaborated by the PCT. However, the project's performance was badly affected due to frequent transfers of 7 National Project Director and 5 National Project Coordinators over five years of the project implementation. This risk was not predicted during the design phase. During the implementation phase this risk was identified but the proposed mitigation measures suggested were not effective.

The **Table 3.1** shows the risks and mitigation measures considered by the Project.

Table 3.1: Risks and mitigation measures considered by the Project

Project Risk	Mitigation Measure/Plan	Status
Design Phase		
Lack of Government's commitment to support EE standards and labels.	Strengthening ES&L policy, strong institutional agreements with all levels of government and the private sector	
In-sufficient support from relevant line departments	The stakeholders and line departments will be involved in the project implementation from the very initial stage.	
Unfavorable investment climate for EE standards and labels by private sector	The project will work closely with the stakeholders to assist in creating a more favorable climate for acceptance to the standards and labels in public.	
The security situation remains unfavorable	While initiating the project activities with partner organizations, the security update will be kept in mind and activities will be organized accordingly.	

Project Risk	Mitigation Measure/Plan	Status
Implementation Phase		
Delay in implementation of the project due to frequent transfers of key government officials over short period of time.	To bring on board as many partners as possible. However, the mitigation measure did not yielded any positive results.	High risk
Delay in implementation due to coordination issues between BRESL PCT and RPMU China.	Technical resources were reasonably devolved for the satisfactory functioning of the project.	Low risk
Weak capacity and priority of the collaborating agencies to deliver project outputs on schedule.	Some way out needs to be devised to overcome these difficulties.	Moderate Risk
Initial misconception of private sector particular manufactures associations about the project objective.	The awareness campaigns and workshops on EE appliances cleared the misconception about the project.	Moderate Risk

3.1.3 Lessons from other relevant projects

The lesson learned from other relevant projects in Pakistan as well as in BRESL's participating countries were considered during design of the project.

3.1.4 Planned stakeholder participation

The MoW&P through ENERCON was responsible for overall implementation of the project. UNDP provided management oversight along with financial management and accountability. GEF provided financial assistance for the project.

The BRESL project consisted of two level activities i.e., (i) enhancing the regional cooperation/multi-recognize and sharing the best practices of energy efficiency standards and labelling, and (ii) developing and implementing country specific strategies and activities for energy efficiency standards and labelling to overcome the barriers of reducing the energy consumption in Pakistan.

3.1.5 Replication approach

BRESL is GEF funded project with global environmental benefits, replication effects and other local effects.

BRESL project was designed to have a balanced mix of policy making, awareness about ES&L regime, manufacturers support program, regional co-operation and harmonization of energy efficient products, and creating awareness amongst consumers activities that were tailored to Pakistan' specific conditions, markets, regulatory environment, and absence of ES&L programs on the ground for the targeted six products.

The balanced mix of activities did initiated market transformation favoring energy efficient appliances and equipment in Pakistan. This will eventually shift purchasing

patterns from standard quality appliances and equipment toward those of the energy efficient varieties.

The project has already launched Energy Efficiency (EE) Endorsement Labeling Procedure and Label for fans, motors and CFLs. ENERCON has already received applications for grant of energy efficient labels from two fan manufacturers. The fans produced by these two manufacturers have already passed all energy efficiency tests as per requirement and soon energy efficient product labels will be granted.

The manufacturers will use the energy efficiency labels of their appliances as a marketing tool. Once the energy efficient fans advertisement by the manufacturers start in the electronic media. This will give a sense of competition among other fan manufactures in Pakistan. Indeed, this will start replications of EE appliances and equipment in Pakistan particularly in fans, motors and CFL. Moreover, with the higher electricity cost in Pakistan, the demand for energy efficient appliances and equipment will increase for household, commercial and industrial sectors.

The replication of energy efficiency appliances and equipment will be enhanced if the project supports the problems being faced by the manufacturers.

During meeting with the stakeholders, the manufacturers of targeted six products raised following problems which should be considered during design of BRESL II Project:

- The main reason for manufacture of substandard electrical appliances is non-availability of quality raw material for the targeted products like i.e., electrical silicon steel sheets and 99.99% cooper wire for fan and motor manufacturers. There are no standards for raw material used in the manufacturing of targeted products. Furthermore, overall cost of electrical appliances production is very high as such small and medium sized manufacturers are forced to use substandard raw material in order to be competitive.
- There is no custom duty on import of electrical silicon sheets if imported by the manufacturer. However, this facility can only be availed by 10-15 big fan manufacturers.
- There are 400-450 small and medium sized fan manufacturers who do not have any capacity to import raw material directly rather they have to buy from the traders. There is 10% custom duty on electrical silicon sheets if the importer is a trader. Therefore, there is a need that this anomaly in custom duty on the imported raw material used in manufacture of electrical appliances should be resolved.
- The manufacturers of fans and motors do faced a lot of problems in import of raw material for their production. The process of testing of imported raw material is very slow and cumbersome. The testing of imported material takes longer time and most of time test results vary from one laboratory to another. There is a need that the clearance of imported raw material consignment should be time bound and testing of raw material should be carried out by duly accredited laboratories.
- There is a need that the Pakistan Energy Efficiency Conservation Board should be expanded to include members from Ministry of Commerce, Federal Bureau

of Revenue and Ministry of Finance, Importers of raw material which is used in production of electrical appliances.

The terms of references of all the board members and their responsibilities should be defined so that they can resolve the problems being faced by the manufacturers of targeted products.

- There is no third party testing laboratory for refrigerating appliances in Pakistan. PCSIR is planning to establish testing facilities for refrigerating products which is very expensive and will take time to materialize. There is a need for establishment of testing laboratory for refrigerating appliances in Pakistan.
- Haier Pakistan is establishing an air conditioner testing laboratory at their premise in Lahore. Haier Pakistan is willing to open this facility to manufacturers and importers of air conditioners provided that the facility is declared as national laboratory for air conditioners.
- PCSIR is implementing a project which was started during July 2014 to expand their testing facilities for the targeted products which will be completed by December 2016. They have already established testing facilities for fans, CFLs and Ballast and soon they will be able to test LED lightings, Motors and Air Conditioners.
- The standardization and labeling of energy efficient appliances and equipment is a remarkable achievement by BRESL project. However, ENERCON/PSQCA must ensure that PEEC Bill is passed at the earliest and its voluntary compliance begins.
- The effectiveness of energy efficient appliances and equipment can only be achieved if Electricity Supply Companies in Pakistan do supply the stable designated voltage to the consumers.
- Majority of small and medium manufacturers of fans and motors will have to upgrade their processing facility for production of energy efficient appliances in accordance with established standards.

There is a need that next phase of BRESL should focus on providing Research and Development support to small and medium sized manufacturers to upgrade their facility and financial assistance from Energy Conservation Fund that should be provided to them.

3.1.6 UNDP comparative advantage

The project is funded by GEF and implemented by UNDP Pakistan. This is a regional project management unit (RPMU) located at China. BRESL is a regional project which is being implemented in Bangladesh, China, Indonesia, Pakistan, Thailand & Vietnam.

