



# GEF-6 REQUEST FOR PROJECT ENDORSEMENT/APPROVAL

PROJECT TYPE: Full-sized Project

TYPE OF TRUST FUND: GEF Trust Fund

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## PART I: PROJECT INFORMATION

Project Title: Leapfrogging Myanmar's market to high efficient lighting and appliances			
Country(ies):	Myanmar	GEF Project ID: <sup>1</sup>	9499
GEF Agency(ies):	UN Environment	GEF Agency Project ID:	01357
Other Executing Partner(s):	Ministry of Industry	Resubmission Date:	June 19, 2018
GEF Focal Area (s):	Climate Change	Project Duration (Months)	48
Integrated Approach Pilot	IAP-Cities <input type="checkbox"/> IAP-Commodities <input type="checkbox"/> IAP-Food Security <input type="checkbox"/> Corporate Program: SGP <input type="checkbox"/>		
Name of Parent Program	Leapfrogging markets to high efficiency products (Appliances, including lighting, and electrical equipment).	Agency Fee (\$)	200,122

## A. FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES<sup>2</sup>

Focal Area Objectives/Programs	Focal Area Outcomes	Trust Fund	(in \$)	
			GEF Project Financing	Co-financing
CCM-1 Program 1	Promote timely development, demonstration and financing of low-carbon technologies and mitigation options	GEFTF	2,223,578	3,635,000
<b>Total project costs</b>			<b>2,223,578</b>	<b>3,635,000</b>

## B. PROJECT DESCRIPTION SUMMARY

<b>Project Objective: To facilitate a market transformation toward high efficiency lighting and electrical appliances through the integrated policy approach, thereby reducing growth in electrical demand and greenhouse gas (GHG) emissions, while simultaneously increasing energy access.</b>						
Project Components/Programs	Financing Type <sup>3</sup>	Project Outcomes	Project Outputs	Trust Fund	(in \$)	
					GEF Project Financing	Confirmed Co-financing
1. Minimum energy performance standards (MEPS) and labeling	TA	1. Adoption by government of MEPS and label requirements	1.1 Assessment of market baseline for lighting products and air-conditioners completed and other target appliances prioritized based on saving estimates  1.2 Training program for responsible government entities and involved stakeholders to understand, design and implement MEPS and labeling programs implemented	GEFTF	672,236	977,125

<sup>1</sup> Project ID number remains the same as the assigned PIF number.

<sup>2</sup> When completing Table A, refer to the excerpts on [GEF 6 Results Frameworks for GETF, LDCF and SCCF](#) and [CBIT programming directions](#).

<sup>3</sup> Financing type can be either investment or technical assistance.

			1.3 MEPS and labeling for target products developed and piloted on a voluntary basis			
2. Market Monitoring, Verification and Enforcement	TA	2. Strengthened national systems to implement market monitoring, verification and enforcement activities	<p>2.1 Legislative and institutional framework developed for effective market monitoring, verification and enforcement (MVE)</p> <p>2.2 MVE training program for the responsible government entities including policy makers, enforcement officials and customs officials designed and delivered</p> <p>2.3 Training program for relevant national authorities to test products or collaborate with external accredited test laboratories designed and delivered</p>	GEFTF	446,709	482,625
3. Awareness raising and Demonstrations projects	TA	3. Government actions for an increased awareness, availability and use of efficient lighting products and appliances are in place	<p>3.1 Public awareness raising through multi-media communication and mass media campaigns implemented</p> <p>3.2 Small scale pilot demonstration projects in public and commercial building designed and implemented</p> <p>3.3 Awareness and capacity building program of importers and local industry on new MEPS and labeling requirements implemented</p>	GEFTF	1,000,483	2,042,625
Subtotal					2,119,428	3,502,375
Project Management Cost (PMC) <sup>4</sup>				GEFTF	104,150	132,625
<b>Total project costs</b>					<b>2,223,578</b>	<b>3,635,000</b>

<sup>4</sup> For GEF Project Financing up to \$2 million, PMC could be up to 10% of the subtotal; above \$2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.

### C. CONFIRMED SOURCES OF CO-FINANCING FOR THE PROJECT BY NAME AND BY TYPE

Please include evidence for co-financing for the project with this form.

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount (\$)
Recipient Government	Ministry of Industry	In-kind	1,700,000
Recipient Government	Ministry of Education	In-kind	500,000
Private Sector	Daikin	In-kind	385,000
GEF Agency	UN Environment	In-kind	90,000
Others	International Copper Association (ICA)	In-kind	300,000
Others	Global Efficient Lighting Centre (GELC)	In-kind	150,000
Others	International Institute for Energy Conservation (IIEC)	In-kind	10,000
Others	Small & Medium Industrial Development Bank (SMIDB)	Loans	500,000
<b>Total Co-financing</b>			<b>3,635,000</b>

### D. TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES), FOCAL AREA AND THE PROGRAMMING OF FUNDS

GEF Agency	Trust Fund	Country Name/Global	Focal Area	Programming of Funds	(in \$)		
					GEF Project Financing (a)	Agency Fee <sup>(*)</sup> (b)	Total (c)=(a)+(b)
UN Environment	GEFTF	Myanmar	Climate Change	CCM-1 Program 1	2,223,578	200,122	2,423,700
<b>Total Grant Resources</b>					<b>2,223,578</b>	<b>200,122</b>	<b>2,423,700</b>

(\*) Refer to the Fee Policy for GEF Partner Agencies

### E. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS<sup>5</sup>

Provide the expected project targets as appropriate.

Corporate Results	Replenishment Targets	Project Targets
1. Maintain globally significant biodiversity and the ecosystem goods and services that it provides to society	Improved management of landscapes and seascapes covering 300 million hectares	<i>hectares</i>
2. Sustainable land management in production systems (agriculture, rangelands, and forest landscapes)	120 million hectares under sustainable land management	<i>hectares</i>
3. Promotion of collective management of transboundary water systems and implementation of the full range of policy, legal, and institutional reforms and investments contributing to sustainable use and maintenance of ecosystem services	Water-food-ecosystems security and conjunctive management of surface and groundwater in at least 10 freshwater basins;	<i>Number of freshwater basins</i>
	20% of globally over-exploited fisheries (by volume) moved to more sustainable levels	<i>Percent of fisheries, by volume</i>

<sup>5</sup> Update the applicable indicators provided at PIF stage. Progress in programming against these targets for the projects per the *Corporate Results Framework* in the GEF-6 Programming Directions, will be aggregated and reported during mid-term and at the conclusion of the replenishment period.

Corporate Results	Replenishment Targets	Project Targets
4. Support to transformational shifts towards a low-emission and resilient development path	750 million tons of CO <sub>2</sub> e mitigated (include both Direct and Consequential)	Direct: 292,174 tCO <sub>2</sub> <sup>6</sup> Indirect: 491,238 tCO <sub>2</sub>
5. Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern	Disposal of 80,000 tons of POPs (PCB, obsolete pesticides)	<i>metric tons</i>
	Reduction of 1000 tons of Mercury	<i>metric tons</i>
	Phase-out of 303.44 tons of ODP (HCFC)	<i>ODP tons</i>
6. Enhance capacity of countries to implement MEAs (multilateral environmental agreements) and mainstream into national and sub-national policy, planning financial and legal frameworks	Development and sectoral planning frameworks integrate measurable targets drawn from the MEAs in at least 10 countries	<i>Number of Countries:</i>
	Functional environmental information systems are established to support decision-making in at least 10 countries	<i>Number of Countries:</i>

**F. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT? No**

(If non-grant instruments are used, provide an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF/CBIT Trust Fund) in Annex D.

