



UNDP Project Document

Governments of Bangladesh, China, Indonesia, Thailand & Vietnam

and

United Nations Development Programme

**BARRIER REMOVAL TO THE COST-EFFECTIVE DEVELOPMENT AND
IMPLEMENTATION OF ENERGY EFFICIENCY STANDARDS AND LABELING
PROJECT (BRESL)**
(PIMS# 3327)

Brief Description:

BRESL 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. The project is expected to cost-effectively deliver an average 10% reduction in total residential and commercial energy use in partner countries at the time of peak impact 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 will focus largely on capacity building and assisting government, manufacturing, distributing, retail, consumer and environmental stakeholders throughout the Asian region 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.

Table of Contents

<u>Section</u>	<u>Page</u>
Acronyms	3
Section I: Elaboration of the Narrative	5
Part I: Situation Analysis	5
Part II: Strategy (Expanded Details Contained in Section IV, Part VI)	22
Part III: Management Arrangements	40
Part IV: Monitoring and Evaluation Plan and Budget	43
Part V: Partnerships Strategy	44
Part VI: Legal Context	45
Section II: Strategic Results Framework and GEF Increment	46
Part I: Incremental Cost Analysis	46
Part II: Logical Framework Analysis (Project Planning Matrix)	59
Section III: Total Budget and Work Plan	71
Section IV: Additional Information	76
Part I: Additional Agreements	76
Part II: Stakeholder Involvement Plan	77
Part III: CO ₂ Emissions Reduction Estimates	79
Part IV: Project Risks and Assumptions	84
Part V: Monitoring and Evaluation Plan and Budget	86
Annex A: How the BRESL Concept Paper Evolved into BRESL Project Document	92
Annex B: Summary of Barriers Identified in Regional Survey	94
Annex C: Assumptions in Baseline and Alternative Scenarios	95
Annex D: Overview of Project Impacts in Terms of Energy Savings and CO ₂ Emissions Reductions, by country	98

List of Acronyms

Acronym	Meaning
A/Cs	Air Conditioners
ACE	ASEAN Centre for Energy
AED	Academy for Educational Development
APEC	Asia-Pacific Economic Cooperation
APEC-ESIS	APEC Energy Standards Information System
APR/PIR	Annual Project Reports and Project Implementation Review reports
ASEAN	Association of Southeast Asian Nations
AWP	Annual Work Plans
BAU	business-as-usual
BRESL	Barrier Removal to the Cost-Effective Development and Implementation of Energy Efficiency Standards and Labeling
BSTI	Bangladesh Standards & Testing Institute
CES-BUET	Center for Energy Studies, Bangladesh University of Engineering & Technology
CFLs	compact fluorescent lamps
CLASP	Collaborative Labeling and Appliance Standards Program (NGO)
CNIS	China National Institute of Standardization
COs	Country Offices (UNDP)
CSC	China Standard Certification Center
CTs	Country Teams
DANIDA	Danish International Development Assistance
DEDE	Department of Alternative Energy Development and Efficiency
DGEED	Directorate General of Electricity and Energy Development
DGEEU	Directorate General for Electricity and Energy Utilization
DSM	demand side management
EE&C-SSN	Energy Efficiency and Conservation Sub-Sector Network (ASEAN)
EE	energy-efficient
EI	Electrical and Electronics Institute (Thailand)
EGAT	Electricity Generating Authority of Thailand
EGEE&C	Expert Group on Energy Efficiency & Conservation (APEC)
ELI	Efficient Lighting Initiative
EOI	Expression of Interest
EOP	End of Project
EPA	Environmental Protection Agency
EPPO	Energy Policy and Planning Office (Thailand)
ES&L	energy-efficiency standards and labels
EU	European Union
EUEEP	End-Use Energy Efficiency Project (China GEF project)
EVN	Electricity of Vietnam
FSP	full size proposal
FTLs	fluorescent-tube lamps
GEF	Global Environment Facility
GFP	Government Focal Points
GHG	greenhouse gas
HEEMA	high-efficiency electric motor agreement
HEM	high-efficiency motor
ICA	International Copper Association
IEA	International Energy Agency
IFC	International Finance Corporation
IPMVP	International Monitoring and Verification Protocol

Acronym	Meaning
IPPs	independent power producers
IR	inception report
IW	inception workshop
KTL	Korea Testing Laboratory
LFA	United States Agency for International Development
LPAC	Local Project Appraisal Committee
M&E	monitoring and evaluation
MDG	Millennium Development Goals
MEPS	Minimum Energy Performance Standards
MME	Ministry of Mines and Energy
MMT	Million Metric Tons
MOCIE	Ministry of Commerce, Industry and Environment
MOI	Ministry of Industry
MOST	Ministry of Science and Technology
MPR	Multi-Partite Review
MRAs	Mutual Recognition Agreements
MUPPER	Memorandum of Understanding on Promotion of Energy Efficient Refrigerators
NDRC	National Development and Reform Commission
NEX	Nationally-Executed
NGOs	Non-Governmental Organizations
NPC	National Project Coordinator
OP	Operational Program
PAC	Project Assurance Committee
PIMS	Project Information Management System
PMO	Project Management Office
PPM	Project Planning Matrix
PROMEEC	Promotion of Energy Efficiency and Conservation
QPR	Quarterly Project Reports
RCU	Regional Coordination Unit
ROK	Republic of Korea
RPD	Regional Project Director
RPMU	Regional Project Management Unit
RPSC	Regional Project Steering Committee
SAC	Standardization Administration of China
SARI	South Asia Regional Initiative
SRF	Strategic Results Framework
TEPS	target energy performance standards
TISI	Thailand Industrial Standards Institute
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention for Climate Change
USAID	United States Agency for International Development
VEEPL	Vietnam Energy Efficiency Public Lighting (GEF project)

SECTION I: Elaboration of the Narrative

PART I: SITUATION ANALYSIS

Context and Global Significance

1. Energy-efficiency standards and labeling (ES&L) 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.
2. ES&L programs contribute to the realization of the Millennium Development Goals (MDG), particularly MDGs 1, 7 and 8, whereby the program can contribute to the eradication of extreme poverty, improve environmental sustainability of a country's and/or a region's development path, and help improve trade ties and develop global partnership for development.
3. Asia accounts for 28% of world energy use, with China, Japan, India and South Korea using 73% of the total energy used in the region. The average rate of growth in energy use in Asia over the past decade has been 3.7%, over double the 1.6% world average. Throughout this region, growth in the demand for electric power is requiring the extension and upgrading of electricity transmission and distribution networks. Energy use related to buildings (including use of appliances and equipment and lighting) accounts for a significant percentage of the region's total energy consumption. With the rapid economic growth in many countries in the region, the demand for major appliances and equipment - ranging from refrigerators and clothes washers in homes, to photocopiers and lighting equipment in office buildings - is expected to continue to grow. Such technologies primarily rely on fossil fuel based power generation, which is one of the major sources of greenhouse gas (GHG) emissions. It is estimated that, over the next decade, GHG emissions in the region will increase commensurate with economic growth, and these will have to be reduced if the global climate is to be stabilized.
4. Clearly, without focused efforts to better utilize energy efficient technology and reduce energy consumption by household and office appliances and equipment, energy demand in the residential and commercial sectors throughout Asia will continue to outstrip supply. The proposed project is entitled Barrier Removal to the Cost-Effective Development and Implementation of Energy Efficiency Standards and Labeling (BRESL). The goal of the project is the reduction in the annual growth rate of greenhouse gas (GHG) emissions from thermal power generation in selected Asian countries. The objective of the project is 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 among developing countries throughout Asia, when appropriate. The project will be applied for funding from the Global Environment Facility (GEF) and will be implemented by the United Nations Development Program (UNDP).
5. BRESL will be 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 participating countries. The harmonization of government policies and programmes that will help these markets deliver more energy

efficient products can be most efficiently addressed regionally. The project will focus largely on capacity building and assisting government, manufacturing, distributing, retail, consumer and environmental stakeholders throughout the Asian region to implement the most cost-effective energy efficiency measure available. The technical assistance activities that make up this GEF project will be carried out by key agencies in the participating countries. In each country, priority activities, selected among a menu of interventions that will be offered by the project to help foster each country's preferred process for developing or expanding its ES&L program.

Barriers to Energy Efficiency Standards & Labeling (ES&L) and Regional Harmonization on ES&L

6. Most Asian countries regard ES&L programs as cost-effective ways to realize their energy efficiency goals, since they provide substantial electricity peak demand reduction and energy savings with attractive cost/benefit ratios. Such programs have proven to be effective for mitigating climate change in all countries in which they have been implemented. However, they are hindered by certain persistent barriers, which can be broadly classified into the following categories:¹

- Policy/regulatory;
- Institutional;
- Technical;
- Information and awareness;
- Market; and,
- Financial.

More details on the barriers can be found in Annex B.

Policy/Regulatory Barriers

7. Country's growth model hindering the promotion and implementation of ES&L programs: Without a policy framework that requires, or at least encourages, ES&L for energy-using equipment, manufacturers will tend to produce lower-cost equipment that is less efficient. In order to overcome this barrier, it is important to strengthen an understanding among policymakers about the importance and substantial benefits of ES&L programs.

8. No mandatory regulations for minimum energy performance standards (MEPS) or mandatory energy labeling: International experience has shown that a framework for mandatory MEPS is the key underlying sustained product efficiency improvements over time. Without mandatory programs, initial progress can be made, but there is no incentive for suppliers of very low efficiency equipment to improve their equipment. A number of countries have initiated voluntary product labeling, but the ultimate efficiency potential from voluntary labeling schemes is limited for many products because many suppliers of low-efficiency equipment choose not to apply the label. In order to overcome this barrier, it is important to develop a regulatory framework and systematically, over time, implement mandatory ES&L programs.

9. Lack of policy framework on ES&L: Few of the countries in the region have a systematic policy and regulatory framework for ES&L. The policy framework is important because it provides a road map for how to prioritize products; test their energy performance; and how to

¹ The section on barriers draws on a survey carried out in participating countries, and further discussion at the Regional Stakeholder Workshop for the BRESL project held in Beijing during 30-31 August 2006.

set requirements for energy labeling and MEPS; and how to regularly review and update the labeling and MEPS requirements, which is critical to maintaining long-term energy efficiency improvements. The regulatory framework is important because it provides the legal basis for implementing the program. The barrier to development of such frameworks may be the belief that energy labeling alone can achieve energy savings, and the limited presence of such frameworks in the region. Korea is one of the only countries in the region with a systematic, integrated framework for testing, establishing MEPS, and integrating the MEPS into its labeling scheme, regularly updating the MEPS levels to make them more stringent. In order to overcome this barrier, it is important to highlight examples of best practice in ES&L and to promote adoption of systematic regulatory frameworks at the national level.

10. Difficulties in negotiations between manufacturers and stakeholders: Policymakers do not have experience with negotiating with equipment manufacturers to increase their efficiency levels. Without an ES&L framework, many countries take an *ad hoc* approach. The problem with this approach is that if there is a substantial minority of suppliers making or distributing low-efficiency equipment they will not agree to, or stall, efforts to develop aggressive MEPS and energy labeling requirements. The threat of mandatory MEPS and labeling is a necessary tool for the government in its negotiations, as is the possibility of limited technical assistance to help suppliers improve the efficiency of their products.

Institutional Barriers

11. Lack of integrated institutional approach to ES&L implementation: To date, implementation of ES&L in the region has been largely *ad hoc*, as has the selection of an implementing institution. For example, in Thailand, energy labeling was carried out for nine years by the electric utility (Electricity Generating Authority of Thailand), without any legal mandate, before the first minimum energy performance standard (MEPS) for end-use equipment (air conditioners). Similarly, Electricity of Vietnam (EVN) is carrying out programs to promote energy-saving lighting equipment (compact fluorescent lamps and thin-tube, “T8” fluorescent lamps) while the Vietnamese Ministry of Industry is in parallel developing a scheme for energy labeling and MEPS for these products. This barrier will be addressed through both regional and national-level training and capacity enhancement in the development and implementation of a standards and labeling scheme for the 5 targeted products.

Technical Barriers

12. Lack of regular testing programs for energy performance of end-use equipment: The BRESL project survey indicated that there are few if any regular programs for testing the energy performance of the target appliances in the participating countries. Such testing programs are critical to establishing the basis initially for energy labeling, and then for later establishment of MEPS. This barrier stems from the lack of clear regulatory framework and mandate and also from lack of awareness among policymakers of the importance of having a human and technical infrastructure for testing and certification of a number of products. This barrier will be addressed by strengthening of national and regional testing and certification infrastructure.
13. Lack of training programs on ES&L framework and implementation: There are no systematic training courses or modules covering the step-by-step process of building up an ES&L regime. In the past, there have been some one-off regional courses sponsored by USAID (e.g., for the South Asia Regional Initiative on Energy), but most of the technical assistance has been provided by direct consultancy to specific agencies that are responsible for establishing ES&L programs. The lack of commonly available training and course materials is a real barrier, which will be addressed through an ES&L Capacity-Building Program that will build

institutional and individual capacity to secure on-the-ground implementation of regulatory frameworks, as well as actual ES&L programs.

14. Lack of accredited testing laboratories: Accredited laboratories are needed for energy performance testing, and to implement harmonized standards across the region. In some cases, test laboratories are available, and can do testing of products, but the laboratory is not accredited, which means that the test results will not be accepted by any other agency in another country. This means that products have to be re-tested after they are imported into the destination country, and this creates a logistical and financial barrier to wider trade in energy-efficient products. In other cases, there are simply no test laboratories in the country, which means that it is not possible to test and label product efficiency, or that products must be tested overseas, which is very expensive. The lack of test laboratories (accredited or not), generally stems from the lack of a regulatory framework for ES&L and the perceived need among policymakers to fund, and implement, a means of performance measurement. This barrier will be addressed through the establishment of a regulatory framework for ES&L and the subsequent establishment of a testing and certification infrastructure.
15. No laboratories for equipment efficiency testing: This is directly related to the institutional barrier above on the lack of accredited test laboratories. For example, the Philippines has done fairly well on its ES&L programs for several products (e.g., lighting, refrigerators, air conditioners) because they long ago established a appliance testing laboratory to measure the energy performance of equipment. This barrier will be addressed in the BRESL project primarily institutionally, through the long-term strengthening of the infrastructure for testing and certification. In some cases there are labs that can be modified or upgraded to perform the testing; but in many cases, there is a need to develop a plan and seek funding for establishment of a test lab. For such decisions, it is important to do an assessment of existing testing capacity and needs.
16. Lack of technical knowledge on ES&L assessments: In cases where ES&L have been implemented for several products (i.e. China, Thailand), there is some local knowledge of the technical basis and terms for carrying out a benefit-cost analysis for energy labeling and MEPS requirements. For many of the countries, however (e.g., Bangladesh, Indonesia, Vietnam), there will be limited institutional knowledge on the framework for terms of reference for carrying out a benefit-cost analysis for an ES&L regime. Often, the work is done by an outside consultant (paid for by an international agency), with limited direct involvement from the implementing agency in the host country. This barrier will be addressed by building institutional and individual capacity to secure on-the-ground implementation of regulatory frameworks, as well as the design of actual programs for MEPS and energy labeling programs.

Information and Awareness Barriers

17. Insufficient public awareness about energy-saving equipment: The lack of public awareness stems in part from the policy barriers above: in many Asian countries, there is not a strong ES&L framework with a requirement for mandatory labeling of all equipment and gradual adoption of MEPS. As the price of oil increases, consumers become much more aware of their role in saving energy, but without even a comprehensive scheme of energy testing and labeling of appliances (let alone establishment of MEPS), the energy performance of appliances that a consumer purchases is relatively “invisible”. This barrier will be addressed largely at the policy level, through the root cause, by working to strengthen the policy context for EE technologies.

Market Barriers

18. Market not driven to EE equipment because without labeling, energy efficiency is an invisible attribute: Without a requirement for energy labeling, there is no driver either for producers to produce energy-saving equipment, or for consumers to pro-actively select such equipment. This is because without energy labeling, energy efficiency is basically an invisible attribute and plays little or no role in the consumer selection process. This barrier will be addressed through the application and enforcement of ES&L legislation and regulations; as well as through capacity enhancement in the development and implementation of ES&L.
19. Limited or no market monitoring and sampling suffer due to lack of manpower and funds: Unfortunately, enforcement and compliance appears to be an afterthought in the implementation of ES&L programs. Survey respondents pointed to the lack of market monitoring and sampling as a key weak link in the chain of ES&L implementation. This barrier will be addressed through strengthening of policy context for EE technologies; application and enforcement of ES&L legislation and regulations; and capacity enhancement in the development and implementation of standards and labeling for the 5 targeted products.
20. Lack of knowledge about the benefits of ES&L among sellers and buyers: This barrier stems from the general lack of public awareness campaigns, which is due in large part to the lack of widespread energy labeling of products. In most of the countries surveyed, energy testing and labeling schemes were in place for only 1 or 2 products - if at all! This barrier will be addressed through application and enforcement of ES&L legislation and regulations; and capacity enhancement in the development & implementation of ES&L for the target products.
21. Table 1 below summarizes the barriers identified in a recent regional survey carried out by UNDP, and indicates the project component under which the barrier will be addressed.

Table 1: Summary of Barriers to Implementation of ES&L Programs

Identified Barrier in BRESL Survey	Activities Addressing Barrier
<p>Policy/Regulatory</p> <p>No mandatory regulations for minimum energy performance standards (MEPS)</p>	<p>Activity 1.1: Strengthening of the Policy Context for Energy Standards and Labels</p> <p>Activity 1.2: Adoption and Implementation of Energy Standards and Labeling Regulations</p> <p>Activity 2.1: Training to Strengthen and Enable Public Institutions to Support Development and Implementation of ES&L Programs</p> <p>Activity 2.2: Capacity Enhancement in the Development and Implementation of Standards and Labeling for the 6 Targeted Products</p> <p>Activity 4.2: Lessons Learned Reports</p> <p>Activity 5.1: Government Procurement (Bangladesh, Indonesia, Thailand, and Vietnam)</p>
<p>Country's growth model hindering the promotion and implementation of ES&L programs</p>	<p>Activity 2.1: Training to Strengthen and Enable Public Institutions to Support Development and Implementation of ES&L Programs</p> <p>Activity 4.2: Lessons Learned Reports</p>
<p>Lack of policy framework on ES&L</p>	<p>Activity 1.1: Strengthening of the Policy Context for Energy Standards and Labels</p> <p>Activity 2.1: Training to Strengthen and Enable Public Institutions to Support Development and Implementation of ES&L Programs</p> <p>Activity 2.2: Capacity Enhancement in the Development and</p>

Identified Barrier in BRESL Survey	Activities Addressing Barrier
	Implementation of Standards and Labeling for the 6 Targeted Products Activity 5.1: Government Procurement (Bangladesh, Indonesia, Thailand, and Vietnam)
Difficulties in negotiations between manufacturers and stakeholders	Activity 2.3: Strengthening of National and Regional Testing and Certification Infrastructure Activity 2.4: Strengthening of Data Collection and Reporting Procedures on Equipment Availability and Sales by Efficiency Level in Participating Countries Activity 3.2: Educational Workshops for Manufacturers and Retailers on Impacts of Standards on Manufacturers and Retailers and Ways to Work with Standards to Increase Profitability Activity 3.3: Technical Assistance to Manufacturers
Institutional	
Lack of accredited testing laboratories	Activity 2.3: Strengthening of National and Regional Testing and Certification Infrastructure
No independent institution to carry out program	Activity 2.2: Capacity Enhancement in the Development and Implementation of Standards and Labeling for the 6 Targeted Products
Technical	
Lack of regular testing programs for energy performance of end-use equipment	Activity 2.3: Strengthening of National and Regional Testing and Certification Infrastructure Activity 2.4: Strengthening of Data Collection and Reporting Procedures on Equipment Availability and Sales by Efficiency Level in Participating Countries Activity 3.1: Product Technical Analysis and Reports
Lack of training programs on ES&L framework and implementation	Activity 2.1: Training to Strengthen and Enable Public Institutions to Support Development and Implementation of ES&L Program
No lab for equipment efficiency testing	Activity 2.3: Strengthening of National and Regional Testing and Certification Infrastructure Activity 3.3: Technical Assistance to Manufacturers
Lack of technical knowledge on ES&L assessments	Activity 2.1: Training to Strengthen and Enable Public Institutions to Support Development and Implementation of ES&L Programs Activity 2.2: Capacity Enhancement in the Development and Implementation of Standards and Labeling for the 6 Targeted Products Activity 2.4: Strengthening of Data Collection and Reporting Procedures on Equipment Availability and Sales by Efficiency Level in Participating Countries Activity 4.2: Lessons Learned Reports Activity 5.2: Database (and Web Site) of Energy-Efficient Equipment (Bangladesh and China)
Information and Awareness	
Insufficient public awareness about energy-saving equipment due to low government priority and lack of funding	Activity 1.1: Strengthening of the Policy Context for Energy Standards and Labels Activity 2.4: Strengthening of Data Collection and Reporting Procedures on Equipment Availability and Sales by Efficiency Level in Participating Countries Activity 5.1: Government Procurement (Bangladesh, Indonesia, Thailand, and Vietnam) Activity 5.2: Database (and Web Site) of Energy-Efficient Equipment (Bangladesh and China) Activity 5.3: Development of consumer education schemes (Bangladesh, Indonesia, and China)

Identified Barrier in BRESL Survey	Activities Addressing Barrier
Market	
Market not driven to EE equipment because without labeling energy efficiency is an invisible attribute	Activity 1.2: Adoption and Implementation of Energy Standards and Labeling Regulations Activity 2.2: Capacity Enhancement in the Development and Implementation of Standards and Labeling for the 6 Targeted Products Activity 5.1: Government Procurement (Bangladesh, Indonesia, Thailand, and Vietnam)
Limited or no market monitoring and sampling suffer due to lack of manpower and funds	Activity 1.1: Strengthening of the Policy Context for Energy Standards and Labels Activity 1.2: Adoption and Implementation of Energy Standards and Labeling Regulations Activity 2.4: Strengthening of Data Collection and Reporting Procedures on Equipment Availability and Sales by Efficiency Level in Participating Countries Activity 5.2: Database (and Web Site) of Energy-Efficient Equipment (Bangladesh and China) Activity 5.3: Development of consumer education schemes (Bangladesh, Indonesia, and China)
Lack of knowledge about the benefits of ES&L among sellers and buyers	Activity 1.2: Adoption and Implementation of Energy Standards and Labeling Regulations Activity 2.2: Capacity Enhancement in the Development and Implementation of Standards and Labeling for the 6 Targeted Products Activity 3.2: Educational Workshops for Manufacturers and Retailers on Impacts of Standards on Manufacturers and Retailers and Ways to Work with Standards to Increase Profitability Activity 5.1: Government Procurement (Bangladesh, Indonesia, Thailand, and Vietnam) Activity 5.3: Development of consumer education schemes (Bangladesh, Indonesia, and China)

22. The identified barriers were discussed, verified and confirmed during a Regional Stakeholder Consultation Workshop, in which the project framework design was developed using logical framework analysis (LFA). The project activities to remove the barriers were also reviewed and confirmed. The agreed project planning matrix (PPM) is shown in Section II, Part II.

Institutional, Sectoral and Policy Context

23. International experience has shown that ES&L programs have the potential to reduce the unit energy consumption of end-use equipment by as much as 30-50% within a time frame of five to ten years. These savings can be obtained systematic application of a regime that includes product testing, energy labeling, and establishment of minimum energy performance standards for the most significant energy-using equipment in the home. These savings pay for themselves over time, and the efficient equipment has a lower life-cycle cost for consumers.

24. Recently, an APEC report based on a set of international expert consultations² concluded that ES&L programs should be a national priority; but that at the same time, in order to maximize the impact of a national program, countries should also work internationally with like-minded governments and trading partners to harmonize ES&L efforts. The report also included

² *A Strategic Vision for International Cooperation on Energy Standards and Labeling: A Monograph with Commentary by International Experts.* Published by Australian Greenhouse Office. June 2006.

examples of the significant energy savings and CO2 emissions reductions that can be achieved through ES&L in a relatively short time frame. Figure 1 below shows product efficiency improvements in the range of 40-60% in Korea over a seven-year time period. This level of savings was only possible through application of a combined, integrated program including mandatory labeling linked to mandatory energy performance standards (MEPS).

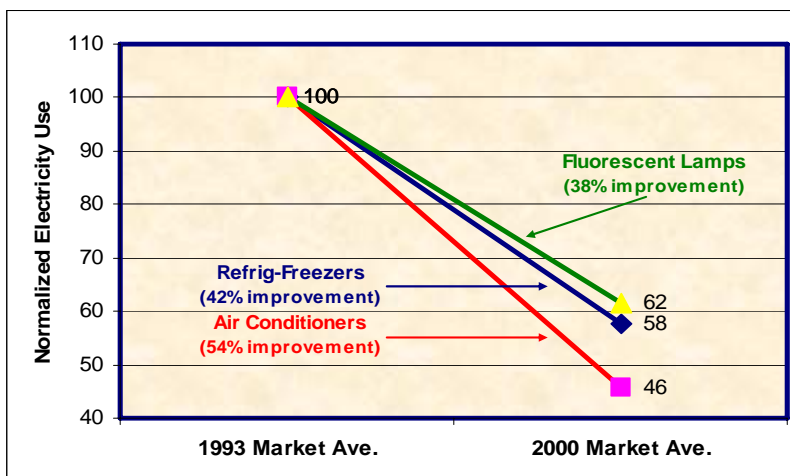


Fig. 1: Change in Average market Efficiency of Korean Appliances, 1993 – 2000³

25. In general, Asian energy policymakers understand the benefits from the implementation of an effective ES&L program, and ES&L programs are considered a core part of most countries' overall energy efficiency programs. However, despite this high awareness of ES&L, and the prevalence of ES&L programs in Asia, only a few Asian countries are systematically implementing ES&L programs in a way that leads to significant, sustained savings. This is because many countries begin ES&L with voluntary energy labeling, and they are reluctant to counter pressure from manufacturers against imposition of mandatory labeling or MEPS.
26. Currently, the number of countries with ES&L programs in Asia is 12 and these programs cover more than 25 different types of products (see Table 2). Although the number of ES&L programs in place is increasing, the rate of increase is slow, and there are many countries with few or no programs in place. In addition, the vast majority of the ES&L programs is mandatory, and is not regularly updated to continually yield efficiency improvements.

Table 2: Cumulative Number of Standards and Labeling Programmes in Asia and Worldwide (as of the end of 2005)

Region	Pre-1980	1980-1985	1986-1990	1991-1995	1996-2000	2001-2005
Asia	1	2	5	10	11	12
Worldwide	5	9	15	38	46	62

Source: Collaborative Labeling and Appliance Standards Program (CLASP). Based on Wiel and McMahon (2005) and ESIS web site (2006)

³ Lee Sun-Keun, 2001. "MEPS Experience in Korea." Paper presented at the conference, *Lessons Learned in Asia: Regional Conference on Energy Efficiency Standards and Labeling*. Organized by Collaborative Labeling and Appliance Standards Program (CLASP) and the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). Bangkok, Thailand, 29-31 May.

27. Clearly, there is a need to increase the number of ES&L programs, while at the same time building capacity to establish the institutions to operate the program and to effectively implement and monitor the programs. There is also a need for more urgency in efforts to harmonize and align regulatory processes. The consensus of the international consultations sponsored by APEC was that the first and most productive area for exploring alignment is in energy performance test procedures, since this facilitates the ability to manufacture and sell products across different markets, and also allows a consistent comparison of energy performance and energy efficiency.

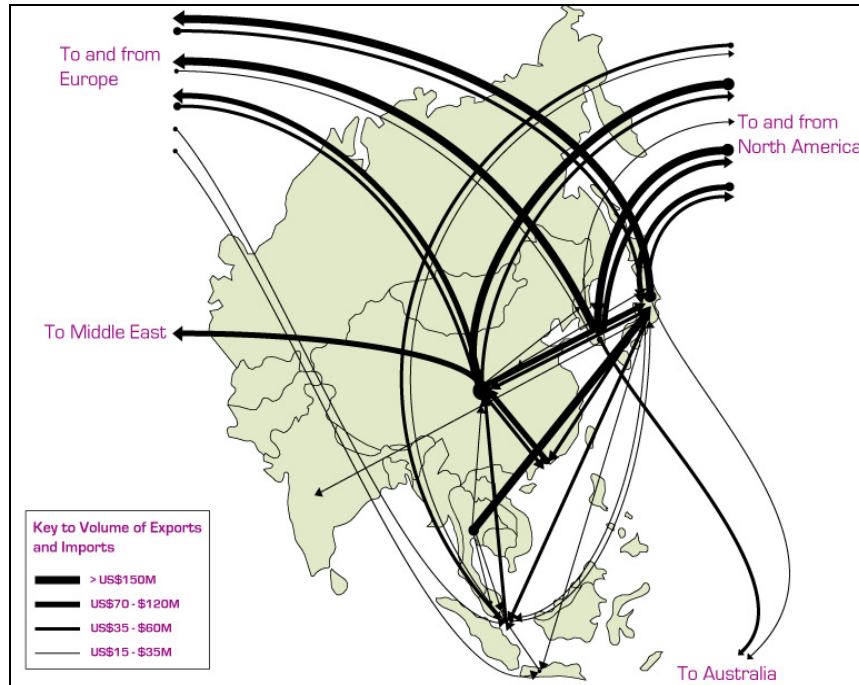


Fig. 2: Exports and Imports of Refrigerators throughout Asia
(70% of product trade shown)

28. Appliance, equipment and lighting products manufactured in the countries in the region are presently found both in regional and global markets. For example, most of the refrigerators that are used throughout Asia are made in China, South Korea, Japan, Singapore, Europe or the United States. However, nearly all countries manufacture some refrigerators for internal sale and export. For instance, Indonesia, which manufactures refrigerators, still imports refrigerators from eleven Asian countries and exports refrigerators to these same eleven plus four other Asian countries. A chart showing this product flow throughout Asia is shown in Fig. 2 above.

29. With regard to ES&L information, a number of authoritative information sources are now available with data and tools on international standards and labeling efforts. Three of the most prominent are the APEC Energy Standards Information System (APEC-ESIS); the Collaborative Labeling and Appliance Standards Program (CLASP); and the International Energy Agency (IEA). APEC has entered into a sponsorship agreement with CLASP, and that this has led to the development of a new Global Standards and Labeling Database, which was formally launched in mid-2005.

Stakeholders and Regional Collaboration in ES&L

30. The proposed project is designed to build on the present capacity for ES&L programs in some of the Asian countries, as well as on the outputs and lessons learned from the implementation of previous and ongoing ES&L initiatives in the region, which are mostly sub-regional collaborations addressing ES&L:
31. **APEC Expert Group on Energy Efficiency & Conservation, under the APEC Energy Working Group** - For nearly a decade, APEC has been actively working to reduce the barriers to trade from the proliferation of different energy standards, and to facilitate energy efficiency improvements. The APEC Energy Ministers have directed that APEC economies introducing or preparing mandatory energy-efficiency requirements should advise other economies of these proposals before they are implemented. In addition, they have directed APEC to develop a Standards Notification Procedure to facilitate the co-ordination of the development of energy standards and technical requirements. Through the APEC Experts Group on Energy Efficiency & Conservation (EGEE&C), APEC has focused on harmonization to reduce barriers to trade in energy-efficient appliances and equipment. Its efforts since 1997 have culminated in the development in 2002 of an, web-based Energy Standards Information System (ESIS – www.apec-esis.org); a user-friendly, web-based database that provides regularly updated, comprehensive information on technical standards for energy-using equipment in the 21 APEC economies.
32. **South Asia Regional Initiative (SARI) – Energy** - The SARI-Energy initiative is funded by the U.S. Agency for International Development. SARI countries (Bangladesh, Bhutan, India, Nepal, Maldives, and Sri Lanka) conducted three EE S&L Harmonization Meetings in Sri Lanka and India during 2003 to 2005. The meetings were organized by the Academy for Educational Development (AED), Nexant Consultants, and the Collaborative Labeling and Appliance Standards Program (CLASP). Through the SARI program, countries in the region worked on a Harmonization Road Map, with the objective of harmonizing test protocols, strategy and structure for regional harmonization in the area of appliance/equipment energy standards and labeling. The SARI initiative on ES&L been regarded as an example of the strong potential for regional cooperation. Unfortunately, the ASEAN effort also not gone forward due to lack of funding and lack of strong leadership among the South Asian countries.
33. **Association of Southeast Asian Nations (ASEAN)** - In 1999, ASEAN energy ministers identified the development of an ES&L initiative for the ASEAN region as an ASEAN priority in the energy sector. The ASEAN leader highlighted ES&L in order to curb growing electricity demand in the region, and in light of the proven success of energy ES&L programs being pursued by some of its ten member countries. The ASEAN Energy Efficiency and Conservation Sub-Sector Network (EE&C-SSN) under the ASEAN Centre for Energy (ACE) was given a mandate to develop and implement the ASEAN Energy Labeling Project. The objective was to accelerate the rate of improvement in the energy efficiency of end-use equipment, while avoiding the introduction of regional non-tariff trade barriers. Due to limited funding, the ASEAN countries decided that the label would be a voluntary endorsement type that could be used alone or with national labels. An initial round of labels were developed for electromagnetic ballasts for fluorescent lamps (2004-2005); followed by refrigerators (2005-2006); and, soon to come, air conditioners, electric motors and fans (2006-2009). Unfortunately, the ASEAN energy labeling project never got off the ground – in large part due to financial constraints and the lack of a strong lead agency.