UNDP has considerable experience in implementing regional projects in South-east Asia. Moreover, UNDP Pakistan is actively involved in supporting Environment and Energy sectors in Pakistan.

3.1.7 Linkages between project and other interventions within the sector

BRESL project has contributed to the realization of the Millennium Development Goals (MDGs), particularly 1, 7 and 8, as follows:

- BRESL project has created awareness about energy efficient appliances, established energy efficiency standards and labelling regime for the targeted products and some of the energy efficient appliances are already available in the market which will reduce energy bills of consumers thus resulting in achievement of MDG 1: Eradication of extreme poverty and hunger.
- BRESL project has supported ES&L Policy making program which resulted in preparation of PEEC Bill as well as ES&L Regime. This active policy support to the Government of Pakistan has resulted in the integration of the principles of sustainability into country policies and programs, which is in line with the MDG 7: Ensure environmental sustainability.
- BRESL Project has taken a lead role in harmonization of fans on regional level which will eventually result in exports of Pakistani fans in the BRESL's participating countries thus opening of new markets. The opening of the markets in the region will increase trade and sale of energy-efficient appliances and equipment, and the diffusion of technology through technical exchange and demonstration is in line with MDG 8: Develop a global partnership for development.

3.1.8 Management arrangements

There project management has been carried out by Pakistan Country Team of BRESL. The management arrangements and structure of BRESL project were well defined and generally effective to implement the project activities.

The BRESL project consists of two levels of activities i.e., in Pakistan and China. The Regional Project Management Unit (RPMU) did provided all technical and administrative support to BRESL Pakistan Team as and when required.

The overall project management arrangements were elaborate and well-conceived. The Project Steering Committee made up of representative from government, the manufactures and private sector organisation ensured that the project activities are carried out as planned. The PCT was supported by technical experts engaged by the project. Although there was a need that five years long project must have full time technical staff.

The overall project management was greatly affected with the frequent change of National Project Director and National Project Coordinator. This has led to serious delays in decision making process of the project as well as draw down of funds for project activities.

There is a need that in the next phase of BRESL project continuity of National Project Director and National Project Coordinator should be ensured. Furthermore, nomination of alternative officials/staff should be made in case of transfer or long absence of NPD and NPC.

3.2 Project Implementation

3.2.1 Adaptive management

There were no adaptive management changes to the design and outputs during implementation of BRESL project.

The PCT undertook and fulfilled GEF reporting requirements. The quarterly and annual progress reports were clear and concise. The annual and quarterly progress reports did mention the progress of the project. However, there is a need that annual progress reports must describe the actual performance of the project against targeted indicators.

The majority of manufacturers of motor and fans appliances have little or no knowledge of English language. All technical reports including energy efficiency standards and labels were prepared in English which were of little use to them. There is a need that during the next phase of BRESL project, important technical reports should be published in Urdu language.

The lesson derived from adaptive management process has been documented in all the annual progress reports which are shared with all stakeholders. The internal project communication between the RPMU China, UNDP Pakistan, PSQCA, PCSIR as well as with stakeholders was regular and effective and no complaint was noted during meetings with the stakeholders. The PCT received regular feedback from the project stakeholders.

The BRESL project website has been developed which is being regularly maintained. However, limited technical reports have been uploaded on the website.

3.2.2 Partnership arrangements

The overall partnership arrangement with UNDP Pakistan, PCT of BRESL Project, RPMU, ENERCON, PSQCA, and PCSIR were cooperative and productive.

The project's partners were actively involved in achieving the project objective. Their commitment could not be deterred with the delays in the project implementation particularly the passage of PEEC Bill by the Parliament and approval of ES&L Regime by the Cabinet.

The partnership with manufacturers of targeted products and their associations were mixed. Initially, they had misconceptions about the project as they perceived it as a threat to their business. However, the PCT of BRESL was able to clear their misgivings and they were actively involved in preparations of MESP, standards and labels. The participation of manufacturers of targeted products was overwhelming and they took keen interest in the proceedings.

The project developed and leveraged the necessary and appropriate partnerships with stakeholders like Ministry of Science of Technology, National Institute of Electronics, and Engineering Development Board.

3.2.3 Project Finance

The National Project Director of Ministry of Water and Power and National Project Coordinator of the PCT have setup a separate bank account for the management of funds for the project in a coordinated manner and were responsible for required financial management.

The funds for the project were allocated on the basis of annual work plans. The transfer of funds were made on the basis of quarterly request for payment. The next quarter payment was made on the basis of drawdown of funds during the last quarter.

The project is funded by GEF and the Government of Pakistan contribution was in a kind. The final project expenditure is US\$ 632,201/- against US\$ 650,000/- as such the funds utilisation is 97%.

There are variations in the projected budget as per ProDoc and actual as follows:

- The Component No 1: budget was underutilized which is 70% of the projected amount.
- The Component No 2: budget was over utilized by 211% of the projected amount.
- The Component No 3: budget was over utilized by 122 % of the projected amount.
- The Component No 4: budget was underutilized which is 11% of the projected amount. However, it is pointed out that regional component of the project was funded by RPMU China through a separate allocation of US \$ 100,000 made to them.
- There was no budgeted amount for Component No 5 but an amount of 14% was spent.
- The PMU budget was over utilized by 106 % of the projected amount.

A major part (47%) of the project expenditure was made during the last two years of the project i.e., 2013 and 2014.

The detail of project expenditure from 2010 to 2014 has been provided in **Table 3.2**.

Table 3.2: Project expenditure – projected vs actual over time

Component/year	Projected as per ProDoc	2010	2011	2012	2013	2014	Total	Variation in %
Component No 1	143,727	15,483	10,184	18,573	18,283	38,542	101,066	70
Component No 2	40,714	10,707	4,283	13,198	16,525	41,153	85,866	211
Component No 3	87,902	33,648	14,705	16,699	3,413	39,114	107,580	122
Component No 4	157,790	2,602	7,046	2,863	0	5,006	17,516	11
Component No 5	0	0	0	9,632	0	77,474	87,106	14
PMU	219,867	59,289	43,969	68,426	26,319	35,065	233,067	106

Total	650,000	121,729	80,188	129,389	64,540	236,354	632,201	
Percentage	%	19	13	20	10	37	100	

3.2.4 Monitoring and evaluation

The Monitoring and Evaluation of BRESL project activities were carried out in accordance with UNDP and GEF's established procedures. However, the project did not have a full time Monitoring and Evaluation staff. The Pakistan Country Team prepared quarterly and annual project progress reports.

The quality of progress reports were satisfactory and give an overview of progress of all the five outputs. However, there is a need that at least the annual project progress should mention progress on achievements of all the 12 activities of the project in comparison with the targeted indicators. This will allow having a review of the overall progress of the project.

3.2.5 UNDP and Implementing Partner implementation

UNDP and Pakistan Country Team of BRESL implemented the project in a satisfactory manner. The implementing partner, ENERCON did provide required support to the project but there was frequent shortage of key staff. The Ministry of Water and Power did provide all support but their performance was affected by frequent transfer of National Project Director.