<sup>6</sup> As agreed with the GEF Secretariat, the Direct benefits attributable to each of the child projects under the "Leapfrogging markets to high efficiency products (appliances, including lighting and electrical equipment)" Program shall represent 50% of the projects' estimated Direct GHG emission reductions.

## **PART II: PROJECT JUSTIFICATION**

### ***A.0. Describe any changes in alignment with the project design with the original PIF***

During preparation of the CEO Endorsement Request document, it was evident that Myanmar has made little progress in promoting energy efficient lighting and appliances and all lighting products and appliances in Myanmar are virtually import. In view of this, the overall project designs at the Component and Outcome level are generally in alignment with the original Concept Note. However, adjustments have been made to descriptions of Components, Outcomes and Outputs to reflect the local market situations and conclusions from the stakeholder consultations during the project preparation phase. These are summarized below.

<b>Original Component, Outcome &amp; Output Statement</b>	<b>Revised Component, Outcome &amp; Output Statement</b>	<b>Explanations</b>
Outcome 1: Increased efficiency of lighting products and appliances available on the Myanmar market through ambitious MEPS and labelling requirements	Outcome 1: Adoption by government of MEPS and label requirements	Outcome wording has been simplified in order to better reflect the uptake of Component 1
Output 1.1: Assessment of market baseline for lighting products and prioritization of appliances to address based on saving estimates (GHG, financial and energy)	Output 1.1: Assessment of market baseline for lighting products and air-conditioners completed and other target appliances prioritized based on saving estimates	Minor text revisions to the Output statement to reflect the proposed project activities
Output 1.2: Capacity building for responsible government entities to understand, design and implement efficient efficiency regulatory program.	Output 1.2: Training program for responsible government entities and involved stakeholders to understand, design and implement MEPS and labeling programs implemented	Minor text revisions to the Output statement to reflect the proposed project activities
Output 1.3: Development and implementation of MEPS and energy labels for target products in line with the ASEAN regional approach	Output 1.3: MEPS and labeling for target products developed and piloted on a voluntary basis	Minor text revisions to the Output statement to reflect the proposed project activities
Outcome 2: Strengthened capacity of the responsible government entities including policy makers, enforcement officials and custom officials to implement market control procedures	Outcome 2: Strengthened national systems to implement market monitoring, verification and enforcement activities	Outcome wording has been simplified in order to better reflect the uptake of Component 2
Output 2.1: Legislative and institutional framework developed and adopted for effective market monitoring, verification and enforcement (MVE)	Output 2.1: Legislative and institutional framework developed for effective market monitoring, verification and enforcement (MVE)	Minor text revisions to the Output statement to reflect the proposed project activities
Output 2.2: Capacity building for the responsible government entities including policy makers, enforcement officials and customs official to implement market control procedures	Output 2.2: MVE training program for the responsible government entities including policy makers, enforcement officials and customs officials designed and delivered	Revision to the Output statement to reflected the proposed project activities
Output 2.3: Capacity building for relevant national authorities to test products or collaborate with external accredited test laboratories (professional skills and infrastructure)	Output 2.3: Training program for relevant national authorities to test products or collaborate with external accredited test laboratories designed and delivered	Minor text revisions to the Output statement
Component 3: Supporting Policies	Component 3: Awareness raising and Demonstration projects	The new wording better reflects the activities proposed under this component.
Outcome 3: Increased penetration of high efficiency lighting products and	Outcome 3: Government actions for an increased awareness, availability and use of	Outcome wording has been adjusted in order to better reflect the uptake of

appliances through stakeholder awareness and support to the private sector	efficient lighting products and appliances are in place	Component 3
Output 3.1: Public awareness raising through multi-media communication and distribution campaigns	Output 3.1: Public awareness raising through multi-media communication and mass media campaigns implemented	Minor text revisions to the Output statement
Output 3.2: Small scale pilot demonstration projects in public and commercial buildings	Output 3.2: Small scale pilot demonstration projects in public and commercial building designed and implemented	Minor text revisions to the Output statement
Output 3.3: Training for the local lighting and appliance manufacturing industry to produce energy efficient lighting and electrical appliances in an environmentally sound manner	Output 3.3: Awareness and capacity building program of importers and local industry on new MEPS and labeling requirements implemented	Output statement revised to reflect the absence of local manufacturing industry for lighting and appliance in Myanmar. Scope of this output was revised to include importers to ensure supply of high quality energy efficient lighting and appliance in Myanmar.

Allocation of the GEF trust fund to each project component was adjusted to reflect the nature and intensity levels of project activities in each components. The budget originally allocated for Component 2 was trimmed down due to smaller scale of MVE activities to support the voluntary energy labeling program during the project period and distributed to support activities under Component 1 and 3, as summarized below.

Component	Concept Note	CEO Endorsement
1. Minimum energy performance standards (MEPS) and labeling	640,000	672,236
2. Market monitoring, verification and enforcement	640,000	446,709
3. Awareness raising and demonstration projects	840,578	1,000,483
Project management cost (PMC)	103,000	104,150
<b>Total</b>	<b>2,223,578</b>	<b>2,223,578</b>

It was agreed during the second stakeholder consultation workshop organized by the Energy Efficiency and Conservation Division (EECD) in October 2017 that the project will provide investment supports for equipment, design and evaluation of pilot demonstration project/s for public buildings and develop financial mechanism(s) with technical assistance to support energy efficiency investments in commercial buildings. Allocation of the GEF trust fund for the investment in the pilot demonstration projects and establishment of the financial mechanism(s) is shown in Annex F-1.

Compared to the Concept Note, the co-finance situation at CEO Endorsement is as follows:

Source of Co-Financing	Concept Note	CEO Endorsement
Ministry of Industry, Government of Myanmar	1,000,000	1,700,000
Ministry of Education	N/A	500,000
Local appliance industry	1,000,000	0
Osram	250,000	0
Philips	250,000	0
Electrolux	250,000	0
Daikin	N/A	385,000
European Commission	250,000	0
Asian Development Bank	250,000	0
UN Environment	50,000	90,000
International Copper Association (ICA)	N/A	300,000
Global Efficient Lighting Centre (GELC)	N/A	150,000
International Institute for Energy Conservation (IIEC)	N/A	10,000
Small & Medium Industrial Development Bank (SMIDB)	N/A	500,000
<b>Total</b>	<b>3,300,000</b>	<b>3,635,000</b>

On top of the in-kind support from the international partners mentioned above, Electrolux has expressed its technical backing of the project in a support letter (refer to Annex L) and other manufacturers such as Osram and Phillips have reconfirmed their supports to the whole U4E program during the Conference of the Parties in Bonn. This support will continue to include in-kind contributions and technical assistance for the development of standards and labels promoting higher efficiency equipment. Finally, the Small & Medium Industrial Development Bank of Myanmar has shared its interest in the project and could potentially contribute to the financial mechanisms through the provision of loans. According to their co-finance letter (refer to Annex L) it has been conservatively estimated that the bank could provide at least US\$ 500,000 in loans over the 4 years of project implementation.

#### ***A.1. Project Description.*** Elaborate on:

##### **1) Global environmental and/or adaptation problems, root causes and barriers that need to be addressed**

Based on the Initial National Communication (INC) issued in 2012<sup>7</sup>, the total GHG emission from the energy sector which includes fossil fuel combustions in various end-use sectors<sup>8</sup> in Myanmar was estimated at 7,659 ktCO<sub>2</sub> in 2000 and about 30% of which (2,323 ktCO<sub>2</sub>) is contributed by energy and transformation industries, including electricity generation. Myanmar's per capita electricity consumption is among the lowest in Asia, around 156 kWh per year<sup>9</sup>, and, according to the most recent census data published in 2014, only about 30% of the general population have access to grid electricity services. Although emissions from the energy sector are not significant at present, this sector's contribution to the national GHG emissions will be more significant in the future, as Myanmar's economy is rapidly growing and is expected to expand by about 9% yearly on average up to 2030, driven by increased flow of foreign direct investment.