34. **CFL Harmonization Schemes** - One set of harmonization schemes that appears headed for success are for compact fluorescent lamps (CFLs). The Efficient Lighting Initiative (ELI) includes a certification scheme for energy-efficient lighting, that currently focuses primarily on labeling of CFLs. ELI was initiated as a seven-country, US\$ 15 million GEF-funded initiative managed by the International Finance Corporation (IFC). After the project ended in 2003, IFC issued an international tender and supported the establishment of the ELI Quality Certification Institute to operate the ELI certification and labeling scheme. The Institute is located in Beijing and is managed by the China Standardization Center (CSC), and ELI's CFL technical specifications have been adopted by a number of countries internationally that are operating large-scale CFL programs.
35. A related initiative is the International CFL Harmonization Initiative, which is an international effort supported by the major CFL manufacturers, a number of national governments, lighting trade associations, and NGOs active in the energy and lighting field. The CFL Harmonization Initiative has two main objectives: to develop a single, international, harmonized test procedure for CFLs through the International Electrotechnical Commission; and to develop a common set of internationally recognized performance specifications, which can be voluntarily adopted by governments in order to rationalize the way that CFLs are regulated internationally. This is especially important, since 90% of CFLs are made in China, and they are currently regulated internationally by more than 33 different sets of MEPS and labeling programs in countries around the world. Since CFLs are one of the core products in BRESL, the BRESL countries will have an excellent opportunity to coordinate their activities through the two ongoing CFL harmonization efforts -- the ELI program and the International CFL Harmonization Initiative.
36. Through the proposed BRESL project, the participating Asian countries will work together to coordinate and share information on their ES&L programs. Such cooperation is envisioned as something that will yield the benefits of greater market transparency, reduced costs for monitoring and evaluation (M&E) and product testing, enhanced prospects for trade and technology transfer, reduced costs for developing government and utility energy efficiency programs, and open trading of energy efficient appliances/equipment.
37. The BRESL project will also collaborate with IEA countries in the Asia-Pacific region (Australia, Canada, Japan, Korea, New Zealand and the U.S), which are important current and future trading partners. Moreover, BRESL will also collaborate with several other GEF-funded projects that include ES&L components as major activities in achieving GHG emission mitigation goals.
38. The BRESL project will work with national teams and government counterparts associated with the above regional efforts, as well as with other UNDP/GEF projects in the region to collaborate in the design and implementation of national ES&L programs. It will also build on outputs/outcomes of previous GEF-funded ES&L-related projects in the region like the completed Efficient Lighting Initiative (ELI) in the Philippines. ELI follow up activities are currently being handled out of Beijing by CSC, which is also a partner for the End-Use Energy Efficiency Project (EUEEP) project in China. With the National Development and Reform Council's (NDRC) strong mandate to coordinate all ongoing activities in China, it is hoped that many of the past stand-alone activities on standards & labels by different agencies on different appliances can coherently be brought under one umbrella. The project will pursue new ES&L goals and attempt to stimulate a regional sharing of the expertise that is expanding throughout the region.

39. Table 3 below summarizes the ongoing and planned cooperation efforts for regional initiatives on ES&L. The donor projects include both GEF projects and a range of other donor-funded projects. This indicates the substantial amount of leverage that will be provided by the BRESL project. While many of the initiatives below are in-country efforts to develop standards for specific projects, none of the current or ongoing efforts takes the regional approach that BRESL will take to facilitate regional cooperation, harmonization, and actual implementation, of energy labeling and MEPS for a set of core energy-using appliances and products.

Table 3: Summary of BRESL Country Involvement in Regional Cooperation or Harmonization Efforts Related to ES&L

Country	Description of Involvement	Donor
Bangladesh	Energy Efficiency Improvement in Industries (appraisal mission completed, will include some ES&L)	GTZ
	Energy efficiency standard and labeling	USAID/SARIE
China	Harmonization with CSC and U.S. Energy Star	U.S. EPA
	Certification of Energy Efficiency Power Adapters	Energy Foundation
	Development of labeling technical specification for office equipments	Energy Foundation
	Riding the New Digital Wave: Developing Energy Efficiency Labeling and MEPS for Set Top Boxes in China	Energy Foundation
	Barrier Removal for the Efficient Lighting Products and Systems (China Green Lights) (completed)	UNDP/GEF
	Barrier Removal for the Widespread Commercialization of Energy-Efficient CFC-Free Refrigerators (completed)	UNDP/GEF
	End-Use Energy Efficiency Project (EUEEP)	UNDP/GEF
	Cooperation between CSC and Australian government on ES&L	Australian Greenhouse Office
	Efficient Lighting Initiative	International Finance Corp.
International CFL Harmonization Initiative	Australia, United Kingdom	
Indonesia	ASEAN Regional Standards and Labeling Harmonization Program	ASEAN
Korea	The development of the test standard and the energy efficiency level for Kimchi refrigerator	Ministry of Commerce, Industry, and Energy
	The development of the test standard and the energy efficiency level for Dishwasher	Ministry of Commerce, Industry, and Energy
	The development of MEPS level for AC and refrigerator	Ministry of Commerce, Industry, and Energy
	The development of the test standard and the energy efficiency level for Freezer	
	The development of the test standard and the high energy efficiency level for Heat Recovery Ventilator	
Thailand	DSM energy labeling for refrigerators, air conditioners, electric fans, ballasts, rice cookers, etc.	World Bank/GEF and Thailand funding
	Promotion of Energy Efficiency through 30% subsidy program for energy-efficient equipment for buildings and factories	DANIDA and Thailand funding
	ASEAN Regional Standards and Labeling Harmonization Program	ASEAN
Vietnam	Vietnam Phase 2 DSM (CFLs, FTLs, solar water heaters)	World Bank/GEF

Country	Description of Involvement	Donor
	Energy Efficiency in SMEs	UNDP/GEF
	Vietnam: Energy Efficiency Public Lighting(VEEPL)	UNDP/GEF

Source: Based on May 2005 GEF concept paper for BRESL project; May 2006 BRESL survey; and consultant's research.

Baseline Scenario

40. Countries in the Asian region are at various levels of development and implementation of ES&L programs. Some countries—such as Korea, China, Thailand, and the Philippines—have fairly well developed standards and labeling programs for several products, but are at variance from each other. Other countries have programs in their beginning stages or no programs at all.
41. Presently, ES&L programs are carried out at the national level and – despite the regional cooperation efforts mentioned above – nearly entirely without the benefit of exchange of both technical and human capital with other countries in the region. Initial indications of interest from some of the target countries in the region (particularly those from ASEAN) were expressed during an APEC-sponsored energy efficiency standards and label workshop that was held in Taiwan in November 2003. Table 4 provides an overview of information on the countries participating in the BRESL project.

Table 4: Comparative Information on the BRESL Countries (including Republic of Korea)

BRESL Country	Population (million)	Annual Elec Use (GWh/yr)	Peak Electric Demand (MW)	Electricity Growth Rate (%/yr)	Estimated Appliance Saturation Rates (pieces per household)		
					Refrigerators	Air Conditioners	Rice Cookers
Bangladesh	140	21,408	4,700	7.5	25%	7%	0%
China	1,295	2,194,300	332,200	15.2	32%	18%	31%
Indonesia	NA	101,800	NA	NA	25%	7%	0%
Korea	47.3	332,413	54,631	NA	104%	42%	105%
Thailand	61	126,000	21,000	5.7	101%	29%	99%
Vietnam	84	39,000	8,500	15.5	27%	7%	66%

42. Table 28 in Annex C shows the volume of stock and sales of each BRESL product in 2004. Only the products that each BRESL country will work on under this regional project are shown. These data were used as baseline in estimating the anticipated energy consumptions and CO₂ emissions under a business-as-usual scenario. These were also used in estimating the potential energy savings and corresponding CO₂ emission reductions from the utilization of the improved and energy efficient versions of the 6 BRESL products under the alternative scenario, which the BRESL project aims to achieve.
43. The baseline scenario is that countries in the region continue to develop their ES&L programs, but still at a slow and uneven pace and hindered by and the mentioned barriers in financing, policy, technology and information. This is the “business-as-usual” scenario in the field of ES&L development and implementation in Asia. Table 5 summarizes the existing status of energy labeling programs among the BRESL countries, and Table 6 indicates which countries have MEPS in place.⁴ Clearly, China and Korea are the most active. Thailand is quite active in the area of labeling, but has only implemented MEPS for one product to date.

⁴ The data in these tables are based on responses from the BRESL survey carried out in May 2006. The status of labeling and MEPS were updated during the regional stakeholders' consultation workshop held in Beijing, China during 30-31 August 2006, as part of the project development activities.

Table 5: Current Status of Energy Labeling Programs in BRESL Countries (including Republic of Korea)

Product	Bangladesh	China	Korea	Thailand	Vietnam
Refrigerator		●	●	●	
Freezer			●		
Kimchi Refrigerator			●		
Room Air-conditioner		●	●	●	
Washing Machine		●	●		
Horizontal drum washing machine		●	●		
Dishwasher			●		
Dish drier			●		
Electrical Cooler and Heater for Drinking Water			●		
Brown rice cooker				●	
Rice cooker		●	●	●	
Vacuum cleaner			●		
Residential Fan	●		●	●	
Incandescent lamp	●		●		
Compact fluorescent lamp		●	●	●	
Fluorescent tube lamp	●	●	●		
Fluorescent lamps ballast		●	●	●	
HID Lamp		●			
Associated ballast		●	●		
Household Gas Boiler			●		
Luminaire				●	
Electric motor (3-phase)			●		
Air Cleaner			●		

Source: May 2006 BRESL survey and consultant's research; updated at BRESL Stakeholder Consultation Workshop in Beijing during 30-31 August 2006. Data are not available for Indonesia.

Table 6: Current Status of Minimum Energy Performance Standards (MEPS) in Selected BRESL Countries (including Republic of Korea)

Product	China	Korea	Thailand	Vietnam
Refrigerator	●	●	●	
Freezer	●	●		
Kimchi Refrigerator		●		
Room Air-conditioner	●	●	●	
Washing Machine	●	●		
Horizontal drum washing machine	●	●		
Dishwasher		●		
Dish drier		●		
Electrical Cooler and Heater for Drinking Water		●		

Product	China	Korea	Thailand	Vietnam
Rice cooker	●	●		
Vacuum cleaner		●		
Residential Fan	●	●		
Incandescent lamps	●	●		●
Compact fluorescent lamp	●	●		
Fluorescent tube lamp	●	●		●
Fluorescent lamps ballast	●	●		●
HID Lamp	●			
Associated ballast	●	●		
Electric motors (3-phase)	●	●		●
Air Cleaner		●		
Household Gas Boiler		●		
Industrial pumps	●			
Television	●			
Gas heater	●			
Radio	●			
Iron	●			

Source: May 2006 BRESL survey and consultant's research; updated at BRESL Stakeholder Consultation Workshop in Beijing during 30-31 August 2006. Data are not available for Bangladesh & Indonesia

44. **Bangladesh:** Bangladesh enacted a National Energy Policy in 1996. The plan gives special importance to energy efficiency. The plan calls for awareness campaigns, the gradual implementation of ES&L programs, and energy auditing and training. The Bangladesh Standards and Testing Institute has primary responsibility for implementation of ES&L. Bangladesh has plans to initiate energy labeling programs for a number of products. *Bangladesh is only likely to make very minimal progress on labeling and MEPS in a baseline mode, without the GEF assistance to attend the regional technical product working groups and the technical assistance in the analysis and implementation of ES&L.*
45. **China:** China enacted an Energy Conservation Law in 1997. The law aims to achieve the rational and efficient use of energy through enhanced energy use management, the adoption of measures, and the reduction of loss and waste in the energy production and consumption chain. Since then, the various state agencies responsible for standardization and certification have been aggressively developing new measures to implement the Energy Conservation Law. These include China the National Institute of Standardization, which is responsible for the development, implementation and supervision of MEPS; and the China Standardization Center (CSC), which is responsible for endorsement labeling. Starting in 1998, China focused on its endorsement labeling program for high-efficiency products. Starting in 2003, China also announced and began implementing a comparative labeling program, which is now mandatory for several products. A Medium- and Long-term Energy Conservation Plan was drafted in 2004. The plan sets the following targets: (a) energy consumption per unit of GDP in 2010 shall 20% lower than the level in 2005; (b) water consumption in industry is targeted for a reduction of 30%; (c) the effective coefficient of irrigation water use is targeted to increase to 0.5; and, (d) the integrated utilization of industrial solid waste rate is targeted to increase to more than 60%. *China therefore has a strong base of existing products covered by MEPS, mandatory labeling, and voluntary labeling. China will not participate in the BRESL product for refrigerators and electric motors, since their MEPS for these products are under*

development; however, they will participate through BRESL in the development of ES&L for the other four products – air conditioners, ballasts, electric fans, and rice cookers.

46. **Indonesia:** In Indonesia, the Directorate General of Electricity and Energy Development (DGEED), under the Ministry of Mines and Energy (MME), completed a Master Plan in 1995 for Energy Conservation. The plan included an import tax reduction on high-efficiency equipment and soft loans for companies implementing energy efficiency improvements. DGEED is also responsible for developing and establishing national energy standards. However, no minimum energy efficiency standards have been imposed on any electrical products in Indonesia. At present, Indonesia is in the process of drafting national standards for room air conditioners, electric water heaters, televisions and electric irons. When implemented, the standards will mandate minimum energy efficiency levels for these products. *Progress on ES&L has been very slow in Indonesia, and without the GEF assistance it is unlikely to actually effectively implement 1-2 labeling programs and the same number of MEPS over the next five years.*
47. **Korea:** The Republic of Korea's effort to promote energy efficiency and conservation was triggered by the two oil crises of the 1970s. To overcome its high-energy prices and unstable supply, the Korean government developed energy efficiency and conservation policies. The result is one of the most extensive ES&L programs in the region, with mandatory standards and labels covering a broad range of products. The key legislation on energy efficiency in Korea is the Rational Energy Utilization Act of 1992. Programs implemented under the framework of this act include the Energy Efficiency Labeling & Standards Program, the Energy-Saving Office Equipment & Home Electronics Program; and the High-Efficiency Equipment Certification Program. *As a long-time regional leader in the implementation of ES&L, Korea will participate actively in the program, but will not be a recipient of GEF funding. Korea will share information, attend meetings, and provide technical assistance. In particular, Korea will participate in a process of coordinating MEPS and labeling for four of the target products: air conditioners, refrigerators, motors, and CFLs.*
48. **Thailand:** Thailand has one of the more active energy conservation frameworks in Asia. The Ministry of Energy is the overall agency in charge of energy policy, and the Department of Alternative Energy Development and Efficiency (DEDE) serves as Chair of a Working Group on Energy Standards and Labeling. DEDE has responsibility for setting high-efficiency levels for energy-using equipment and for establishing MEPS; the Electricity Generating Authority of Thailand (EGAT) has been running a voluntary energy labeling program covering several types of end-use equipment since 1996; the Energy Policy and Planning Office (EPPO) is responsible for macro policy and promotion of ES&L programs; and the Thailand Industrial Standards Institute (TISI) is responsible for energy performance test protocols and for publishing the MEPS. All of these agencies sit on the ES&L Working Group. Thailand currently has voluntary energy labeling for refrigerators, air conditioners, brown rice, rice cookers, residential fans, compact fluorescent lamps, and fluorescent lamp ballasts; and MEPS are in place for air conditioners (2005) and will soon be implemented for refrigerators.
49. **Vietnam:** The Vietnamese government passed a *Governmental Decree on Energy Conservation and Energy Efficiency (102/2003/ND-CP)* on 3 September 2003. The Decree sets forth the roles and responsibilities for all actors in government and society with respect to energy efficiency. The decree calls for suppliers of energy-consuming equipment and facilities to declare the energy consumption of the equipment in the user instructions and on the labels of such equipment and facilities. After verification, the products will receive an Energy Efficiency Quality Products Certificates and then attach an Energy Efficiency Labels to their products. The Prime Ministerial Decision of the 14 April 2006 approved the

Electricity Saving Program for the period 2006 to 2010. The Electricity Saving Program authorizes the Ministry of Industry (MOI) to issue Circular guides requiring that suppliers put a label on high-efficiency electric appliances: electric motors, fans, air conditioners, fluorescent-tube lamps (FTLs); and FTL ballasts. Actual technical standards for equipment energy performance will be issued by the Ministry of Science and Technology. The Electricity Saving Program also calls for MOI to develop a road map for replacement of 40 million incandescent lamps with CFLs, FTLs, and T5 lamps. The national utility, Electricity of Vietnam (EVN) has been implementing a national DSM program since 2001, and is currently implementing a national program to distribute 1 million compact fluorescent lamps and thin-tube fluorescent lamps. *While Vietnam has recently issued MEPS for a few products, they have yet to actually begin enforcement, and the GEF assistance will be very useful in this regard. In addition, Vietnam has designed both a comparative and endorsement energy label, but it has not yet developed implementing guidelines for the labels and algorithms for applying them. Without the GEF assistance, it is likely that Vietnam would implement no more than two MEPS and two labeling schemes over the next five years.*

50. The Baseline Scenario will be a continuation of existing ES&L programs with an assumption that future implementation of programs proceeds at the trajectory of the past five years. For most of the participating countries, this means that under the baseline scenario, perhaps one or two new ES&L programs would be added during the five-year period of this BRESL project.

51. Based on studies carried out on ES&L in the region and from the BRESL Survey, the baseline, or business-as-usual (BAU), scenario will most likely be characterized by the following:

- The rate at which MEPS and labeling programs are implemented proceeds at a very slow pace, with most countries (with the exception of China and Korea) implementing only voluntary labeling programs and no more than one MEPS every five years.
- The natural rate of increase in equipment efficiency, will be as follows:

Appliance/Equipment	BAU increase in efficiency (% improvement per year)
Refrigerators	1.0%
Room air conditioners	1.0%
Electric motors	0.2%
Ballasts for FTLs	1.0%
Electric fans	0.5%
Compact fluorescent lamps	1.0%
Rice cookers (1)	0.5%

52. Without the BRESL project, efficiency levels would gradually increase under a Business-as-Usual (BAU) scenario, from 0.2 % to as high as 1% per year, depending on the product.

PART II: STRATEGY (*Expanded Details Contained in Section IV, Part VI*)

Project Rationale and Policy Conformity

53. The proposed GEF-supported alternative to the baseline scenario is intended to reduce greenhouse gas emissions in the participating countries by removing barriers to effective ES&L programs and policies, leading to significantly expanded ES&L programs in the region, thereby substantially reducing energy consumption in the participating countries. Some of the participating countries (e.g., Bangladesh, Indonesia, Vietnam) have limited or no ES&L programs and policies. This project will provide them with the information and assistance needed to develop and begin implementing such programs. Some of the participating countries (e.g., Thailand) have a number of ES&L programs and policies in place. This project will enable them to significantly expand their programs. A few participating countries (e.g., China, Korea) have extensive ES&L programs. This project will enable them to update and expand their programs and will also use their expertise to help mentor other participating countries.
54. The proposed BRESL project aims to facilitate development of efficiency programs in the participating countries through ES&L capacity building and improved harmonization. Harmonization is envisioned to serve the interests of all countries involved, whether more or less advanced in their development of a program. Countries with well-developed ES&L programs for appliances and equipment have an interest in bringing their programs into better alignment for the purposes of promoting free trade. This means that different existing standards are made to agree by modifying the specifications of one or both existing programs. For those that are in the early phase of initiating an ES&L program, harmonization can refer to the selection of procedures and practices from the list of already existing programs throughout the region. In this way, countries can leapfrog and take advantage of well-established successful practices. However, harmonization is likely to be a gradual, long-term process. Due to differences between countries and resistance to changing established procedures, in many cases harmonization will not be easy. This proposed project will begin this long-term project, achieving concrete harmonization progress by project end.
55. With a major focus on capacity building and information exchange, such a regional program will help to collectively eliminate ineffective practices, reduce financial barriers, and strengthen both policy formulation and enforcement. The technical exchange that is envisioned to happen under such a regional initiative will allow for information and expertise to flow more freely across borders within the region. Facilitating regional cooperation will allow the participating countries to appreciate and gain from harmonization, or mutual recognition of energy performance test procedures. Initiating a dialogue between countries will help to lay the groundwork for eventual harmonization. The overall effect of this will be to increase the rate at which energy-efficient products are developed by local manufacturers and suppliers, recognized and supported by government policy, and purchased and used by consumers.
56. This proposed project will include a major focus on working with and assisting individual countries to actually set and begin to implement standards and labels on a menu of targeted products. In this way concrete energy-saving and carbon-reduction benefits will be achieved during the project period, helping to show participating countries the benefits of ES&L and increasing the likelihood that some project activities will continue even after GEF support ends. This focus on setting minimum standards and implementing labeling programs comes from a survey of participating countries, who asked that this project focus on “doing” and not just capacity building.

57. Based on a survey of participating countries carried out during May 2006, and based on activities elsewhere in the world, the project will focus on six products: (1) refrigerators; (2) room air conditioners; (3) electric motors; (4) ballasts for fluorescent tubes; (5) electric fans; and (6) compact fluorescent lamps. These appliances and equipment account for the majority of electricity consumption in the residential and industrial sectors, and are covered in the national ES&L programs of a number of Asian countries. This list of products was developed during the May 2006 survey and was validated at the Regional Stakeholder Consultation Workshop held in Beijing during 30-31 August 2006. In addition, China will develop a new rice cooker standard as part of BRESL, consulting with Viet Nam and Thailand who also expressed interest in this product (in a vote of participating countries, rice cookers just missed the cut for full-fledged inclusion in the project's regional activities).
58. The proposed BRESL project will achieve the objective set out in GEF Operational Programme 5, to remove barriers to energy efficiency and energy conservation. It will address the abovementioned barriers, which if not removed will consequently hinder achievement of the desired market transformation for energy-efficient appliances and equipment in the Asia region. The project will involve ongoing and planned ES&L activities of the various countries in the region, as well as incremental activities for removing barriers, in order to achieve the envisioned regional progress in the field of ES&L.
59. The BRESL project, by developing a regional forum and network for dialogue and action on ES&L, will increase the capacity and political will of Asian countries to develop, implement and finance ES&L programs. Ultimately, the outcome will lower energy intensity within countries in the region. The active policy support of the government in these programs will also result in the integration of the principles of sustainability into country policies and programs, in line with the MDG 7 goals. The opening of the markets in the region to increased trade and sale of energy-efficient appliances and products, and the diffusion of technology through technical exchange and demonstration is in line with MDG 8's mandate to develop an open trading and financial system that is rule-based and predictable and to cooperate with the private sector to make available the benefits of new technologies.

Alternative Scenario

60. Under the alternative scenario, the participating Asian countries (hereinafter referred to as BRESL countries) will develop a much-improved capacity to design and implement national ES&L programs. Clearly, there is still substantial room for improvement in the ongoing ES&L programs in the countries in the region. As noted earlier, there is little or no ES&L activity in most of the target countries, especially with regard to implementation of the most effective energy-saving policy option – mandatory minimum energy performance standards (MEPS).
61. To achieve the alternative scenario, the proposed BRESL project will involve a serious and sustained effort to expedite and enhance the development of ES&L programs both within and across borders. BRESL will facilitate development of efficiency programs in the participating countries through technical assistance that leads to direct implementation; through capacity building in all aspects of ES&L activities; and through sharing of experience and steps towards harmonization of energy-performance test procedures, product certification procedures, and product standards. Under BRESL, countries with extensive ES&L experience such as Korea, China (for standards) and Thailand (for labels) will help to mentor other participating countries. Such a regional program will help to collectively eliminate ineffective practices, reduce financial barriers, and strengthen both policy formulation and enforcement.

The technical exchange that is envisioned to happen under such regional initiative will allow for information and expertise to flow more freely across borders within the region. Facilitating regional cooperation will allow the participating countries to appreciate and gain from harmonization, or mutual recognition of energy standards & test procedures. Initiating a dialogue between countries will help to lay the groundwork for eventual harmonization. The overall effect of this will be the increased rate at which energy efficient products are developed by local manufacturers, recognized and supported by government policy, and purchased and used by consumers.

62. The Alternative Scenario will be a concerted effort that includes substantial regional cooperation and information sharing but leads to concrete implementation of MEPS and labeling programs for the six targeted products within the five-year duration of the project.
63. The realization of the Alternative Scenario is manifested by and large by the following:
- Implementation of minimum energy performance standards and energy labeling schemes for all six products in all countries that participate for the particular product.
 - Mandatory MEPS are announced for each of the products at the end of Year 2 and take effect in Year 4 of the BRESL project. The MEPS are expected to lead to an immediate reduction in energy use of 4 to 30%, depending on the product⁵.
 - Mandatory labeling programs are also implemented in each BRESL country, and starting in Year 5, they lead to additional savings beyond the MEPS of 0.4% to 2% annually, depending on the product.
 - Increased utilization of energy efficient appliances/equipment in the commercial, industrial and residential sectors of the BRESL countries.
 - Significant energy savings from the utilization of energy efficient appliances/equipment and the corresponding GHG emissions reduction.
64. The analysis of the Alternative Scenario only models savings for new products being sold – i.e. it does not include efficiency improvements in the existing stock of equipment. In addition, the difference in baseline and alternative electricity consumption does not translate directly to electricity savings attributed to BRESL. This is because electricity savings also include reductions from reduced purchases of incandescent lamps, and these are calculated at 2.75 times the annual unit electricity consumption of CFLs.
65. Table 7 below summarizes the characteristics of the Baseline and Alternative Scenarios and the net project impact in terms of electricity savings (GWh/year) and CO₂ reductions (MMT CO₂ per year, and cumulative). The summaries of estimated energy savings and CO₂ emissions reductions in each BRESL country from the widespread utilization of energy efficient appliances/equipment can be found in Annex D.

Project Goal, Objective, Outcomes and Outputs/Activities

66. The goal of the project is the reduction of GHG emissions arising from the generation of electricity from thermal power generation units and used in appliances/equipment in the

⁵ This refers to the impact of MEPS once after it is announced and implemented. Because the manufacturers know that they could receive a penalty, or their product could be banned, if it does not meet the new performance standards, they (at least the international and higher-quality domestic suppliers will shift their product mix toward more efficient models in order to meet the MEPS. The range varies depending on the technical characteristics and ease of efficiency improvements for any one product. For example, a CFL would only experience a small increase in efficiency, and the greatest impact would be on its light quality and lifetime; whereas an air conditioner or refrigerator could see a relatively much larger increase in efficiency.

residential, commercial, and industrial sectors of the countries participating in the project. Experience in Asia, as well as in many other countries in the world, is that ES&L programs and policies are one of the most effective ways to improve energy efficiency, and energy efficiency is one of the most effective ways to reduce emissions of greenhouse gases. Specifically, the proposed project will reduce carbon emissions by an estimated 23.4 million metric tons (MMT) per year (cumulative total of about 34.5 MMT) by end of the project. Twenty years after the project end (2031), carbon emissions are projected to be around 268.7 MMT lower each year (cumulative total of about 3,787 MMT), for a reduction of about 9.4% in annual emissions below total 2004 emissions in the participating countries. (See Annex D)

Current (2004) total CO2 emissions for all BRESL countries	2,855 MMT
CO2 emission reductions attributed to the widespread utilization of energy efficient appliances/equipment in 2031 (20 years after project end)	268.7 MMT/yr
CO2 emission reductions attributed to BRESL project in 2031 as % of total CO2 emissions in BRESL countries in 2004	9.4 %

Table 7: Summary of Expected Results of Baseline and Alternative Scenarios

Indicator	2007 (Project Start)	2011	2021	2031
Baseline Electricity Consumption (GWh/yr)	482,068	1,032,132	2,366,352	3,701,553
Alternative Electricity Consumption (GWh/yr)	482,068	1,008,111	2,165,084	3,404,982
Electricity Savings (GWh realized in each year)	0	24,021	201,268	296,571
Savings compared to Baseline (% lower than baseline)	0	2.3	8.5	8.0
CO ₂ Reductions (MMT/year) (2)	0	23.4	195.1	313.1
CO ₂ Emission Avoided (% lower than baseline)	0	2.5	9.4	8.8
Cumulative CO ₂ Savings (Total MMT)	0	34.5	1,158.7	3,787.4

67. The objective of the project is the removal of barriers that have persistently hindered the widespread development and application of ES&L programs. These barriers were discussed in Section I above. This project will address these barriers through a combination of training and capacity-building, assessing and transmitting lessons learned, learning by doing, sharing work among countries to reduce the effort needed from each country, and technical assistance. The majority of the project will address barriers that hinder governments from developing and implementing ES&L, but a significant project component will also address project manufacturers and the barriers that can hinder their support for ES&L efforts.

68. A number of outcomes resulting from full project activities are expected. These include:

- New minimum efficiency standards for air conditioners, refrigerators, fluorescent ballasts, CFLs and electric motors adopted in at least 4 countries respectively, reducing energy use for these products by at least 10% relative to business as usual (4% for motors).
- At least 4 countries adopt new or improved appliance and equipment energy efficiency labeling schemes.

- ES&L programs are operating by project end in all participating countries, with plans in place to continue these programs after the GEF project ends.
 - Regional coordination on ES&L makes it easier for all countries to develop and maintain ES&L efforts and countries elect to continue this coordination after the GEF project ends.
 - A majority of appliance/equipment manufacturers in the region recognize the benefits of, and opportunities for, ES&L efforts to increase their profits.
 - Mutual recognition agreements and product certification and posting procedures in place so testing and certification in one country generally meets requirements in other countries, easing burdens on manufacturers and promoting regional trade.
 - Increased market share of EE equipment/appliances in the different countries and in the region as a result of the ES&L programs.
 - Energy savings from the utilization of energy efficient appliances/equipment in the end use sectors in each participating country.
69. The proposed project focuses on building capabilities and interest to pursue ES&L efforts in each of the participating countries, and then using these capabilities to help participating countries set and implement standards on six target products (air conditioners, refrigerators, three-phase electric motors; compact fluorescent lamps (CFLs); fluorescent ballasts and residential fans). In addition, as noted above, several countries will develop new standards on rice cookers. The heart of the project is six regional product-specific working groups that will conduct and oversee technical work that develops model test procedures, standards, and voluntary labeling levels for each targeted product. These model standards will include multiple levels (tiers) in order to fit the needs of different countries. In this way, some of the more advanced countries can adopt more stringent tiers while countries just starting ES&L programs can adopt less stringent tiers. By working together, workloads can be shared, expenses reduced relative to each country doing their own independent analysis, and standards harmonized (same procedures and formats, with a limited number of actual levels in place). Harmonization on standards will encourage regional trade.
70. The many standards put in place through this project will transform regional markets for targeted equipment, substantially raising efficiency levels. In addition, the labeling schemes put in place will promote purchases of even higher efficiency products, creating a significant market for efficient products in the region.
71. The proposed project will involve a mix of regional and national activities. Countries will work together on training, technical analysis, compilation of reports on lessons learned, development of model standards and procedures, and regular consultations with each other. Individual countries will then use these regional outputs to develop and implement their own standards and labels. In addition, each country will conduct a few pilot projects to address country-specific needs.
72. The proposed project is comprised of five major components consisting of complementary activities designed to remove barriers to achieve the project objectives. A separate component on project management is also included.
- ES&L Policy-Making Program: Establishment of legal basis for standards and labels and assisting with the development of regulations for the targeted products.
 - ES&L Capacity Building Program: Building of institutional and individual capacity to secure on-the-ground implementation of standards and labels, including establishment of regional working groups for each of the targeted products.