3.3 Project Results

3.3.1 Overall results

The objective of the project was the removal of barriers to the development and effective implementation of energy efficiency standards and labeling (ES&L) programs, thereby facilitating the transformation of the regional product markets of targeted energy consuming appliances, equipment and lighting products. It will also facilitate harmonization of test procedures, standards and labels in Pakistan.

The project was able to remove most of the barriers to the cost effective development and implementation of energy efficient standards and labels which has been launched as follows:

- Adoption of Energy Efficiency Testing Protocols for all the six targeted appliances.
- Formulation/ adoption/ notification of Minimum Efficiency Performance Standards for CFLs, Electronic & Magnetic Ballasts, Fans, Motors and Air conditioners.
- Harmonization of MEPS for Fans and CFLs with BRESL participating countries.
- Approval of EE Endorsement Labeling Procedure/ Logo and Energy Performance Rating Criteria by PSC and their harmonization with other participating countries.

- Submission of Revised Pakistan Energy Efficiency Conservation (PEEC) Bill to MoW&P for processing with Council of Common Interests and passage by Parliament.
- Submission of Amended ES&L Policy Summary to MoW&P for approval of Cabinet.

However, the last important barrier i.e., promulgation of PEEC Bill and approval of ES&L Regime by the cabinet is yet to be dismantled.

Once the Bill and ES&L Regime are approved, production of Energy Efficient appliances and equipment will commence. The objective of the project will be achieved through electricity savings, reductions in usage of energy efficient appliances and equipment. Hence achievement of project's goal of reduction of GHG from thermal power generation in Pakistan.

The whole concept of BRESL is very dynamic and it is requirement of the day. The energy crises in Pakistan are worsening day by day and the demand for energy efficient products and equipment is becoming an essential requirement.

BRESL project concept is in line with the national sector development priorities and plans which has been developed in collaboration with Government of Pakistan by the United Nations.

An output of Pakistan's 2004-2008 UNDAF is the "One Program" which defines the CP between 2008 and 2010 through the implementation of five Joint Program (JP) Components, one of which is the Joint Programme for Environment.

The global objective of the project is to facilitate GHG reductions through energy efficient appliance and equipment.

The Achievement of Project Results/Outputs matrix has been provided in **Table 3.3**.

Table 3.3: Achievement of Project Results/Outputs matrix

Project Output-I: ES&L Policy making program provides a legal basis for prescribing and enforcing energy efficiency (EE) standards and labeling regime					
Activities/Indicators:	Baseline	End of project Status	Target(s):	Terminal Evaluation Comment	Rating¹
Activity 1.1: Strengthening of the policy context for ES&L actions Activity 1.2: Adoption and implementation of ES&L regulations. Indicator: Development/ establishment of ES&L Regime	No ES&L Policy/ Regulations exist	<ul style="list-style-type: none"> Energy Efficiency Testing Protocols have been adopted for all the six targeted appliances. Minimum Efficiency Performance Standards have been formulated/adopted/ notified for CFLs, Electronic & Magnetic Ballasts, Fans, Motors and Air conditioners. MEPS for fans and CFLs have been revised to harmonize with BRESL participating countries. EE Endorsement Labeling Procedure and Label has been launched in the country for fans, CFLs and Motors. Revised Pakistan Energy Efficiency Conservation (PEEC) Bill has been submitted to MoW&P for processing with Council of Common Interests and passage by Parliament. Amended ES&L Policy Summary has been submitted to MoW&P for Approval of Cabinet. 	Adoption of ES&L Regime	<ul style="list-style-type: none"> All planned activities were carried out. PEEC Bill for empowering laws/regulations and ES&L Policy summary in the process of approval. Six testing standards, five performance standards (excluding refrigerator) adopted and five labels revised. Four MEPS adopted, three MEPS & Labels enforced (on voluntary basis) 	S

¹ Rating assigned using the 6 point Progress towards Results Rating Scale: **HS** (Highly Satisfactory), **S** (Satisfactory), **MS** (Moderately Satisfactory), **MU** (Moderately Unsatisfactory), **U** (Unsatisfactory), **HU** (Highly Unsatisfactory).

Project Output-2:	To facilitate awareness and implementation of ES&L Regime and to enhance the support mechanism				
Activities/Indicators:	Baseline	End of project Status	Target(s):	Terminal Evaluation Comment	Rating
<p>Activity 2.1: Training to strengthen and enable public institutions to support development and implementation of EE standards and labeling.</p> <p>Activity 2.2: Capacity enhancement in the development and implementation of standards and labeling for the 6 targeted products.</p> <p>Activity 2.3: Strengthening of national and regional testing and certification infrastructure.</p> <p>Activity 2.4: Strengthening of data collection and reporting procedures on equipment availability and sales by efficiency level in participating countries.</p> <p>Indicator: Identification/ selection of appropriate EE</p>	<p>Non-availability of trained personnel; absence of energy efficiency testing protocols, minimum energy performance standards and labelling policy; and limited availability of accredited EE testing facilities in the country</p>	<ul style="list-style-type: none"> Technical workshop for motor manufacturers was held in Gujranwala in September 2014 to facilitate them to qualify for affixing energy label on their products. Workshop was attended by over 150 participants. Two fan manufacturers have already applied for registration of their products for obtaining energy efficient labels. Moreover, a number of fan manufacturers are in the process of applying for energy efficient labels for their fans. Liaison developed/ maintained with Research and Development (R&D) Organizations, academia and Associations of Manufacturers to facilitate implementation of ES&L regime. A PC-I submitted by PCSIR EMTL (Electrical Measurements & Testing Laboratory) has been approved by Government for funding to upgrade their facility/laboratory for EE testing of BRESL targeted products, particularly motors, air conditioners and refrigerators. Public/Private Sector being encouraged through awareness campaigns to establish EE testing facilities. 	<p>Adoption of EE testing protocols, MEPS and labelling policy for six targeted appliances</p>	<ul style="list-style-type: none"> Most of planned activities were carried out. Energy Efficiency Testing Protocols have been adopted for all the six targeted appliances. Minimum Efficiency Performance Standards have been formulated/ adopted/ notified for CFLs, Electronic & Magnetic Ballasts, Fans, Motors and Air conditioners (Excluding refrigerators) EE Endorsement Labeling Procedure and Label has been launched in the country for Fans, Motors and CFLs. A report on applied model of data collection and reporting procedures was not prepared, as there is no energy efficient products in the market. The data collection and reporting procedures on equipment availability and sales by efficiency level was not undertaken as ES&L Regime is not enforced. 	MS