In 2011, the residential sector accounted for 42% of the total electricity consumption of 7,696 GWh, followed by the industrial sector with 36% and commercial sector with 21%. In 2012, the electricity consumption by the industrial sector overtook the residential sector as the largest consuming sector, accounting for about 44% of the total electricity consumption of 8,254 GWh, followed by the residential sector, 32% and commercial sector, 20%. The total electricity consumption in Myanmar in 2013 was reported at 10.1 TWh. According to the National Energy Policy (2014), the electricity sector will be rapidly developed over the next decade with a target of 45% electrification by 2020-2021 and 60% by 2025-2026. The Energy Master Plan approved in 2015 has set the target electrification rate at 87% by 2030. As a result of fast economic development and higher electrification rates, energy demand in Myanmar is expected to quickly increase. The Energy Master Plan (2015) proposed multiple scenarios for power sector development in Myanmar until 2030 and thermal power generations based on gas and coal are expected play a major contribution in meeting the increasing demand. These developments will underline the growing trend of GHG emissions by the energy sector, unless considerable efforts to reduce emissions are implemented.

The Myanmar Government has recognized the important roles of energy efficiency and conservation in mitigating GHG emissions from the energy sector and the Ministry of Industry (MOI) is appointed as the policy making body for energy efficiency and conservation in Myanmar. The Energy Efficiency and Conservation Division (EECD) was created under MOI to be responsible for energy efficiency policy and activities in the country. Along with the establishment of EECD, the National Energy Efficiency and Conservation Policy, Strategy and Roadmap for

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<sup>7</sup> Myanmar's Initial National Communication under United Nations Framework Convention on Climate Change (UNFCCC), The Republic of the Union of Myanmar Ministry of Environmental Conservation and Forestry, 2012

<sup>8</sup> Industry & Construction, Transport, Commercial & Institutional, Residential, Agriculture/Forestry/Fishery and Others

<sup>9</sup> ADB. Power Sector Development. Manila, Philippines, October 2015, <http://www.adb.org/sites/default/files/publication/175801/ewp-460.pdf>

Myanmar<sup>10</sup> was prepared under the technical assistance from Asian Development Bank (ADB) and approved by the Myanmar government in February 2016. The National Energy Efficiency and Conservation Policy document estimated that Myanmar can save about 25% of its annual electricity consumption through implementation of various energy efficiency and conservation measures in major consuming sectors. Among which, the residential sector was estimated to have the greatest saving potential of 9.7% of the total electricity consumption. To achieve the energy efficiency target outlined in the policy, implementation of energy standards and labeling (S&L) programs for lighting and household appliances are recommended as one of the priority activities for the residential sector in Myanmar, and the Energy Standards and Labeling Roadmap for Myanmar was also prepared as part of the National Energy Efficiency and Conservation Policy. Myanmar has not yet a signatory of Minamata Convention and the Kigali amendment. However, the “Development of Minamata Initial Assessment and National Action Plan for Artisanal and Small Scale Gold Mining in Myanmar” project is approved by the UN Environment/GEF project in June 2017 and will be implemented by Ministry of Natural Resources and Environmental Conservation (MONREC).

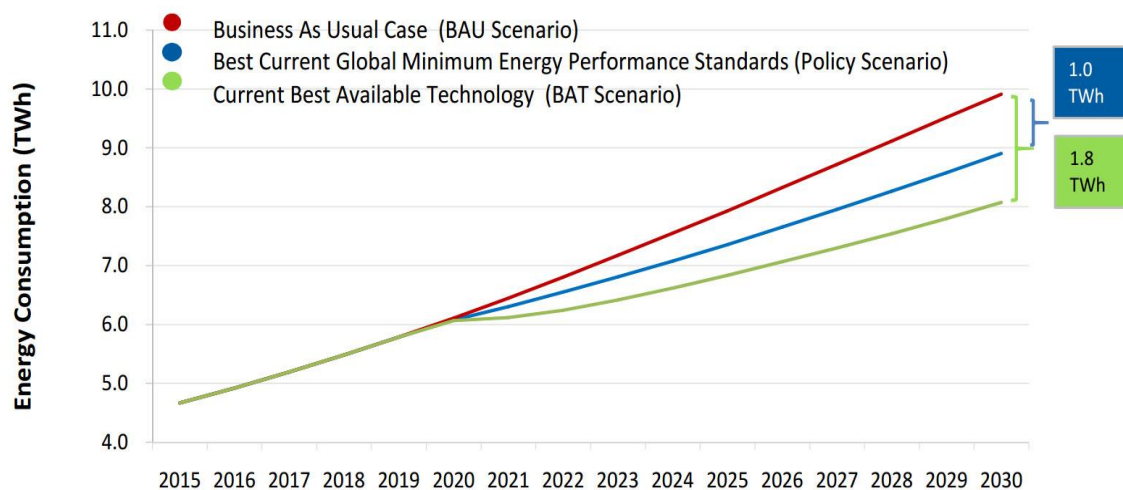
The current market penetration of energy efficient products and appliances (lighting products, air conditioners, refrigerators and other home appliances) in the residential sector is very low: for example, the share of LED lamps in annual sales of lighting products is less than 10%. There is therefore potential for significant energy savings through the introduction of Minimum Energy Performance Standards (MEPS) and energy labeling schemes similar to most countries in the region (Thailand, Malaysia, India, Philippines, Vietnam and Sri Lanka). MEPS and energy labeling strategies are in line with the INC abatement strategy for 2000 – 2030 which the use of new technologies such as efficient lighting and air-conditioning and refrigeration systems with higher overall energy efficiency is recommended. According to the National Energy Efficiency and Conservation Policy, Strategy and Roadmap for Myanmar MEPS and energy labeling strategies will be implemented nationwide, covering urban and rural households, and the strategies will reduce household energy expenses and thus reduce poverty, a priority Millennium Development Goals (MDG) of the country.

In parallel with the development of the National Energy Efficiency and Conservation Policy, EECD has participated in several regional and international cooperation on energy efficiency, including the ASEAN Energy Efficiency and Conservation Sub-Sector Network (EE&C-SSN) and United for Efficiency (U4E) under the leadership of UN Environment. The U4E assessment modeling estimated that Myanmar could save 574 GWh and 1,007 GWh in 2025 and 2030 respectively through adoption of best current global MEPS for lighting, residential refrigerators, room air-conditioners, distribution transformers and industrial motors in 2020. The savings in 2030 are estimated to be greater at 1.8 TWh if Myanmar opts for adoption of current Best Available Technologies in 2020.

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<sup>10</sup> National Energy Efficiency and Conservation Policy, Strategy and Roadmap for Myanmar, Technical Assistance by the Asian Development Bank (TA 8356-MYA: Institutional Strengthening of National Energy Management Committee in Energy Policy and Planning) <http://www.adb.org/projects/46389-001/main>





**FIGURE 1: MYANMAR'S SAVING POTENTIAL WITH MEPS AND BAT SCENARIO**

Source: U4E, Myanmar U4E country assessment, 2016

Despite recent efforts on establishment of policy and institutional frameworks to support implementation of energy efficiency and conservation in Myanmar as well as ongoing regional and international cooperation to promote energy efficient lighting and MEPS for room air-conditioners in the country, development and implementation of an energy S&L program to transform the lighting and appliances market in Myanmar into a market of efficient and quality lighting products and appliances are unlikely to progress in a desirable pace due to several barriers as described below.