- ES&L Manufacturer Support Program: Information and technical assistance for local product manufacturers to help them develop efficient products and realize profit opportunities from efficient products.
- ES&L Regional Cooperation Program: Regional cooperation activities that will aid individual countries with development and implementation of their ES&L programs and that will take important steps towards regional harmonization of standards and labels.
- ES&L Pilot Projects: Pilot activities implemented on a demonstration basis by individual countries, or groupings of countries, showcasing various aspects of the design, facilitation and implementation of ES&L programs, including support activities that build on the regional foundation provided by BRESL. This will include a number of activities implemented at the national level, with coordination across the region, including initial work on regional harmonization led by China.

73. The following paragraphs describe the various major activities and sub-activities under each project component. Note that in the following tables that present the various sub-activities, the “*Country*” column refers to the country or countries where the sub-activity (national) will be implemented. In the case of regional sub-activities, this column refers to the beneficiary countries (i.e., the BRESL countries) of the sub-activity. The “*Responsible Entity*” column refers to the institution/agency (and where relevant, also the project partners, i.e., those in-charge of the co-financed and/or baseline activities) in each country that is responsible for the implementation. In the case of regional activities, this column refers mainly to the regional project management unit (and in some cases, together or in coordination with the relevant project partners). It should be noted also that in some cases, as agreed during the Regional Stakeholders’ Consultation Meeting in August 2006, a specific country (or countries) will also implement supplementary sub-activities. Results of such sub-activities will also be shared to the other countries.

Component 1: ES&L Policy-Making Program

74. This component will include several activities to put in place new laws and regulations enabling and establishing equipment standards and labels. The focus here is to establish a legal and regulatory foundation for ES&L in each of the participating countries. This will include providing information and TA to countries without ES&L enabling authority in place so they can pass necessary enabling laws or regulations, and will also include providing information and TA to participating countries so they can adopt new standards and labels for the six targeted products. Lack of enabling regulations is a key barrier in five of the seven participating countries. In addition, this component will include information and TA on standards and labeling implementation, in order to maximize compliance with ES&L regulations. By working together to establish new standards and labels on the six targeted products, substantial and concrete benefits will be achieved. In addition, documentation of these benefits will help to build support for continued ES&L activities in each of the participating countries. For example, a country achieving substantial benefits from initial standards is more likely to allocate money out of national budgets to continue ES&L activities. In our survey of participating countries, one clear message we received was they want this project to focus on standard-setting actions and not just training and other enabling activities. This project component addresses this need.

75. **Activity 1.1: Strengthening of the Policy Context for Energy Standards and Labels:** Most of the BRESL countries lack enabling legislation or regulations to establish ES&L programs. The following are the proposed sub-activities that will be carried out to address such barrier/constraint. These will be mainly implemented at the national level:

Sub-Activity	Country	Responsible Entity
Compilation of ES&L policy and feasibility studies by experts in each country to assess the current situation and options for going forward.	All	Designated Implementing Partners (DIPs) ⁶
Provision of information (e.g., sample laws from the region) and technical assistance to each country to support the government in: (1) Developing draft ES&L legislation, rules and regulations; and, (2) Adopting and enforcing laws, rules and regulations.	All	DIPs, Energy Foundation (China)
Creation, definition of mandate and functions, mobilization and operationalization of an ES&L Inter-Agency Committee whose members are from the various key stakeholders/players in the area of ES&L ⁷	All	Country Teams (CTs) in coordination with DIPs
Provision of technical advice in the review of, and formulation of relevant recommendations to a proposed ES&L Legislation, and will include conduct of stakeholder consultation meetings, ES&L law analysis, drafting of implementing rules and regulations, and lobbying of the energy department/ministry and ES&L stakeholders. ⁸	All	CTs in coordination with DIPs
Supplementary: Development of an ES&L policy model, which will involve: (1) Institutional review of institutional structures for organizing and managing DSM and end-use efficiency projects in Asian (and other) countries; (2) Review of mandatory labeling schemes in other Asian (and other) countries; (3) Development of a plan to introduce mandatory comparative energy labeling along with an endorsement labeling scheme; (4) Design of institutional structure and mandatory labeling program; (5) Study tour of senior policymakers to the best practice country and development of an integrated ES&L policy model. ⁹	Thailand	DEDE
Supplementary: Provision of technical assistance to national and local government authorities on policy formulation and impact analysis of ES&L schemes, as well as on the planning, implementation and evaluation of ES&L programs, and design and implementation of incentives for EE product importers and manufacturers	Indonesia	DGEEU

⁶ The Designated Implementing Partners are as follows: Bangladesh - Bangladesh Standards & Testing Institute (BSTI); China - National Development and Reform Commission (NDRC); Indonesia - Directorate General for Electricity and Energy Utilization (DGEEU); Thailand - Department of Alternative Energy Development and Efficiency; and, Vietnam - Ministry of Industry (MOI).

⁷ This is to facilitate the enactment and the strict and proper enforcement of the ES&L legal frameworks. The proposed Committee will regularly coordinate and report on ES&L policy issues related broadly to policies within the country's energy, industry and financial sectors. The Committee is tasked primarily with the monitoring of impacts of policy implementation and coordinates the revision and improvement of policies as necessary in accordance with the sustainable energy goals/objectives of the country.

⁸ Consultations with different stakeholders particularly the private sector to capture their true sentiments about the major concerns that must be addressed by the proposed legislation and its implementing rules and regulations to facilitate ES&L development and implementation.

⁹ The outputs will include two international review reports, a policymaker study tour, a policy paper on integrated ES&L policy model, a mandatory labeling program for consideration by the Thai government, including the proposed implementing rules and regulations. The project will help facilitate the eventual implementation of the mandatory labeling program.

76. All of the abovementioned activities will be done at the direction of the government in each country and will respond to each country’s specific needs. Each country will provide government personnel to work on this activity. *GEF support is required for the technical assistance in the feasibility studies and policy and regulations/laws implementation and for provision of information.*

77. **Activity 1.2: Adoption and Implementation of Energy Standards and Labeling Regulations:** This major activity will involve providing information and assistance to individual countries to help them adopt standards and labels on the six products covered by the project.

Sub-Activity	Country	Responsible Entity
Provision of technical assistance in adopting energy efficiency standards and labels on the 6 BRESL products ¹⁰	All	DIPs, Others (EF, ICA) ¹¹
Provision of technical assistance in the development and enforcement of the implementation plans for the adopted standards and labels ¹²	All	DIPs
Provision of information on all specific actions that were successfully implemented in other countries that ensured the strict and proper enforcement of the ES&L policies and associated legislation and legal framework will be shared to each BRESL country.	All	CTs in coordination with DIPs, KEMCO
Evaluation of the applicability of proven successful measures in countries in other regions to enforce ES&L programs	All	CTs in coordination with DIPs, KEMCO
Provision of technical assistance in the design and piloting of feasible ES&L program enforcement measures ¹³	All	CTs in coordination with DIPs
Supplementary: Extensive capacity building and technical assistance activities covering specific aspects of ES&L, such as: (1) Updating of existing ES&L programs including the formulation of implementing rules & regulations; (2) Enhancement of ES&L work (development and implementation) done on the 6 BRESL products; (4) Development of an accreditation program for appliance testing laboratories in existing factories (energy performance testing capability, staff technical skills upgrading, and facility R&D capacity upgrading); and, (5) Tool development such as impact assessment methodology, data survey protocols, and program evaluation protocol.	Indonesia	DGEEU

¹⁰ This work will use the outputs of Activities 2.2 and 3.1, as well as information from countries that have previously adopted standards, to assist individual countries to adopt standards and labels on the covered products, and then to develop and follow implementation plans for the standards and labels adopted. Included in the implementation plans will be outreach to product retailers.

¹¹ TA for China from Energy Foundation; TA on ES&L for motors and air conditioners for Bangladesh, China and Vietnam from International Copper Association.

¹² The Inter-Agency Committee in each country (Activity 1.1) will help ensure that proper enforcement of ES&L policies and programs are carried out. This Committee is tasked to be the ES&L “watch dog”; monitoring the administrative, regulatory and legal aspects of the national ES&L program implementation.

¹³ This can involve modifying proven successful measures (e.g., “manufacturers challenge”) in countries in other regions to enforce ES&L programs to fit each country’s circumstances.

78. Each BRESL country will provide government personnel to work on the implementation of this major activity. *GEF support is required for the necessary technical assistance on the development, adoption and implementation of energy efficiency standards and labels for appliances/equipment, and in the development and piloting of ES&L program enforcement measures.*

Component 2: ES&L Capacity-Building Program

79. This component will address several barriers including lack of technical know-how on ES&L, lack of institutional capacity on ES&L implementation, absence of adequate information on appliance and equipment efficiency and trends and limited local energy performance testing facilities. This component will include several key activities to build capacity for developing and implementing energy standards and codes including staff training, establishment of product-specific working groups, provision for adequate testing facilities, establishment of regular data collection and reporting processes, and facilitation of mutual recognition agreements so that equipment tested and certified in one country does not need to be retested and recertified in other BRESL countries.

80. **Activity 2.1: Training to Strengthen and Enable Public Institutions to Support Development and Implementation of ES&L Programs:** This activity will involve training courses for officials and consultants involved with ES&L development and implementation on standard and labeling processes, technical content, implementation and related issues. These courses will emphasize practical experiences in the region and lessons learned. These short courses will be given at several locations in the region and will be designed to make sure that all personnel working on the project have a common basis of knowledge upon which they can build by participating in other project activities. These courses will build on material developed previously by CLASP.

Sub-Activity	Country	Responsible Entity
National		
Conduct of detailed gap analysis and capacity need assessment on ES&L development, implementation and enforcement	All	CTs in coordination with DIPs
Regional		
Review and verification of capacity needs of BRESL countries on ES&L development, implementation & enforcement	All	Regional PMU, EF, ICA, KEMCO
Design of training materials based on capacity needs assessment	All	Regional PMU
Organization and conduct of training courses	All	Regional PMU
Evaluation of the impacts of the training courses	All	Regional PMU

81. *GEF support is required for the in-country capacity needs assessments and for updating and customizing the ES&L training material for regional needs, as well as for organizing, delivering and evaluating the training courses.*

82. **Activity 2.2: Capacity Enhancement in the Development and Implementation of Standards and Labeling for the 6 Targeted Products:** This activity will involve establishment of working groups for each of the six targeted products and the development of model test procedures, standards and labeling programs for each product by its respective working group. The intent is to develop a body of common information and approaches each country

can use to set standards and labels, making adoption easier in individual countries and also bringing a degree of harmonization to standards and labels in the region. This is in line with the laying of the groundwork for the planned regional harmonization.

Sub-Activity	Country	Responsible Entity
National		
Development of new set of standards for rice cookers – This will involve: (1) Conduct of research on opportunities and costs for improving the efficiency of rice cookers; (2) Development of a new standard and endorsement label for rice cookers; (3) Publication of report on the rice cooker standards for dissemination to other countries. ¹⁴	China	NDRC/CSC
Conduct of initial work on the development of proposed Harmonized Test Protocols, Certification, Accreditation and Compliance Regimes for 6 BRESL products. ¹⁵	China, Indonesia	NDRC/CSC (China), DGEEU (Indonesia)
Regional		
Establishment of 6 Technical Working Groups (TWGs), one for each BRESL product. ¹⁶	All	Regional PMU, DIPs
Development of model test procedures, standards and labeling programs for each product by each respective technical working group (TWG). ¹⁷	All	TWGs, CFL-HI, KEMCO
Conduct of regional consultation meetings to deliberate on the outputs of the TWGs.	All	TWGs, Regional PMU
Publication and dissemination of proposed model test procedures, standards and labeling programs.	All	TWGs, Regional PMU

83. GEF support is required for the administration and facilitation of the tasks that will be carried out by the working groups, including travel costs to working group meetings, and documentation of technical reports produced, as well as in the technical assistance for the supplementary initial work that China and Indonesia will be doing on regional harmonization.

84. **Activity 2.3: Strengthening of National and Regional Testing and Certification Infrastructure:** This major activity is meant to address the barrier related to the inadequate capacity of testing and certification facilities and programs in the region. It involves the implementation of the national and regional technical assistance and capacity development sub-activities tabulated below:

¹⁴ This is in addition to the 6 core BRESL products. As part of this activity, China will consult with Thailand and Viet Nam (both of whom have expressed interest in rice makers) in the hope that they can use the new Chinese standard to help set new standards and labels for their countries. Many rice makers sold in the region are produced in China, so even a China-only standard is likely to produce some energy savings in other countries. The prime output will be a new Chinese standard, including an updated specification for their endorsement label.

¹⁵ This is in addition to the work carried out by the TWGs, and will complement the regional work on harmonization in Component 4.

¹⁶ Unlike other ES&L projects in the region, these working groups will be very technical, with each one devoted to a specific product. Other regional groups are much more strategic and do not get into specific technical details of regional harmonization of test procedures and standard levels.

¹⁷ These models will include multiple tiers and options for consideration by individual countries. These tiers and options will be needed to serve the different needs of different countries.

Sub-Activity	Country	Responsible Entity
National		
Conduct of survey on testing and certification facilities and programs in the region, identification of gaps, and development and implementation of a plan to fill these gaps.	All	CTs/DIPs, Others (EF, ICA, CFL-HI)
Review of existing ES&L technical capacity (manpower, equipment, facilities and techniques/procedures) and capacity needs for appliance/equipment testing.	All	CTs/DIPs
Evaluation of the opportunities for utilization of test facilities by other countries. ¹⁸	All	CTs/DIPs, Others (EF, ICA, CFL-HI)
Evaluation of the legal, logistical and technical requirements for the implementation of future harmonized test procedures, compliance to established mutual-recognition agreements and posting of certification data.	All	CTs/DIPs
Implementation of feasible capital improvements on ES&L testing facilities. ¹⁹	All	CTs
Supplementary: Development and implementation of a market monitoring system for ES&L that involves sampling random products and testing for compliance with standards and accuracy of labels. ²⁰	China	NDRC/CSC
Supplementary: Development of testing capabilities, and the development of standards and labels for other major appliances/equipment	Indonesia	DGEEU
Regional		
Conduct of round robin testing	All	Regional PMU & CTs/DIPs, CFL-HI ²¹
Provision of technical assistance in the design of capital improvements on ES&L testing facilities, based on the findings and recommendations of the round-robin testing and in-country ES&L technical capacity assessments.	All	Regional PMU & CTs/DIPs
Documentation and dissemination of the results and recommendations of the round robin testing.	All	Regional PMU & CTs/DIPs

85. *GEF support is needed for the survey on testing and certification facilities and preparation of recommendations, for provision of technical assistance in the harmonization of test procedures and the establishment of mutual recognition agreements and procedures, and in the performance of the regional round robbing testing.*

¹⁸ This is for facilitating the use of test facilities in one country to help serve testing needs in other countries, at least until test facilities can be established in all participating countries.

¹⁹ Capital improvements will be funded by host countries, by national trade associations, or local manufacturers wherever possible. This forms part of the co-financing from each BRESL country.

²⁰ This sub-activity will involve a survey of international experience and best practices, develop a detailed market monitoring scheme, develop a sampling methodology, and conduct some market monitoring tests. The outputs will include a detailed market monitoring scheme; a product sampling scheme; results of product sampling tests, and an interim and final report on the activity.

²¹ TA for round robin testing of CFL testing facilities in all BRESL Countries from CFL Harmonization Initiative.

86. **Activity 2.4: Strengthening of Data Collection and Reporting Procedures on Equipment Availability and Sales by Efficiency Level in Participating Countries:** ES&L programs rest on a foundation of data on equipment energy use and how this use is changing over time. Such data are needed to set standards and to monitor standard implementation and benefits. This activity will involve developing a simple model data collection and reporting procedures, based on successful efforts in the region, and provision of technical assistance to countries that now lack such procedures, so they can adopt such procedures.

Sub-Activity	Country	Responsible Entity
National		
Evaluation of the applicability of the model data collection and reporting procedures.	All	CTs/DIPs
Modification (if necessary) of the model data collection and reporting procedures suited to the data requirements and protocols, data availability, as well as the planned/established harmonization requirements in the country.	All	CTs/DIPs
Implementation of the data gathering and reporting procedures	All	CTs/DIPs
Regional		
Design and development of the model data collection and reporting procedures. ²²	All	Regional PMU
Promotion of, and where required, provision of technical assistance in the use of, the model data collection and reporting procedures.	All	Regional PMU
Conduct of a regional meeting to initiate the data reporting procedures	All	Regional PMU
Follow up on the application of the reporting model and doing any necessary adjustments on the regional data reporting procedures.	All	Regional PMU

87. This major activity on data collection and monitoring will be in line with the data banking requirements needed to support the regional harmonization efforts. *GEF support is needed for the technical assistance and facilitation of the development and application of the procedure.*

Component 3: ES&L Manufacturer Support Program

88. This component has been primarily designed to address the barrier that manufacturers are often distrustful of standards and labels, and their objections can delay ES&L efforts or result in weakening of standards. During the Regional Stakeholder Workshop in August 2006, it was agreed that this manufacturer-related barrier is generic across the region, but must be dealt with in the context of each national economic and cultural setting. Therefore the activities will be carried out separately within each country, but with the sharing of lessons learned at the regular regional BRESL meetings being an important part of the component design. The activities under this component will include the provision of information to manufacturers on ways to improve product efficiency at modest cost; training

²² The data model will be shared with the BRESL countries, who will be encouraged to use it and to report annually to the BRESL Steering Committee. While the data model will be a foundation for this work, there are likely to be variations from country to country to match local needs and capacities, it is important that there be a consistent set of core data for regional comparisons and benchmarking.

on ways to use ES&L programs to increase profitability; and technical assistance to individual local manufacturers on these issues.

89. **Activity 3.1: Product Technical Analysis and Reports:** This is a regional activity that will be supported by all BRESL countries. It basically involves the preparation of a set of six reports (one per targeted product) on ways to improve product efficiency and the costs involved (including capital and product variable costs).

Sub-Activity	Country	Responsible Entity
Desk review of the energy performance of existing brands of the 6 BRESL products in each country.	All	Regional PMU & CTs/DIPs, Others (EF, ICA, CFL-HI)
Conduct of visits to selected local manufacturing plants in the BRESL countries to assess designs and production processes today, and opportunities for improvements. ²³	All	Regional PMU & CTs/DIPs, Others (EF, ICA, CFL-HI)
Preparation of a report on the product energy efficiency performance of products evaluated. ²⁴	All	Regional PMU & CTs/DIPs
Preparation of a report on recommendations for improving product efficiency, including costs involved. ²⁵	All	Regional PMU & CTs/DIPs
Publishing of the consolidated report on the 6 BRESL products, and dissemination to local appliance & equipment manufacturers in the BRESL countries. ²⁶	All	Regional PMU & CTs/DIPs

90. This major activity will assist in ensuring that local manufacturers comply with enforced implementing rules and regulations of the national ES&L programs. The reports will also encourage consumers to use energy efficient appliances, and make them aware of the benefits of such products. *GEF support is required for the technical assistance in preparing the reports, including logistics needed for data gathering.*

91. **Activity 3.2: Educational Workshops for Manufacturers and Retailers on Impacts of Standards on Manufacturers and Retailers and Ways to Work with Standards to Increase Profitability:** This activity will involve holding one-day training programs for manufacturers and retailers on how standards and labels can affect them and ways to use standards and labels to increase profitability. These will be held in each BRESL country, with the provision of technical expertise facilitated by the Regional PMU.

Sub-Activity	Country	Responsible Entity
National		
Evaluation of current (if any) ongoing and/or planned advocacy campaigns on ES&L, from manufacturers, retailers and consumers	All	CTs/DIPs

²³ The BRESL products that will be evaluated are only those that each country will specifically be working on under the BRESL Project. Note that only Thailand and Vietnam will work on all 6 BRESL products.

²⁴ This maybe shared with the local manufacturing plants that were visited.

²⁵ This maybe shared with the local manufacturing plants that were visited.

²⁶ These reports will be used in activity 1.2 and will also be provided to manufacturers so they can have information on ways to improve the efficiency of their products.

Sub-Activity	Country	Responsible Entity
Evaluation of the feasibility of ES&L program implementation both at the national perspective and the local appliance/equipment manufacturers' standpoint	All	CTs/DIPs
Evaluation of potential financial benefits to manufacturers and retailers (and possibly potential financiers) of an effectively enforced ES&L program	All	CTs/DIPs
Evaluation of potential market strategies to use ES&L efforts to "up sell" to higher value, higher profit products	All	CTs/DIPs
Regional		
Design of the ES&L workshop program	All	Regional PMU, Others (EF, ICA, CFL-HI)
Organization and conduct of the workshops	All	Regional PMU
Evaluation of the impacts of the workshops	All	Regional PMU

92. The workshops will review implementation experience in several countries, including actual costs of compliance which are generally much less than pre-effect date perceptions of the costs of compliance. One workshop will be conducted for each country. The workshops will include examples from the region and elsewhere. *GEF support is needed for required research work for use in the design of the workshop program and to organize and conduct the workshops.*

93. **Activity 3.3: Technical Assistance to Manufacturers:** This major activity will involve the provision of a limited amount of technical assistance to selected local manufacturers of the 6 BRESL products as identified by the participating countries. *GEF support is need for the required technical assistance that will be provided to local appliance/equipment manufacturers, including for the evaluation of potential improvements and efficient designs for locally made BRESL products, as well as the capacity building to be provided for banking/financial institutions that can fund production improvement projects of these manufacturers.*

Sub-Activity	Country	Responsible Entity
Selection of local manufacturers of each BRESL product that will be provided technical services under the project ²⁷ , based on a set of selection criteria that will be developed and used in the selection process	All	CTs/DIPs
Conduct of plant walkthroughs to evaluate the existing manufacturing operations and processes, and provision of advice/recommendations on: (1) the processes and equipment needed to improve and upgrade appliance/equipment design and production technologies; (2) Preparation of business plans and project proposals for financing; and, (3) Linking	All	CTs/DIPs, Others (EF, ICA, CFL-HI) ²⁸

²⁷ This is about 2 to 3 manufacturers of each BRESL product in each country, or approximately 60 local manufacturers.

²⁸ TA for local appliance manufacturers in China from Energy Foundation; TA for local manufacturers in Bangladesh (motors & air conditioners), in China (motors and magnetic ballasts), and Vietnam (motors) from International Copper Association; and TA on CFLs from CFL Harmonization Initiative.

Sub-Activity	Country	Responsible Entity
with funding institutions, banks and other financial intermediaries for sourcing of funds for facility and production improvements to accommodate energy efficient product manufacturing.		
Supplementary: Provision of capacity building for financial institutions to encourage them to provide financial support to ES&L and EE product manufacturing projects of local manufacturers ²⁹	Bangladesh	BSTI
Supplementary: Development of a voluntary agreement scheme with selected local appliance/equipment manufacturers ³⁰	China, Indonesia	NDRC/CSC (China), DGEEU (Indonesia)
Supplementary: Conduct of negotiations with local banking/financing institutions on financing arrangements for energy efficient equipment/appliance suppliers (importers and manufacturers)	China, Indonesia	NDRC/CSC (China), DGEEU (Indonesia)

Component 4: ES&L Regional Cooperation Program

94. This component is intended to help countries to learn from one another so they can emulate successful efforts and avoid repeating mistakes that others have made. An activity to plan for follow-up activities when GEF funding ends will also be carried out. This is to ensure that regional cooperation and progress and standards can continue. The following are the four specific activities under this component:

95. **Activity 4.1: Project Web Site:** This regional activity will develop a project web portal so that information compiled by the project can be posted and available to all. This web portal will build on the existing APEC ESIS web site (www.apec-esis.org), which is intended to serve as the repository for ES&L information related to this GEF project and to accommodate information intake and dissemination related to the harmonization work that will be carried out.

Sub-Activity	Country	Responsible Entity
Enhancement of the APEC-ESIS web site ³¹	All	Regional PMU
Conduct of training for country officials and experts on how to place updates on their national programs directly into the APEC-ESIS web site	All	Regional PMU & CTs, AGO, CLASP
Evaluation of the impacts of the project website	All	Regional PMU

²⁹ Expected outcome is increased investments in plants and production lines to produce energy-efficient equipment.

³⁰ Manufacturers will be selected based on the assessment of their capabilities to produce EE products. They will also be provided advice on potential improvements and efficient designs for locally made EE products to make them compliant to MEPS).

³¹ The benefit of this arrangement is that it would enhance an existing resource – APEC ESIS – which is the primary international database of record for the status and basic information on ES&L programs. Major portions of the web portal will be public, but some components will be password protected so that non-public information can be shared. This website will not replicate information that is already available on the web and instead will include extensive linkages to other websites and websites for national ES&L programs. Each participating country will have a portal for overview country information.

96. GEF support is required to develop the project web portal and to support development of national portals for the participating countries.

97. **Activity 4.2: Lessons Learned Reports:** This regional activity will involve the documentation of all relevant lessons (successes and shortcomings) that were learned in the development, implementation and enforcement of ES&L programs/projects. A series of concise “lessons learned” reports will be prepared to address important ES&L issues identified by participating countries.

Sub-Activity	Country	Responsible Entity
Conduct of interviews with program administrators in the region as well as in other countries.	All	Regional PMU, EF, ICA, CFL-HI
Preparation of the “lessons learned” reports ³²	All	Regional PMU
Publication and dissemination of the “lessons learned” reports in Year 1	All	Regional PMU
Analysis of each country’s overall perceptions or views, work completed and planned, and expectations for the regional harmonization efforts ³³	All	Regional PMU
Revision of “lessons learned” reports in Year 4 ³⁴	All	Regional PMU

98. GEF support is required for the preparation (interviews, researches and analyses), publishing and dissemination of the relevant reports.

99. **Activity 4.3: Regional Energy Efficiency Standards and Labeling Network:** This major activity involves the design and establishment of a Regional Energy Efficiency Standards and Labeling Network (REESLN), which builds on the start-up work funded through the end of 2007 by APEC³⁵.

Sub-Activity	Country	Responsible Entity
National		
Initiation work on a regional ES&L information sharing network (in line with Activity 4.1), which will facilitate the gathering and consolidation of information to be uploaded in the Project Web Site ³⁶	Indonesia ³⁷	DGEEU in coordination with Regional PMU
Regional		

³² Based on the BRESL Survey, the following could be the topics for the reports: (a) Evaluation of ES&L program implementation in each country; (b) Policy-frameworks for ES&L programs; (c) Test procedures and test laboratories; (d) Standard and label implementation and enforcement; (e) Complementary efforts to promote efficient products including ES&L promotion (including outreach to retailers), Incentive schemes for high-efficiency equipment, Government procurement schemes targeted at high-efficiency equipment; and, (f) Work done in-country and collectively in the region on the harmonization efforts.

³³ Results and recommendations of the analyses will be used in aligning or if necessary, redirecting the collective efforts to achieve the regional ES&L harmonization objectives.

³⁴ This is to take advantage of additional lessons gleaned from BRESL project evaluation reports.

³⁵ APEC is funding the start-up of a regional network on energy labeling, with work continuing through the end of 2007. BRESL funds will be used to continue this and expand this network to include standards and to continue operations from 2008 until the end of the BRESL project.

³⁶ This will include information sharing regarding ES&L conference announcements and papers, journal articles, media communications, success stories, best practices, etc.

³⁷ Indonesia will carry out and lead this activity in coordination with the other BRESL countries.

Sub-Activity	Country	Responsible Entity
Enhancement of the APEC's REESLN	All	Regional PMU, CLASP, AGO
Conduct of training workshop on the REESLN operations, in particular on the sharing of ES&L experience under the numerous GEF-assisted ES&L programs in the various geographic regions.	All	Regional PMU, CLASP, AGO

100. This particular activity places emphasis on the importance of enhancing cooperation regionally and internationally, and not just within the 6 BRESL countries (including ROK). Through the Regional Project Steering Committee, the project would attempt to build on experience in S&L programs in other countries, both industrialized as well as developing countries, including those supported through GEF projects. This will facilitate more information uptake that will be useful in guiding the collective work for on ES&L harmonization, starting with the test procedures. *GEF support is required for administration of the work group and for meeting expenses including travel.*

101. **Activity 4.4: Regional ES&L Harmonization Initiative** - This major activity will consist of specific tasks aimed at laying the groundwork for the facilitation of the planned regional ES&L harmonization starting with test procedures, and later on standards & labels. These will be carried out in consultation with the Working Groups and the Country Teams in the BRESL countries. The technical assistance that will be provided under this major activity will be for the conduct of the following sub-activities:

Sub-Activity	Country	Responsible Entity
Design/development of policies, implementing rules and regulations related to the harmonization and mutual recognition of ES&L test protocols among the participating countries.	All	Regional PMU (in cooperation with Partners) ³⁸
Evaluation of the impacts (e.g., on national and regional trade, energy savings from the implementation of ES&L programs at the national and regional levels)	All	Regional PMU (in cooperation with Partners)
Development of a regional energy efficient equipment and appliance market monitoring program, which will be implemented collectively by the BRESL countries	All	Regional PMU (in cooperation with Partners)
Development of a promotion program for worldwide recognition of regionally produced ES&L program-compliant equipment/appliances	All	Regional PMU (in cooperation with Partners)
Development of methodology and tool development (universal impact calculator, impact assessment methodology, data survey protocols, program evaluation protocol)	All	Regional PMU (in cooperation with Partners)
Design of pilot programs for the application of harmonized Test Procedures, Certification, Accreditation Implementation, and ES&L Tools ³⁹	All	Regional PMU (in cooperation with Partners)

³⁸ Partners refer to the co-financers (excluding the BRESL country governments) that have parallel activities, which are subsumed into BRESL. These are the regional harmonization initiatives of EF (China), ICA (Bangladesh, China, Thailand & Vietnam), CFL-HI (Asia), as well as TA from Australian Greenhouse Office (AGO) and Korea Energy Management Company (KEMCO) on ES&L harmonization.

Sub-Activity	Country	Responsible Entity
Design of a pilot program for a regional energy benchmarking system	All	Regional PMU (in cooperation with Partners)
Conduct of regional workshops on collaborative harmonization initiatives where, among others, the results of the above technical assistance activities will be disseminated to all BRESL countries (and where possible other Asian countries)	All	Regional PMU (in cooperation with Partners)

102. The work on the abovementioned sub-activities will be carried out in an integrated and coordinated fashion with the initial work towards regional ES&L harmonization led by China. GEF support is required for the technical assistance in developing the studies, evaluation, and pilot program design work that will be carried out under this activity.

103. **Activity 4.5: Preparation of a Plan for Regional Activities and Coordination after the GEF-Funded Project Ends:** When the BRESL project ends, there will be many ES&L activities to continue. It is anticipated that with barriers eliminated or at least substantially reduced, many of these activities will continue, particularly at the national level. However, regional coordination and harmonization will still be useful. Towards the end of the project, a Sustainable Follow up Plan for activities that will be carried out after the BRESL will be developed, so that key regional activities and frameworks that were established under BRESL can continue. It is important to begin development activities in Year 5 for the continuation of the regional coordination activities particularly for sustaining and enhancing the established regional ES&L harmonization.

Sub-Activity	Country	Responsible Entity
Stocktaking of the interventions that were carried out and outputs delivered ⁴⁰	All	Regional PMU & CTs/DIPs
Setting up of revised targets to be accomplished in the next 5 or 10 years after the project	All	Regional PMU in consultation with CTs/DIPs
Definition of the activities designed to achieve the set targets, and preparation of budget estimates for the proposed activities	All	Regional PMU in consultation with CTs/DIPs
Identification and securing of potential funding sources ⁴¹	All	Regional PMU
Agreement on, and approval of, the follow-up plan	All	Regional PMU in consultation with CTs/DIPs

104. GEF support is required for technical assistance in the development of the sustainable follow-up plan.

³⁹ This will be in conjunction with the regional work that will be led by China in Activity 5.5.

⁴⁰ These could include established frameworks that has to continue, M&E and reporting activities that becomes a regular activity/responsibility of a specific institution, continuing education activities, replications of demonstrations, information sharing agreements within a region, monitoring of energy savings and CO2 emission reductions, etc.