testing protocols, development of MEPS, and support for strengthening/ up-gradation/ creation of accredited EE testing facilities		<ul style="list-style-type: none"> ▪ 20 EE personals (against a target of 60) trained. ▪ 10 trainees (against a target of 15) are applying ES&L principles in their work. ▪ 4 participants (against a targeted 30) participated in regional product working group. ▪ An estimated 10% improvement (against 20%) in the EE testing facility that implemented capital improvement. ▪ 2 sets of procedures for engagement in MRAs on product testing/certification were established. ▪ The report on applied model of data collection and reporting procedures was not prepared, as production of energy efficient appliances and equipment has not commenced. 			
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Project Output-3:		To put in place manufacturers support program with reference to the six BRESL targeted appliances			
Activities/Indicators:	Baseline	End of project Status	Target(s):	Terminal Evaluation Comment	Rating
<p>Activity 3.1: Analysis and preparation of technical reports on each of the 6 covered products; reports cover techniques for improving product efficiency and the costs involved.</p> <p>Activity 3.2: Educational workshops for manufacturers on impacts of standards on manufacturers and ways to work with standards to increase profitability.</p> <p>Activity 3.3: Limited assistance that addresses technical and marketing/financial barriers to increasing EE in the manufacturing of equipment and appliances for local manufacturers on techniques for increasing efficiency of their products</p>	Lack of awareness and non-willingness amongst manufacturers to switch to internationally preferred ES&L Regime.	<ul style="list-style-type: none"> Aggressive awareness campaign was undertaken in print media during June, July and August 2014. The response from general public and manufacturers/ retailers was encouraging as there was increasing number of queries relating to energy efficient products and the workshop for motor manufacturers held in Gujranwala in September 2014 was very well attended and displayed visible interest of participants. Two fan manufacturers have already applied for registration of their products for obtaining energy efficient labels. Moreover, a number of fan manufacturers are in the process of applying for energy efficient labels for their fans. Awareness campaign for electronic media was launched in December 2014. Consultative meetings were held with manufacturers/ associations for awareness regarding ES&L Regime. 2 technical reports (against 3) were completed. There is no documented record of % of manufacturers that apply recommended techniques in the technical reports. 3 Educational workshops (against 1) for manufacturers on impacts of 	Seeking grant of EE labels by manufacturers for their products	<ul style="list-style-type: none"> The overall performance of this components was mixed. While a number of technical reports were prepared and training workshops were conducted. However, the manufacturers did not commenced production of energy efficient appliances and equipment as ES&L Regime is not enforced. EE Endorsement Labeling Procedure and Label has been launched in the country for Fans, Motors and CFLs. There is no documented record of impacts of the project interventions, as ES&L Regime is not enforced. 	MU

Indicator Acceptance/ adoption of labeling policy by manufacturers		standards on manufacturers and ways to work with standards to increase profitability were held. <ul style="list-style-type: none"> ▪ A total of 150 trainees (against 80) participated. ▪ An estimated 15% of trainees (against 50%) are applying concepts learned in workshops. ▪ 3 manufacturers (against 6) are adopting technical recommendations. ▪ An estimated 60% of local manufacturers satisfied with the technical assistance provided. ▪ An estimated 5% of local manufacturers (against 25%) that benefited financially from the application of technical assistance provided. ▪ An estimated 5,000 fans (against 135, 000 for all six products) of two model manufactured whom will be granted energy efficient label by ENERCON will be sold by local manufacturers that received technical assistance. 			
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Project Output-4:		Development/ updating of a regional website and sharing of reports			
Activities/Indicators:	Baseline	End of project Status	Target(s):	Terminal Evaluation Comment	Rating
<p>Activity 4.1: Regional work group on labeling and standards (cutting across products)</p> <p>Activity 4.2: Preparation of a plan for regional activities and coordination after the GEF-funded project ends.</p> <p>Indicator: Harmonization of ES&L Regime amongst BRESL regional participating countries.</p>	Insufficient harmonization of ES&L Regime amongst BRESL regional participating countries	<ul style="list-style-type: none"> BRESL Project Pakistan web-site has been developed and maintained. Requisite input provided by BRESL Pakistan to TWG/ RPMU for Regional ES&L harmonization. BRESL Pakistan participated in 6th Regional Project Steering Committee (RPSC) meeting held in Vietnam in March 2014. As per recommendations of Annual Technical Working Group (TWG) Meeting held in China in September 2012 and also of RPMU, TWGs Pakistan has been reconstituted. Two new members, one for fans and other for lighting, have been appointed, and are on board. As per recommendations/ resolutions of 1st TWG 2014 meeting held in China in October 2014, Feasibility Study Report for fans was revised and completed through incorporating inputs from all the participating countries and in-country stakeholders. This revised report was circulated to all the in-country stakeholders for review and comments. The report was communicated to RPMU for approval/ regional adoption. Needed inputs were provided to TWG Indonesia, lead country for CFLs, for finalization of Feasibility Study Report on CFLs. Draft BRESL specifications for EE standards for fans were developed. These have been finalized in light of inputs from BRESL 	Enhanced harmonization through RPMU	<ul style="list-style-type: none"> All planned activities which was supposed to be carried out by BRESL Pakistan were conducted. MEPS for fans and CFLs have been revised to harmonize with the participating countries. Feasibility Study Report for fans and CFLs has been harmonized. EE Endorsement Labeling Procedure and Label has been launched in the country for fans, Motors and CFLs. Energy Performance Rating Criteria has been harmonized with other participating countries. RPMU China played a supportive role to enable BRESL Pakistan to achieve output of this component. The work of TWGs was productive. BRESL Pakistan carried out all the activities which were planned to be carried out in the regional context. 	MS

		<p>participating countries and approved by Regional Project Steering Committee for regional adoption.</p> <ul style="list-style-type: none"> ▪ MEPS for fans and CFLs have been revised to harmonize with BRESL participating countries. These have been discussed with PSQCA and PCSIR in a meeting. After incorporating their suggestions, these were re-submitted to Technical Committee of PSQCA for adoption/ notification. ▪ RPMU has established Regional Energy Efficiency Standards & Labeling Network (REESLN) to share resources and information among BRESL participating countries. <p>BRESL Pakistan invited 25 stakeholders for participation in this forum. So far eleven organizations have applied for registration. National Institute of Electronics has been identified as focal point institute for REESLN in Pakistan.</p> <ul style="list-style-type: none"> ▪ BRESL project established information sharing network with Lites Asia based in China for data collection, Research and Development on global EE lighting products. ▪ Plan for regional activities and coordination after the GEF Funded Project ends is being initiated by RPMU. BRESL Pakistan has been provided needed inputs. ▪ The lesson learned report is presented in PIRs and APRs of the project. 			
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Project Output-5:		Pilot projects to create awareness among consumers			
Activities/Indicators:	Baseline	End of project Status	Target(s):	Terminal Evaluation Comment	Rating
Activity 5.1: Consumer education Indicator: Market acceptability of labeled products by the consumers	Absence of awareness amongst ES&L stakeholders	<ul style="list-style-type: none"> Aggressive awareness campaign was undertaken in print media during June, July and August 2014. <p>The response from general public and manufacturers/ retailers was encouraging as there was increasing number of queries relating to energy efficient products.</p> <p>The workshop for motor manufacturers held in Gujranwala in September 2014 was very well attended and displayed visible interest of participants.</p> <ul style="list-style-type: none"> Awareness campaign for electronic media was launched in December 2014. Universities/academia were encouraged through consultative meetings to promote ES&L Regime in Pakistan. The procurement of energy efficiency appliances and equipment has been incorporated in the ES&L Regime to be approved by the Cabinet. Online database has not been developed. However, paper based database of on EE appliance and equipment is available. 	Increasing availability of EE labeled products	<ul style="list-style-type: none"> Most of planned activities were carried out but evaluation of impact of awareness campaign were not conducted. The manufacturers and consumers are now aware of the benefits of energy efficient products. 	MS

3.3.2 Relevance

The project was highly relevant in meeting the objectives of removal of barriers to the successful implementation of energy standards and labelling policy in Pakistan and in meeting the needs of targeted beneficiaries and its relevance is rated as **Highly Satisfactory**. The project design was satisfactory and the project document contains a convincing approach to address the existing barriers.