### **Institutional and Coordination Barrier**

- Absence of coordination frameworks for key government agencies on implementation of the S&L program:** Implementation of the energy S&L program requires strong coordination of multiple government agencies and support from institutions and industries. In Myanmar, it is envisaged that at least 3 ministries will play key roles in supporting EECD in development and implementation of the S&L program, and these include: Ministry of Education (Science and Technology) – Myanmar national standard body; Ministry of Commerce (import/export licenses); and Ministry of Planning and Finance (Customs Department). The S&L program is new to Myanmar and it is critical for EECD to establish an effective coordination frameworks for these key stakeholders to ensure that roles and responsibilities of each key stakeholder in development and implementation of the S&L program are well understood.
- Lack of local capacity and collaboration with external accredited testing facilities for testing of lighting products and household electric appliances:** Currently there is no in-country testing facility in Myanmar capable of testing safety, electrical and energy performance parameters for lighting products and household appliances. Although the implementation of the ASEAN Harmonized Electrical and Electronic Equipment Regulatory Regime (AHEEERR) and the ASEAN Sectoral Mutual Recognition Arrangement for Electrical and Electronic Equipment (ASEAN EE MRA) allow ASEAN member countries, including Myanmar, to recognize test results and product certifications conducted by testing laboratories and certification bodies in other ASEAN member countries, Myanmar's participation in these schemes has been limited, and no MRA has been established between Myanmar and other ASEAN member countries. This has prevented Myanmar to strengthen capacity of relevant stakeholders and institutions in supporting development and implementation of an energy S&L program.

### **Regulatory barrier**

- **Lack of regulatory frameworks to support implementation of energy efficiency:** EECD has been established to take the lead roles in promoting and regulating energy efficiency in Myanmar. However, there is no existing legal mechanism for EECD to set up and enforce requirements on energy efficiency, such as MEPS. Myanmar is drafting its first Energy Efficiency and Conservation Law and it is currently under a consultation process. It is envisaged that approval of the first Energy Efficiency and Conservation Law in Myanmar will be a multiple-year process. It should be noted that once the Energy Efficiency and Conservation Law is in place, it is also important for Myanmar to develop by-laws and regulations which will provide specific provisions to support implementation and enforcement of energy efficiency in Myanmar.

### Technical Barrier

- **Limited knowledge on design and selection of efficient lighting and appliances:** Small commercial and public buildings in Myanmar typically use the same types of lighting products and appliances (such as air-conditioners and refrigerators) as Myanmar households. However, these small commercial buildings generally purchase in a larger quantity and usages are more extensive (longer operating hours). Transition to more efficient lighting, cooling and refrigeration among these end-users is currently hampered by capacity of building managers and contractors in design and selection of energy efficient technologies that suit well with the applications in small commercial and public buildings.

### Market Barriers

- **Lack of market competition and demand in energy efficient lighting and appliances:** Myanmar suppliers of lighting products and household appliances do not view energy efficiency as the competitive advantage for their businesses, and there is generally a lack of appreciation and knowledge among the local suppliers in promoting to consumers economic and environmental benefits of energy efficient lighting products and household appliances. Although LED lighting can be found in most electrical shops in Myanmar, they are mostly unbranded cheap Chinese-made LED lamps. It is also not difficult to find obsolete T12 fluorescent technology in Myanmar. Incremental costs of high quality energy efficient lighting and household appliances compared with inefficient models are relatively high compared with neighboring countries. These supply constraints together with low affordability of Myanmar consumers in general have directly weakened demand of energy efficiency lighting and other household appliances in Myanmar.

### Information/Awareness and Capacity Barriers

- **Lack of credible information on benefits of energy efficient lighting and appliances:** To date there has been inadequate effort in consolidating and verifying benefits of energy efficient lighting and appliances in Myanmar. Moreover, real life demonstration on cost-effective, best commercially available technologies such as LED lighting and inverter-type air-conditioners are also limited. These lead to limited awareness, knowledge and confidence in adoption of energy efficiency technologies in Myanmar.
- **Lack of awareness of energy efficiency opportunities:** Myanmar consumers are generally not aware of energy efficient technologies and their associated benefits. This is a result of limited awareness and communication activities on energy efficiency implemented to date in Myanmar and inadequate resources to educate general public on how energy efficiency could benefit general consumers and foster economic growth at the national level.
- **Limited knowledge and experience in implementation of the S&L program:** Energy efficiency and the energy S&L program are new in Myanmar, and human resources in relevant government agencies and authorities appear to have limited technical knowledge in energy efficiency and the S&L program. Although various ongoing activities carried out by key government agencies are highly relevant to the S&L

program, for example, verification of controlled goods by the customs department, import/export data compilation by the National statistical office, specific requirements of the S&L program are specific and shall be well understood prior to development and implementation of the S&L program.

## **2) Baseline scenario or any associated baseline projects**

There are several ongoing activities in the field of energy efficiency in Myanmar being conducted under the lead of EECD with assistance from donor agencies. Baseline efforts related to promoting energy efficient lighting and appliances and overall energy efficiency in Myanmar are summarized below:

- **Improvement of Industrial Energy Efficiency (IEE) in Myanmar Project (2015 - 2019):** This project is funded by UNIDO/GEF and MOI is the national executing agency. The project aims to promote sustained GHG emission reduction in the Myanmar industry by: improving policy and regulatory frameworks; institutional capacity building for industrial energy efficiency (IEE); implementation of energy management system (EnMS) based on ISO 50001; and optimization of energy systems in industry.
- **Resource Efficient and Cleaner Production (RECP) Project (2016 - 2017):** This project is funded by the New Energy and Industrial Technology Development Organization (NEDO) and being implemented for food processing and hotel sector in Myanmar.
- **Preparation of the Energy Efficiency and Conservation (EC) Law:** The EC Law is being drafted with the technical assistance from the Energy Conservation Center, Japan (ECCJ) under Japan-Myanmar bilateral cooperation for EE&C regulatory framework development. First draft was prepared in August 2016 and now being reviewed and discussed among stakeholders.
- **ASEAN-Standard Harmonization Initiative for Energy Efficiency (ASEAN SHINE):** EECD is collaborating with the United Nation Environment Programme (UN Environment) and ASEAN EE&C-SSN in supporting energy efficient market transformation for room air-conditioners and lighting through harmonization of testing standards and adoption of harmonized MEPS. ASEAN SHINE has supported EECD in development of a national policy roadmap for harmonization of energy performance standard for air conditioners with other ASEAN member countries. Details of the policy targets the country will adopt for air conditioners are set out in the table on page 16.

In addition to the above regional and international collaborations, EECD is currently planning to raise the public awareness on energy efficiency by organizing workshops, seminars, training and dissemination of awareness materials. However, it is clear that relevant efforts to mainstream energy efficiency in the residential sector undertaken to date in Myanmar have been very limited, and Myanmar has not yet developed or adopted any MEPS or labeling for lighting products and appliances.

The most recent population census was conducted in 2014 indicates a nationwide electrification rate of 32.4%. Yangon has the highest electrification rate, at 69.3%, followed by Kayah (48.6%), Nay Pyi Taw (42.6%) and Mandalay (39.4%). The 2014 census does not provide data related to ownerships of lighting products and appliances in Myanmar households and there is no other official statistical data source related to installed stocks and annual sales of lighting products and appliances in Myanmar. However, interviews with local stakeholders and visits to appliances retailers in Nay Pyi Taw and Yangon suggest that the current market penetration of energy efficient lighting and household appliances in Myanmar is very low. It should be noted that recent market evaluation and assessment undertaken under the ASEAN SHINE program provide some specific insights of the lighting and room air conditioner (RAC) market in Myanmar, as briefly summarized below.