⁴¹ This could include discussions with regional and international agencies that may be interested in supporting and sponsoring regional ES&L activities on an ongoing basis.

Component 5: ES&L Pilot Projects

105. This component is intended to provide flexibility to individual countries, or groupings of countries, to carry out policy research and implement pilot projects at the national level that build on the regional foundation provided by BRESL. Some of the regional activities, e.g., regional training efforts (Activity 2.1) and the Lessons Learned reports (Activity 4.2) – will provide input into the specific activities described below. But the activities under Component 5 will be implemented at the national level, with coordination across the region. An important note is that, for each activity under Component 5, the scope and budget will vary by country depending on the needs and interests of the particular country.

106. **Activity 5.1: Government Procurement (Bangladesh, Indonesia, Thailand, and Vietnam):** A number of governments in the region – and in particular China and Korea – have developed aggressive government procurement programs that mandate the purchase of high-efficiency equipment (i.e. equipment in the top ranking of a comparative label or that receives a national endorsement label ranking). This activity will build on the review of government procurement schemes included in the Lessons Learned report (Activity 4.2).

Sub-Activity	Country	Responsible Entity
Review of the Lessons Learned report and conduct of a national seminar to present the findings and recommendations	Bangladesh, Thailand, Vietnam	BSTI, DEDE, MOI
Development of a strategy to promote, and eventually mandate, procurement of only high-efficiency equipment ⁴²	Bangladesh, Thailand, Vietnam	BSTI, DEDE, MOI
Design and development of a mass purchasing program involving government/private sector and manufacturers/importers of energy efficient products ⁴³	Indonesia	DGEEU
Piloting of appropriate mass purchasing agreements for a selected EE product (one of the 6 BRESL products) in 3 private establishments ⁴⁴	Indonesia	DGEEU

107. This major activity is related to the objectives of Activity 2.1. *GEF support is necessary for the required technical assistance in the development and implementation of the proposed government procurement schemes, and in the development of mass purchasing agreements.*

108. **Activity 5.2: Database (and Web Site) of Energy-Efficient Equipment (Bangladesh and China):** This major activity will involve the development of an accurate and widely available in-country database (and web site) on energy-efficient products and their usage, similar to that in South Korea. This will be carried out in Bangladesh and China.

⁴² Each country will tailor a pilot program to its own domestic situation, but will share the results with other countries at the regular regional BRESL meetings. The outcome of this activity will be a specific procurement policy or directive in each country and actual procurement of efficient equipment by at least one government agency or ministry.

⁴³ Mass purchasing, as a market aggregation activity, is intended to provide consumer with better quality products, efficient delivery and lower first cost.

⁴⁴ The impacts of this market aggregation activity will be monitored and evaluated. Results of the exercise will be disseminated to all government offices and other buyer groups to include, housing estate developers, homeowners and commercial centers association, and industrial zones. The results will also be shared to other BRESL countries.

Sub-Activity	Country	Responsible Entity
Conduct of a survey on consumer information needs related to energy-efficient products.	Bangladesh, China	BSTI, NDRC/CSC
Collection of necessary information on 2 identified pilot BRESL products from local manufacturers.	Bangladesh, China	BSTI, NDRC/CSC
Development of a web-based national database system that will include core ES&L information ⁴⁵	Bangladesh, China	BSTI, NDRC/CSC

109. The information will be presented for use by domestic consumers but will also be linked to the BRESL regional project web site, with the intention of eventually creating a regional database for compliance that shows test results of the energy performance of all major end-use equipment. This major activity will also be linked to Activities 2.3 and 2.4. *GEF support is necessary for the required technical assistance in the development of the database of EE appliances/equipment.*

110. **Activity 5.3: Development of Consumer Education Schemes (Bangladesh and Indonesia):** This major activity will address the barrier related to consumers having a low level of awareness about the benefits of energy-efficiency standard and labeling.

Sub-Activity	Country	Responsible Entity
Design and development of a national awareness campaign using media to increase people's awareness about ES&L	Bangladesh, Indonesia	BSTI, DGEEU
Implementation of the national awareness campaign to remove market barriers for the energy efficient appliances in general	Bangladesh, Indonesia	BSTI, DGEEU
Development and promotion of financial incentives in parallel with the awareness enhancement efforts ⁴⁶ .	Bangladesh	BSTI

111. This activity will be linked to Activity 1.2. *GEF support is necessary for the required technical assistance in the design and implementation of the awareness enhancement schemes.*

112. **Activity 5.4: ES&L Initiatives Financing (Indonesia)** - The focus of this activity, which will be carried out in Indonesia, is on ensuring the financially sustainable implementation of the country's ES&L program. It will include carrying out tasks that would lead to the building of joint government and private sector financing schemes for ES&L programs and the development of consumer-financing schemes for the purchase of ES&L equipment. The sub-activities are the following:

Sub-Activity	Country	Responsible Entity
Development & implementation of consumer financing schemes for the purchase of EE equipment/appliances that comply with MEPS.	Indonesia	DGEEU

⁴⁵ These could include a listing of the top-rated energy-efficient products; sales and market share information for different appliance and equipment types; saturation rates and usage levels; etc.

⁴⁶ The application of financial incentives has been identified as an element of Bangladesh's Draft National Energy Policy.

Sub-Activity	Country	Responsible Entity
Provision of technical assistance in the conduct of negotiations on financing arrangements with EE equipment/appliance suppliers (importers and manufacturers)	Indonesia	DGEEU
Establishment of financing schemes for projects in the commercial and industrial sectors that employ equipment/appliances in compliance with the ES&L program	Indonesia	DGEEU
Conduct of national workshops to: (1) present the financial schemes; and, (2) present the results and impacts of the implemented financial assistance schemes	Indonesia	DGEEU

113. GEF assistance is required for supporting the design and development of the financing schemes, as well as in the promotion and evaluation of the same.

114. **Activity 5.5: Regional Harmonization Promotion (China)** - As the BRESL lead country, China will initiate the implementation of regional ES&L harmonization work that will complement the activities carried out in Component 4. The major tasks that will be carried out under this activity are as follows:

Sub-Activity	Country	Responsible Entity
Establishment of a Regional ES&L Harmonization Facility, which will serve as the main service platform for BRESL countries, and possibly other Asian countries in their individual and collective ES&L efforts	China in cooperation with other BRESL countries	NDRC/CSC, Regional PMU, in coordination with CTs/DIPs; ICA ⁴⁷
Conduct of regional training workshops/programs in selected ES&L testing facilities on the development and implementation ES&L programs and testing protocols for the 6 BRESL products ⁴⁸	China in cooperation with other BRESL countries	NDRC/CSC, Regional PMU, in coordination with CTs/DIPs; ICA
Piloting of developed harmonized ES&L test procedures and the application of ES&L tools	China	NDRC/CSC in coordination with Regional PMU; ICA

115. GEF support is required for the technical assistance needed in the establishment of the regional ES&L harmonization facility, conduct of training workshops, and the piloting of harmonized ES&L test procedures and tools.

116. All of the BRESL countries will participate in most of the Component 5 project activities. However, a few countries have elected to skip some activities or to emphasize certain aspects of an activity. Country participation by activity is summarized in Tables 8 & 9.

⁴⁷ Harmonization work of ICA on motors, magnetic ballasts and air conditioners in China (including work on motors in Thailand and Vietnam) are included in Activity 5.5.

⁴⁸ This is where the participation of other Asian countries in the BRESL's regional harmonization scheme will be ensured.

117. **Changes Relative to the Project Concept Document.** This Project Brief includes some evolution in project thinking since the Project Concept Paper was submitted. Major changes include a reduced number of countries (several countries dropped out due to other priorities for using their GEF allocation) and the expansion of the number of targets targeted from 5 to 6 ½ (the half is work on rice cookers in three of the countries). Most of the activities in the Concept Paper are retained, but have been rearranged to make implementation easier. A few components were dropped because they were either not needed or were too expensive relative to the value they provide. Annex A summarizes how the Project Concept Paper has evolved into this Project Brief.

Project Indicators, Risks and Assumptions

118. The project success indicators are shown in the Project Planning Matrix (PPM) in Section II, Part II. The target values for these indicators based on the PPM, which will be monitored during the course of the BRESL project implementation, are summarized in Section IV, Part VI.

Table 8: Country Participation in the Various Project Elements.

(Table reflects input from countries at Regional Stakeholder Consultation Workshop held in Beijing during 30-31 August 2006.)

Activity	Bangladesh	China	Indonesia	Thailand	Vietnam	Korea
Component 1: ES&L Policy-Making Program						
1.1 Legal framework	●	Emphasize implementation	●	Improve framework, make labels mandatory	EC law formulation	
1.2 S&L regulations						
AC	●	●	●	●	●	●
Ballast	●	●	●	●	●	
Fan	●	●	●	●	●	
Motor	●	TA resource	●	●	●	●
Refrigerator		TA resource	●	●	●	●
CFLs	●	●	●	●	●	●
Rice cookers		●		●	●	
Component 2: ES&L Capacity Building Program						
2.1 Workshops	●	help teach	●	●	●	
2.2 Tech working groups	●	●	●	●	●	●
2.3 Testing & certification	Emphasize accreditation	Emphasize MRAs	●	MRAs & certifying extra labs	●	
2.4 Data reporting	●	●	●	●	●	
Component 3: ES&L Manufacturer Support Program						
3.1 Tech reports	●	●	●	●	●	●
3.2 Manufacturer workshops	●	●	●	●	●	
3.3 TA to Local equipt/appliance manufacturers	●	Emphasize sales of high EE products	●	Needs assessment, emphasize S&M	●	
Component 4: ES&L Regional Cooperation Program						
4.1 Web	●	●	●	●	●	●
4.2 Lessons learned	●	●	●	●	●	●
4.3 Standards and label network	●	●	●	●	●	

Activity	Bangladesh	China	Indonesia	Thailand	Vietnam	Korea
4.4 Regional Harmonization Support	●	●	●	●	●	●
4.5 ES&L Continuation plan	●	●	●	●	●	●
Component 5: ES&L Pilot Projects						
5.1. Government procurement	●		●	●	●	
5.2. Web Site of EE products	●	●				
5.3. Consumer education	●		●			
5.4. ES&L Initiatives Financing			●			
5.5. Regional Harmonization Promotion ⁴⁹		●				

119. The likely role of participating countries is shown in Table 9. The table is based on the survey responses and limited informal consultations with likely partners. The table will be revised and updated at the regional stakeholders' consultation workshop in Beijing on 30-31 August 2006.

Table 9: Role of Participating Countries in the BRESL Project

Country	Direct implementation in country	Participation in regional harmonization activities	Donor or provider of TA
Australia		●	●
Bangladesh	●	●	
China	●	●	
Indonesia	●	●	
Korea, South		●	●
Thailand	●	●	
Vietnam	●	●	

120. While all possible efforts have been made to ensure the effective design and implementation of the project activities in the project design phase, there are inevitably some unavoidable residual risks that will have to be carefully monitored and managed during the project to ensure its success. The different risks that were identified during the project formulation and the recommended mitigation measures and a commentary on the need for mitigation measures are provided in detail in Section IV, Part V.

121. The overall project risk is moderate. The principal risks, which can potentially hinder the successful project implementation and/or reduce project effectiveness, relate to: (a) the sustainability of the support by key stakeholders in the participating countries; (b) lack of, or fading, interest of the private sector (particularly appliance/equipment manufacturers and suppliers); (c) Financing of investments for manufacturers to modify their production facilities may not be available. (d) ineffective project coordination at the national and/or regional levels; (e) failure of EE products to perform as claimed by manufacturers resulting in customer dissatisfaction; (f) unabated proliferation of illegally traded and unreliable EE equipment/appliances; and, (g) unwillingness of consumers to buy EE products due to bad

⁴⁹ Led by China, but participated in by all BRESL countries, and possibly some non-BRESL countries in Asia.

experiences in the past and high initial cost may lead to failure of the project to induce increased sales and widespread use of EE equipment and appliances. To address these risks, the project has to establish effective means to monitor and to the extent possible mitigate these risks. Mitigation measures include a strong emphasis on hands-on project management and participation of each country, mobilizing private sector participation and a continuous dialogue between the project's donors, implementing Partner, executing agency, regional organizations and national governments.

Expected Global, National and Local Benefits (Details Contained in Section IV, Part V)

Global Benefits

122. The project is projected to reduce GHG emissions from the region by 24 MMT of CO₂ by project end. Savings will steadily mount after the project ends as existing equipment is replaced by more efficient equipment, reducing GHG emissions by about 200 MMT ten years after project end, and by about 325 MMT twenty years after project end. In addition, the project will demonstrate successful ES&L programs in the BRESL countries, which represent a wide range of situations and experiences. The demonstration of the various aspects of the development and implementation of ES&L programs, and the lessons learned will be helpful for starting or improving ES&L programs in other regions.

National Benefits

123. The participating countries will benefit from a substantial reduction in electricity growth rates, meaning less new power plants that need to be built. This will free up capital for other uses. Consumers and businesses will have lower electricity bills due to reduced electricity consumption. Assuming an average electricity price of US\$ 0.08 per kWh, electricity bill savings will total about US\$ 2 billion in the last year of the project, rising to about \$29 billion twenty years after the project (all figures in 2006\$). After considering the slightly higher cost of efficient products and a 6% real discount rate, net consumer benefits will total over US\$ 100 billion over the 2011-2031 period (2006\$). In addition, equipment manufacturers in the region will be producing more efficient products, allowing them to better compete in world markets. And many of them will be producing more "value-added" products that generally have higher profit margins than "commodity grade" products, increasing profits relative to baseline.

Country Ownership: Country Eligibility and Country Drivenness

124. All of the five (5) participating countries in the BRESL project have ratified the UNFCCC. The ratification dates are as follows: Bangladesh (22 June 1994); China (16 May 1994); Indonesia: (29 June 1994); Thailand (30 June 1994); and, Vietnam (12 May 1994).
125. All of these countries have completed and submitted their First National Communications under the framework of the UNFCCC. These communications all highlighted that EC&EE, in general, and ES&L, in particular and among the measures each country are considering for the reduction of GHG emissions. At present, some of the participating countries have already carried out ES&L programs. Two of them (China & Korea) are already well-advanced in their activities in this area. The others are either just starting (Bangladesh, Indonesia, Vietnam) or have done significant work on ES&L as part of their demand side management (DSM) activities (Thailand). All of these countries are now preparing their Second national Communications to the UNFCCC.

126. UNDP came up with the concept of this regional ES&L project as part of its initiative to promote energy and environment for sustainable development back in May 2004. Since then, the development of the BRESL has involved consultation meetings with the participating countries starting mainly with energy officials in the ASEAN countries. A regional survey was also carried out to identify ongoing and planned ES&L initiatives in the Asian region as well as the barriers to ES&L development and implementation in each participating country and those that affect and hinder regional efforts to ES&L harmonization. A regional stakeholders' consultation workshop was also conducted to discuss the identified national and regional barriers. Said consultation workshop also came up with the national and regional activities that are proposed to be carried out under the BRESL project, including the project implementation and management arrangements.
127. BRESL is currently the only regional ES&L barrier removal initiative in Asia. It has direct linkages to and collaboration with ongoing Asia-Pacific regional and national programs. These include ongoing and planned ES&L programs of the participating countries, most of which are in China and Korea. BRESL will also work in collaboration with the ES&L activities of the International Copper Association (ICA) in some of the participating countries, as well as the ongoing project on the International CFL harmonization Initiative. Some of these have parallel activities that, as per agreement with the project proponents/owners, would be subsumed in the BRESL Project.
128. It should be noted that these projects are funded separately and are among the co-financed activities of BRESL. As part of the regional project (and indicated in the PPM), their results are reported as among the outputs of BRESL. Where necessary, GEF resources will be used for technical assistance in the implementation of some of these parallel activities. The matching of these parallel activities and BRESL's technical assistance is very important in achieving the market transformation envisioned through the widespread implementation of effective ES&L programs. Representatives from these partner organizations are members of the BRESL's Regional Project Steering Committee.

Sustainability

129. Sustainability is an integral element of the BRESL activities and is ensured through the outputs of most of the project components. The sustainability of the institutional elements of the project will be ensured through the adoption of collaborative approaches and strategies that seek to foster and reinforce the long-term sustainability of existing institutional and coordination structures that have been established and are operational at both the national and regional levels with regards to projects dealing with energy and trade.
130. The establishment of effective energy efficiency standards and/or labels leads to a more sustainable energy future. First of all, energy standards and labels are generally introduced through a formalized process leading to a government regulation or endorsement during the project. Once established with a clear government imprimatur and a solid institutional infrastructure, a properly designed and implemented ES&L program can effectively transform the market to a higher level of energy efficiency with a gradual ratcheting-up of energy efficiency standards over time to take into account new technological developments and the country's capacity to pay for that technology.
131. Since the BRESL is designed as a strong capacity-building project (as part of the barrier removal objective), the main project outputs will not only be new energy efficiency standards and labels, but also institutional structural growth with a capacity to effectively maintain and revise the ES&L program over time. The government agency with the ES&L

mandate (or those actively engaged in energy conservation and energy efficiency promotion activities) in each Asian country, which will play a significant role in the implementation of the national activities under BRESL, is expected to continue to spearhead and sustain the activities after the project life. The national activities of the BRESL project will be mainstreamed into the country's energy efficiency program in the next 10 years. If a country has an energy conservation law, the project will strengthen the component that relates to ES&L programs. The proposed project will strengthen the role of these agencies in leading the ES&L efforts and GHG emission mitigation activities in each participating country. Periodic monitoring and evaluation of ES&L programs and activities in each country will be institutionalized and will be continued even after the end of the BRESL project. This will bring sustainability of the project with desired benefits in the long run.

132. Regional cooperation in the area of ES&L will be encouraged and established to enable South-South transfer of technical know how and technology. A network of collaborators throughout the region and around the world with a common mission, bringing attention and high priority to efficiency standards and labels within key development institutions will be established. This is to achieve higher awareness of international developments, benefits of harmonization, and trade advantages. It should be emphasized that BRESL will foster regional collaboration and harmonization throughout the region, which will greatly strengthen the effectiveness of individual national ES&L programs. With this, the market transformation and resulting carbon emission reduction from this project will persist far beyond the term of the project.

Replicability

133. BRESL is designed to have a balanced mix of capacity building and enabling environment activities that are tailored to the participating countries' specific conditions, markets and regulatory environment, and ES&L programs on the ground. Such balanced mix of activities is expected to promote market transformation favoring energy efficient appliances/equipment in the region and shifting investment patterns from standard quality appliances/equipment toward those of the energy efficient varieties. With enhanced enabling environment and the capacity built through the project, replications of several specific interventions that will be carried out in the project are expected. In particular, the pilot project activities that will be carried out are meant to showcase feasible design and application of ES&L programs, design and manufacturing of energy efficient equipment and appliances, widespread utilization of such equipment/appliances in the commercial, industrial and residential sectors, enforcement of policies and policy support activities, and implementation of financing schemes for supporting projects that promote utilization of energy efficient equipment and appliances. Replication is an integral component of the project design as the expected energy savings from the utilization of energy efficient equipment/appliances (and the corresponding GHG emissions reduction from the reduced electricity demand) rely on the replication of the relevant BRESL activities.
134. Replicability of the proposed project components will be ensured through the documentation of the package of activities/inputs that went into each EC&EE projects that are in one way or another, directly or indirectly influenced by the BRESL.

PART III: MANAGEMENT ARRANGEMENTS

135. Given the past experience with UNDP-supported project, UNDP seeks to implement an innovative management approach based on a partnership where accountability and responsibility for managing and achieving project outputs are equally shared among the BRESL participating countries. The partnership will be based on strengthened management at the regional level and the national level. The BRESL consists of two levels activities: (i) enhancing the regional cooperation/ multi-recognize and sharing the best practices of energy efficiency standard and labeling (EESL), and (ii) developing and implementing country-specific strategies and activities for energy efficiency standard and labeling (EESL) to overcome the barriers of reducing the energy consumption within each national context. The organizational structure is shown as follows:

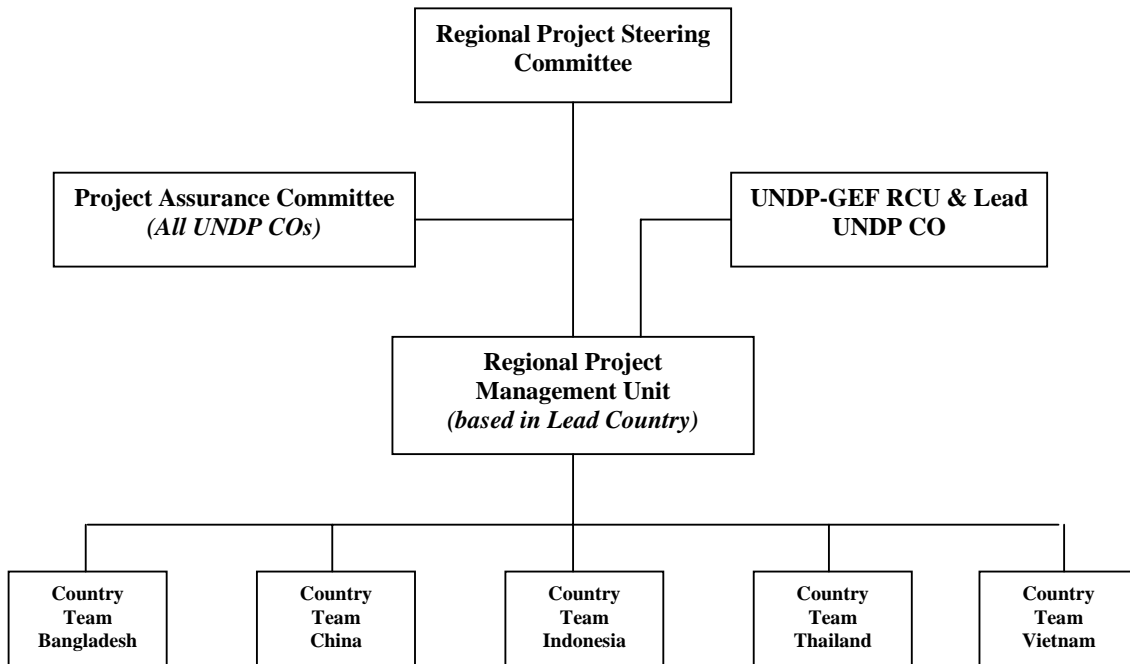


Fig. 3: BRESL Project Organizational Structure

Regional Coordination and Implementation Arrangements

136. The management structure of the BRESL project will mirror the aforementioned two-track approach, and will be at 2 levels. The first level will mainly be for the facilitation of regional cooperation. A Regional Project Steering Committee (RPSC) will be established and will comprise of the representatives of the UNDP-GEF Regional Coordination Unit (RCU) for Asia-Pacific, UNDP-China, participating country’s Government Focal Points (GFP), NDRC, and also including CSC and the Director of the Regional Project Management Unit (RPMU). The RPSC will play the role of an advisory committee. The RPSC member will also be invited to participate in the annual project review meetings. The Chairperson of the RPSC will be elected on a rotating basis among the participating countries. The RPMU will be also established to be responsible for coordinating and implementing the regional and national activities of the project. The RPMU Director will serve as the Secretary of the RPSC. BRESL will be Nationally-Executed (NEX) on behalf of the participating countries by China as the host country. It will assume the overall responsibility of ensuring that all activities are executed accordingly and as per the

approved Project Document. The National Development and Reform Commission (NDRC) will be the Implementing Partner (or Executing Agency) for the BRESL project while the China Standard Certification Center (CSC) is the Designated Implementing Partner (or Designated Implementing Agency).

137. The Regional Project Steering Committee (RPSC) will be established with the key responsibilities as follow: (a). Reviewing of annual progress reports for necessary guidance; (b) Reviewing and approving the annual work plans and budgets; (c) Providing guidance on the effectiveness of BRESL project implementation, and its linkages to corporate UNDP policy decisions, and other UNDP initiatives; and, (d) Monitoring and evaluating the implementation of BRESL towards the intended outputs, after two years of project execution. As a minimum, the RPSC will meet at least once a year, allowing for the stakeholders to review the progress with the project implementation and to agree on a coordinated annual project implementation strategy and plan.
138. UNDP-China, together with the UNDP-GEF Regional Technical Advisor for Climate Change in the Asia-Pacific region will carry out the GEF oversight. Working in conjunction with the various project partners, UNDP-China will be responsible for monitoring and evaluation (M&E), including organizing project reviews, approving annual implementation work plans and budget revisions, monitoring progress, identifying problems, suggesting actions to improve project performance, facilitating timely delivery of project inputs, and provide linkages to the other sub-regional, Asia-Pacific regional and global initiatives. All M&E functions will be carried out in line with standard UNDP and UNDP-GEF procedures. UNDP China will also provide country office support for all the activities of the project as agreed with the implementation partner of China.
139. As the Implementing Partner for this regional project, China's NDRC will appoint a Regional Project Director (RPD) to be in charge of overall responsibilities, including planning, coordination, administration and financial management of the project with support by UNDP-China. The RPD will be responsible for the achievement of the project objectives, for all projects' reporting, including the submission of Annual Work Plans (AWP) and financial reports. He/She will ensure the delivery of the project outputs and the judicious use of the project resources. This will ensure that expected outputs are delivered using the most efficient and cost-effective implementation strategies and procedures. The RPD will be also a member of the BRESL RPSC. As the project's Implementing Partner, the NDRC will also provide in-kind contribution to implement the BRESL project.
140. As the Designated Implementing Partner for this regional project, the China Standard Certification Center (CSC) will take responsibility of supporting NDRC and UNDP-China in managing and implementing the BRESL project. The Director of CSC will be a member of the BRESL RPSC. At the same time, the director will also provide guidance to the RPMU Director to manage the project. The CSC will also provide the overall guidance and approval of all operational activities and will report to the Implementing Partner on achievement of project results.
141. A Regional Project Management Unit (RPMU) will be established by UNDP-China, together with the NDRC and CSC. The RPMU will be responsible for the day-to-day management of all the project activities including those on capacity building, demonstration sub-projects and dissemination activities both at the regional and national level. At the same time, the RPMU will undertake some regional activities directly if needed. RPMU will be managed by a RPMU Director, who will be supported by three staff members.

142. A Project Assurance Committee (PAC) will be established with the main responsibility of monitoring the project implementation process and achievements. The Energy Focal Points of UNDP Country Offices (UNDP-COs) in the BRESL countries will be members of the PAC. They will also be called upon periodically to contribute inputs on the relevance of BRESL activities to the on-going and planned national level energy efficiency and related initiatives. Each PAC member will be responsible for the coordination of project activities and activities of the organizations he/she represents to avoid duplication of effort. On request from the RPMU, the PAC will provide guidance on the execution of project activities.
143. Relevant regional activities will be subcontracted to, and executed by appropriate regional organizations with the expertise and time on mutually agreed terms. Regional organizations, which have the comparative advantage vis-à-vis the relevant regional activities, will be designated as the sub-contractor for those activities. One mechanism to determine such possible comparative advantages is procurement via Open International Competition or Limited International Competition, as per UNDP Results Management User Guide.

National Coordination and Implementation Arrangements

144. The second level will mainly be on the implementation of the Country Teams (CTs) in each BRESL country. The CTs, made up of representative from government, the private sector and civil society including NGOs will ensure that the national activities are carried out in coordination with all the parallel activities. Each CT will provide support as per agreed work plan to the BRESL implementation at the regional level to ensure the maximum outputs and achievement of the project. Each country will decide on the most appropriate person to chair the CT. Each CT will appoint their own national experts, as needed, in accordance with the agreed national activities to be carried out under the BRESL project. Each country will appoint a National Project Coordinator (NPC) who will work full time on the project and paid from its country budget. The NPC will also be responsible for the day-to-day management and implementation of all national project activities.
145. In each BRESL country, the national level activities that were identified and defined by the country will be implemented by its CT. These are activities that address specific barriers to ES&L at the national level, delivering on-the-ground activities including appliance/equipment testing utilizing local experts and involving entities working on ES&L, as well as those that will contribute to the regional ES&L harmonization efforts. This is to ensure maximum impacts and visibility. It will also give country's ownership of the project, maximum local participation, particularly of the private sector, NGOs and local authorities, and more importantly the consumers. CTs may subcontract certain activities to regional and international experts where necessary.
146. National government professionals and other relevant national stakeholders from the private sector and civil society will, to the extent possible, manage, coordinate and implement the in-country activities. The CTs will upon request of the RPMU and as per agreed work plans be provided with external technical assistance for implementation of specific in-country activities. Relevant regional organizations, national consultants, regional consultants or international consultants can provide such needed expertise to the RPMU as needed.

BRESL Project Implementation

147. The proposed BRESL project will be implemented for five years. Considering the duration of the process of obtaining GEF funding, it is anticipated that the project will kick-off by the fourth quarter of 2007 and will conclude by the end of 2012.
148. To accord proper acknowledgement to GEF for providing funding, a GEF logo will appear on all relevant publications and documents produced by the project, including among others, project hardware purchased with GEF funds. Any citation from any of the BRESL project publications and documents will also accord proper acknowledgment to GEF. The UNDP logo should be more prominent and separated from the GEF logo if possible, as UN visibility is important for security purposes.

PART IV: MONITORING AND EVALUATION PLAN AND BUDGET

149. Project monitoring, evaluation and dissemination will be undertaken in accordance with UNDP and GEF established procedures. The executing agency will be required to prepare Quarterly Project Reports (QPR) and combined Annual Project Reports and Project Implementation Review reports (APR/PIR) to UNDP. The QPR will provide the summary of the project results, progress and variances from the original plan, implementation issues, and steps being taken to address these issues, and work plans for the next quarters for review and endorsement.
150. Quarterly work plans will be prepared based on the overall project objectives and performance indicators. These will be used to measure performance. It is through these reports and meetings that the project approach and activities will be formally refined. The PMO will present the project status and accomplishment to the PSC every quarter. A quarterly work plan based on project objectives and performance indicators will be presented, evaluated and adjusted as and when necessary.
151. The APR/PIR will provide a more in-depth summary of work-in-progress, measuring performance against both implementation and impact indicators. Any adjustments in project approach will be reported to the Regional Project Steering Committee who will evaluate and approve the adjustments recommended.
152. The project is subject to two in-depth independent reviews. One will be conducted in the mid-term (first quarter of the third year) and the other will be scheduled upon project termination. A terminal report would be completed prior to the completion of the project and would detail project achievements and lessons learned. Additional independent evaluation may be conducted if UNDP and the GEF deem it necessary.
153. As executing agency, CSC will carry out continuous self-monitoring of the project implementation performance. The in Section II, Part II states all the success indicators and means of verification for each activity that will be carried out under this project. These indicators are the parameters that will be monitored by CSC under this project.
154. To ensure coherent, coordinated and timely implementation of project activities, appropriate practical mechanisms, monitoring and evaluation (M&E) procedures and implementation arrangements will be developed between and among national and local government agencies, financial institutions, private sector partners, local NGOs and consumer groups. Specifically, an M&E plan for the BRESL implementation will be developed together with

the key stakeholders, and this plan will be based on the identified success indicators and means of verification for the project goal, project purpose, project outcomes, and project activities. The Regional PSC will advise and approve this M&E plan.

155. Surveys will be conducted during the project to track these and other indicators of project impact. Monitoring and Evaluation (M&E) activities will be undertaken to best international practice standards with reference to the International Monitoring and Verification Protocol (IPMVP) methodology. This reference to established international best practice IPMVP methodologies will be a vital element in the presentation of the results of the overall BRESL project to the full range of project stakeholders, including but not limited to GEF.
156. Success indicators for each objective and activity in the PPM will be monitored and evaluated during the course of project implementation. Section IV, Part VI provides the annual targets and the monitoring plan. The extent by which the GEF developmental goal is achieved will be evaluated from the monitored results. Annual target values for the indicators will be confirmed during project document finalization.
157. The project will coordinate with all the project partners. The continuous monitoring and evaluation of all project activities, even after completion of the project period, will bring sustainability of the project with desired benefits in the long run. All evaluation reports will be uploaded to the project website for widespread dissemination. A formal Monitoring and Evaluation Strategy will be developed and implemented in the full-scale project to track the activities and contributions of the activities by all the project partners, in terms of both in-cash and in-kind contributions as detailed in the attached letters of commitment. These M&E findings will be reported on in the project's two in-depth independent reviews.