The project's outcomes are consistent with the GEF strategies. The project focus is on better utilization of energy efficient technology so as to reduce energy consumption by household, commercial and industrial sectors. The energy demand in these sectors in Pakistan will continue to outstrip supply.

BRESL has been implemented on a regional basis in order to transform the regional product markets of the targeted appliances, equipment and lighting products, and address the common barriers to, and concerns about, ES&L by the BRESL participating countries.

The harmonization of government policies and programmes helped the participating countries markets deliver more energy efficient products, this can be most efficiently addressed regionally. The project focused on ES&L Policy making and awareness raising which largely assisted government, manufacturing, and stakeholders in Pakistan to implement the cost-effective energy appliances availability.

3.3.3 Effectiveness and Efficiency

The project was effective in achieving most of its expected outputs; its effectiveness is rated as **Moderately Satisfactory**. The project succeeded in establishing ES&L Regime for fans, motors and CFL.

Two fan manufacturers have already applied for grant of energy efficient labels. Their fans were tested and were found to be in compliance with standards adopted for fans. However, no energy efficient fan, motor or CFL have been developed by the manufacturers, pending promulgation of PEEC Bill and approval of ES&L Regime by the Cabinet.

The project was satisfactorily managed and the resources utilized efficiently; its efficiency is rated as **Moderately Satisfactory**. The Pakistan Country Team of BRESL managed to secure project outputs despite frequent transfers of NPD and NPC.

The PCT of BRESL project was able to bring all the stakeholders to agree on PEEC Bill and ES&L Regime which is indeed a great achievement when compared with the cost of the project.

The overall working of TWGs and REESLN was effective. However, there is a need to further strengthening their role and activities during next phase of the project. Regional Component including REESLN should be expanded and new component for collaboration between the research institutions, industry and manufacturing associations should be added.

BRESL project has increased awareness of energy efficient appliances and equipment in Pakistan to the stakeholders, manufacturer of six targeted products and to the general public.

The project has highlighted need for testing laboratories in Pakistan which effectively forced the Government of Pakistan to establish testing laboratories for energy efficient appliances and equipment at PCSIR. There is a need that energy efficient appliance and equipment testing laboratories should be provided within their manufacturers clusters like there is a need to support University of Gujrat and Fan Development Institute for establishment of testing facilities for motors and fans.

There is a need to support Establishment of Electrical Appliance Testing Laboartory at NED University of Engineering and Technollogy, Karachi which is one of the oldest engineering universities of Pakistan, has a good reputation in quality engineering education with research and industrial collobration for students from all over the country.

3.3.4 Country Ownership

BERSL project has directly contributed to the objectives of the National Conservation Strategy (1992), which emphasis the adaptation of Energy Conservation activities i.e., energy standards & labelling of appliances and equipment.

The project is also in line with the National Environmental Action Plan of Pakistan, which employed a cross Sectoral and holistic approach in achieving energy conservation and energy efficiency in the use of household equipment and appliances.

Pakistan Standards and Quality Control Authority Act, 1996 also provides some directions for standardization and labelling of products, processes or services.

3.3.5 Mainstreaming

BRESL has carried out work under each intervention and the outcomes are as follows:

- Identification and adoption of Energy Efficiency Testing Protocols for the electric home appliances targeted under the project
- Development & Approval of Minimum Energy Performance Standards for the targeted appliances
- Introduction & Implementation of Energy Labeling Programme for the targeted appliances
- Regional harmonization of testing protocols and energy performance standards
- Availability of EE (Energy Efficiency) Labeled products in the market

Sustainability BRESL Project interventions have been designed to look at all aspects that influence the scale up of energy efficiency appliances and equipment in Pakistan. The focus was to initiate and accelerate the shift towards energy efficient products design and development for household, commercial and industrial sectors as well as to develop a market for sustainable and energy efficient appliances and equipment.

The ES&L Regime of the BRESL project will be mainstreamed into Pakistan's forthcoming energy efficiency programs which are main priority area for the Government of Pakistan due to the ongoing energy crises. The Asian Development Bank, the World Bank and, GIZ, JICA are already planning a number of projects in the energy efficiency sector in Pakistan.

3.3.6 Sustainability

BRESL project achievements are dependent upon passage of PEEC Bill by the Parliament and approval of ES&L Regime by the cabinet: its sustainability is rated as **Moderately Unlikely**.

The promulgation of PEEC Bill and approval of ES&L Regime in the country would entail three major aspects i.e., control on import of inefficient energy appliances, support to local manufacturing of energy efficient appliances, mass awareness on purchase and use of energy efficient appliances.

In order to adopt and implement an effective ES&L Regime in Pakistan, the following policy initiatives needs to be adopted to ensure compliance of PEEC Act:

- ENERCON, being the focal agency for every aspect of energy conservation and related affairs, be allowed to have the ownership of ES&L regime.
- The implementation and monitoring of ES&L regime be assigned to ENERCON and PSQCA as a joint responsibility.
- PSQCA to enforce the approved standards on electric home appliances (including fans, refrigerators, room air conditioners, electric motors, magnetic ballasts and CFLs) by creating a credible and effective enforcement mechanism.
- After the commencement of the Act, the Federal Government shall, establish a Board to be known as the Pakistan Energy Efficiency & Conservation Board (PEECB)
- PCSIR, be designated as the national testing facility and mandated for testing the energy efficiency parameters of the electrical home appliances (including fans, refrigerators, room air conditioners, electric motors, ballasts and CFLs).
- Pakistan National Accreditation Council, be directed to create enabling environment for the private sector for the establishment and accreditation of energy efficiency testing laboratories.
- The ES&L regime for six targeted products may be allowed to be introduced in the country for voluntary compliance over a period of three years and subsequently the compliance may be made mandatory.
- Engineering Development Board, be assigned the shared responsibility along with ENERCON/Ministry of Water & Power for overseeing and facilitating the transition during the voluntary phase by establishing the relevant material banks among other steps and facilitating the outreach programs for the local manufacturers of energy efficient home appliances.
- Ministry of Commerce be directed to build in the necessary provisions/conditions in the next financial year import policy, for import of only

those energy appliances/equipment which comply with PSQCA energy standards.