- **Lighting stock and annual sales:** The total number of lamps installed among the end-use sectors is estimated to be 40 million lamps in 2014<sup>11</sup>. The majority of installed lamps, around 85% (34 million units), are in the residential sector. The professional sector (commercial and industrial) share was around 14%, or 6 million lamps. The number of lamps installed in the street and outdoor lighting sector was very small (around 1%). Linear fluorescent lamps and CFLs are the most common lighting technologies in the residential and professional sectors. Annual sales of lighting products in Myanmar were estimated to be around 19 million lamps in 2014 and are projected to grow more than twofold up to more than 40 million lamps per year in 2030. CFLs had the highest market share, accounting for 37%, followed by fluorescent lamps (linear and circular fluorescent) at 29%, while incandescent lamps, halogen lamps and LED lamps were at 29%, 10%, 9% and 6% respectively. Based on industry interviews and import statistics, most of lighting products have been imported from China and Thailand.
- **RAC stock and annual sales:** There is no data on RAC installed stock in Myanmar but Myanmar's RAC demand was approximately 170,000 units in 2015, and the market grew more than threefold when compared with the annual sales volume in 2010<sup>12</sup>. However, the percentage of households that owns an air conditioner is still low. It is estimated that split-type ACs account for around 98% of the total RAC market in 2015. There is no available information on the market share of inverter-type RACs in Myanmar but based on the annual market share data from other ASEAN member countries<sup>13</sup>, the annual sales of inverter-type RACs accounted for about 21% of the total annual sales in 2014 and 25% in 2015. Considering the tropical climatic conditions and fast economic development in Myanmar, the potential RAC demand is expected to grow rapidly.

More details of the lighting and RAC market in Myanmar are described below.

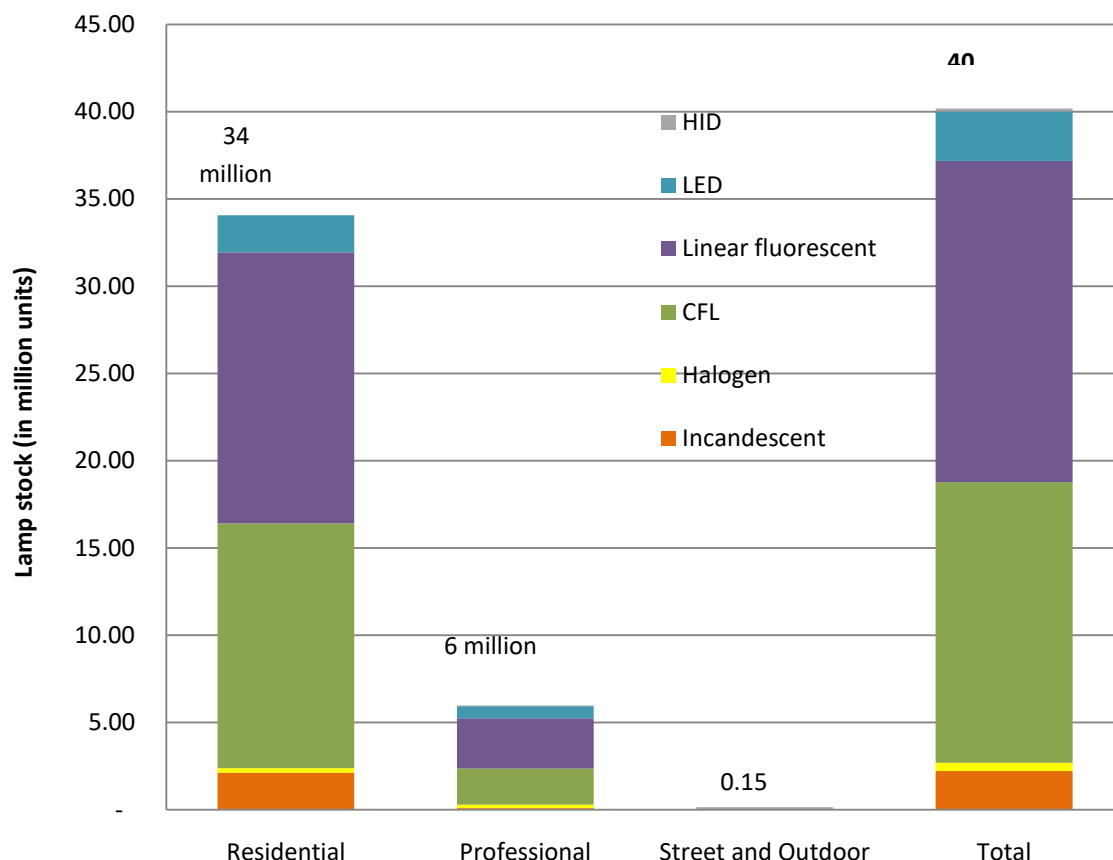
## Lighting Market in Myanmar

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<sup>11</sup> ASEAN Regional Efficient Lighting Market Assessment (IIEC, 2016).

<sup>12</sup> World Air Conditioner Demand by Region. Tokyo: Japan Refrigeration and Air Conditioning Industry Association (JRAIA, 2016).

<sup>13</sup> Annual sales data for Cambodia, Indonesia, Lao PDR, Malaysia, the Philippines, Singapore, Thailand and Vietnam from the Evaluation of the ASEAN SHINE Program and Recommendations for Promotion of Higher Efficiency Air Conditioners in Large Buildings report, IIEC, February 2017.



**FIGURE 2: LAMP STOCK BY TECHNOLOGY AND END-USE SECTOR, 2014**

Source: Household survey<sup>14</sup>, industry interviews<sup>15</sup> and PAMA model, IIEC (2015)

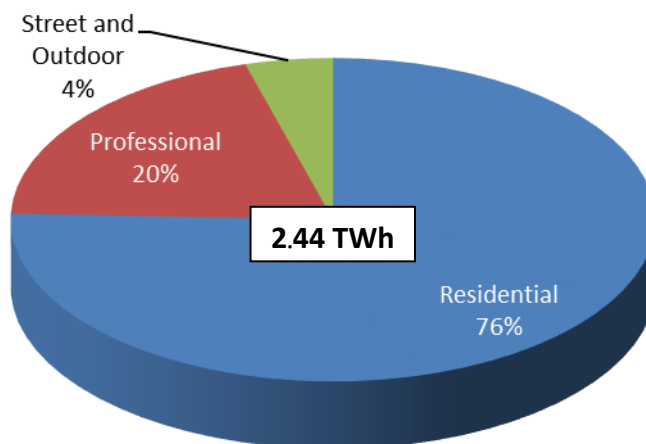
The regional market assessment conducted as part of the ASEAN SHINE program for lighting estimated that there are about 40 million lamps connected to electricity grid in Myanmar in 2014 (see Figure 2). The residential sector has the largest share of about 85% of the total stock with linear fluorescent lamps as the most common lighting technology in Myanmar, accounting for 46% of the total stock, followed by CFLs at 40% of the total stock. Penetration of LED lighting technologies is estimated at 7% of the total installed stock.

Based on the total installed stock and shares of different lighting technologies, it was estimated that the electricity consumption from total lamp stock in Myanmar is about 2.44 TWh<sup>16</sup> in 2014, or about 24% of the total electricity consumption in the country in 2013. The residential sector is the major consuming end-use sector accounting for about 76% of the annual lighting electricity consumption. The two main lighting types, linear fluorescent lamps and CFLs, are estimated to account for about 86% of the total lighting electricity consumption in Myanmar, as shown in Figure 4. Transforming the markets of these two lighting technologies to LED will significantly reduce the lighting electricity consumption in Myanmar.

<sup>14</sup> Household surveys conducted, IIEC (2015).