PART V: PARTNERSHIPS STRATEGY

158. The successful implementation of BRESL will depend on the development of effective partnerships between numerous different agencies at multiple levels. Partnerships will be pursued with international and national agencies, as well as international partners to enrich and further project aims. The project will form a partnership strategy with three elements: (a) international coordinating and implementation function; (b) national coordination and implementation function; and, (c) Technical and commercial function.

Key Partners

159. BRESL will undertake the following activities to ensure that the project work is synergized with on-going national and regional level activities, as well as to benefit from the expertise available in the region:
 - Strengthen its links by developing Inter-agency Partnerships with key energy-related project nationally and internationally. These will include the Efficient Lighting Initiative (ELI), funded by the GEF and managed by the International Finance Corporation (IFC) and currently by the ELI Quality Management Institute; the UNDP-GEF funded End-Use Energy Efficiency Project (EUEEP) in China; and the Vietnam Energy Efficient Public Lighting (VEEPL). This outreach will also include finding synergies with on-going activities funded by the UNDP-GEF or GEF portfolio implemented by the World Bank, UNEP; other initiatives by UN sister agencies such as UN/ESCAP as well as projects funded by the Asian Development Bank (ADB) and APEC, etc. BRESL will work with

financing institutions in the region to provide support for energy service related initiatives.

- Partner with the NGO funding and implementation agencies such as the International Copper Association (ICA) and the Collaborative Labeling and Appliance Standards Program (CLASP) to broaden the reach and impact of the BRESL project.

PART VI: Legal Context

160. This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement between the Government of the Peoples Republic of China and the United Nations Development Programme, signed by the parties on 29 June 1979. The Executing Agency and Implementing Agencies shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government cooperating agency described in that Agreement.

161. The UNDP Resident Representative in China is authorized to affect in writing the following types of revision to this Project Document, provided that he/she has verified the agreement thereto by the UNDP-GEF Unit and is assured that the other signatories to the Project Document have no objection to the proposed changes:

- Revision of, or addition to, any of the annexes to the Project Document;
- Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation;
- Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility; and,
- Inclusion of additional annexes and attachments only as set out here in this Project Document

SECTION II: STRATEGIC RESULTS FRAMEWORK AND GEF INCREMENT

PART I: Incremental Cost Analysis

Broad Development Goals

1. Most of the Asian countries consider energy conservation and energy efficiency (EC&EE) to be cost-effective means of achieving their respective national energy objectives. Among these measures is the implementation of energy-efficiency standards and labeling (ES&L) programs. Such 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.
2. ES&L programs contribute to the realization of the Millennium Development Goals (MDG), particularly MDGs 1, 7 and 8, whereby the program can contribute to the eradication of extreme poverty directly and indirectly, improve environmental sustainability of a country's and/or a region's development path, and help improve trade ties and develop global partnership for development. Among the reasons for Asian countries becoming motivated to implement ES&L programs are the following:
 - Reduce growth in electricity use among the BRESL countries
 - Reduce energy bills, allowing consumers and businesses to use money saved to purchase local goods and services.
 - Improve products produced in BRESL countries so they can better compete in world markets.

Global Environmental Objective

3. ES&L programs are among the most cost-effective types of policies and EC&EE measures to address global climate change. Such programs have the potential to effect transformation of energy consuming appliance/equipment markets, which translates to widespread utilization of energy efficient appliances/equipment, at a cost far below the cost of providing new energy supply. With the widespread utilization of energy efficient products, GHG emissions from thermal power generation in China, Bangladesh, Indonesia, Thailand and Vietnam can be reduced significantly, as well as additional reductions in South Korea.
4. The project's objective is the removal of barriers to the cost-effective development and implementation of ES&L programs in Asia (particularly in the participating countries). To achieve the project objective, BRESL will comprise of 5 major components, each of which is a specific program consisting of specific activities designed to address the identified barriers.

Baseline Activities

5. In general, ES&L is known to many of the countries in the region, and some of these countries have already embarked on developing and implementing ES&L programs. However, such programs have progressed slowly and unevenly in Asia. In most Asian countries, even those that have ES&L programs, the average efficiency of products on the market is still far below the most efficient products available. Despite the difficulties, it is expected that countries in the region would continue to develop their ES&L programs, but still at a slow and uneven pace and hindered by and the mentioned barriers in financing,

policy, technology and information. Such would be the characteristic of the “business-as-usual” scenario in the field of ES&L development and implementation in Asia.

6. ES&L programs are underway in many countries in Asia region and are under consideration in most of the others. China and Korea both have extensive ES&L programs and update several standards and labels annually. Still, many of the standards in China are old and well below international norms. Thailand has a strong labeling program for several products but to date has set only two standards. A few lighting standards are likely to be set in the baseline. Other countries are just starting or exploring ES&L programs and are likely to make only limited progress without GEF support.
7. Electricity use is growing rapidly in the region with growth rates over the period 1999-2004 ranging from 4.9% – 12.3% annually (a simple average of 8.3% across the participating countries). In some countries such as China and Vietnam are growing at double-digit rates annually, straining electricity networks and requiring large investments in the electricity sector that are hard to sustain given other development goals. Table 10 below provides growth rates for individual countries.

Table 10: Average Annual Growth Rate in Electricity Sales, 1999-2004

Country	Annual Growth Rate (%)
Bangladesh	5.8
China	12.3
Indonesia	6.6
Korea	9.1
Thailand	7.8
Vietnam	11.9

Source: Energy Information Administration, U.S. Dept. of Energy

8. Several large global manufacturers are increasingly dominating appliance and equipment sales, squeezing sales and profit margins at many local manufacturers.

GEF Alternative

9. Under the alternative scenario, the BRESL countries will develop a much-improved capacity to design and implement ES&L programs. Barriers will be removed, capabilities improved, and countries will share analyses and experiences, all providing the foundation for adoption of more than 20 new standards and labels as part of this project (e.g., each of the BRESL countries is planning to establish standards and labels on approximately 4 products as part of this project). Furthermore, both national programs and regional cooperation will be well-established, allowing many ES&L activities to continue after GEF support ends.
10. The GEF alternative (i.e., BRESL project) will reduce electricity use in the participating countries by approximately 427,000 GWh in 2031, equivalent to about 17% of 2004 electricity use in the participating countries. These electricity savings will translate into billions of dollars of avoided investments in new power plants.
11. Standards adopted and education and technical assistance provided to manufacturers under the proposed project will provide local manufacturers with information on ways to improve product efficiency at moderate cost and on how to better sell more efficient products for increased profits. Manufacturers who adopt these techniques will be able to better compete in world markets.

12. In line with the GEF strategic objective for OP-5, the following interventions will be carried out under the BRESL Project:

- Creating the legal and regulatory basis for removing lowest EE technologies from the market and promoting high efficient technologies. Support will be provided to develop new laws and regulations including enabling laws, standards and labels on specific products, and implementation regulations and procedures.
- Strengthening institutions and developing capacities both in public and private spheres to secure on-the-ground implementation of the above. Activities will include training, regional technical working groups to develop standards, strengthening the national and regional testing and certification infrastructure, and improving data collection and reporting.
- Assisting manufacturers to better understand standards and labels and ways to use these programs to improve products and profits through modest cost efficiency improvements and improved marketing of high-efficiency, higher-profit products.
- Promoting regional coordination and information sharing through a regional ES&L website, preparation of a report on ES&L lessons learned from the region, establishment of a regional workgroup of ES&L officials from the region, and obtaining and providing information on ES&L activities beyond the region. In addition, planning for follow-up activities will begin in Year 3 and will be put in place by Year 5 so regional coordination can continue after this project ends.
- Undertaking several national level pilot projects to raise consumer awareness about efficient products and increase sales of efficient products that exceed minimum efficiency standards.

13. The following are the expected outcomes by end of the project:

- GHG emissions reduced by 22.0 MMT/yr CO₂ compared to business-as-usual scenario and a cumulative savings of 34.5 MMT by the end of the project (2011).
- Electricity savings of 24,021 GWh/yr compared to business-as-usual scenario and a cumulative electricity savings of about 37,688 GWh/yr by end of project.
- New minimum efficiency standards for air conditioners, refrigerators, fluorescent ballasts, CFLs and electric motors adopted in at least 4 countries, reducing energy use for these products by at least 10% relative to business as usual (4% for motors).
- At least 4 countries adopt new or improved appliance and equipment energy efficiency labeling schemes.
- ES&L programs are operating by project end in at least 5 participating countries, with plans in place to continue these programs after the GEF project ends.
- Regional coordination on ES&L makes it easier for all countries to develop and maintain ES&L efforts and countries elect to continue this coordination after the GEF project ends.
- A majority of manufacturers in the region recognize the opportunities for ES&L efforts to increase their profits.
- Mutual recognition agreements and product certification and posting procedures in place so testing and certification in one country generally meets requirements in other countries, easing burdens on manufacturers and promoting regional trade.
- Increased market share of EE equipment/appliances in the different countries and in the region as a result of the ES&L programs.

14. The proposed project is comprised of five major components consisting of complementary activities designed to remove barriers to achieve the project objectives. A separate component on project management is also included. The project components are as follows:

- ES&L Policy-Making Program - Establishment of legal basis for standards and labels and assisting with the development of regulations for the targeted products.
- ES&L Capacity Building Program - Building of institutional and individual capacity to secure on-the-ground implementation of standards and labels, including establishment of regional working groups for each of the targeted products.
- ES&L Manufacturer Support Program - Information and technical assistance for local product manufacturers to help them develop efficient products and realize profit opportunities from efficient products.
- ES&L Regional Cooperation Program: Regional cooperation activities that will aid individual countries with development and implementation of their ES&L programs and that will take important steps towards regional harmonization of standards and labels.
- ES&L Pilot Projects: Pilot activities implemented on a demonstration basis by individual countries, or groupings of countries, showcasing various aspects of the design, facilitation and implementation of ES&L programs, including support activities that build on the regional foundation provided by BRESL. This will include a number of activities implemented at the national level, with coordination across the region, as well as the initial work on regional harmonization led by China.

15. **Component 1: ES&L Policy-Making Program** - This component will include several activities to put in place new laws and regulations enabling and establishing equipment standards and labels. This will address the barrier that enabling laws or procedures are not in place in several of the participating countries or suffer from significant limitations. The focus here is to establish a legal and regulatory foundation for ES&L in each of the participating countries. This will include providing information and TA to countries without ES&L enabling authority in place so they can pass necessary enabling laws or regulations, and will also include providing information and TA to participating countries so they can adopt new standards and labels for the six targeted products. In addition, this component will include information and TA on standards and labeling implementation, in order to maximize compliance with ES&L regulations. Several of the participating countries lack experience and skills on the analyses and procedures to follow to establish standards and labels. This component will address this barrier. By working together to establish new standards and labels on the five targeted products, substantial and concrete benefits will be achieved. In addition, documentation of these benefits will help to build support for continued ES&L activities in each of the participating countries. For example, a country achieving substantial benefits from initial standards is more likely to allocate money out of national budgets to continue ES&L activities. In our survey of participating countries, one clear message we received was they want this project to focus on standard-setting actions and not just training and other enabling activities. This project component addresses this need. The activities under this component will collectively cost about US\$ 8.192 million. Incremental activities will cost US\$ 1,289,200 which will be financed by the GEF.

16. **Component 2: ES&L Capacity-Building Program** - This component will address several barriers including lack of technical know-how on ES&L, lack of institutional capacity on ES&L implementation, absence of adequate information on appliance and equipment efficiency and trends and limited local energy performance testing facilities. This component will include several key activities to build capacity for developing and implementing energy standards and codes including staff training, establishment of product-specific working groups, provision for adequate testing facilities, establishment of regular data collection and

reporting processes, and facilitation of mutual recognition agreements so that equipment tested and certified in one country does not need to be retested and recertified in other participating countries. The activities under this component will collectively cost around US\$ 10.979 million. Incremental activities will cost US\$ 2,076,100 which will be financed by the GEF.

17. **Component 3: ES&L Manufacturer Support Program** - This component has been primarily designed to address the barrier that manufacturers are often distrustful of standards and labels, and their objections can delay ES&L efforts or result in weakening of standards. During the Regional Stakeholder Workshop in August 2006, it was agreed that this manufacturer-related barrier is generic across the region, but must be dealt with in the context of each national economic and cultural setting. Therefore the activities will be carried out separately within each country, but with the sharing of lessons learned at the regular regional BRESL meetings being an important part of the component design. This component will include the provision of information to manufacturers on ways to improve product efficiency at modest cost; training on ways to use ES&L programs to increase profitability; and technical assistance to individual local manufacturers on these issues. The activities under this component will collectively cost about US\$ 5.810 million. Incremental activities will cost US\$ 688,600 which will be financed by the GEF.

18. **Component 4: ES&L Regional Coordination Program** - This component is intended to help countries to learn from each other so they can emulate successful efforts and avoid relearning mistakes that others have made. In addition, this component will include an activity to plan to follow-up activities when GEF funding ends, so that regional cooperation and progress and standards can continue. The activities under this component will collectively cost around US\$ 3.843 million. Incremental activities will cost US\$ 643,100 which will be financed by the GEF.

19. **Component 5: ES&L Pilot Projects** - This component is intended to provide flexibility to individual countries, or groupings of countries, to carry out activities that can showcase specific aspects of the various aspects of the design, facilitation and implementation of ES&L programs, including support activities. The specific pilot projects are on ES&L-related policy research and implementation, marketing and promotion of energy efficient equipment (equipment that exceeds MEPS) that is identified through energy labeling, consumer education on how to identify efficient products or the benefits of purchasing these products. Information on successful pilots will be shared with other countries, so they can replicate them. The activities under this component will collectively cost about US\$ 3.229 million. Incremental activities will cost US\$ 1,202,800 which will be financed by the GEF.

Incremental Cost Matrix and Project Indicative Budget

20. The proposed budget for each project component is shown in Table 11 below. In total we are requesting US\$ 6,800,000 from the GEF.

Table 11: Summary Cost of Each Project Component (US\$)

Project Component	Baseline	Incremental	Total Cost	%
1. ES&L Policy Making Program	6,903,000	1,289,200	8,192,200	24.0%
2. ES&L Capacity Building Program	8,903,200	2,076,100	10,979,300	32.1%
3. ES&L Manufacturer Support	5,120,900	688,600	5,809,500	17.0%

Project Component	Baseline	Incremental	Total Cost	%
4. ES&L Regional Cooperation	3,200,700	643,100	3,843,800	11.3%
5. ES&L Pilot Projects	2,026,600	1,202,800	3,229,400	9.5%
Project Management Unit Support	1,200,500	900,200	2,100,700	6.2%
<i>of which Monitoring and Evaluation</i>	0	100,000	100,000	
Total	27,354,900	6,800,000	34,154,900	100%

21. Table 12A shows the distribution of the GEF budget among the BRESL countries. The total cost figure of each country represents the amount from their respective GEF-4 climate change allocation that is earmarked for the BRESL Project.

Table 12A: Country Contribution to BRESL Project, by Activity (US\$)

Country	Project Components					Project Mgm't	Total
	1	2	3	4	5		
Bangladesh	189,200	310,300	128,410	99,410	140,300	132,380	1,000,000
China	214,600	617,700	175,615	180,515	546,800	264,770	2,000,000
Indonesia	369,200	505,700	185,855	160,055	340,900	238,290	1,800,000
Thailand	282,500	292,800	94,410	99,210	98,700	132,380	1,000,000
Vietnam	233,700	349,600	104,310	103,910	76,100	132,380	1,000,000
Total	1,289,200	2,076,100	688,600	643,100	1,202,800	900,200	6,800,000

22. Table 12B provides the summary of budget cost sharing among GEF and the co-financiers of the full-scale project by components/activities (*excluding the US\$50,000 GEF plus co-financing for the PDF-A exercise*).

Table 12B: BRESL Cost Sharing Matrix (US\$)

No	COMPONENTS	GEF	National Gov't.	Regional Org.	Private Sector	Foundations	Total
1	ES&L Policy-Making Program	1,289,200	6,549,300	0	290,000	63,700	8,192,200
	Bangladesh		778,700				778,700
	China		1,000,700				1,000,700
	China -- Energy Foundation					63,700	63,700
	Indonesia		1,186,700				1,186,700
	Korea		11,700				11,700
	Thailand		2,134,000				2,134,000
	Vietnam		1,437,500				1,437,500
	ICA				290,000		290,000
	CLASP				0		0
2	ES&L Capacity-Building Program	2,076,100	7,904,600	100,000	580,000	318,600	10,979,300
	Bangladesh		591,800				591,800
	China		5,008,400				5,008,400
	China -- Energy Foundation					318,600	318,600
	Indonesia		817,300				817,300
	Korea		58,500				58,500
	Thailand		853,600				853,600
	Vietnam		575,000				575,000

No	COMPONENTS	GEF	National Gov't.	Regional Org.	Private Sector	Foundations	Total
	ICA				580,000		580,000
	CFL Harmonization Initiative			100,000			100,000
3	ES&L Manufacturer Support Program	688,600	4,012,900	100,000	870,000	138,000	5,809,500
	Bangladesh		529,500				529,500
	China		2,408,600				2,408,600
	China -- Energy Foundation					138,000	138,000
	Indonesia		360,500				360,500
	Thailand		426,800				426,800
	Vietnam		287,500				287,500
	ICA				870,000		870,000
	CFL Harmonization Initiative			100,000			100,000
4	ES&L Regional Cooperation Program	643,100	2,536,000	5,000	580,000	79,700	3,843,800
	China		1,500,600				1,500,600
	China -- Energy Foundation					79,700	79,700
	Indonesia		213,300				213,300
	Korea		7,800				7,800
	Thailand		426,800				426,800
	Vietnam		287,500				287,500
	ICA				580,000		580,000
	Australia - AGO		100,000				100,000
CLASP			5,000			5,000	
5	ES&L Pilot Projects	1,202,800	1,446,600	0	580,000	0	3,229,400
	China		553,700				553,700
	Indonesia		178,600				178,600
	Thailand		426,800				426,800
	Vietnam		287,500				287,500
	ICA				580,000		580,000
	Regional Project Management	900,200	1,200,500	0	0	0	2,100,700
	Bangladesh		100,000				100,000
	China		528,000				528,000
	Indonesia		152,500				152,500
	Thailand		210,000				210,000
	Vietnam		210,000				210,000
TOTAL		6,800,000	23,649,900	205,000	2,900,000	600,000	34,154,900

Table 12C: Summary of Project Co-Financing

Contributor	Classification	Type	Amount (US\$)	Status
Bangladesh Government	Government	Cash & In-Kind	2,000,000	Confirmed
China Government	Government	Cash	10,068,000	EOI
		In-Kind	932,000	
China – Energy Foundation	Foundation	Cash	600,000	Confirmed
Indonesia Government	Government	Cash & In-Kind	2,908,900	EOI
Korea Government	Government	In-Kind	78,000	Confirmed
Thailand Government	Government	Cash & In-Kind	4,478,000	EOI
Vietnam Government	Government	Cash & In-Kind	3,085,000	EOI

Contributor	Classification	Type	Amount (US\$)	Status
International Copper Association	Private	In-Kind	2,900,000	Confirmed
CFL Harmonization Initiative	Regional Organization	Cash	100,000	Confirmed
		In-kind	100,000	
Australian Greenhouse Office (AGO)	Government	Cash	50,000	Confirmed
		In-kind	50,000	
CLASP	Regional Organization	Cash	5,000	Confirmed
Total			27,354,900	

EOI = Expression of Interest; to be confirmed prior to GEF CEO Approval of BRESL Project

23. Bangladesh: The Bangladesh co-financing budget (baseline) is US\$ 2.0 million. This includes budget for national and international experts from current and ongoing programs related to ES&L. The funds come from a number of sources, including development agencies, but the cost share is shown in the budget as a Bangladeshi government contribution.

24. China: The China co-financing budget (baseline) is US\$ 11.0 million. The largest portion is US\$ 7.551 million for equipment, staff, and training for test laboratories for six products. US\$ 2.517 million is for manufacturer promotion; US\$ 755,000, US\$ 101,000, and US\$ 76,000 are for in-kind salary contributions from SAC; manufacturers; and NDRC, respectively.

25. Indonesia. The co-financing budget from Indonesia is basically the budget allocated for ES&L-related activities by the DGEEU. This amounts to US\$ 2,908,900.

26. Korea: The Korean co-financing budget (baseline) is US\$ 78,000. This includes the man-days contributed by two Korean experts at each of the 5 Technical Working Group meetings each year. It also includes an estimated US\$ 2,600 per year of S&L-related program costs.

27. Thailand: The Thai co-financing budget (baseline) is US\$ 4.478 million. This includes US\$ 0.228 million as in-kind salary contributions from the Thai government, and an estimated US\$ 4.25 million from the government's current and ongoing national ES&L programs operated by DEDE and EGAT.

28. Vietnam: The Vietnam co-financing budget (baseline) is US\$ 3.085 million. This includes US\$ 0.285 million as in-kind salary contributions from the Vietnamese government, and an estimated US\$ 2.8 million from the government's current and ongoing national ES&L programs operated by EVN, MOST, and MOI.

29. Australian Government Office – This Australian government agency is contributing US\$ 100,000 as co-financing for the regional harmonization activities that will be carried out under the BRESL.

30. International Copper Association (ICA): In China and in Southeast Asia (Indonesia, Malaysia, Thailand, and Vietnam), ICA is working on three of the core BRESL products: air conditioners, electric motors, and fluorescent lamp ballasts. ICA's in-kind contribution to BRESL (US\$ 2.90 million) involves support for development of MEPS and labeling schemes, market awareness and education, and technical assistance to manufacturers. The following are the work program activities of ICA for 2007-2012 that it has agreed to be subsumed under BRESL:

Country	ES&L Program Development	ES&L Market Education	Capacity Building for Local Manufacturers
Bangladesh	Motors, Transformers, Air Conditioners		Motors, Transformers, Air Conditioners
China	Motors, Transformers, Magnetic Ballasts, Air Conditioners, Water Heaters	Motors, Transformers, Magnetic Ballasts, Air Conditioners, Water Heaters	Motors, Water Heaters, Magnetic Ballasts
Thailand		Motors	
Vietnam	Motors, Transformers	Motors	Motors

31. The International CFL Harmonization Initiative is an alliance of governments, private sector companies, associations, and non-governmental organizations that is working together to develop a single, improved international harmonized test protocol for compact fluorescent lamps; to carry out round-robin testing in order to validate the new test protocol; to develop a set of discrete performance levels that can be adopted on a voluntary basis by any country; and to share these results with the wider international community. Cost-sharing activities (US\$ 200,000) include round-robin testing; a series of international events; an international web site (www.apec-esis.org/cfl); consulting input and analysis; and in-kind participation by industry.
32. The Energy Foundation in China has also committed US\$ 600,000 for activities focusing on ES&L policy making and capacity building, appliance/equipment manufacturer support and regional cooperation activities on ES&L.
33. CLASP, which is active in ES&L capacity building in the region, has also committed US\$ 5,000 cash technical assistance support for the ES&L policymaking and regional cooperation programs of the BRESL project.
34. Table 13 shows the incremental cost matrix. The baseline and alternative courses of actions are presented together with the costs of achieving them.

Table 13: Incremental Cost Matrix

Component	Baseline	Alternative	Increment
Global Environmental Benefits	<ul style="list-style-type: none"> • EE products installed from 2004 to 2011 will use 1,032,132 GWh/year in 2011 • Limited GHG emissions reduction of about 876 MMT/yr due to limited implementation of ES&L programs. 	Cumulative 34.5 MMT CO2 reduced by project end, attributed to 2.3% reduction in electricity consumption	2.5% reduction in annual growth rate of GHG emissions by about 22 MMT/yr in 2011
Domestic Benefits	<ul style="list-style-type: none"> • Limited energy savings from the application of EE appliance/equipment • Proliferation of appliance/equipment that are energy inefficient in the local markets 	<ul style="list-style-type: none"> • New energy efficient products are available and affordable in local appliance and equipment markets • Regulations and enforcement of energy standards and labels • Reduced dependence on energy inefficient energy using equipment/appliance • Predominance of better quality and EE equipment/appliances in local and regional markets 	<ul style="list-style-type: none"> • Significant improvement in the implementation of ES&L programs in Asian countries • Built/developed capacity on ES&L programs, and in the local manufacturing of EE products • Enhanced campaigns and advocacy on the use of EE products • Improved policies and regulatory regimes supportive of ES&L programs and utilization of EE products
Component 1: ES&L Policy-Making Program	<p>Business as Usual China and Korea have substantial ES&L programs. Thailand has strong labeling program but only a few standards. ES&L programs just starting in Viet Nam. Exploratory efforts in Bangladesh and Indonesia.</p>	<p>Proposed Situation Substantial and on-going ES&L programs in all participating countries.</p>	<p>Additional Features Programs in Thailand, and Viet Nam significantly expand, Bangladesh and Indonesia begin programs.</p>
	<p>Domestic Benefits</p> <ul style="list-style-type: none"> • Substantial energy and operating cost savings in China and Korea, moderate in Thailand, small in Viet Nam • Many ES&L programs are haphazard and do not operate smoothly. 	<p>Domestic Benefits</p> <ul style="list-style-type: none"> • Substantial energy and operating cost savings in all participating countries • ES&L programs operate more smoothly and have increased support from both manufacturers and consumers. 	<p>Domestic Benefits</p> <ul style="list-style-type: none"> • Energy savings and operating cost savings increase substantially in all countries. • Locally produced products more efficient and advanced and better able to compete in world markets.
	<p>Global Benefits</p> <ul style="list-style-type: none"> • Moderate amount of greenhouse gas emissions reductions, primarily in China and Korea. 	<p>Global Benefits</p> <ul style="list-style-type: none"> • Substantial greenhouse gas emissions reductions. 	<p>Global Benefits</p> <ul style="list-style-type: none"> • Greenhouse gas savings from ES&L programs more than double. • Additional successful policy examples for other countries to replicate.

Component	Baseline	Alternative	Increment
COST	US\$ 6,903,000	US\$ 8,192,200	US\$ 1,289,200
Component 2: ES&L Capacity- Building Program	Business as Usual <ul style="list-style-type: none"> • Training is limited and ad hoc • A few country-specific analyses conducted which vary in quality • Test laboratories strong in some countries but weak in others • Limited data tracking conducted in just a few countries 	Proposed Situation <ul style="list-style-type: none"> • Training provided in all participating countries • Regional analyses of good quality • Testing infrastructure strengthened in weak countries • Most participating countries collect and report basic data annually 	Additional Features <ul style="list-style-type: none"> • Public officials, consultants and others understand and can carry-out ES&L processes and procedures • Regional analyses and working groups provide foundation for national actions (more than 20 new national standards-- about 4 new product standards per country) • Data collected that allows monitoring of progress in each country and development of steps to address weaknesses
	Domestic Benefits <ul style="list-style-type: none"> • Capacity grows slowly, supporting modest improvements in energy efficiency 	Domestic Benefits <ul style="list-style-type: none"> • Capacity increases significantly in many of the participating countries add staff and improve capabilities 	Domestic Benefits <ul style="list-style-type: none"> • Increased capacity, supporting significant improvements in national ES&L programs, reducing energy use and consumer electricity bills
	Global Benefits <ul style="list-style-type: none"> • Capacity grows slowly, supporting modest reductions in greenhouse gas emissions relative to current products 	Global Benefits <ul style="list-style-type: none"> • Capacity increases significantly, enabling larger emissions reductions 	Global Benefits <ul style="list-style-type: none"> • Increased capacity enables standards which significantly reduce GHG emissions. • Countries outside the region have additional models to emulate on ways to pursue ES&L programs.
COST	US\$ 8,903,200	US\$ 10,979,300	US\$ 2,076,100
Component 3: ES&L Manufacturer Support Program	Business as Usual <ul style="list-style-type: none"> • Manufacturers generally skeptical about ES&L efforts and are a barrier to ES&L progress • Manufacturers often believe it will be difficult and expensive to improve product efficiency 	Proposed Situation <ul style="list-style-type: none"> • Manufacturers understand opportunities to use ES&L to increase profits • Manufacturers understand and implement modest-cost strategies for increasing product efficiency 	Additional Features <ul style="list-style-type: none"> • Manufacturers more supportive of ES&L efforts, particularly efforts that increase opportunities to sell higher profit products with low incremental costs
	Domestic Benefits <ul style="list-style-type: none"> • Manufacturer concerns reduce progress on ES&L 	Domestic Benefits <ul style="list-style-type: none"> • Sales of value-added efficient equipment increase 	Domestic Benefits <ul style="list-style-type: none"> • Increased manufacturer profits • Reduced consumer energy bills

Component	Baseline	Alternative	Increment
	<ul style="list-style-type: none"> Profitability not affected 	<ul style="list-style-type: none"> Manufacturer support allows stronger ES&L programs 	<ul style="list-style-type: none"> Energy savings
	Global Benefits <ul style="list-style-type: none"> Most of the benefits of energy savings and emissions reductions are not realized 	Global Benefits <ul style="list-style-type: none"> Manufacturers in region more supportive of ES&L efforts in other countries 	Global Benefits <ul style="list-style-type: none"> Greater emissions reductions
COST	US\$ 5,120,900	US\$ 5,809,500	US\$ 688,600
Component 4: ES&L Regional Cooperation Program	Business as Usual <ul style="list-style-type: none"> Each country pursues ES&L largely on their own Modest amounts of regional cooperation 	Proposed Situation <ul style="list-style-type: none"> Extensive regional collaboration Countries can share analyses and experiences Gradual move towards harmonized standards 	Additional Features <ul style="list-style-type: none"> Shared analyses and experiences make it easier for individual countries to adopt new standards and labels Standards increasingly harmonized with countries in the region
	Domestic Benefits <ul style="list-style-type: none"> Modest energy and energy bill savings 	Domestic Benefits <ul style="list-style-type: none"> Significantly increased energy and bill savings Stature of and support for ES&L efforts increase in the region 	Domestic Benefits <ul style="list-style-type: none"> Substantial energy and bill savings Increased support for ES&L efforts
	Global Benefits <ul style="list-style-type: none"> Modest emissions reductions 	Global Benefits <ul style="list-style-type: none"> Much larger emissions reductions 	Global Benefits <ul style="list-style-type: none"> Emissions reductions more than double Example of regional cooperation for other regions to emulate
COST	US\$ 3,200,700	US\$ 3,843,800	US\$ 643,100
Component 5: ES&L Pilot Projects	Business as Usual <ul style="list-style-type: none"> Modest existing efforts continue 	Proposed Situation <ul style="list-style-type: none"> Pilot projects undertaken in 6 countries Successful pilots continued in originating country and replicated in several other countries 	Additional Features <ul style="list-style-type: none"> On-going government procurement programs for efficient equipment in at least 3 countries On-going consumer education efforts in at least 3 countries
	Domestic Benefits <ul style="list-style-type: none"> Some consumers familiar with efficient products, how to identify them and their benefits but most consumers are not familiar with efficient products. 	Domestic Benefits <ul style="list-style-type: none"> Number of consumers familiar with efficient products increases significantly. 	Domestic Benefits <ul style="list-style-type: none"> Informed consumers much more likely to purchase efficient products.
	Global Benefits <ul style="list-style-type: none"> Modest emissions reductions. 	Global Benefits <ul style="list-style-type: none"> Much greater emissions reductions 	Global Benefits <ul style="list-style-type: none"> Substantial incremental reductions in emissions.