- The Pakistan Custom Authorities/Federal Board of Revenue be directed to make policy changes in their rules/regulations to make compulsory, the inspection and sample testing of every consignment of imported electric home appliances through PCSIR or PSQCA.
- In order to support the local manufacturing of targeted energy efficient products, Federal Board of Revenue may reduce the existing custom duties on the import of quality raw material for manufacturing of energy efficient appliances and equipment.
- The public sector organizations and other buyers from state owned corporations/enterprises be directed to purchase only the energy efficient appliances and equipment. Necessary changes in Public Procurement and Regulatory Authority rules need to be brought in.
- The State Bank of Pakistan be directed to entertain the local manufacturers of energy efficient home appliances for long term financing at competitive commercial mark-up rates for purchase of new imported and locally manufactured plants/machinery to upgrade existing units and setting up of new units.

Moreover, there should be smooth transition from BRESL project to ENERCON as follows:


- A duly indexed record of all activities carried out.
- A statement of all activities carried out under the project which should be classified as completed, ongoing and incomplete. The next steps should be elaborated for all ongoing and incomplete activities.
- The project website: www.bresl.net.pk should be made part of ENERCON website: www.enercon.gov.pk after necessary changes.


The project has created awareness of energy efficiency appliances and equipment and supported stakeholders and manufacturers as follows:


- Identification and adoption of Energy Efficiency Testing Protocols for the electric home appliances targeted under the project.
- Development & Approval of Minimum Energy Performance Standards (MEPS) for the targeted appliances.
- Introduction & Implementation of Energy Labeling Programme for the targeted appliances.
- Regional harmonization of testing protocols and energy performance standards
- Availability of EE (Energy Efficiency) Labeled products in the market.


There are variety of labels beings used by the countries where ES&L Regime is enforced. BRESL project has proposed a three star energy label system.


Energy Efficient Appliances - Dawn of a Bright Future






ELECTRIC FANS


COMPACT FLUORESCENT LAMPS


BALLASTS (CHOKE)


ELECTRIC MOTORS & PUMPS



REFRIGERATORS


AIR CONDITIONERS

Note: Check this label when you purchase these products. More stars mean more energy efficiency.

Your right decision of buying electric appliances of "Energy Efficiency Label" will provide base for;





- Reduction in electricity bill
- Reduction in load shedding
- Reduction in discharge of greenhouse gases; that will ensure a healthy environment for our coming generations



ENERCON - BRESL

Labeling of Energy Efficient Electric Appliances for the First Time in Pakistan

BE PART OF ENERGY EFFICIENCY MOVE

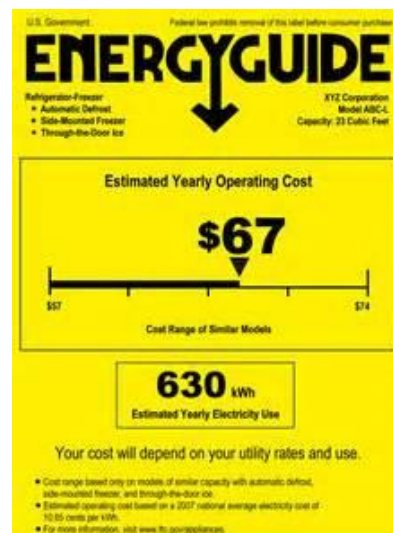
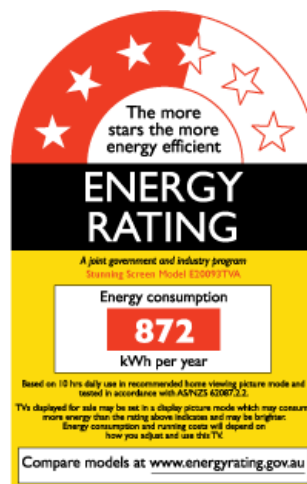
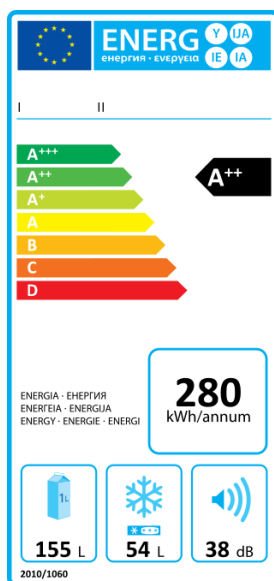





For permission to label your products as energy efficient ones, please contact:

National Project Coordinator
GEF/UNDP BRESL Project Pakistan
www.bresl.net.pk | www.enercon.gov.pk

National Energy Conservation Centre
Enercon Building G-5/2, Islamabad | info.bresl.pk@gmail.com
051-9206004, 2276386

Presently, majority of countries are using different types of energy efficiency labels and star rating as presented below:



ES&L Regime once enforced will be in voluntary phase for three years and thereafter it will be move towards mandatory phase. The present design of energy efficient label is comprised of three star rating system. The design and number of stars rating system varies from one country to another. The existing 3 star rating system needs to be reviewed, at the time when ES&L Regime moves from voluntary phase to mandatory phase, and be converted to 5 stars rating system in order to humanize with majority of countries.

Regional harmonization on EE Testing Protocols, EE Standards has been achieved among the BRESL participating countries on CFLs and Fans. However there is a need to create connectivity and harmonization of products with the regional countries for manufacturing of energy efficient appliances and equipment. This is a sensitive issue which must be considered before issuing the first energy efficiency label.

There is strong likelihood that the manufacturers will be able to design and develop production of energy efficient appliances even after the project conclusion. However,

there is strong need that BRESL project activities should be continued with a second phase of the project.

The sustainability of the project is already based on the market-oriented strategy adopted i.e., less consumption of electricity, because energy efficient appliances and equipment will be used by residential, commercial and industrial sectors only if they see a direct and tangible benefits.

The establishment of effective energy efficiency standards and labels will lead to a more sustainable energy future. First of all, energy standards and labels have been introduced through a formalized process leading to a government regulation and endorsement by manufacturers associations.

The government agencies i.e., ENERCON and PSQCA with the ES&L mandate in Pakistan will have to play a significant role in the implementation and enforcement of PEEC and ES&L Regime. This is expected to spearhead and sustain the activities after the project life. However, there is a need that institutional strengthening and capacity building of both the key organizations in regulatory, legal, enforcement and compliance monitoring aspects of PEEC Act and ES&L Regime should be carried out.

Regional cooperation under BRESL Project particularly the ES&L Regime has facilitated, encouraged and established South-South transfer of technical know-how and technology.

The enforcement of ES&L Regime in Pakistan will contribute to the realization of the Millennium Development Goals, particularly MDGs 1, 7 and 8, whereby the project implementation has contributed towards the eradication of extreme poverty, improved environmental sustainability of a country's and region's development path, and help improve trade ties and develop global partnership for development.

The role of TWGs in regional harmonisation on EE Testing Protocols, EE Standards have been achieved by BRESL Pakistan on CFLs and Fans. However there is a need to create connectivity and harmonization of products with the regional countries for manufacturing of energy efficient appliances and equipment.

The BRESL project, by developing a regional forum and network – REESLN - for dialogue and action on ES&L Regime, will increase the capacity and political will of participating countries to develop, implement and finance ES&L programs. Ultimately, the outcome will lower energy intensity within countries in the region.