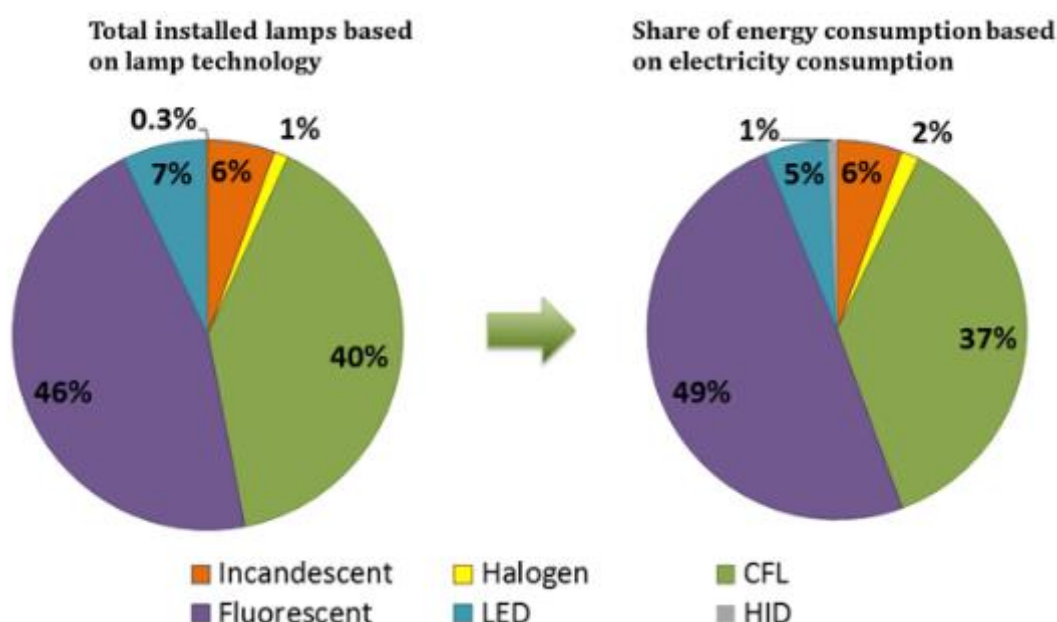
<sup>15</sup> Interviews with lighting importers: Beauteous Valley; Bo Myint Thu; Kabar Kweye; Khwar Nyo; Maw Cherry Land; Mya Yun Thu; November Snow; Shwe Hlaing Htoo; T Two Trading; and Than Lwin Shwe Pyi.

<sup>16</sup> PAMA model, IIEC (2015).



**FIGURE 3: LIGHTING ELECTRICITY CONSUMPTION BY END-USE SECTOR IN MYANMAR, 2014**

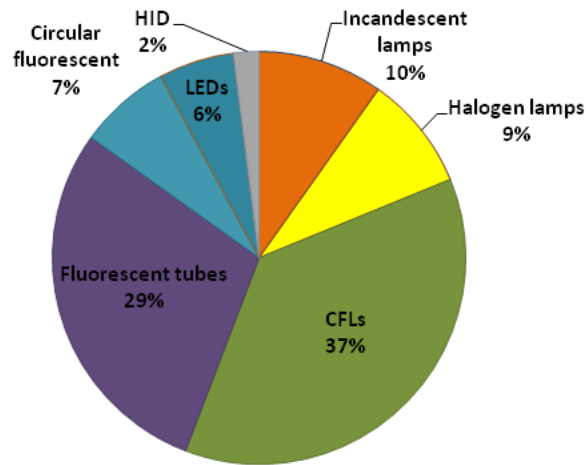
Source: PAMA model, IIEC (2015)



**FIGURE 4: SHARE OF LIGHTING TECHNOLOGY AND THEIR ENERGY CONSUMPTION IN MYANMAR IN 2014**

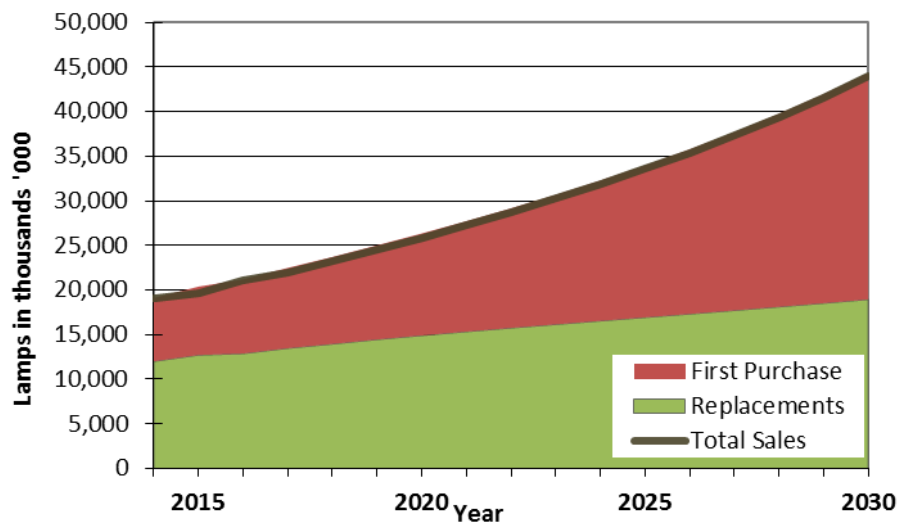
Source: Household survey, industry interviews and PAMA model, IIEC (2015)

The current annual lighting market size in Myanmar is estimated to be around 19 to 20 million lamps, dominating by CFLs and linear fluorescent lamps, as shown in Figure 5. It is projected that the annual lighting market size in Myanmar will grow more than twofold over the next 10 year, from around 20 million lamps to more than 40 million lamps per year in 2030 due to higher electrification rates and economic development in the country (see Figure 6).



**FIGURE 5: ESTIMATED SHARES BY LIGHTING TECHNOLOGIES IN 2014 ANNUAL SALES IN MYANMAR**

Source: Customs Department, industry interviews and PAMA model, IIEC (2015)



**FIGURE 6: PROJECTION OF ANNUAL LIGHTING MARKET SIZE IN MYANMAR**

Source: ASEAN Regional Efficient Lighting Market Assessment (IIEC, 2016)

Based on the import statistics from the Customs Department in Myanmar as shown in

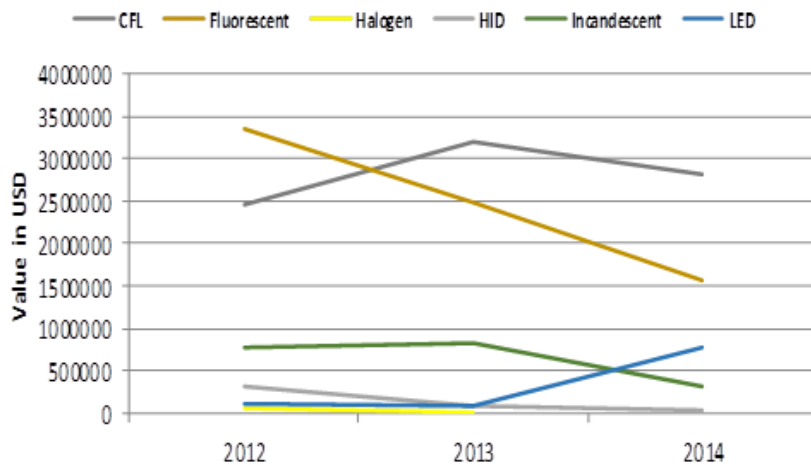
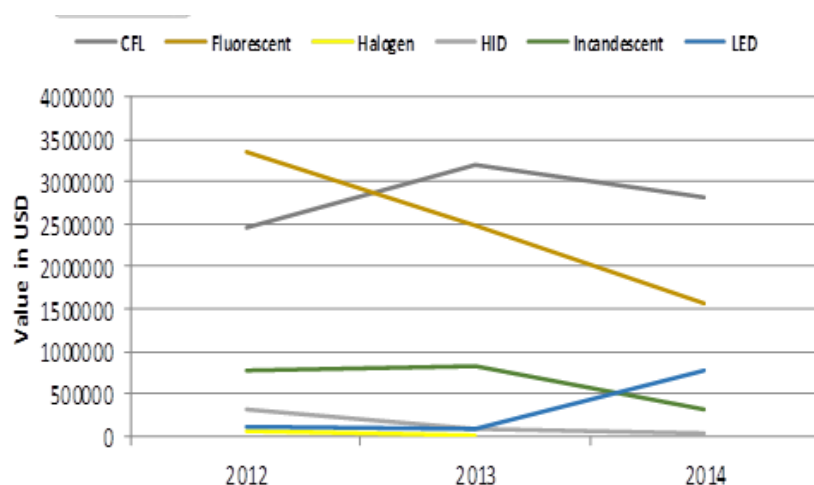