Component	Baseline	Alternative	Increment
COST	US\$ 2,026,600	US\$ 3,229,400	US\$ 1,202,800
Project Management Unit Support Cost (including M&E)	US\$ 1,200,500	US\$ 2,100,700	US\$ 900,200
TOTAL COST	US\$ 27,354,900	US\$ 34,154,900	US\$ 6,800,000

PART II: Logical Framework Analysis (Project Planning Matrix)

Table 14: Project Planning Matrix (PPM)

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
GOAL: Reduction of GHG emissions from thermal power generation in selected Asian countries.	<ul style="list-style-type: none"> Reduction in GHG emissions from thermal power generation Reduction in the annual growth rate of GHG emissions from thermal power generation. 	<ul style="list-style-type: none"> CO2 emissions generation in Year 0 = 410.6 MMT/yr CO2 emission generation in Year 5 = 875.7 MMT/yr 	<ul style="list-style-type: none"> CO2 emission generation in Year 5 = 853.7 MMT/yr CO2 emission reduction = 22 MMT/yr by Year 5 2.4 % per year compared to business-as-usual (BAU) by project end 	<ul style="list-style-type: none"> Monitoring reports on changes in average equipment efficiency and sales from participating governments to the PMU 	<ul style="list-style-type: none"> Continuous and committed support and participation from governments of participating countries
OBJECTIVE: Removal of barriers to the successful implementation of energy standards and labeling policies and programs in Asia.	<ul style="list-style-type: none"> Reduction in total electricity use in the residential, commercial and industrial sectors. Reduction in average energy use of targeted products being sold by Year 5. Market share of energy efficient appliances and equipment 	<ul style="list-style-type: none"> Electricity usage in Year 0 = 482,068 GWh/year Electricity usage in Year 5 = 1,032,132 GWh/yr Increase in efficiency of products is at rate of 0.2 to 1% per year 	<ul style="list-style-type: none"> Electricity usage in Year 5 = 1,008,111 GWh/yr Electricity savings in Year 5 = 24,021 GWh/yr 10% energy savings from new standards (4% for motors) Increase in efficiency of products at rate of 0.4 to 2% per year (varying by product) from Year 5 onward due to labeling Market share of efficient products increase 25% in year 5 relative to baseline 	<ul style="list-style-type: none"> Official publications or documents on sales and saturation rates of energy-efficient equipment provided by each selected country. Annual reporting on progress from the participating countries 	<ul style="list-style-type: none"> Interest in energy issues will remain at current levels or will increase over time Proactive participations of equipment suppliers, engineering firms, and financial institutions
• OUTCOMES					
Component 1: ES&L Policy-Making Program. Establishment of legal and regulatory basis for removing lowest EE technologies from the market and promoting	<ul style="list-style-type: none"> Clear ES&L principles expressed in laws and regulations of participating countries by Year 3. 	<ul style="list-style-type: none"> Except for China and Korea, countries lack clear regulatory and legal framework 	<ul style="list-style-type: none"> 4 countries adopt new laws and regulations on ES&L by Year 3 10% energy savings in new AC by Year 5; 	<ul style="list-style-type: none"> Official publications or documents on energy-efficiency regulations and policies provided by 	<ul style="list-style-type: none"> Continued political support by governments in participating countries to advance legislation.

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
<i>high-efficiency technologies.</i>	<ul style="list-style-type: none"> • New minimum standards for air conditioners (A/Cs). • New minimum standards for refrigerators • New minimum standards for fluorescent ballasts. • New minimum standards for motors. • Quality standards for compact fluorescent lamps (CFLs). • Labeling scheme implementation. 	for MEPS and mandatory labeling	<ul style="list-style-type: none"> • approved in 4 countries by Year 3. • 10% energy savings in new refrigerators by Year 5; approved in 4 countries by Year 3. • 30% reduction in losses from new ballasts by Year 5; approved in 4 countries by Year 3. • At least 4% energy savings for new motors by Year 5; approved in 4 countries by Year 3. • 15% reduction in electricity use from new electric fans by Year 5; approved in 4 countries by Year 3. • 20% reduction in electricity use from rice cookers by Year 5; approved in China by Year 3. • Quality standards for CFLs approved in at least 4 countries by Year 3. • Labels in use for at least two products in 5 countries by Year 5. 	<ul style="list-style-type: none"> • each selected country. • National statistics on standards and labeling programs as reported on APEC Energy Standards Information System (www.apec-esis.org) • Annual reports to the PMU by each participating country • Project visits and surveys. 	
Activity 1.1: Strengthening of policy context for ES&L actions Supporting Activities: <ul style="list-style-type: none"> • Activities that support the 	<ul style="list-style-type: none"> • Approved laws and policy documents setting clear principles for EE by end year 1 	<ul style="list-style-type: none"> • Limited awareness and support among energy policymakers 	<ul style="list-style-type: none"> • 3 countries that currently lack ES&L laws and policies • In Thailand, at least 4 	<ul style="list-style-type: none"> • Official publications or documents on energy testing, standards, and 	<ul style="list-style-type: none"> • Interest of the policy-makers in EE remains at least at the current level

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
<p>implementation of the recommendations for more favorable policy principles and a more favorable regulatory framework in the core-countries for market transformation.</p> <ul style="list-style-type: none"> • Policy research study in Thailand on restructuring national ES&L program based on experiences of other countries to make them more effective. 	<ul style="list-style-type: none"> • More effective Thai ES&L program manifested by number of standards adopted and labels revised 	<p>about central role of ES&L in achieving energy savings and GHG mitigation targets</p>	<p>new standards adopted and labeling scales revised for at least 2 products</p>	<p>labeling provided by each selected country</p> <ul style="list-style-type: none"> • Annual reports to the PMU by each participating country • Evaluation report on performance of Thai ES&L program • Market survey results 	<ul style="list-style-type: none"> • Commitments for allocation of public budgets for EE standards and labels increases
<p>Activity 1.2: Adoption and implementation of ES&L regulations</p> <p>Supporting Activities:</p> <ul style="list-style-type: none"> • Implementation of standards and labeling programs for A/Cs, refrigerators, fluorescent ballasts, motors, CFLs and electric fans • Provision of technical assistance to individual counties to help them adapt workgroup products (Activity 2.2) to individual country needs. 	<ul style="list-style-type: none"> • Adopted and enforced minimum standards and labels <ul style="list-style-type: none"> • No. of countries implementing ES&L programs for A/Cs • No of countries implementing ES&L programs for refrigerators • No. of countries implementing ES&L programs for fluorescent ballasts • No of countries implementing ES&L programs for motors • No. of countries implementing ES&L programs for 	<ul style="list-style-type: none"> • China and Korea implement mandatory labeling • Implementation of MEPS and labeling in China only partially effective • For other countries, only voluntary labeling, and only 1 MEPS passed on average per country during project period 	<ul style="list-style-type: none"> • 4 countries implementing new standards and labels for A/Cs by end of year 4 • 4 countries implementing new standards and labels for refrigerators by end of year 4 • 4 countries implementing new standards and labels for fluorescent ballasts by end of year 4 • 4 countries implementing new standards and labels for CFLs by end of year 4 • 4 countries implementing new standards and labels for electric fans by end of year 4 • 1 country implementing new standards and labels for rice cookers by end of 	<ul style="list-style-type: none"> • Official publications or documents on monitoring or enforcement programs provided by each selected country • Annual reports to the PMU by each participating country • National statistics on standards and labeling programs as reported on APEC Energy Standards Information System (www.apec-esis.org) 	<ul style="list-style-type: none"> • Interest of the policy-makers in EE remains at minimum at the current level • Mechanisms to monitor and enforce standards and labels are in place

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
	CFLs <ul style="list-style-type: none"> No of countries implementing ES&L programs for electric fans 		year 4		
Component 2: ES&L Capacity-Building Program. Building of institutional and individual capacity to secure on-the-ground implementation of regulatory frameworks, as well as actual standards and labeling programs.	<ul style="list-style-type: none"> New testing standards and testing facilities in place and operational by Year 4. Mutual recognition agreements in place and enforced for product testing and posting of certification information by Year 4 Web-based posting procedures for certified equipment information developed and implemented by Year 5 Countries with annual data collection and reporting systems in place and being implemented 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> At least one for the targeted products in at least 3 countries At least 3 participating countries sign mutual recognition agreements by Year 4. At least 4 participating countries are posting certification information by Year 5 Certification information posted on at least 500 products by Year 5 At least 4 participating countries have such procedures in place by end of Year 3 	<ul style="list-style-type: none"> PMU annual progress reports Mutual Recognition Agreements (MRAs) between appropriate agencies in each country 	<ul style="list-style-type: none"> Interest of key individual and organizations remains at least at current levels throughout the project Program managers willing to accept test results from accredited labs in other countries Organizations involved with testing have some flexibility to accommodate needs of other countries
Activity 2.1: Training to strengthen and enable public institutions to support development and implementation of EE standards and labeling Supporting Activities: <ul style="list-style-type: none"> Carry out short-term training 	<ul style="list-style-type: none"> EE professional public officers and consultants trained Number of trainees that are applying ES&L principles in their work 	<ul style="list-style-type: none"> Limited, one-off regional workshops related to ES&L No systematic and sustained training and hands-on meetings related to 	<ul style="list-style-type: none"> At least 6 EE professional public officers and consultants per participating country trained by end of year 1 60% of trainees engaged in national ES&L program implementation 	<ul style="list-style-type: none"> Annual reports by each participating country to PMU 	<ul style="list-style-type: none"> Sustained interest of governments and in-country associations

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
courses on EE technical standards and labeling, product testing, and data collection and reporting for public officers such as energy and environmental policy-makers, officers at standards and testing organizations, utility DSM offices as well as manufacturer staff involved with EE products and regulations		ES&L planning and implementation in the region	by Year 2		
<p>Activity 2.2: Capacity enhancement in the development and implementation of standards and labeling for the 6 targeted products</p> <p>Supporting Activities:</p> <ul style="list-style-type: none"> • Formation of regional product working groups that meet at least annually for each of the 6 targeted products. • Working groups share information on activities in each participating country and undertake joint research and analysis to facilitate development and implementation of standards and labeling in individual countries. 	<ul style="list-style-type: none"> • Number of private sector and government participants in regional product working groups. • Number of improved government-supported national ES&L programs implemented • Implemented National ES&L programs incorporate recommendations of working groups 	<ul style="list-style-type: none"> • No regional working groups on end-use policies or ES&L related to five of the six target products • Meetings on CFL harmonization and the Efficient Lighting Initiative (ELI) occur in Asia region on average 1-2 times per year, with 1-2 people attending from each participating country 	<ul style="list-style-type: none"> • At least 2 officials from each of the participating countries participate in at least 2 product-specific working groups • At least 4 national ES&L programs significantly enhanced • At least 4 countries participating in each working group use working group products to adopt new standards and/or labels 	<ul style="list-style-type: none"> • PMU reports. • Working group reports • Annual reports of each participating country to PMU 	<ul style="list-style-type: none"> • Sustained interest of countries and associations • Countries allocate staff time, and at least some budget, to indicate buy-in to Working Groups
Activity 2.3: Strengthening of national and regional testing and certification infrastructure	<ul style="list-style-type: none"> • Number of improved test procedures developed and adopted 	<ul style="list-style-type: none"> • No systematic regional discussion on coordination of 	<ul style="list-style-type: none"> • 4 countries adopt improved test procedures on at least one product 	<ul style="list-style-type: none"> • Annual reports of each participating country to PMU 	<ul style="list-style-type: none"> • Sustained interest of public officials and others involved in

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
<p>Supporting Activities:</p> <ul style="list-style-type: none"> • Product-specific working groups address testing issues including commonalities, differences and modifications to testing standards to improve testing accuracy and regional cooperation • Survey of testing laboratory availability and capabilities in participating countries and identification of gaps • TA in the development and operation of ES&L testing facilities • Drafting, negotiation and execution of Memorandum of Understanding and MRAs on testing and certification • Market monitoring system for ES&L design & implementation in China, to include development of a detailed market monitoring scheme, a sampling methodology, and conduct of market monitoring tests. 	<p>by Year 3.</p> <ul style="list-style-type: none"> • Number of improved testing facilities constructed and operational by end of project • Number of countries with testing and certification procedures in place • Round-robin testing completed to assess comparability of testing between countries • Number of mutual recognition agreements (MRAs) on product testing and certification signed and implemented by Year 4. • Web-based posting procedures developed and implemented by Year 4. • Labeling accuracy in China 	<p>test procedures for any of the target products and no round-robin testing in the region</p> <ul style="list-style-type: none"> • Three countries have certification procedures in place • In 2004-2005, there was one regional meeting and study tour to Australia to discuss harmonized ballast test procedure; but it has not yet been adopted by ASEAN countries • No active MRAs in place covering the six target products in the BRESL countries • No web posting of results of energy performance testing for any of the six target products 	<ul style="list-style-type: none"> • At least 1 improved testing facility for targeted products in at least 2 countries. • At least 6 countries have certification procedures in place by end of Year 3 • Round-robin testing completed by end of Year 4 • At least 3 countries sign and implement MRAs with other participating countries. • At least half of the participating countries post information on testing procedures on the web. • Significant increase in the accuracy of labels in the last year of the market monitoring scheme under this project relative to the first year 	<ul style="list-style-type: none"> • PMU reports. • Report on round-robin testing results • Memorandums of Understanding on regional cooperation on testing and certification • Information posted on APEC Energy Standards Information System (www.apec-esis.org) • Documentation of market monitoring system results in China 	<p>testing and certification</p>
<p>Activity 2.4: Strengthening of data collection and reporting procedures on equipment availability and sales by</p>	<ul style="list-style-type: none"> • Model procedures provided to participating countries • Number of countries 	<ul style="list-style-type: none"> • No systematic data collection and reporting on end-use energy, 	<ul style="list-style-type: none"> • Model procedures completed by end of Year 1 • TA provided to at least 5 	<ul style="list-style-type: none"> • Documentation of Model procedures • Annual PMU report • Annual reports to 	<ul style="list-style-type: none"> • Countries willing to collect data once shown importance of regular data

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
efficiency level in participating countries Supporting Activities: <ul style="list-style-type: none"> • Development of model data collection and reporting procedures • TA to individual countries seeking to implement procedures 	receiving TA <ul style="list-style-type: none"> • Number of countries with annual data collection and reporting procedures in place 	including unit size; operating hours and conditions; unit energy consumption or efficiency; stock; annual sales; and efficiency potential	countries by end of Year 2 <ul style="list-style-type: none"> • At least 4 participating countries have such procedures in place by end of Year 3 and collect data annually thereafter 	PMU of each participating country	collection to monitor implementation and aid ES&L program refinements <ul style="list-style-type: none"> • Manufacturers willing cooperate and provide data, as long as request not onerous
Component 3: ES&L Manufacturer Support Program. Provision of information and technical assistance to manufacturers of covered products	<ul style="list-style-type: none"> • Total number of local manufacturers manufacturing EE equipment/appliance by Year 5 • Number of high efficiency models produced • Volume of EE products sold • Percent of manufacturers involved in project who agree that ES&L can provide opportunities to increase profitability 	<ul style="list-style-type: none"> • Market shares of EE products in participating countries are low (typically less than 5-10%) • Local manufacturers or suppliers do not produce EE products • No current survey data on manufacturer attitudes but this % is assumed to be low 	<ul style="list-style-type: none"> • At least 5 local manufacturers begin producing EE equipment • Manufacturers in the region add at least 50 EE models to their product lines • Sales of EE products increase at least 25% by Year 5 • 50% of manufacturers agree that ES&L can provide opportunities to increase profitability 	<ul style="list-style-type: none"> • Survey of manufacturers receiving reports and technical assistance • Annual reports to PMU of each participating country 	<ul style="list-style-type: none"> • Manufacturers will use information they are provided. • Manufacturers receiving information will be better able to adapt to standards and will be more supportive of standards.
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.	<ul style="list-style-type: none"> • Technical reports completed • Manufacturer ratings of usefulness of technical reports • Percent of manufacturers that 	<ul style="list-style-type: none"> • During 2004-2006, benchmarking reports prepared for APEC covering air conditioners, electric motors, and CFLs 	<ul style="list-style-type: none"> • 5 technical reports completed by Year 2 • Technical reports receive average rating from manufacturers of at least 4 on a 1-5 scale by Year 3 	<ul style="list-style-type: none"> • Technical reports on products • Survey of manufacturers 	<ul style="list-style-type: none"> • Manufacturers open to new ideas on ways to improve their products

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
Supporting Activities <ul style="list-style-type: none"> • Preparation of technical reports • Dissemination of technical reports to local appliance/equipment manufacturers • Conduct of survey of manufacturers 	<ul style="list-style-type: none"> • apply recommended techniques in the technical reports • Percent of manufacturers that benefited financially from the application of recommended techniques 	<ul style="list-style-type: none"> • No regionally focused product-specific technical reports prepared to document benefit-cost of efficiency improvements for the target products 	<ul style="list-style-type: none"> • 20% of manufacturers by Year 4 • 10% of manufacturers by Year 4 		
Activity 3.2: Educational workshops for manufacturers on impacts of standards on manufacturers and ways to work with standards to increase profitability. Supporting Activities <ul style="list-style-type: none"> • Conduct of workshops for manufacturers • Conduct of post workshop evaluations (<i>after at least 1 year</i>) 	<ul style="list-style-type: none"> • Number of trainees • Percent of trainees applying concepts learned in workshops • Percent of trainees whose companies are actually profiting and benefiting from ES&L 	<ul style="list-style-type: none"> • Manufacturers and suppliers participate in occasional half-day or full-day workshops to learn about government ES&L policies or programs • No sustained technical training or outreach to manufacturers on ES&L 	<ul style="list-style-type: none"> • At least 100 trainees, including at least 15 per country by Year 2 • At least 50% by Year 4 • At least 30% by Year 5 	<ul style="list-style-type: none"> • Documentation of workshop evaluation • Documentation of post-workshop evaluation results (<i>after at least 1 year</i>) 	<ul style="list-style-type: none"> • Other factors that also affect manufacturer attitudes align so that BRESL's limited efforts produce an attitude shift • Local ES&L will reinforce workshop concepts in on-going contacts
Activity 3.3: Limited technical 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.	<ul style="list-style-type: none"> • Total number of local manufacturers adopting technical assistance recommendations by Year 5 • Percent of local manufacturers satisfied with TA provided 	<ul style="list-style-type: none"> • Local manufacturers do not receive technical assistance on steps to upgrade manufacturing and on benefits for profitability • Local banks do not 	<ul style="list-style-type: none"> • At least 5 manufacturers adopt some of the technical assistance recommendations • Manufacturers give average rating for TA provided of at least 4 on a 1-5 scale by Year 5 • 50% of manufacturers receiving TA by Year 5 	<ul style="list-style-type: none"> • Survey of local manufacturers • Documentation of the TA provided • Manufacturer reports • Documentation of results of Bangladesh TA program for local FIs/Banks • Documentation of 	<ul style="list-style-type: none"> • Useful TA can be provided within a limited budget • Local manufacturers that receive TA share experiences with and knowledge from TA with other manufacturers

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
Supporting Activities <ul style="list-style-type: none"> • Assessment of local manufacturers capacity to produce EE appliance/equipment • Assessment of potential improvements in the manufacturing capacity of local manufacturers to produce EE appliance/equipment • TA to selected local appliance/equipment manufacturers to improve their manufacturing and product efficiency • An outreach and TA program for financial institutions in Bangladesh to encourage them to finance manufacturing plant upgrades to produce more efficient products. 	<ul style="list-style-type: none"> • Percent of local manufacturers that benefited financially from the application of the TA provided • Volume of EE products manufactured and sold by local manufacturers that received TA • Number of financial institutions in Bangladesh that are financing EE product manufacturing projects of equipment/appliance manufacturers • Number of BRESL countries replicating good lessons learned from Bangladesh TA program for financing institutions 	<p>promote or encourage investment in upgrades to produce EE equipment</p>	<ul style="list-style-type: none"> • At least 5 new EE products manufactured and sold by local manufacturers that received TA by Year 5 • 3 local financing institutions/banks in Bangladesh providing financing for EE products manufacturing projects • 1 other BRESL country carrying out TA program for financing institutions to finance EE product manufacturing projects. 	<p>bank loan transactions for EE products manufacturing in Bangladesh and in other BRESL countries</p>	
Component 4: ES&L Regional Cooperation Program. <i>Regional cooperation and information sharing on-going and helps to maximize impacts</i>	<ul style="list-style-type: none"> • Number of national web sites operating and updated annually • Lessons learned reports • Work group activities contributing to regional ES&L harmonization • Regional Follow-up 	<ul style="list-style-type: none"> • APEC ESIS web site operating and displays current ES&L programs • CLASP Manual • No regional work group on ES&L 	<ul style="list-style-type: none"> • All BRESL countries have ES&L websites operating by Year 2 and updated at least annually • Report completed & posted by Yr 2 on at least 4 issues • At least countries use harmonized standards • Follow-up action plan 	<ul style="list-style-type: none"> • Web sites • PMU reports • Lessons Learned reports • Work group minutes • Documentation of MRAs • Documentation of Follow-up plan 	<ul style="list-style-type: none"> • Interest in regional coordination continues • Governments provide support to work group activities

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
	Action Plan		(Yr 4)		
<p>Activity 4.1: Project web site with regional information developed and maintained; provides umbrella for websites referenced in other components.</p> <p>Supporting Activities:</p> <ul style="list-style-type: none"> • Prepare and activate web site including extensive links to available national information and to APEC ESIS • Participating countries post additional national information on the web 	<ul style="list-style-type: none"> • Operational project website • Number of national web sites operating and updated annually 	<ul style="list-style-type: none"> • APEC ESIS web site operating and displays current ES&L programs • Little advance public notice (and regional awareness) of planned MEPS and labeling and revisions to current MEPS and labeling 	<ul style="list-style-type: none"> • Operating by end of Year 1 • All participating countries have ES&L websites operating by Year 2 and updated at least annually 	<ul style="list-style-type: none"> • Web sites • PMU reports 	<ul style="list-style-type: none"> • Participating countries willing to make information publicly available
<p>Activity 4.2: Lessons learned are assessed, documented and disseminated.</p> <p>Supporting Activities:</p> <ul style="list-style-type: none"> • Prepare and post lessons learned reports on key issues identified by participating countries and not adequately covered in existing materials 	<ul style="list-style-type: none"> • Lessons learned reports 	<ul style="list-style-type: none"> • CLASP manual 	<ul style="list-style-type: none"> • Report completed and posted by end of year two on at least 4 issues 	<ul style="list-style-type: none"> • Lessons Learned reports 	<ul style="list-style-type: none"> • Participating countries are willing to contribute to documentation of lessons learned • Stakeholders in region access the web site and lessons learned materials
<p>Activity 4.3: Regional work group on labeling and standards (cutting across products)</p>	<ul style="list-style-type: none"> • Participation in workgroup • ES&L Information generated and provided by work group that are useful to participating countries • Work group activities contributing to 	<ul style="list-style-type: none"> • No regional work group on ES&L • Some information generated on ES&L activities posted on APEC, but limited dissemination to policymakers 	<ul style="list-style-type: none"> • 80% of BRESL countries participate in workgroup annually starting Year 1_ • Starting Year 2, at least 80% of participants each year are satisfied with information provided by work group • At least 4 participating 	<ul style="list-style-type: none"> • Work group minutes • Documentation of information/reports generated and services provided by work group • Survey of recipients of work group ES&L products and services 	<ul style="list-style-type: none"> • Governments provide support to work group activities

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
	regional ES&L harmonization	working on ES&L in BRESL countries	countries use harmonized standards or procedures developed under project	<ul style="list-style-type: none"> Documentation of harmonization agreements and MRAs 	
Activity 4.4: Preparation of a plan for regional activities and coordination after the GEF-funded project ends. Supporting Activities: <ul style="list-style-type: none"> Development of follow-up sustainable action plan 	<ul style="list-style-type: none"> Regional Action Plan approved by BRESL countries for post-GEF activities to continue progress and regional coordination 	<ul style="list-style-type: none"> APEC ESIS exists as useful information platform, but no long-term plan for coordination of ES&L activities in the region 	<ul style="list-style-type: none"> Completed action plan approved by mid-Year 5r; and implementation begins by project end 	<ul style="list-style-type: none"> PMU annual reports Documentation of the approved follow-up action plan 	<ul style="list-style-type: none"> Participating countries remain interested in and committed to follow-up activities.
COMPONENT 5: ES&L Pilot projects – Demonstration of various aspects of the development and implementation of ES&L programs	<ul style="list-style-type: none"> Number of countries implementing government procurement schemes for EE products Number of countries with EE products databases Number of countries with EE consumer education schemes 	<ul style="list-style-type: none"> China and Korea implementing government procurement policies On-line databases of efficient equipment only available in Korea Limited consumer education and promotion schemes 	<ul style="list-style-type: none"> 2 countries by Year 3 2 additional countries by Year 3 Successful and acceptable results in at least 3 countries by Year 3, at least two more countries replicate successful schemes 	<ul style="list-style-type: none"> Official documents on government procurement policies Websites Annual PMU Reports Report on pilot schemes 	<ul style="list-style-type: none"> Governments will adopt and implement successful schemes Other countries can find the funds to replicate successful schemes Consumers interested in web-based information
Activity 5.1: Government procurement <ul style="list-style-type: none"> Development and implementation of government procurement schemes in Thailand, Vietnam and Bangladesh 	<ul style="list-style-type: none"> Number of countries implementing government procurement schemes for efficient products Percentage of covered equipment that is efficient Number of BRESL 	<ul style="list-style-type: none"> China and Korea implementing government procurement policies Thailand implementing for air conditioners only 	<ul style="list-style-type: none"> In addition to China and Korea, two countries implement government procurement programs by Year 3 At least 75% of covered equipment is efficient by Year 5 At least one other 	<ul style="list-style-type: none"> Official documents on government procurement policies Final evaluation reports on government procurement pilots 	<ul style="list-style-type: none"> Once policies developed, governments will adopt and implement them Other countries can find the funds to replicate successful schemes

Project Strategy	Objectively Verifiable Indicators			Means of Gauging Success	Critical Assumptions
	Indicator	Baseline	Target		
	countries replicating successful schemes		BRESL country adopts similar policy by Year 5		
Activity 5.2: On-line databases of efficient equipment <ul style="list-style-type: none"> • Development and implementation of an on-line database of efficient equipment and promotion to consumers in China and Bangladesh 	<ul style="list-style-type: none"> • Number of countries with databases developed and on-line • Number of database users • Percentage of users rating database “useful” or “very useful” 	<ul style="list-style-type: none"> • On-line databases of efficient equipment only available in Korea 	<ul style="list-style-type: none"> • Two additional countries have databases operating and populated by Year 3 • Databases have at least 1 million “hits” per month in China and at least 100,000 hits per month in Bangladesh by Year 5 • At least 75% of users surveyed rate databases useful or very useful 	<ul style="list-style-type: none"> • Web sites • Web site use statistics • Email survey of a sample of website users 	<ul style="list-style-type: none"> • Consumers interested in web-based information
Activity 5.3: Consumer education <ul style="list-style-type: none"> • Development and implementation of consumer education schemes for EE products in Bangladesh and Indonesia 	<ul style="list-style-type: none"> • Number of countries demonstrating EE consumer education schemes • Number of countries replicating successful EE promotion/market development schemes 	<ul style="list-style-type: none"> • Limited consumer education and promotion schemes; usually one-off schemes for particular project, and then discontinued 	<ul style="list-style-type: none"> • Successful and acceptable results in at least 3 countries by Year 3 • At least two more countries replicate successful schemes by Year 5 	<ul style="list-style-type: none"> • Final reports on pilot schemes • Annual country reports to PMU 	<ul style="list-style-type: none"> • Other countries can find the funds to replicate successful schemes

SECTION III: Total Budget and Work Plan

Award ID:

Award Title: PIMS 3327 CC FSP: Barrier Removal to the Cost-Effective Development and Implementation of Energy Efficiency Standards and Labeling Project (BRESL)

Project ID:

Project Title: PIMS 3327 CC FSP: Asia - BRESL

Table 15: BRESL Project Budget

Activity	Agency	Source	Code	Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Component 1: ES&L Policy Making Program										
Activity 1.1: Strengthening of policy context for ES&L actions	National Implementing Agencies	GEF	71200	International experts	52,500	52,500	0	0	0	105,000
		GEF	71300	National experts	67,500	60,500	7,000	0	0	135,000
		GEF	71400	Administrative assistant	7,500	7,500	1,800	0	0	16,800
		GEF	71600	International travel	25,900	11,500	6,000	0	0	43,400
		GEF	74500	Meetings and workshops	70,000	29,000	0	0	0	99,000
Activity 1.2: Adoption and implementation of ES&L regulations	National Implementing Agencies	GEF	71200	International experts	20,100	44,400	48,600	4,200	4,200	121,500
		GEF	71300	National experts	72,500	155,600	172,000	37,000	34,400	471,500
		GEF	71400	Administrative assistant	2,160	4,240	4,860	1,120	1,120	13,500
		GEF	71600	International travel	15,200	29,900	5,900	1,500	1,500	54,000
		GEF	74500	Meetings and workshops	40,500	91,000	94,000	3,500	500	229,500
				Total Component 1	373,860	486,140	340,160	47,320	41,720	1,289,200
Component 2: ES&L Capacity Building Program										
Activity 2.1: Training on enabling public institutions to support development and implementation of EE standards and labeling	NDRC (Regional PMU)	GEF	71200	International experts	21,000	0	0	0	0	21,000
		GEF	71200	Regional experts	9,000	0	0	0	0	9,000
		GEF	71600	International travel	3,600	0	0	0	0	3,600
		GEF	71600	In-region travel	5,200	0	0	0	0	5,200
		GEF	74500	Workshop expenses	45,000	0	0	0	0	45,000
	National	GEF	71300	National experts	17,025	0	0	0	0	17,025

Activity	Agency	Source	Code	Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
	Implementing Agencies	GEF	71600	In-region travel	128,200	0	0	0	0	128,200
Activity 2.2: Capacity enhancement in the development and implementation of standards and labeling for the 6 targeted products	NDRC (Regional PMU)	GEF	71300	International experts	63,000	126,000	37,800	12,600	12,600	252,000
		GEF	71300	Regional experts	22,500	45,000	13,500	4,500	4,500	90,000
		GEF	71600	International travel	12,960	12,960	12,960	12,960	12,960	64,800
		GEF	71600	In-region travel	9,360	9,360	9,360	9,360	9,360	46,800
		GEF	74500	Meeting expenses	20,400	20,400	20,400	20,400	20,400	102,000
	National Implementing Agencies	GEF	71600	In-region travel	53,950	53,950	53,950	53,950	53,950	269,750
		GEF	71200	Regional experts	0	0	28,000	28,000	28,000	84,000
GEF		71300	National experts	0	0	8,000	8,000	7,900	23,900	
Activity 2.3: Strengthening of national and regional testing and certification infrastructure	NDRC (Regional PMU)	GEF	71200	International experts	21,000	21,000	0	0	0	42,000
		GEF	71200	Regional experts	9,000	9,000	0	0	0	18,000
		GEF	71600	International travel	5,400	5,400	0	0	0	10,800
		GEF	71600	In-region travel	3,600	3,600	0	0	0	7,200
		GEF	74500	Round-robin testing	0	0	200,000	0	0	200,000
	National Implementing Agencies	GEF	71200	International experts	38,500	40,250	3,500	1,750	0	84,000
		GEF	71300	National experts	40,200	44,700	9,000	4,500	0	98,400
		GEF	71400	Administrative assistant	1,500	1,500	0	0	0	3,000
		GEF	71600	International travel	33,500	37,900	5,200	2,600	0	79,200
GEF	74500	Test products (mkt monitoring)	0	5,000	33,350	21,675	0	60,025		
Activity 2.4: Strengthening of data collection and reporting procedures on equipment availability and sales by efficiency level in participating countries	NDRC (Regional PMU)	GEF	71200	International experts (model proceed)	3,500	7,000	2,100	700	700	14,000
		GEF	71600	International travel	0	1,800	1,800	0	0	3,600
		GEF	71200	Regional experts (model proceed)	3,000	6,000	1,800	600	600	12,000
		GEF	71600	In-region travel	1,950	3,900	1,170	390	390	7,800
		GEF	74500	Regional meetings	1,500	3,000	900	300	300	6,000
	National Implementing Agencies	GEF	71200	International experts (TA)	3,445	5,325	5,325	4,160	3,495	21,750
		GEF	71300	National experts (TA)	28,270	33,770	33,270	29,770	25,270	150,350
GEF	71400	Administrative assistant	800	700	700	500	500	3,200		