3.3.7 Impacts

The potential for the project to achieve its long term goal and objective does exist and its overall impact is positive. The demand for energy efficient appliances and equipment will increase with the passage of time due to new technological advancements in home appliances and local manufacturers have to develop energy efficient appliances, the impacts of the project is rated as **Significant**.

The Barrier Removal to the Cost-Effective Development and Implementation of Energy Efficiency Standards and Labeling (BRESL)'s goal is the reduction in the annual growth rate of greenhouse gas (GHG) emissions from thermal power generation in

Pakistan which will be achieved once PEEC Bill is promulgated by the Government of Pakistan and ES&L Regime is in place and production of energy efficient appliances and equipment commence.

Energy-efficiency standards and labeling are among the most cost-effective types of policies and programs to mitigate global climate change. The reason for this is that these programs have the potential to effect complete market transformations for different classes of energy-saving products, at a cost far below the cost of providing new energy supply.

The project's log frame has already established baseline scenario and the anticipated net project in terms of electricity savings (GWh/year) and CO₂ reductions (MMT CO₂ per year, and cumulative). However, this can only be worked out once energy efficient appliances and equipment are developed and marketed resulting in their widespread utilization.

There will be a significant amount of other indirect CO₂ emission reductions due to the BRESL project. Pakistan with a population of 186 million as of July 1, 2014 ranks 6th in the world and the use of electrical appliances is increasing day by day. The manufacturer of energy efficient appliances and their subsequent use by the large consumers based within Pakistan will have a significant global effect.

The BRESL has worked on harmonizing energy performance test procedures for targeted products. The development of a more rational testing regime will facilitate the identification of energy-using products, which will be useful to both policymakers and consumers.

The indirect emission reductions may come from the development and enforcement of energy use standards for such appliance/equipment. Although it would be high, it is estimated that BRESL can be taken as conservatively 25% of the estimated cumulative CO₂ emission reductions (during and post-BRESL) from the use of the energy efficient appliances and equipment.



4 Conclusions, Recommendations and Lessons

4.1 Conclusions

The project implementation was adversely affected by frequent change of NPD/NPC. The project implementation was initially slow but later during the last two years of project there was considerable progress and the project succeeded in achieving most of its outputs.

The performance of Component No. 1: ES&L Policy making program was Satisfactory as most of the activities were carried out as planned.

The performance of Component No. 2: ES&L Capacity Building Program was Moderately Satisfactory as most of the activities were carried out.

The performance of Component No. 3: ES&L Manufacturers Support Program was mixed which was Moderately Unsatisfactory. A number of technical reports were prepared and workshops on standards were organized but manufacturer did not started production of any energy efficient appliances and equipment mainly due to the fact that PEEC Bill has not been promulgated and ES&L Regime is not effective.

The performance of Component No. 4 - ES&L Regional Cooperation Program was Moderately Satisfactory as most of the activities which were supposed to be carried by Pakistan were completed and the role of TWGs were effective.

The performance of Component No. 5 - Consumers Education was Moderately Satisfactory as most of the planned activities were carried out.

The financial performance of the project is 97% of the committed funds that have been spent on project activities.

The terminal evaluation has identified a number of recommendations. There are recommendations which should be followed by ENERCON/MoW&P to enhance sustainability of BRESL project.

The terminal evaluation strongly recommends Phase II of BRESL Project for the continuity of work carried out so as production of energy efficient appliances commence in Pakistan for the targeted six appliances. This will enable achievement of the objective as well as goal of BRESL Project.

4.2 Recommendations

The recommendations based on the finding of the Terminal Evaluation of BRESL Project are presented as follows:

Table 4.1: Recommendations of Terminal Evaluation of BRESL

Rec #	Recommendations	Entity Responsible
R 1	Ensure that the Pakistan Energy Conservation Bill is passed by the Parliament and ES&L Regime is approved by the Cabinet.	ENERCON/ MoW&P
R 2	<p>Institutional Strengthening and Capacity Building of ENERCON and PSQCA to enforce PEEC bill and ES&L Regime.</p> <p>The implementation and monitoring of ES&L regime be assigned to ENERCON and PSQCA as a joint responsibility. ENERCON, being the focal agency for every aspect of energy conservation and related affairs, be allowed to have the ownership of ES&L regime. PSQCA to enforce the approved standards on electric home appliances (including fans, refrigerators, room air conditioners, electric motors, magnetic ballasts and CFLs) by creating a credible and effective enforcement mechanism.</p> <p>There is a need for institutional strengthening and capacity building of ENERCON and PSQCA in regulatory, legal, enforcement and compliance monitoring aspects of PEEC Act and ES&L regime.</p>	
R 3	<p>Development of Network of accredited laboratories at Gujrat and Gujranwala for testing of electric fans and motors.</p> <p>Due consideration should be given to establishment of EE testing laboratories at University of Gujrat and Fan Development Institute.</p> <p>The Engineering Development Board, Ministry of Industries and Production should be asked to expedite approval of PC 1 for purchase of machinery and equipment at Fan Development Institute so as to provide a common facility centre for small and medium entrepreneurs enabling them to produce energy efficient fans.</p>	
R 4	ENERCON should launch aggressive awareness campaign in electronics and print media about energy efficient appliances and equipment when PEEC Bill is promulgated and ES&L Regime is approved.	
R 5	Include energy efficient appliances and equipment in all public procurement of goods and works being undertaken by the Federal and Provincial Governments in Pakistan.	
R 6	ES&L Regime once enforced will be in voluntary phase for three years and thereafter it will be move towards mandatory phase. The present design of energy efficient label is comprised of three star rating system. The design and number of stars rating system varies from one country to another. The existing 3 star rating system needs to be reviewed, at the time when ES&L Regime moves from voluntary phase to mandatory phase, and be converted to 5 stars rating system in order to humanize with majority of countries.	
R 7	<p>There should be a smooth transition from BRESL project to ENERCON.</p> <ul style="list-style-type: none"> ▪ A duly indexed record of all activities carried out. ▪ A statement of all activities carried out under the project which should be classified as completed, ongoing and incomplete. The 	