Figure 7, imports of fluorescent lamps sharply declined during the period of 2012 to 2014, as did the incandescent lamp imports but at lower decreasing rates. Imports of CFLs were somewhat stable during 2012 to 2014, while imports of LED lamps showed a significant increase from 2013 to 2014. These trends have suggested possible changes in adoption of lighting technologies in Myanmar in coming years with expectation of higher penetration of LED technologies in the total lighting supplies.



**FIGURE 7: TRENDS OF LIGHTING PRODUCT IMPORT IN MYANMAR**  
Source: Customs Department, Myanmar

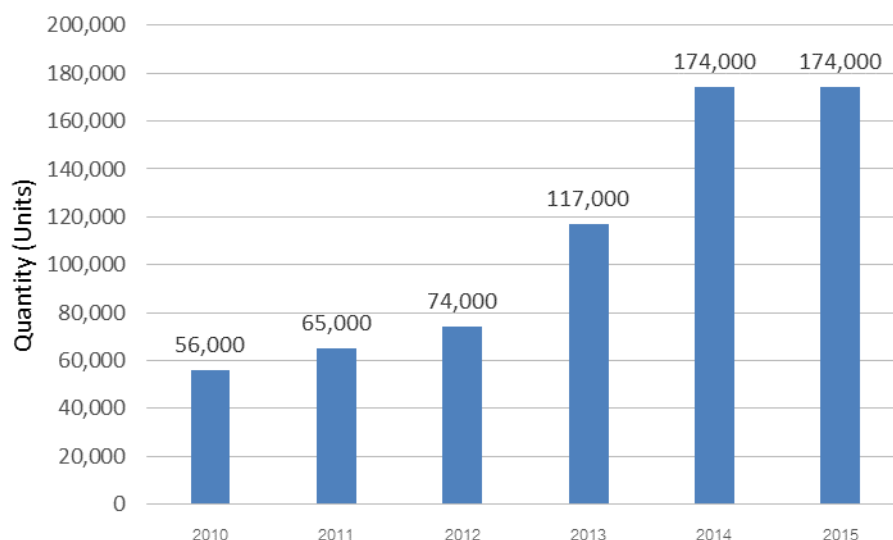
## RAC Market in Myanmar

RACs in general are characterized as high energy consumption appliances and their use in Myanmar is limited; however, given the predominant tropical climatic conditions in the country and fast economic growth, their use is likely to increase in the coming years. As of now, the use of RACs is mostly concentrated in the cities. The primary users of air conditioners are commercial and government sectors, with the residential use also gradually increasing. Myanmar does not have domestic manufacturers of RACs. All the RACs currently sold in Myanmar are imported primarily from China, Singapore and Thailand<sup>17</sup>.

Similar to many other developing countries, Myanmar's RAC market is dominated by cost competitive products from China. Chinese manufacturers including Chigo, Midea, Gree, Changhong, TCL, and Hisense have about half of the market share. In addition, the Chinese brand Changhong is planning to establish a new white goods manufacturing base in the local market, while Gree has carried out a series of promotional campaigns in Myanmar. Shown in Figure 8 below are estimated annual sales of RACs in Myanmar from 2010 to 2015. There is no available data on annual sales volume of inverter type ACs.

<sup>17</sup> ASEAN SHINE Program – National Policy Roadmap, Myanmar, 2016.





**FIGURE 8: SALES OF RACS IN MYANMAR, 2010 – 2015**

Source: JRAIA, 2016

Considering that a RAC are an appliance with high price and long life-expectancy, purchasing a poor energy performance RAC will result in a higher electricity consumption for many years to come. Through participation in the ASEAN SHINE program, EECD has developed a National Roadmap on energy efficient RACs to implement the recommendations of the Regional Policy Roadmap to harmonize air conditioners standards in ASEAN countries by 2020 which aim at facilitating market transformation towards more energy efficient air conditioners. It targets all air conditioners (fixed speed and inverter) with the cooling capacity of and below 3.52 kW. The National Roadmap sets the following targets and goals:

<b>1. Minimum Energy Performance Standards (MEPS)</b>	<ul style="list-style-type: none"> <li>By 2020, adopt regionally harmonized technology neutral and mandatory MEPS at minimum EER 2.9W/W and CSPF 3.08 W/W for all air conditioners below 3.52kW by 2020.</li> <li>Review of MEPS every 5 years.</li> </ul>
<b>2. Effective compliance mechanism</b>	<p>Adoption of the testing and evaluation methods:</p> <ul style="list-style-type: none"> <li>By end of 2017 adopt ISO 5151-2010 as a uniform testing standard for air conditioners, and adjust import regulations accordingly.</li> <li>By 2020, adopt CSPF method of ISO 16358 as a uniform testing standard for all fixed speed and inverter units, and adjust import regulations accordingly.</li> </ul> <p>Recognition of the testing results from accredited laboratories in the third countries:</p> <ul style="list-style-type: none"> <li>By 2018, adopt provisions on recognizing testing results from laboratories certified and accredited based on ISO/IEC 17025.</li> <li>Participate in development and adoption of the regional Mutual Recognition Agreement on recognition of energy performance testing standards and testing results reports for air conditioners from properly certified and accredited testing laboratories.</li> </ul>
<b>3. Monitoring, verification and enforcement (MVE)</b>	<ul style="list-style-type: none"> <li>By 2020, establish and operationalize an efficient national system for MVE.</li> <li>Participate in establishing a coordinated regional monitoring, reporting and verification regime in ASEAN.</li> <li>Participate in the establishment of a Regional Product Database as a tool to support exchange of product information and non-compliance alerts, and to coordinate verification activities.</li> </ul>

To achieve the abovementioned goals and targets, several preparatory activities are listed in the National Roadmap with the implementation timeframe in 2017, including: setting up coordination mechanisms for stakeholders involved; establishing working group on information/ database system development; and formalizing institutional mechanisms for regular data/ market information collection and analysis. However, implementation of these preparatory activities has not been carried out as planned due to limited resources and, considering this, adoption of MEPS for RACs as well as implementation of effective compliance mechanisms and MVE in Myanmar in accordance with to the National Roadmap are likely to be delayed until sufficient resources are allocated.

### **3) Proposed alternative scenario, GEF focal area strategies, with a description of the objective, components, expected outcomes, outputs and activities of the project**

The “Leapfrogging Myanmar’s Market to High Efficiency Lighting and Appliances” Project has the goal to transform the lighting and appliances market in Myanmar into a market of efficient and quality lighting products and appliances. The objective of the project is to facilitate a market transformation toward high efficiency lighting and electrical appliances through the integrated policy approach, thereby reducing growth in electrical demand and greenhouse gas (GHG) emissions, while simultaneously increasing energy access. The project aims to achieve the objective through implementation of the following project components:

- Component 1: Minimum energy performance standards (MEPS) and labeling;
- Component 2: Market monitoring, verification, and enforcement;
- Component 3: Awareness raising and demonstration projects.