Activity	Agency	Source	Code	Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
		GEF	71600	In-region travel	6,500	13,000	13,000	15,000	0	47,500
		GEF	74500	Meetings and workshops	0	15,000	15,000	15,000	0	45,000
				Total Component 2	612,860	525,515	510,085	246,715	180,925	2,076,100
Component 3: ES&L Manufacturer Support Program										
Activity 3.1: Analysis and preparation of technical reports on each of the 6 covered products	NDRC (Regional PMU)	GEF	71200	International experts	70,000	70,000	0	0	0	140,000
		GEF	71300	Regional experts	30,000	30,000	0	0	0	60,000
		GEF	71600	In-region travel	16,250	16,250	0	0	0	32,500
		GEF	71600	International travel	9,000	9,000	0	0	0	18,000
Activity 3.2: Educational workshops on impacts of standards on manufacturers and working with standards to increase profitability	NDRC (Regional PMU)	GEF	71200	International experts	0	10,500	0	0	0	10,500
		GEF	71200	Regional experts	0	4,500	0	0	0	4,500
		GEF	71600	International travel	0	1,800	0	0	0	1,800
		GEF	71600	In-region travel	0	2,600	0	0	0	2,600
	National Implementing Agencies	GEF	71200	International experts	0	11,400	0	0	0	11,400
		GEF	71300	National experts	0	13,000	0	0	0	13,000
		GEF	71600	Travel	0	23,100	0	0	0	23,100
GEF	74500	Workshop expenses	0	100,000	0	0	0	0	100,000	
Activity 3.3: Technical assistance for EE products manufacturing for local manufacturers on techniques for increasing efficiency of their products.	National Implementing Agencies	GEF	71200	International experts	0	10,950	18,950	15,450	1,050	46,400
		GEF	71300	National experts	0	23,590	34,175	24,875	1,260	83,900
		GEF	71400	Administrative Assistant	0	650	800	600	0	2,050
		GEF	71600	Travel	0	18,100	54,750	64,700	1,300	138,850
				Total Component 3	125,250	345,440	108,675	105,625	3,610	688,600
Component 4: ES&L Regional Cooperation Program										
Activity 4.1: Development of Project web site	NDRC (Regional PMU)	GEF	71300	National experts	13,500	11,250	9,000	6,750	4,500	45,000
		GEF	74500	Website host	5,000	5,000	5,000	5,000	5,000	25,000
Activity 4.2: Lessons learned - assessed, documented and disseminated.	NDRC (Regional PMU)	GEF	71200	International experts	21,000	21,000	0	0	0	42,000
		GEF	71200	Regional experts	9,000	9,000	0	0	0	18,000
		GEF	71600	International travel	1,800	1,800	0	0	0	3,600
		GEF	71600	In-region travel	2,600	2,600	0	0	0	5,200
Activity 4.3: Regional work group on labeling and	NDRC (Regional)	GEF	71300	National experts	2,250	2,250	2,250	2,250	2,250	11,250
		GEF	71600	In-region travel	1,950	1,950	1,950	1,950	1,950	9,750

Activity	Agency	Source	Code	Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
standards (cutting across products)	PMU)	GEF	74500	Meetings and workshops	4,500	4,500	4,500	4,500	4,500	22,500
	National Implementing Agencies	GEF	71300	National experts	6,430	6,430	6,430	6,430	6,430	32,150
		GEF	74500	Information Sharing Network	20,000	10,000	10,000	10,000	10,000	60,000
		GEF	71600	In-region travel	9,750	9,750	9,750	9,750	9,750	48,750
Activity 4.4: Regional ES&L Harmonization Initiative	(Regional PMU)	GEF	71200	International Experts	0	25,000	20,000	10,000	10,000	65,000
		GEF	71300	National Experts	0	15,000	15,000	10,000	10,000	50,000
		GEF	71600	International Travel	0	5,000	5,000	2,500	2,500	15,000
		GEF	71600	In-regional Travel	0	2,500	2,500	2,500	2,500	10,000
		GEF	74500	Meetings & Workshops	0	0	0	30,000	30,000	60,000
Activity 4.5: Follow-On Plan	(Regional PMU)	GEF	71200	International experts	0	0	0	21,000	7,000	28,000
		GEF	71300	National experts	0	0	0	9,000	3,000	12,000
		GEF	71600	International travel	0	0	0	3,600	1,800	5,400
		GEF	71600	In-region travel	0	0	0	5,200	5,200	10,400
		GEF	74500	Meetings and workshops	0	0	0	3,000	3,000	6,000
		GEF	74500	Seed money for follow-up activities	0	0	0	0	25,000	25,000
	National Implementing Agencies	GEF	71300	National experts	0	0	0	13,125	4,375	17,500
		GEF	71600	In-region travel	0	0	0	7,800	7,800	15,600
Total Component 4					97,780	133,030	91,380	164,355	156,555	643,100
Component 5: ES&L Pilot Projects										
Activity 5.1: Government procurement	National Implementing Agencies	GEF	71200	International experts	0	7,550	21,200	21,200	7,550	57,500
		GEF	71300	National experts	0	15,400	28,850	28,850	16,400	89,500
		GEF	71400	Administrative Assistant	0	500	2,000	2,000	500	5,000
		GEF	71600	International Travel	0	0	7,700	5,900	0	13,600
		GEF	72200	Purchaser education materials	0	0	0	30,000	4,000	34,000
		GEF	74500	Meetings and workshops	0	4,500	47,000	15,500	6,000	73,000
Activity 5.2: On-line databases of efficient	National Implementing	GEF	71200	International experts	0	1,050	4,200	4,200	1,050	10,500
		GEF	71300	National experts	0	9,900	29,850	29,850	9,900	79,500

Activity	Agency	Source	Code	Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
equipment	Agencies	GEF	71400	Administrative Assistant	0	500	2,000	2,000	850	5,350
		GEF	71600	International travel	0	2,700	0	0	0	2,700
		GEF	74500	Website host	0	10,000	10,000	10,000	10,000	40,000
Activity 5.3: Consumer education	National Implementing Agencies	GEF	71200	International experts	0	1,050	4,200	4,200	1,050	10,500
		GEF	71300	National professional	0	8,800	22,550	21,450	8,800	61,600
		GEF	71400	Administrative Assistant	0	500	2,000	2,000	850	5,350
		GEF	71600	International travel	0	2,700	5,000	5,000	0	12,700
		GEF	74100	Consumers ed materials (development & print)	0	0	37,000	0	0	37,000
		GEF	74500	Meetings	0	2,000	108,000	33,000	2,000	145,000
Activity 5.4: ES&L Initiatives Financing	National Implementing Agencies	GEF	71200	International experts	0	0	10,000	10,000	0	20,000
		GEF	71300	National Experts	0	0	10,000	10,000	3,500	23,500
		GEF	71600	International Travels	0	0	2,000	2,000	0	4,000
		GEF	74500	Meetings & Workshops	0	0	2,500	5,000	5,000	12,500
Activity 5.5: Regional Harmonization Promotion	National Implementing Agencies	GEF	71200	International experts	0	10,000	10,000	10,000	10,000	40,000
		GEF	71300	National experts	0	30,000	30,000	30,000	30,000	120,000
		GEF	71600	In-region travel	0	6,500	6,500	6,500	6,500	26,000
		GEF	74500	Harmonization Pilots & Workshops	0	50,000	50,000	50,000	50,000	200,000
		GEF	74100	Subscriptions (Journals & Database)	0	2,500	2,500	2,500	2,500	10,000
		GEF	74100	Documentation (development & print)	0	25,000	20,000	10,000	9,000	64,000
						Total Component 5	0	191,150	475,050	351,150
Monitoring & Evaluation										
Auditing	NDRC (Regional PMU)	GEF	74100	Audit firm	5,000	5,000	5,000	5,000	5,000	25,000
Mid-project		GEF	71200	International consultants	0	0	45,000	0	0	45,000
End-of-project		GEF	71200	International	0	0	0	0	30,000	30,000

Activity	Agency	Source	Code	Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
				consultants						
				Total M&E	5,000	5,000	50,000	5,000	35,000	100,000
Project Management										
Project Implementation	NDRC (Regional PMU)	GEF	71200	Chief technical advisor (international)	54,000	54,000	54,000	54,000	54,000	270,000
		GEF	71200	PMU director	22,230	22,230	22,230	22,230	22,230	111,150
		GEF	71200	Project officer	24,000	24,000	24,000	24,000	24,000	120,000
		GEF	71400	Administrative assistant	6,000	6,000	6,000	6,000	6,000	30,000
		GEF	74500	Designated implementing agency liaison	3,600	3,600	3,600	3,600	3,600	18,000
		GEF	71600	In-region travel (PMU staff)	10,400	10,400	10,400	10,400	10,400	52,000
		GEF	72200	Office equipment	10,000	1,000	1,000	1,000	1,000	14,000
		GEF	73100	Office expenses (telecom, stationeries)	12,000	12,000	12,000	12,000	12,000	60,000
		GEF	74500	Steering committee meetings	10,000	10,000	10,000	10,000	10,000	50,000
		GEF	72100	Contract management fees	22,500	22,500	22,500	3,800	3,750	75,050
				Total PMO	179,730	170,730	215,730	152,030	181,980	900,200
Grand Total (all components)					1,389,480	1,852,005	1,741,080	1,067,195	750,240	6,800,000

SECTION IV: ADDITIONAL INFORMATION

PART I: Other Agreements (See attached)

- A. GEF Operational Focal Point Letter of Endorsements
- B. Co-Financing Letters

Attached separately

PART II: Stakeholder Involvement Plan

During the conduct of PDF-A exercise for BRESL, several stakeholders in each participating country were consulted through a survey, and round table discussions. A regional stakeholders' consultation workshop was also conducted. The following are the national and regional stakeholders of BRESL and their expected role in the project:

Table 16: Role of Stakeholders

Institution	Mandate on ES&L and Role in BRESL
Bangladesh	
Bangladesh Standards & Testing Institute (BSTI)	Lead agency for development of MEPS and also for establishing processes and institutions for energy performance testing.
Center for Energy Studies, Bangladesh University of Engineering & Technology (CES-BUET)	Responsible for analysis and implementation in end-use energy efficiency, including cooperation on ES&L in Bangladesh.
China	
National Development and Reform Commission (NDRC)	Lead agency overseeing energy policy and regulatory and legal framework for ES&L in China.
Standards Administration of China (SAC)	Oversight of minimum energy performance standards (MEPS), mandatory labeling, and endorsement labeling in China.
China National Institute for Standardization (CNIS)	Implementing agency for MEPS and mandatory labeling in China. Under SAC.
China Standards Certification Centre (CSC)	Implementing agency for voluntary endorsement labeling in China. Under SAC.
Indonesia	
Directorate General for Electricity and Energy Utilization (DGEEU)	Lead agency for developing and implementing energy efficiency and ES&L in Indonesia.
Korea (Republic of)	
Ministry of Commerce, Industry and Environment (MOCIE)	Oversight of all energy efficiency policy and implementation in Korea, including the legal and regulatory framework for ES&L.
Korea Testing Laboratory (KTL)	Lead agency for testing of energy performance for ES&L programs.
Thailand	
Department of Alternative Energy and Energy Efficiency (DEDE)	Lead implementing agency on energy efficiency and ES&L. DEDE has authority to develop MEPS and to designate endorsement levels for high-efficiency products.
Electricity Generation Authority of Thailand (EGAT)	Key implementing agency for Thailand's successful voluntary comparative energy labeling programs.
Thailand Industrial Standards Institute (TISI)	Lead agency for developing and implementing mandatory standards for product safety and quality. Also responsible for enacting MEPS as Thailand national standards.
Electrical and Electronics Institute (EEI)	Quasi-government laboratory responsible for energy performance testing on behalf of EGAT and government ES&L programs.
Vietnam	

Institution	Mandate on ES&L and Role in BRESL
Ministry of Industry (MOI)	Lead agency for developing energy labeling criteria, regulations for MEPS, and working with MOST to ensure that these are developed as national standards and implemented.
Ministry of Standards (MOST)	Lead agency for developing and implementing mandatory standards for product safety and quality. Also responsible for enacting MEPS as Thailand national standards.
Electricity of Vietnam	Implementing voluntary programs on end-use efficiency, including certification of high-efficiency equipment. Supports ES&L activities in cooperation with MOI.
OTHERS	
UNDP China	GEF Implementing Agency. Overall oversight on behalf of GEF of the BRESL project (regional and national)
UNDP Country Offices	Oversee BRESL project execution in participating countries
International Copper Association (ICA)	Industry-funded association that is quite active in China, Southeast Asia, and South Asia, promoting development of a strengthened ES&L framework as well as MEPS and labeling schemes for products covered under BRESL, such as air conditioners, fluorescent lamp ballasts, and air conditioners.
ELI Quality Certification Institute	Manages international certification and labeling program for high-quality compact fluorescent lamps (CFLs). Can be key strategic partner with BRESL program. Institute is under management of China Standardization Center.
International CFL Harmonization Institute	International initiative supported by a number of governments, major manufacturers, trade associations, and NGOs. Working to develop a single harmonized international test procedure for CFLs, as well as a set of common performance levels that could be adopted internationally in order to harmonization and rationalize the way that CFLs are regulated and promoted by individual countries. The Initiative works in close cooperation with the ELI program.
Australian Greenhouse Office	This office is part of the Department of the Environment and Water Resources, and is responsible for the delivery of the majority of programmes under the Australian Government's climate change strategy. It will support BRESL in the regional harmonization activities, along with its current work with APEC.
CLASP	The Collaborative Labeling and Appliance Standard Program (CLASP) is a U.S.-based non-profit organization that works internationally to promote the development and implementation of ES&L programs. CLASP was active in the initial development of the BRESL concept paper.

PART III: CO₂ Emissions Reduction Estimates

Summary

The BRESL Project is an OP-5 project intended to remove barriers to the cost-effective development and implementation of energy efficiency standards & labeling programs. The anticipated energy savings from the use of energy efficiency products (appliances/equipment) that will be facilitated and influenced by the interventions that will be carried out in the project's 7 participating countries will bring about CO₂ emission reductions from the reduced utilization of fossil fuels used in thermal power generation units that produce the electricity utilized in these energy using products. BRESL is comprehensive OP-5 project covering 6 large end-use products in 6 countries (including Republic of Korea). The implementation of ES&L initiatives catalyzed by the BRESL project will lead to about 22.0 million tons of CO₂ by end of project, and a cumulative CO₂ reduction of 34.5 million tons. The long-term direct CO₂ emissions reductions will be much greater, and cumulative reductions will reach about 1,159 million and 3,787 million tons of CO₂ in 2021 and 2031, respectively.

These CO₂ emissions reductions will be dispersed across the participating countries and will likely lead to substantial indirect emissions reductions as well. The product that will yield the largest CO₂ emissions reductions is air conditioner.

Direct CO₂ Emissions Reductions

The BRESL project includes the implementation of ES&L programs for six product types across the seven participating countries. Not all countries will participate in activities designed for all of the products, but most countries will participate in activities for most of the products (see Section II for details).

Assumptions

The CO₂ emission factors that were used in estimating the CO₂ emission reductions in each BRESL country are as follows:

Country	CO₂ Emission Factor (ton CO₂/MWh)
Bangladesh	0.943
China	1.09
Indonesia	0.757
South Korea	0.767
Thailand	0.674
Vietnam	0.430

Details of the assumptions used in the CO₂ emission reduction estimates for the Baseline and Alternative Scenarios are shown in Annex C. Among the important assumptions is that mandatory minimum energy performance standards will be adopted for those products in the BRESL countries.

The estimated CO₂ emissions reductions for this project are quite large at 22.0 MMT CO₂/year and 34.5 cumulative MMT CO₂ in Year 5 (2011). The savings as % reduction of target year CO₂ emissions for the targeted products is about 2.5% for 2011 and about 8.8% in 2031. This means that the CO₂ emissions resulting from the power generation needed to supply power for all of the

new products sold from 2004 onward will be 8.8% lower in the year 2031 than they would have been otherwise.

The direct energy savings from ES&L programs and the corresponding CO₂ emissions reductions that can be realized during and after BRESL project implementation are shown in Tables 17 and 18. It should be noted from these tables that: (1) Baseline and Alternative electricity consumptions are for products directly addressed in each country in the BRESL Project; (2) Alternative electricity savings are calculated as percent of electricity used by products participating in BRESL Project; and, (3) The difference between Baseline and Alternative electricity usages does not translate to savings, since savings also include savings from reduced purchases of incandescent lamps, and these are calculated at 2.75 times annual unit energy consumption of CFLs.

Table 17: Direct Energy Savings During and After BRESL Implementation

Year	Baseline electricity consumption (GWh/yr)	GEF electricity consumption (GWh/yr)	Project electricity savings (GWh/yr)	Percent electricity savings (%)	Cumulative Project electricity savings (GWh/yr)
2007	482,068	482,068	0	0.0%	0
2011	1,032,132	1,008,111	24,021	2.3%	37,688
2021	2,366,352	2,165,084	201,268	8.5%	1,263,217
2031	3,701,553	3,404,982	296,571	8.0%	4,145,633

Table 18: Direct CO₂ Emissions Reductions During and After BRESL Implementation

Year	Baseline CO ₂ emissions (1) (MMT/yr)	Alternative CO ₂ emissions (1) (MMT/yr)	GEF CO ₂ reduction (2) (MMT/yr)	% CO ₂ Reduction (2)	Cumul CO ₂ Reduction (MMT)
2007	410.6	410.6	0.0	0.0%	0.0
2011	875.7	853.7	22.0	2.5%	34.5
2021	1,965.4	1,781.1	184.3	9.4%	1,158.7
2031	3,060.4	2,791.6	268.7	8.8%	3,787.4

Viewed by country, more than half of the energy savings and CO2 reductions from the BRESL project will come from China. The country with the next largest reductions is Korea, followed by Thailand and Indonesia.

Table 19: Direct Energy and CO₂ Savings by Country

Country	Energy Savings (GWh/year)			Cumulative Energy Savings (GWh)			CO2 Emissions Reductions (MMT/year)			Cumulative CO2 Reductions (MMT)		
	2011	2021	2031	2011	2021	2031	2011	2021	2031	2011	2021	2031
Bangladesh	385	2,928	4,472	619	19,463	63,291	0.4	2.8	4.2	0.6	18.4	59.7
China	12,610	105,064	147,363	19,974	667,711	2,144,111	13.8	115.0	161.2	21.9	730.6	2,346.1
Indonesia	1,260	9,755	15,392	2,009	63,908	210,318	1.0	7.4	11.7	1.5	48.4	159.2
Korea	5,150	47,343	73,478	7,930	281,226	974,328	3.9	36.3	56.3	6.1	215.7	747.2
Thailand	3,814	30,123	46,135	5,858	190,125	619,626	2.6	20.3	31.1	3.9	128.1	417.6
Vietnam	802	6,055	9,731	1,298	40,784	133,959	0.3	2.6	4.2	0.6	17.5	57.6
Total	24,021	201,268	296,571	37,688	1,263,217	4,145,633	22.0	184.3	268.7	34.5	1,158.7	3,787.4

Note: ES&L activities in the ROK are among the baseline activities of the project. In this regard, potential energy savings from ES&L initiatives in this country can be attributed to this project.

Viewed by product, the largest share of the energy savings and CO₂ reductions will come from air conditioners, electric motors and electric fans. One of the reason why the share of reductions from refrigerators is relatively low is that China, which has by far the largest share of electricity consumption of the BRESL countries, is already implementing its own MEPS and therefore the savings for refrigerators-related ES&L activities in China are counted as baseline and not additional.

Table 20: Direct Energy and CO₂ Savings by Product

Product	Energy Savings (GWh/year)			CO ₂ Emissions Reductions (MMT/year)		
	2011	2021	2031	2011	2021	2031
Refrigerators (1)	410	4,532	9,074	0.3	3.2	6.4
Room air conditioners	6,214	67,851	91,989	6.5	71.0	96.0
Electric motors (2)	6,674	60,501	90,527	4.9	44.8	66.8
Ballasts for FTLs (3)	844	6,991	11,220	0.6	5.2	8.3
Electric fans (4)	5,489	30,879	41,935	5.3	29.7	40.2
Compact fluorescent lamps	1,932	12,336	26,046	1.8	11.7	24.6
Rice cookers (5)	2,459	18,179	25,780	2.5	18.7	26.5
Totals	24,021	201,268	296,571	22.0	184.3	268.7

Note: ES&L activities in the ROK are among the baseline activities of the project. In this regard, potential energy savings from ES&L initiatives in this country can be attributed to this project.

Indirect CO₂ Reductions

There will be a significant amount of indirect CO₂ emissions reductions due to the BRESL project. The indirect impacts are attributed to the following:

- Since BRESL includes China, which is the world’s largest manufacturer of electrical appliances and energy-using equipment, the higher efficiency level of Chinese manufactured goods will have a very significant global spillover effect.
- The BRESL economies will be working together on harmonizing energy performance test procedures. 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 BRESL economies will be working together on development of MEPS for the six products, and in some cases, aligning, or at least coordinating MEPS levels and target levels for high-efficiency endorsement. It is expected that these MEPS and EE target levels will be followed by a number of other Asian countries – in order to reduce the transaction costs associated with development new ES&L targets.
- It is expected that publicity surrounding the BRESL project, and the clear benefits that will accrue to the participating economies and will spur a “copy cat” effect in the region, as policymakers in the region become more aware of the benefits of ES&L and start planning and implementing programs.

Considering the barrier removal activities that will be carried out under BRESL, it is deemed that the GEF influence in achieving the abovementioned CO₂ emission reductions during the influence period, which in this case is until 2031, would be high, relative to that during the project period (i.e., 2007-2011). In that regard, some of the indirect CO₂ reduction can be attributed partly to the interventions that will be carried out by BRESL such as the establishment and enforcement of MEPS and mandatory labels, local equipment/appliance manufacturers support, and the successful pilot projects. Although the impacts would be high, it is estimated that BRESL impacts can be taken as conservatively 25% of the estimated cumulative direct CO₂ emission reductions.

Total CO₂ Emissions Reduction

Table 21: Total CO₂ Emissions Reduction Attributed to BRESL

Particulars	Quantity (M tons)	Remarks
Direct CO ₂	34.5	Cumulative savings occurring in Year 4 (when MEPS are implemented) and Year 5 (when mandatory labeling is implemented).
Direct Post-Project CO ₂	3,787.4	Cumulative reduction after 25 years, in 2031. Continued impact due to initial MEPS and follow-up labeling
Indirect CO ₂	946.9	It is conservatively assumed that the “spin-off” impacts of the ES&L activities by the seven participating countries will be 25% of the direct impact.
Total	4,768.8	

$$\text{Total CO}_2 \text{ reduction} = \text{Direct CO}_2 + \text{Direct post-project CO}_2 + [\text{Indirect CO}_2 * \text{GEF Causality Factor}]$$

$$\text{Total CO}_2 \text{ Reduction} = 4,769 \text{ million tons}$$

Part IV: Project Risks and Assumptions

While all efforts are made to ensure the effective design and implementation of the project activities, there are some risks that have to be addressed to ensure success of the project. The Project Planning Matrix (Sec II, Part II) shows a detailed overview of the project’s risk and assumptions. The principal risks, which can potentially hinder the successful project implementation and/or reduce project effectiveness, relate to: (a) the sustainability of the support by key stakeholders in the participating countries; (b) lack of, or fading, interest of the private sector (particularly appliance/equipment manufacturers and suppliers); (c) ineffective project coordination at the national and/or regional levels; (d) failure of EE products to perform as claimed by manufacturers resulting to customer dissatisfaction; (e) unabated proliferation of illegally traded and unreliable EE equipment/appliances; and, (f) unwillingness of consumers to buy EE products due to bad experiences in the past and high initial cost may lead to failure of the project to induce increased sales and widespread use of EE equipment and appliances.

To address these risks, the project has to establish effective means to monitor and to the extent possible mitigate these risks. Mitigation measures include a strong emphasis on hands-on project management and participation of each country, mobilizing private sector participation and a continuous dialogue between the project’s donors, implementing Partner, executing agency, regional organizations and national governments. The different risks that were identified during the BRESL project formulation exercise and the recommended mitigation measures are the following:

Table 22: Summary of Risk Mitigation measures for the BRESL Project

Risk	Level of Risk	Mitigating Actions
<p>Insufficient or Fading Support from the Government of the Participating Country – Unanticipated shift of government energy program priorities leading to reduced technical and budgetary support to EC&EE efforts, in general and ES&L, in particular; Insufficient manpower and infrastructure in the agency with the ES&L mandate leading to slow execution and poor enforcement regulatory mechanisms; and, Uncertainties to approval of the recommended ES&L policy framework delaying implementation ES&L programs.</p>	Moderate	<ul style="list-style-type: none"> • During the project LPAC and inception meetings, government commitments to the project will be clearly established and confirmed, including the commitment to provide adequate project staff • Use of champions both in the government and private sectors to ensure implementation of formulated ES&L policies • The project, through the demonstration on government purchasing schemes, will strongly recommend and lobby the implementing rules and regulations requiring government offices in participating countries to include energy efficiency as a criterion in the purchase of energy using equipment/appliances and products.
<p>Ineffective local participation and coordination The capacity of some of the participating countries to effectively coordinate and collectively implement this regional project maybe low. At times, the very limited available local capacity is fully absorbed on many externally funded projects thereby diverting attention from higher priority activities.</p>	Low to Moderate	<ul style="list-style-type: none"> • Appointing dedicated project personnel to ensure efficiency of implementing project activities. The project will fund full-time National Coordinators in each participating country. • Lead government agencies will be part of the regional PSC and will play the lead role in the management of the implementation of the project activities in their respective countries.

Risk	Level of Risk	Mitigating Actions
<p>Ineffective regional coordination and collaboration with regional organizations Participating countries may continue to carry out ES&L activities on their own losing the potentials for synergetic work towards wider achievement of ES&L harmonization objectives</p>	Low	<ul style="list-style-type: none"> • Regular meetings of the Regional PSC to exchange work programmes and implementation plans.
<p>Lack of Cooperation by the Private Sector - Private sector not participating adequately in the project, due to lack of interest, disruption to operation and business priorities. Financing of investments for manufacturers to modify their production facilities may not be available.</p>	Moderate	<ul style="list-style-type: none"> • Industry associations, professional organizations, NGOs and private individuals in the participating countries will be consulted and involved in the annual project work planning. • Existing effective working relationships with industry and commercial sector associations will be further enhanced to ensure cooperation from their member entities to participate. • Encourage participation of the private sector in the country teams
<p>EE Technology Risk - Failure of EE products (equipment & appliances) to perform as claimed by manufacturers resulting to customer dissatisfaction; Proliferation of illegally traded and unreliable EE products; Poor electricity supply infrastructure quality that may severely affect EE products with low tolerance to power fluctuations.</p>	Low	<ul style="list-style-type: none"> • Serious implementation of EE standards, labeling & warranty requirements. • Consumer education activities focus on use and application of wide range of EE products as well as consumer protection programs of the government. • Inclusion of capacity building and enabling environment activities, focused on each pilot schemes over a period of 5 years with the regular monitoring and progress reporting
<p>EE Market Risk - Unwillingness of consumers to buy EE products due to bad experiences in the past and high initial cost may lead to failure of the project to induce increased sales and widespread use of EE products (equipment & appliances)</p>	Moderate	<ul style="list-style-type: none"> • Assisting and empowering consumers to make real time, informed decision making when buying EE products. • Promotion of suitable financing, incentives, and government mass purchasing programs will be developed and their implementation facilitated under the BRESL project.
OVERALL	Moderate	

Based on enquiries from stakeholders made through the BRESL Survey, the overall project risk is moderate. BRESL is designed to facilitate close coordination and consultation of the relevant stakeholders in each participating country in each of the proposed activities. Activities that provide policies, product standards, guidelines and incentives, tools and procedures to implement ES&L programs, information and education are sufficient to ensure mitigation of the risks. Government agencies (particularly those with the ES&L mandate), their partners and a number of regional organizations have committed to financially support the project and use part of their budget in the next 5 years for BRESL.

At the inception stage of BRESL the project risks and assumptions will be reviewed, and where necessary additional project risks will be identified. In addition, also as part of the project inception activities, a detailed risk management strategy for project implementation will be prepared.

Part V: Monitoring & Evaluation Plan and Budget

The following summarizes the annual targets for high-level success indicators that will be monitored to gauge the effectiveness and impacts of the BRESL project. More detailed indicators for each project activity are shown in the Project Planning Matrix (Part II)

Table 23: Annual Targets for Project Outcomes

Project Strategy	Success Indicators	Annual Targets					
		Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
GOAL	GHG emission reductions, MMT/yr	0	0	0	0	10	22
OBJECTIVE	Electricity savings, GWh/yr	0	0	0	0	10,000	24,000
	Reduction in product energy usage	0	0	0	0	5% (2% for motors)	10% (4% for motors)
	Market share of efficient products				Base established in task 2.4	1.1X base	1.25X base
OUTCOMES							
Component 1: Policy Making	ES&L principles in laws & regulations of participating countries				4 countries adopt new laws & regs		
	New standards for AC, refrigerators, ballasts, motors, fans and CFLs				Approved in 4 countries		10% avg savings for affected products
	New standards for rice cookers				Adopted in China		20% reduction in electricity use
	Labels in use						At least 2 products in 5 countries
Component 2: Capacity-Building	New testing standards				At least one in at least 4 countries		
	New test facilities					At least 1 improved or new facility in at least 2 countries	
	Countries with testing and certification procedures in place				At least 6 countries		
	Round-robin testing					Complete	
	Mutual recognition agreements					At least 3 countries sign	
	Posting of certification info						At least 4 countries posting

Project Strategy	Success Indicators	Annual Targets					
		Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
	Annual data collection system				4 countries have system in place	Annual data collection continues	Annual data collection continues
Component 3: Manufacturer Support	Number of local manufacturers adding efficient products and attributable in part to project interventions						At least 5 manufacturers develop new efficient products
	Number of new efficient products					25	50
	Percent of manufacturers involved in project who agree that ES&L can provide opportunities to increase profitability					50%	
Component 4: Regional Cooperation	Project website		Up	Regularly updated			
	Regional workgroup - # participating countries		5	5	5	5	5
	Follow-up plan						Approved
Component 5: Pilot Projects	Government procurement schemes operating	2	2	2	4	4	5
	On-line databases of efficient equipment	1	1	1	3	3	3
	New consumer education schemes implemented -- # of countries				3		5

Monitoring Plan

The following table summarizes the monitoring plan for the high-level success indicators of the BRESL Project.

Table 24: Monitoring Plan for BRESL

Success Indicators	Targets (EOP)	Means of Verification	Sampling Frequency	Location
GHG emission reductions	22 MMT/yr	<ul style="list-style-type: none"> Monitoring reports on changes in average equipment efficiency and sales; to be provided by participating governments to the PMU 	Annually, starting with year 3	PMU
Electricity savings	24,000 GWh/yr	<ul style="list-style-type: none"> Same as above 	Same as above	PMU
Reduction in product energy usage	10% (4% for motors)	<ul style="list-style-type: none"> Same as above. 		
Market share of efficient products	1.25X baseline identified in year 3	<ul style="list-style-type: none"> Same as above. Other publications and documents on sales and saturation rates of energy-efficient equipment provided by each country. 	Same as above	PMU
ES&L principles in laws & regulations of participating countries	4 countries adopt new laws & regs	<ul style="list-style-type: none"> Official publications or documents on energy-efficiency regulations and policies provided by each selected country. National statistics on standards and labeling programs as reported on APEC Energy Standards Information System (www.apec-esis.org) Annual reports to the PMU by each participating country Project visits and surveys. 	Annual as part of country reports to PMU	Countries, compiled and checked by PMU
New stds for AC, refrigerators, ballasts, motors, fans and CFLs	Approved in 4 countries	<ul style="list-style-type: none"> Same as above. 	Same as above	Same as above
New stds for rice cookers	Adopted in China	<ul style="list-style-type: none"> Same as above. 	Save as above	Same as above
Labels in use	At least 2 products in 5 countries	<ul style="list-style-type: none"> Same as above. 	Same as above	Same as above
New testing standards	At least one in at least 4 countries	<ul style="list-style-type: none"> Same as above. 	Same as above	Same as above
New test facilities	At least 1 improved or new facility in at least 2 countries	<ul style="list-style-type: none"> Annual reports to the PMU by each participating country Project visits and surveys. 	Same as above	Same as above
Countries with testing and certification procedures in place	At least 6 countries	<ul style="list-style-type: none"> Same as above 	Same as above	Same as above
Round-robin testing	Completed	<ul style="list-style-type: none"> Report on round-robin testing results 	Completed by end of Year 4	Coordinated by PMU
Mutual recognition	At least 3	<ul style="list-style-type: none"> Memorandums of 	Annual as part	Countries,

Success Indicators	Targets (EOP)	Means of Verification	Sampling Frequency	Location
agreements	countries sign	Understanding on regional cooperation on testing and certification	of country reports to PMU	compiled and checked by PMU
Posting of certification info	At least 4 countries posting	<ul style="list-style-type: none"> Annual reports to the PMU by each participating country PMU staff check of country websites 	Same as above	Same as above
Annual data collection system	4 countries have system in place	<ul style="list-style-type: none"> Annual reports to the PMU of each participating country Project visits 	Same as above	Same as above
Number of local manufacturers adding efficient products and attributable in part to project interventions	About 60 (i.e., 10 per country; 2-3 per BRESL product)	<ul style="list-style-type: none"> Survey of manufacturers receiving reports and technical assistance Annual reports to the PMU of each participating country 	Annual, beginning in year 3	PMU
Number of new efficient products	50	<ul style="list-style-type: none"> Survey of manufacturers receiving reports and technical assistance Annual reports to the PMU of each participating country 	Same as above	PMU
Percentage of manufacturers that plan to locally produce EE products	50%	<ul style="list-style-type: none"> Survey of manufacturers receiving reports and technical assistance Annual reports to the PMU of each participating country 	Same as above	PMU
Project website	Up, regularly updated	<ul style="list-style-type: none"> Annual reports of the PMU UNDP-China staff check website 	Annual	PMU, UNDP-China
Regional workgroup - # participating countries	At least 5	<ul style="list-style-type: none"> Annual reports of the PMU 	Annual	PMU, UNDP-China to check
Follow-up plan	Approved & implementation begins	<ul style="list-style-type: none"> Approved plan 	Year 5	Same as above
Government procurement schemes operating	5	<ul style="list-style-type: none"> Official documents on government procurement policies Final evaluation reports on government procurement pilots Annual reports to PMU by each participating country 	Annual, beginning in year 3	PMU
On-line databases of efficient equipment	3	<ul style="list-style-type: none"> Annual reports to the PMU by each participating country PMU staff check on-line databases 	Same as above	PMU
New consumer education schemes implemented -- # of countries	5	<ul style="list-style-type: none"> Final reports on pilot schemes Annual country reports to PMU 	Same as above	PMU

Monitoring & Evaluation Budget

The following table summarizes the budget for the various monitoring & evaluation (M&E) activities that will be carried out to manage and gauge the effectiveness of the BRESL project implementation. The table also shows the parties responsible for each M&E activity and the time frame of each activity.