Rec #	Recommendations	Entity Responsible
	<p>next steps should be elaborated for all ongoing and incomplete activities.</p> <ul style="list-style-type: none"> The project website: www.bresl.net.pk should be made part of ENERCON website: www.enercon.gov.pk after necessary changes. 	
	Specific Recommendations for BRESL II Project	
R 8	Consolidate with existing six targeted energy efficient products and include additional products i.e., LED, UPS, Iron and washing Machines in BRESL II.	ENERCON/Mo W&P
R 9	BRESL II should develop standards for raw material used in targeted six products like standards for 99.99% copper wire used in manufacturing of fans and motors.	
R 10	<p>Expand Pakistan Energy Efficiency Conservation Board having representation from all the stakeholders for overseeing performance of the project and implementation of its decisions</p> <p>The Project Board should include all the existing members of Project Steering Committee along with additional members i.e., Ministry of Commerce, Federal Board of Revenue and Ministry of Finance, so that they could remove hurdles being faced by the Manufactures in import of raw material like electrical silicon sheet, copper etc.</p> <p>Electricity utility companies like IESCO, LESCO, and K Electric should also be included in the project steering committee as their input is extremely important to supply required voltage of electricity to the consumers.</p> <p>Representative from raw material importers for the targeted products like cooper wire and electrical silicon sheet manufacturers should also be included.</p>	
R 11	All relevant Technical Reports/Drawings produced by BRESL I and II should be translated into Urdu and distributed to the manufactures.	
R 12	BRESL II should have a robust energy efficiency products and equipment awareness component with advocacy, training and mass communication.	
R 13	Regional Component including REESLN should be expanded and new component for collaboration between the research institutions, industry and manufacturing associations should be added.	
R 14	<p>Support Establishment of Electrical Appliance EE Testing Laboartory at NED University of Engineering and Technollogy, Karachi</p> <p>The objective is to analyze and improve the operational performance characteristics of equipment using advanced measuring and recording computer interfaced instruments. Detailed harmonies and efficiency analysis, thermal imaging can be conducted from these instrument which result in making standards and codes for optimum performance of the equipment. The proposed laboratory will in fact be a landmark practical</p>	

Rec #	Recommendations	Entity Responsible
	step to achieve standardization of the targeted electrical equipment. This lab facility can be used by all the stakeholders in the region. The laboratory will have testing equipment like material testing equipment, power logger (which will be used analyze the equipment for power factor, harmonics, losses and thus overall efficiency), thermal imager etc. Basically, NED University wants R&D units which will helps the electrical industry in technology transfers, technology updates and this R&D units helps the fans, motors, lighting industry to synchronize with international technology.	
R 15	The PCT must include Technical Staff including Monitoring and Evalaution Expert. All the Technical Staff must meet the minimum educational and professional qualification.	

4.3 Lessons learnt

- A five year project must have a minimum core staff comprising of NPD, NPC, Finance and Administrative Officer, Technical as well as Monitoring and Evaluation Staff.

The approach of engaging short/long term technical experts for a five years project is not effective. The project needs full time technical staff to have continuity and institutional memory.

- There is a need that in the next phase of BRESL project the continuity of National Project Director and National Project Coordinator should be ensured. Furthermore, nomination of alternative officials/staff should be made in case of transfer or long absence of NPD and NPC.
- The project had a policy component i.e., ES&L Policy making Program. The awareness rising for energy efficient appliances and equipment was created through trainings and workshops for stakeholders, manufacturers and general public.

The policy making process need strong political support. This can be best achieved by advocacy and mass communications programmes to highlight energy crises in Pakistan through fact sheets, need for energy efficiency appliances and equipment as well as for regulatory mechanism.

- The success of a project depends on performance monitoring indicators of Logical Framework. The annual project progress report must describe the actual progress of targeted indicators as described in the Logical Framework.
- The project produced a number of technical reports for manufacturers of fans and motors who has little or no knowledge of English language. However, all the reports were in English which were of little use to them. There is a need that in future educational level as well as interest of beneficiaries must be considered while designing awareness raising and capacity building initiatives.

5 Terms of Reference of Terminal Evaluation

Context

BRESL as a regional project is aimed at rapidly accelerating the adoption and implementation of energy standards and labels (ES&L) in Asia, and in so doing bring about energy savings from the use of energy efficient appliances/equipment. The project also facilitates harmonization of test procedures, standards and labels among developing countries in Asia, when appropriate, starting with the six countries, Bangladesh, China, Indonesia, Pakistan, Thailand and Vietnam as BRESL participating countries.

The scope of the whole evaluation is at the national and regional level. The goal of the project is the reduction of GHG emissions from thermal power generation in selected Asian Countries.

The objective of the project is to removal of barriers to the successful implementation of energy standards and labeling policy and programs in Asia.

In order to achieve the project objective, the project consists of five outcomes, which is mutually supportive from each other.

Outcome No 1; Establishment of legal and regulatory basis for removing lowest technologies form the market and promoting high efficiency technologies.

Outcome No. 2; Building of institutional and individual capacity to secure on the ground implementation of regulatory frameworks, as well as actual standards and labeling program.

Outcome No. 3; Provision of information and technical assistance to manufacturers of covered products

Outcome No. 4; Regional cooperation and information sharing on-going and helps to maximize impacts

Outcome No 5; Demonstration of various aspects of the development and implementation of ES&L program.

The terminal evaluation will be conducted according to the guidance, rules and procedures established by UNDP and GEF as reflected in the UNDP Evaluation Guidance for GEF Financed Projects.

6 List of documents reviewed

- Revised Final Bill of Pakistan Energy Efficiency Conservation
- Annual Progress Reports of BRESL Project for the year 2010,2011, 2012, 2013 and 2014
- Summary to the Cabinet – Cost Effective Development and Implementation of Energy Efficiency Standards and Labelling Regime.
- Quarterly Progress Reports of BRESL Project for the year 2010,2011, 2012, 2013 and 2014

7 List of Persons met during Terminal Evaluation

Ms. Tamana Banori, National Project Manager, BRESL Project, Islamabad.
Mr. Muhammad Azhar Aslam, Chairman, PEFMA/Chief Executive Officer, BELVIN, Bless Electronics (Pvt.) Ltd, Gujranwala
Mr. Taimoor Rafiq, Royal Fans (Pvt.) Ltd, Ex-Chairman, PEFMA, Gujrat
Mr. Muhammad Naeem, Senior General Manager Commercial, HNR Company (Pvt.) Lahore
Engr. Tafseer Ahmed Khan, Ex-DG PSQCA, Karachi
Mr. Iqbal P. Sheikh, Managing Director, In Consult (Pvt.) Ltd, Lahore
Mr. Najam Rauf Mughal, Goden Pumps (Pvt.) Ltd, Gujranawala
Mr. Noor Ahmad, Akhlaas Pumps, Gujranwala
Engr. Irfan Ahmed Rabbani, Head, EMTL/Chief Engineer, PCSIR, Lahore
Mr. Asif Hussain Siddiqui, Director, Energy Conservation, K Electric, Karachi
Mr Mehboob Alam Khan, Deputy General Manager, Energy Conservation Department, K Electric, Karachi
Dr. Muhammad Ali Memon, Associate Professor, Department of Electrical Engineering, NED University of Engineering and Technology, Karachi
Prof. Sarosh Hashmat Lodhi, Dean (Civil Engineering and Architecture), NED University of Engineering and Technology, Karachi
Mr. Pallari, PSQCA, Karachi
Dr. Frank Fecher, Senior Advisor, Renewable Energy – Energy Efficiency Project, GIZ, Islamabad.
Mr. Ali Yasir, Component Manager, Renewable Energy – Energy Efficiency Project, GIZ, Islamabad.
Mr. Naseem Anwar Khan, Technical Expert, BRESL Pakistan, Islamabad
Mr. Jamil Ahmad Choudhary, Technical Expert, BRESL Pakistan, Islamabad
Choudhary Liaq Ahmed, Technical Expert, BRESL Pakistan, Islamabad
Mr. Iftikhar Ahmed, Technical Expert, BRESL Pakistan, Islamabad