Table 25: M&E Budget for BRESL Project

Type of M&E Activity	Responsible Parties	Budget US\$ <i>Excluding project team Staff time</i>	Time frame
Inception Workshop (IW)	<ul style="list-style-type: none"> ▪ Project Manager ▪ UNDP-China ▪ UNDP/GEF 	Included in PMO budget	Within first 2 months of project start up
Inception Report (IR)	<ul style="list-style-type: none"> ▪ Project Team ▪ UNDP China ▪ UNDP/GEF 	Included in PMO budget	a) Draft IR available before IW b) Final IR available immediately following IW
Measurement of Means of Verification	<ul style="list-style-type: none"> ▪ Project Manager ▪ Project team members 	Included in PMO budget	Start, mid and end of project
Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	<ul style="list-style-type: none"> ▪ Oversight by UNDP-GEF Technical Advisor and PM ▪ Measurements by regional field officers and local IAs 	Included in PMO budget, and the demonstration activities	Annually prior to APR/PIR and to the definition of annual work plans
APR and PIR	<ul style="list-style-type: none"> ▪ Project Team ▪ UNDP China ▪ UNDP-GEF 	Included in PMO budget	Annually
Multi-Partite Review (MPR) and MPR report	<ul style="list-style-type: none"> ▪ GOB Counterparts ▪ UNDP China ▪ Project team ▪ UNDP-GEF RCU 	Included in PMO budget	Every year, upon receipt of APR
PAC/MPR Meetings	<ul style="list-style-type: none"> ▪ Project Manager ▪ UNDP China 	Included in PMO budget	Following Project IW and subsequently at least once a year
Periodic status reports	<ul style="list-style-type: none"> ▪ Project team 	Included in PMO budget	To be determined by Project team and UNDP China
Technical reports	<ul style="list-style-type: none"> ▪ Project team ▪ Hired consultants as needed 	Included in Component 2	To be determined by Project Team and UNDP China
Mid-term External Evaluation	<ul style="list-style-type: none"> ▪ Project team ▪ UNDP- China ▪ UNDP-GEF RCU ▪ External Consultants (i.e. evaluation team) 	\$45,000	At the mid-point of project implementation.
Final External Evaluation	<ul style="list-style-type: none"> ▪ Project team ▪ UNDP China ▪ UNDP-GEF RCU ▪ External Consultants 	\$30,000	At the end of project implementation
Terminal Report	<ul style="list-style-type: none"> ▪ Project team ▪ UNDP China ▪ External Consultant 	Included in line above	At least one month before the end of the project
Lessons learned	<ul style="list-style-type: none"> ▪ Project team ▪ UNDP China 	Included in PMO budget	Annually

Type of M&E Activity	Responsible Parties	Budget US\$ <i>Excluding project team Staff time</i>	Time frame
	<ul style="list-style-type: none"> ▪ UNDP-GEF RCU 		
Audit	<ul style="list-style-type: none"> ▪ UNDP China ▪ Project team 	\$25,000 (\$5000/yr)	Annually
Visits to field sites (UNDP staff travel costs to be charged to IA fees)	<ul style="list-style-type: none"> ▪ UNDP China ▪ UNDP-GEF RCU (as appropriate) ▪ Government representatives 	Included in PMO budget	Annually
TOTAL INDICATIVE COST <i>Excluding project team staff time and UNDP staff and travel expenses</i>		US\$ 100,000	

Annex A: How the BRESL Concept Paper Evolved into BRESL Project Document

Table 26: Comparison of Components in Concept Paper and New Project Document

Component in GEF-Approved Project Concept	Description	How addressed in New Log Frame
Component 1: ES&L Policy Making Enhancement Program.	Focus on capacity building on the policy and regulatory aspects of ES&L within national boundaries.	<p>Component 1: <i>Creation of legal and regulatory basis</i> Activity 1.1: Strengthening of policy context for EE technologies Activity 1.2: Adoption and implementation of ES&L regulations Component 2: <i>Building of institutional and individual capacity</i> Activity 2.1: Public institutions (and utility demand-side management (DSM) offices in some cases) strengthened</p>
Component 2: ES&L Awareness Enhancement and Promotion Program	Address regional network building and information sharing through database and network Allow both policymakers and manufactures to learn from other countries.	<p>Component 3: <i>Regional cooperation and information sharing on-going and helps to maximize impacts</i> Activity 3.1: Web site with regional information developed and maintained Activity 3.2: Lessons learned are assessed, documented and disseminated. Activity 4.1: Project web site with regional information developed and maintained; provides umbrella for websites referenced in other components. Activity 4.2: Lessons learned are assessed, documented and disseminated.</p>
Component 3: EE Equipment/Appliance Market Development Program	Building market for EE equipment and appliances Study equipment and appliance markets. Establish financing schemes	<p>Activity 2.2: Capabilities to develop and implement standards and labeling for the 5 targeted products improved in each of the core-countries (Regional product working groups formed and meet at least annually for each of the five targeted products.)</p>
Component 4: ES&L Technical Support Program	Provide technical capacity building on ES&L for each country. Development or improve local manufacturing capacity for energy efficiency equipment; testing, accreditation, and compliances procedures both regionally and locally.	<p>Component 2: <i>Building of institutional and individual capacity to secure on-the-ground implementation</i> Activity 2.2: Capabilities to develop and implement standards and labeling for the 5 targeted products improved in each of the core-countries Activity 2.3: National and regional testing and certification infrastructure significantly strengthened. Component 3: <i>Regional cooperation and information sharing on-going and helps to maximize impacts</i></p>
Component 5: ES&L Demonstration Program	Implementation of several pilot ES&L programs to demonstrate various aspects of the development &	<p>COMPONENT 5: <i>Conduct of pilot activities showcasing various aspects of the design, facilitation and implementation of ES&L programs</i></p>

Component in GEF-Approved Project Concept	Description	How addressed in New Log Frame
	implementation of ES&L programs and in the regional harmonization of ES test procedures and certification, and application of monitoring and evaluation tools.	
Component 6: Sustainable National & Regional ES&L Program	Ensuring the sustainability of the interventions that will be carried out under the BRESL project that will address the barriers to the widespread development and implementation of ES&L programs in the Asian region	Activity 4.4: Preparation of a Plan for Regional Activities and Coordination after the GEF-Funded Project Ends

Annex B: Summary of Barriers Identified in Regional Survey

Table 27: Barriers to Implementation of ES&L Programs in Asian Countries

Country	Policy/Regulatory	Institutional	Technical	Information and Awareness	Market	Financial
Bangladesh	Lack of policy	No independent institution to carry out program	Lack of technical knowledge	To program to spread awareness	Lack of knowledge about the benefits of ES&L among sellers and buyers	Funding is not available
China	Country's growth model hindering the promotion and implementation of ES&L programs			Lack of public awareness on energy conservation		
Korea	Negotiations between manufacturers and stakeholders					No budget to develop a new standard
Malaysia ⁵⁰	No mandatory regulations		No lab for equipment efficiency testing		Market not driven to EE equipment	Lack of funding for ES&L programs
Philippines ⁵¹		Lack of accredited testing laboratories	Lack of testing programs. Lack of training programs.	Insufficient public awareness due to lack of funding for programs	Market monitoring and sampling suffer due to lack of manpower and funds	Lack of funding for ES&L programs

⁵⁰ Malaysia participated in the BRESL Survey and in the BRESL project design. The country just recently decided to prioritize for GEF-4, national projects on RE (rural electrification) and EE (buildings and industries).

⁵¹ The Philippines participated in the BRESL Survey. Because of limitations in its GEF-4 climate change allocations, it decided to withdraw from this regional project in favor of other national projects.

Annex C: Baseline Data & Assumptions on BRESL Products

Table 28: Volume of Appliances in BRESL Countries (2004)

Appliance ⁵²	Average Size	Saturation (unit/HH)	No. of Units (2004)	
			Stock ⁵³	Sold ⁵⁴
Bangladesh				
Air conditioners (4)	12,000 BTU/hr	0.07	529,250	70,570
Electric motors (1) (5)	4.2 kW		625,000	72,920
FTL Ballasts (2) (5)	14 W _{loss}		21,000,000	2,665,380
Electric fans (3)	70 W	1.3	9,490,000	1,830,210
CFLs (5)	13 W		12,500,000	4,791,670
China				
Air conditioners (3)	1200 W	0.18	58,275,000	18,000,000
Ballasts for FTLs (1)	8 W _{loss}		800,000,000	6,770,000
Electric fans (4)	70 W	0.22	70,000,000	50,000,000
CFLs (2)	15 W		1,170,000,000	117,000,000
Rice cookers (4)	600 W	0.31	100,000,000	20,000,000
Indonesia				
Refrigerators (4)	187.5 liters	0.25	5,933,750	791,170
Air conditioners (4)	12000 BTU/hr	0.07	1,703,750	227,170
Electric motors (1) (5)	4.2 kW		1,875,000	218,750
FTL Ballasts (2) (5)	14 W _{loss}		63,000,000	7,996,150
Electric fans (3)	70 W	1.3	30,550,000	5,891,790
CFLs (5)	13 W		37,500,000	14,375,000
Korea (1)				
Refrigerators (2)	469 liters	1.04	16,627,800	1,575,000
Air conditioners (3)	20623 BTU/hr	0.42	6,715,080	2,056,000
Electric motors (4)	32.89 kW		387,657	361,802
CFLs (5)	15 W		17,001,136	14,361,230
Thailand				
Refrigerators (1)	250 liters	1.01	18,584,000	980,000
Air conditioners (1)	14996 BTU/hr	0.29	5,336,000	380,000
Electric motors (2) (5)	7 kW		2,500,000	750,000
FTL Ballasts (3)	10 W _{loss}		84,000,000	12,000,000
Electric fans (5)	70 W	2.6	47,840,000	14,352,000
CFLs (4)	15 W		50,000,000	15,000,000
Rice cookers	650 W	0.99	18,216,000	5,464,800
Vietnam				
Refrigerators (3)	180 liters	0.27	4,300,000	573,330
Air conditioners (3)	12000 BTU/hr	0.07	1,100,000	146,670
Electric motors (1)	5.25 kW		1,000,000	116,670
FTL Ballasts (2)	12 W _{loss}		33,600,000	4,264,620
Electric fans (3)	70 W	1.77	28,300,000	5,457,860

⁵² Appliances listed are only those that the country will be working on under the BRESL Project

⁵³ Stock is either calculated as saturation x number households, or from market estimates. For China, estimates for appliance stocks are from CNIS

⁵⁴ Sales figures assume 5% new units and stock turnover of 10% for refrigerator, AC, motors, 20% for ballasts, fans, and rice cookers, and 30% for CFLs

Appliance ⁵²	Average Size	Saturation (unit/HH)	No. of Units (2004)	
			Stock ⁵³	Sold ⁵⁴
CFLs (4)	15 W		20,000,000	7,666,670
Rice cookers (3)	650 W	0.66	9,200,000	1,380,000

NOTES:

A. Bangladesh

1. Motor size based on Thailand but discounted 40%
2. Assumed losses for standard magnetic ballasts
3. Fan data based on Thailand, but saturation discounted 50%
4. AC data based on Thailand, but size discounted 25%, avg. electricity use discounted 25%, and saturation and stock discounted 75%
5. Motors, ballast, and CFL stock based on Thailand but discounted 75%

B. China

1. Assumed losses for standard magnetic ballasts (China has MEPS for ballasts)
2. Assumed that 15W CFLs used to replace 60W incandescent lamps
3. AC saturation assumes urban saturation of 0.7; rural saturation of 0.05; and urban/rural mix of 0.2/0.8; hourly operation average of approx 2,000 hrs/year in South, and 300 hrs/yr in North
4. Motor, fan, and rice cooker size and average operation based on CNIS data

C. Indonesia

1. Motor size based on Thailand but discounted 40%
2. Assumed losses for standard magnetic ballasts
3. Fan data based on Thailand, but saturation discounted 50%
4. Refrigerator and AC data based on Thailand, but size discounted 25%, avg. electricity use discounted 25%, and saturation discounted 75%
5. Motors, ballast, and CFL stock based on Thailand but discounted 75%

D. Korea, South

1. All data are from label registrations for 1995-2004, without a sales weighted average
2. Refrigerator values exclude the Kim chi refrigerator
3. Average monthly AC consumption is 427.7 kWh/yr, but it is used only 2 months per year, according to KS C 9306-2002
4. Electric motors limited to 3-phase induction motors
5. Assumed that 15W CFLs used to replace 60W incandescent lamps

E. Thailand

1. Size and use data for refrigerators and ACs based on EGAT labeling data
2. Size, stock, and sales data for motors based on data from International Copper Association (ICA)
3. Assumed losses for standard magnetic ballasts
4. Assumed that 15W CFLs used to replace 60W incandescent lamps
5. Motor and fan sales assume 5 year lifetime and annual increase based on new sales of 10%

F. Vietnam

1. Motors data based on Thailand; size adjusted downward 25%; stock adjusted downward 60%
2. Assumed losses for standard magnetic ballasts; stock based on Thailand, but adjusted downward 60%
3. Data for refrigerator, AC, fans, rice cookers based largely on survey by DSM Cell of Electricity of Vietnam
4. Assumed that 15W CFLs used to replace 60W incandescent lamps; stock based on Thailand, but adjusted downward 60%

Table 29: Description of Assumptions Used in Baseline and Alternative Scenarios⁵⁵.

Limits on Equipment Efficiency

Appliance/Equipment	Limit (kWh/yr)	Efficiency improvement	Comments
Refrigerators	205	50%	US saved 66% in 30 years; Australia saved 60% in 20 years
Room air conditioners	1,042	30%	Assumes current equipment is 9 EER and limit is 13
Electric motors	20,231	7.65%	Based on example that current average motor is 84.7% efficiency (US "standard" efficiency) and best is 91.7% (U.S. premium efficiency)
Ballasts for FTLs	5	75%	Current average losses are 7.7W and electronic ballasts can get down to 2 W of losses (or even better)
Electric fans	102	30%	Assumption
Compact fluorescent lamps	20	10%	Assume quality and performance standards can improve efficacy 10% (up to 15% possible)
Rice cookers	138	30%	Assumes insulation can save up to 30%

Sales increases

Baseline & Alternative Assumption	5.0%	Annual increase in sales from 2005-2025 (See Annex E)
Special case for CFLs	5.0%	Annual increase in sales relative to BAU starting in Year 4 -- indicating increased replacement of incandescent lamps
	2.75	Multiple of annual CFL unit consumption to savings per incremental CFL sold due to GEF program

BAU Efficiency Increase (without BRESL Project)

Appliance/Equipment	BAU increase in efficiency (% improvement per year)
Refrigerators	1.0%
Room air conditioners	1.0%
Electric motors	0.2%

⁵⁵ Based mainly on the findings/results of the BRESL Survey and desk studies conducted during the BRESL PDF-A exercise.

Ballasts for FTLs	1.0%
Electric fans	0.5%
Compact fluorescent lamps	0.0%
Rice cookers	0.5%

Effects of EE labels (due to BRESL Project)

Appliance/Equipment	Increase in efficiency for labels, starting in Year 5 (% improvement per year, relative to previous year, not BAU)
Refrigerators (1)	2.0%
Room air conditioners	2.0%
Electric motors (2)	0.4%
Ballasts for FTLs (3)	2.0%
Electric fans (4)	1.0%
Compact fluorescent lamps	0.2%
Rice cookers (5)	1.0%

Note: For CFLs, small increase in efficacy assumed, but most CFL savings come from increased sales relative to incandescent

Effects of MEPS

Appliance/Equipment	MEPS savings, relative to BAU (in Year 4)
Refrigerators	10%
Room air conditioners	10%
Electric motors	4%
Ballasts for FTLs	30%
Electric fans	20%
Compact fluorescent lamps	5%
Rice cookers	20%

Assumed Equipment Lifetimes

Appliance/Equipment	Lifetime (Years)	Reference
Refrigerators	12	Based on ERM 1999 study used as basis for Thai MEPS
Room air conditioners	12	Based on ERM 1999 study used as basis for Thai MEPS
Electric motors	15	Based on ERM 1999 study used as basis for Thai MEPS; includes rewinding
Ballasts for FTLs	13	Based on ERM 1999 study used as basis for Thai MEPS
Electric fans	7	Assumption
Compact fluorescent lamps	3	Assumption
Rice cookers	10	Assumption

CO2 Emissions Factors (MMT CO2/GWh)

Country	Emissions Factor	Source
Mean average of emissions factors	0.00077	
Bangladesh	0.000943	UNDP
China	0.00109	UNDP
Indonesia	0.000757	UNDP
Republic of Korea	0.000767	UNDP
Thailand	0.000674	UNDP
Vietnam	0.00043	UNDP

Annex D. Overview of Project Impacts in Terms of Energy Savings and CO2 Emissions Reductions, by Country

Notes: Baseline and Alternative energy consumption CO₂ emissions are for products directly addressed in each country in the BRESL Project. The Alternative electricity savings and emissions reductions are calculated as percent of electricity used and CO₂ produced by products participating in BRESL Project. The difference between Baseline and Alternative electricity consumptions does not translate to electricity savings, since electricity savings also include reductions from reduced purchases of incandescent lamps, and these are calculated at 2.75 times annual unit electricity consumption of CFLs.

Bangladesh

Year	BAU Elec Use GWh/yr	Alt. Elec Use GWh/yr	Elec savings GWh/yr	% reduction	Cumul. elec savings GWh/yr	BAU CO2 emission MMT/yr	GEF CO2 emission MMT/yr	CO2 reduction MMT/yr	% reduction	Cumul CO2 reduction MMT	National CO2 Emission in 2004 MMT/yr	Percent of 2004 National CO2 Emissions
2007	6,614	6,614	0	0.00%	0	6.237	6.237	0	0.00%	0	20.188	0.00%
2011	13,945	13,560	385	2.76%	619	13.15	12.787	0.363	2.76%	0.583		1.80%
2021	31,885	28,957	2,928	9.18%	19,463	30.068	27.307	2.761	9.18%	18.353		13.68%
2031	50,098	45,626	4,472	8.93%	63,291	47.243	43.025	4.218	8.93%	59.683		20.89%

China

Year	BAU Elec Use GWh/yr	Alt. Elec Use GWh/yr	Elec savings GWh/yr	% reduction	Cumul. elec savings GWh/yr	BAU CO2 emission MMT/yr	GEF CO2 emission MMT/yr	CO2 reduction MMT/yr	% reduction	Cumul CO2 reduction MMT	National CO2 Emission in 2004 MMT/yr	Percent of 2004 National CO2 Emissions
2007	160,859	160,859	0	0.00%	0	176.016	176.016	0	0.00%	0	2401.055	0.00%
2011	334,164	321,554	12,610	3.77%	19,974	365.65	351.852	13.798	3.77%	21.856		0.57%
2021	642,001	536,937	105,064	16.37%	667,711	702.493	587.529	114.964	16.37%	730.626		4.79%
2031	964,366	817,003	147,363	15.28%	2,144,111	1,055.23	893.984	161.248	15.28%	2,346.14		6.72%

Indonesia

Year	BAU Elec Use GWh/yr	Alt. Elec Use GWh/yr	Elec savings GWh/yr	% reduction	Cumul. elec savings GWh/yr	BAU CO2 emission MMT/yr	GEF CO2 emission MMT/yr	CO2 reduction MMT/yr	% reduction	Cumul CO2 reduction MMT	National CO2 Emission in 2004 MMT/yr	Percent of 2004 National CO2 Emissions
2007	21,340	21,340	0	0.00%	0	16.154	16.154	0	0.00%	0	77.063	0.00%
2011	45,026	43,766	1,260	2.80%	2,009	34.084	33.131	0.953	2.80%	1.52		1.24%
2021	101,954	92,199	9,755	9.57%	63,908	77.179	69.795	7.384	9.57%	48.378		9.58%
2031	159,661	144,269	15,392	9.64%	210,318	120.863	109.212	11.651	9.64%	159.211		15.12%

Korea

Year	BAU Elec Use GWh/yr	Alt. Elec Use GWh/yr	Elec savings GWh/yr	% reduction	Cumul. elec savings GWh/yr	BAU CO2 emission MMT/yr	GEF CO2 emission MMT/yr	CO2 reduction MMT/yr	% reduction	Cumul CO2 reduction MMT	National CO2 Emission in 2004 MMT/yr	Percent of 2004 National CO2 Emissions
2007	192,368	192,368	0	0.00%	0	147.521	147.521	0	0.00%	0	254.918	0.00%
2011	421,840	416,690	5,150	1.22%	7,930	323.496	319.547	3.949	1.22%	6.082		1.55%
2021	1,072,823	1,025,480	47,343	4.41%	281,226	822.716	786.41	36.306	4.41%	215.664		14.24%
2031	1,707,988	1,634,510	73,478	4.30%	974,328	1,309.81	1,253.46	56.347	4.30%	747.183		22.10%

Thailand

Year	BAU Elec Use GWh/yr	Alt. Elec Use GWh/yr	Elec savings GWh/yr	% reduction	Cumul. elec savings GWh/yr	BAU CO2 emission MMT/yr	GEF CO2 emission MMT/yr	CO2 reduction MMT/yr	% reduction	Cumul CO2 reduction MMT	National CO2 Emission in 2004 MMT/yr	Percent of 2004 National CO2 Emissions
2007	87,189	87,189	0	0.00%	0	58.765	58.765	0	0.00%	0	84.924	0.00%
2011	188,303	184,489	3,814	2.03%	5,858	126.916	124.346	2.57	2.02%	3.948		3.03%
2021	452,291	422,168	30,123	6.66%	190,125	304.844	284.541	20.303	6.66%	128.144		23.91%
2031	716,617	670,482	46,135	6.44%	619,626	483	451.905	31.095	6.44%	417.628		36.62%

Vietnam

Year	BAU Elec Use GWh/yr	Alt. Elec Use GWh/yr	Elec savings GWh/yr	% reduction	Cumul. elec savings GWh/yr	BAU CO2 emission MMT/yr	GEF CO2 emission MMT/yr	CO2 reduction MMT/yr	% reduction	Cumul CO2 reduction MMT	National CO2 Emission in 2004 MMT/yr	Percent of 2004 National CO2 Emissions
2007	13,698	13,698	0	0.00%	0	5.89	5.89	0	0.00%	0	16.77	0.00%
2011	28,854	28,052	802	2.78%	1,298	12.407	12.062	0.345	2.78%	0.558		2.06%
2021	65,398	59,343	6,055	9.26%	40,784	28.121	25.517	2.604	9.26%	17.537		15.53%
2031	102,823	93,092	9,731	9.46%	133,959	44.214	40.029	4.185	9.47%	57.602		24.96%

ANNEX E: ELECTRICAL APPLIANCES MARKET REPORTS (Extracts from Global Information, Inc., 2006)

The following are concise description of selected appliance market reports in the Asian region (particularly China and South Korea). These, among others, were utilized as bases for the assumptions made in forecasting market share and volume projections for the 6 EE products covered under the BRESL project.

Domestic Electrical Appliances in China

Growth is beginning to diminish as products such as fridge freezers become more mature. Other home appliances are still underdeveloped like automatic washer dryers, and most small home appliances. Products such as microwaves and irons, although seeing stable growth over the review period, are starting to show signs of maturity. Some products, such as air conditioners, are perceived as being saturated in large cities, but continue to witness vigorous growth in secondary cities and rural areas.

A very low level of product awareness with regard to small kitchen appliances, like rice cookers⁵⁶ contribute to a mixed future outlook for small electrical appliances.

Manufacturers seek to consolidate in face increasingly fierce competition - From refrigeration to air treatment appliances, the process of large players acquiring their smaller counterparts is prevalent. Apart from the already highly concentrated sales revenue, the volume shares of most product types tend to be dominated by the top players. Concentration is not only shaped by market forces, which favor the larger players, but the enthusiasm of the major electrical appliance groups for merger and acquisition activity. At least five such events occurred in 2004/5, having a profound impact on the market's structure.

Changing consumer lifestyles favor premium segment - As well as the movement of retail sales, manufacturers' activities were largely affected by changes in consumer lifestyles over the review period. 2005 was a year of new premium products, a trend evident across the market, especially in refrigeration appliances and home laundry appliances. With busier lifestyles many consumers are demanding home appliances with more features with which require minimal effort in usage. Meanwhile, Chinese consumers are more influenced the promotion of specialty chains, and are becoming new-product-friendly.

While the small and mid-sized cities saw a high level of competition in sales of home appliances, sales of many electrical appliances remained small or negligible in rural areas over the review period. This situation is due largely to the lack of distribution network and purchasing power in these areas. Such regions offer potential for future growth, and are expected to see increased focus by manufacturers in coming years.

Large domestic electrical appliances manufacturers in China launched new products to stimulate demand and regain momentum in the saturated environment, e.g., 3-door and side-by-side refrigerators. For increasingly saturated home electrical appliances, price cutting is also a frequently adopted strategy to maintain brand share, especially when product innovation is difficult to achieve. Most products, even small home appliances, suffered deceleration of value growth over the review period. To stimulate demand, manufacturers and retailers are utilizing

⁵⁶ Rice cookers are widely used in Asian countries like Thailand, Vietnam, Malaysia and Indonesia. Rice cookers, along with pod coffee makers, represented the highest volume small kitchen appliance in 2005 in North America, and is expected to have high growth in the next 5 years (The Worldwide Market for Small Household Appliances - 2006 Edition)

every method possible, including changes to packaging, product innovation and seasonal promotion, in order to encourage consumption.

Domestic Electrical Appliances in South Korea

Both volume and value sales of domestic electric appliances in South Korea improved in 2005. The construction industry recovered and performed well, aiding the sales of domestic electrical appliances. In addition, consumer sentiment, which was lowest in 2004, bounced back in 2005. Air treatment products led the growth in both volume and value, due to the extremely hot weather forecast that increased the consumer base. Rising energy prices alarmed South Korean consumers, and resulted in the growth of electric heating appliances over oil-based appliances.

The major topic in domestic electrical appliances in 2005 was 'premium'. Premium products, such as side-by-side refrigerators, accounted for 65%-80% in terms of volume of domestic home appliances replacing regular products. Domestic sales that previously showed a negative growth turned around in 2005 with 5%-8% growth, due to premium product sales. However, low-priced home appliances, such as energy efficient and refurbished second hand appliances, also sold so strongly that the polarization phenomenon in consumption got even wider in 2005.

Weather affects home electrical appliances sales – Increasing ambient weather temperature has resulted in soaring sales of domestic electrical appliances to deal with the hot weather soared. Manufacturers promptly started the reservation sales, and production lines were in full operation to meet the flood of orders.

All-in-one products - one machine for multi-purposes - attracted attention due to their advantages of time and space saving, as well as economy. Also, many of these products functioned so effectively that they quelled the common idea that all-in-one products were inefficient. However, there were some questions about whether such multi-functions were really what users needed. Along with the multi-functional products, interest in built-in appliances also grew in 2005.

World Commercial Refrigeration Equipment to 2010

World demand for commercial refrigeration equipment is projected to increase over four percent per year through 2010, exceeding \$27 billion. Demand in the Asia/Pacific region will outpace the global average, rising nearly six percent annually through 2010. China will be the fastest growing national market, benefiting from above-average urban population growth and healthy gains in fixed investment, as well as rising income levels. Above-average growth will also occur in India due to solid gains in the number of households with refrigerators and rising per capita incomes. The other developing countries of Asia and Africa/Mideast will also post strong gains, reflecting rising standards of living in the regions.

China has grown into a major supplier of refrigeration equipment, taking advantage not only of its inexpensive labor pool, but also of favorable exchange rates, which have made pricing of Chinese goods especially competitive.

White Goods in China

Filling the 500 million or so households in China with appliances progresses apace - This is great news for China's electricity generating companies, but the appliance manufacturers and retailers are struggling to maintain a margin in this cut-throat, cut-price, pile-'em-high and sell-'em-cheap market. Still, leading producers and retailers seem to be making money somehow. The total white goods market in China grew by 61.81% between 1999 and 2005. Although not a fast growing

market by Chinese standards, the market is still expanding by about 8.21% per annum - very respectable for a relatively mature sector. Significantly, competition in the market is reaching unprecedented levels, making price more important than ever before.

Rapid economic growth following the introduction of open-door policies in 1979 has helped to create a massive consumer market in China. This growth has transformed the lives of ordinary Chinese, raising worker incomes, pushing up overall living standards and strengthening consumers' purchasing power. White goods and household appliances have benefited considerably, with demand amongst the new urban wealthy especially strong.

As the market has matured, so competition for market share has increased amongst the country's numerous white goods manufacturers, which in turn have been forced to take ever-tighter margins on product sales. With ownership levels of basic white goods in some categories at saturation point, manufacturers are now focusing on re-sales and product upgrades rather than first-time purchases.

Tough competition has prompted companies to work harder to find the niche sector sales of new products and win over an increasingly well-informed consumer constituency demanding higher quality, improved technology and value for money. Price-cutting has therefore been a key feature of the market recently, with manufacturers forced to cut costs at every stage of product design, distribution, marketing and retail.

Yet the incentives for white goods firms are enormous. The total value of non-food retail sales grew an impressive 85.02% climb between 1998 and 2004. This steep climb reflects higher disposable incomes a greater consumer confidence as younger, wealthier consumers choose to spend their cash rather than save for the future.

This sea change in consumer attitudes towards spending reflects increased confidence in the government's economic and political policies - in sharp contrast to the uncertainties of the pre-reform era. Factors driving this change include: an increased desire for knowledge as China's integration with the global community gathers pace; higher disposable incomes and increased purchasing power amongst younger consumers; the emergence of an aspirational middle class in major cities; and ever-cheaper goods produced by both local and foreign manufacturers.

World Major Household Appliances to 2009

World demand for major household appliances (white goods) is projected to increase over three percent annually through 2009, exceeding 380 million units. Gains will surpass the 1999-2004 pace due to accelerating global economic growth, which will stimulate consumer spending activity, a major determinant of appliance demand.

Demand in the Asia/Pacific region, in particular India and China, will continue to benefit from above average urban population growth and healthy gains in the number of households. China in particular has grown into the world's largest supplier of white goods, nearly tripling production from 1994 to 2004. The nation has taken advantage not only of its inexpensive labor pool but also of favorable exchange rates, which have made pricing of Chinese goods especially competitive. China has become a leading producer in the refrigerator and microwave oven segments, where products are exported to the US, Western Europe and throughout Asia.