The abovementioned components, which are the core elements of the integrated policy approach, will address the barriers hampering transformation of lighting and appliance market in Myanmar to the market of energy efficient and quality products. The expected outcomes of the three project components are the following:

1. Adoption by government of MEPS and label requirements;
2. Strengthened national systems to implement market monitoring, verification and enforcement activities;
3. Government actions for an increased awareness, availability and use of efficient lighting products and appliances are in place.

The abovementioned outcomes will all collectively lead to a market transformation toward high efficiency lighting and electrical appliances in Myanmar, and will be realized through the delivery of complementary outputs that would result from the activities that will be carried out under the project. Details on outcomes, outputs and activities of each component are discussed below.

#### **Component 1: Minimum Energy Performance Standards (MEPS) and Labeling**

##### ***Expected Outcome 1: Adoption by government of MEPS and label requirements***

Under Component 1, the project will support Myanmar to establish and strengthen necessary institutional and regulatory frameworks to accelerate development and implementation of MEPS and labeling for appliances. The National Energy Efficiency & Conservation Policy, Strategy and Roadmap for Myanmar was prepared under the technical assistance from ADB in 2015 and it was approved by the Government of Myanmar in February 2016. Subsequently the Energy Standards and Labeling Roadmap for Myanmar was also developed by ADB and adopted for implementation by EECD in 2016. Outputs and activities under this component are guided by these two documents and the consultations with stakeholders during the Project Preparation Grant (PPG) phase.

The National Energy Efficiency & Conservation Policy, Strategy and Roadmap classifies implementation of the energy efficiency standards and labeling for appliances as one of the high priority initiatives and the Energy Standards & Labeling Roadmap outlines a set of key tasks which will help Myanmar to identify priority products for MEPS and labeling implementation. Although EECD has not yet formalized annual work plans for MEPS and labeling, Myanmar has been actively participating in the regional cooperation on energy efficiency and through ongoing participation in the ASEAN SHINE program and the stakeholder consultations during the PPG phase, lighting products and room air-conditioners have initially been identified as the priority products for MEPS and labeling in Myanmar. Identification of target products for design and implementation of MEPS and labeling program is usually based on potential benefits gained, including but not limited to energy savings, peak electricity demand reduction, GHG emission reduction, job creation, etc. Other consideration such as alignment with the government policy and strategy, stakeholder supports and private sector participation could be included in the selection criteria. Summarized in the table below are potential energy savings of lighting products and air-conditioners based on the modeling assessment for Myanmar conducted by United for Efficiency (U4E)<sup>18</sup>.

Products	Cumulative electricity savings, 2020-2030 (TWh)
Lighting Products	1.84
Air-Conditions	0.76

There were few baseline efforts on collecting and analyzing data on supply and demand of lighting products and appliances in Myanmar during the preparation of the Myanmar Energy Master Plan<sup>19</sup>; however, the available market data is still not sufficient to support evaluation of potential impact and identification of priority appliances for MEPS and labeling programs in Myanmar. The Energy Standards & Labeling Roadmap has recommended the nationwide household appliance saturation survey as the priority task to support development of MEPS and labeling programs in Myanmar. The project will support conducting market surveys and assessments of the market baselines for the pre-selected two products and other appliances, such as refrigerators, freezers and electric fans, to validate the potential impacts and to identify other priority products for MEPS and labeling programs. Better understanding of the market baselines will enable the project to better estimate the financial, economic and environmental impacts.

### Box 1: Nationwide Household Appliance Saturation Survey

Myanmar recently conducted population and housing census in 2014<sup>20</sup>. The census provides data on number of electrified households in Myanmar but the results do not detail how lighting products and other appliances are used in Myanmar households. In view of this, a nationwide household appliance saturation survey will be conducted at the early stage of the project implementation to understand penetration rates of different types of lighting products and other household appliances and also their usage patterns. Results of the household appliance saturation survey will reveal the penetration rates and usage patterns of different types of lighting products (e.g., incandescent lamp, compact fluorescent lamp – CFL, LED bulbs and fluorescent tubes) and these findings will help determining energy baselines and assessing effectiveness of MEPS and labeling programs or even other energy efficiency programs.

#### Survey design and methodology

Survey questionnaire: The survey questionnaire will include general information (household size, source of

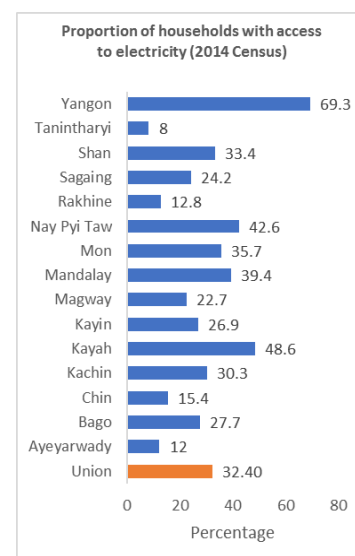
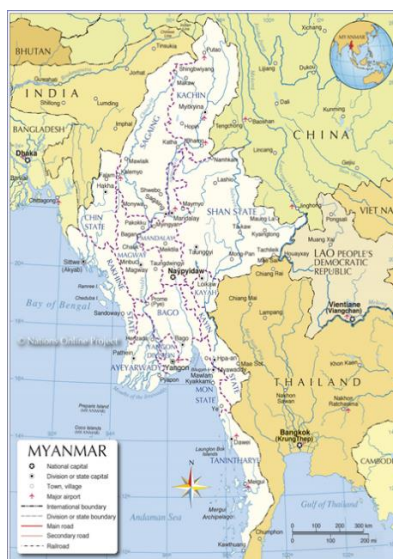
<sup>18</sup> U4E is a public-private partnership led by UN Environment, the Global Environment Facility (GEF), the United Nations Development Programme (UNDP), the International Copper Association (ICA), CLASP and the Natural Resources Defense Council (NRDC) with the support of other international partners.

<sup>19</sup> Preparation of the Myanmar Energy Master Plan was supported by the Government of Japan and ADB and the master plan was launched by the National Energy Management Committee in January 2016.

<sup>20</sup> <http://themimu.info/census-data>

appliances, monthly electricity usage and expenses, etc.), no. Of light points and brand information, electricity consumption per appliance, energy labels or other marking, lighting and appliances usage patterns, gender mainstreaming and decision making related questions, awareness on energy efficiency, etc.

**Survey population and sampling:** The target population of the survey will include all electrified households across the country and the sampling methodology will be based on the two-stage sampling approach. In the first stage, the target population will be stratified geographically by state, union and territory in Myanmar. Based on international experience in conducting similar household appliance saturation surveys, the total sample size of 1,000 households is considered to be a statistically representative sample size. The total sample size will be proportionally allocated based on the percentage share of electrified households of each stratum in the whole target population. The allocated samples in each stratum can be limited to large cities in case there are constraints in local travels and safety concerns. To ensure the good coverage of electrified households, the allocated sample size in each stratum could be further distributed by urban, suburban and rural areas, by different classification of electricity tariffs, or by consumption levels. In the second stage, the target households in each stratum will be randomly selected for interviews.



**Surveyor selection and training:** The local surveyors will be recruited by the survey team and supported by EECD through the advertisement in local newspaper and posted at the institution. The selected local surveyors will be trained on technical prospect of the survey and overall implementation.

**Survey implementation:** The implementation phase will be separated into 2 phases:

- **Pre-Survey Advertising:** Prior to the start of the survey, announcement to the public will be carried out to ensure their participation and cooperation. Communication of upcoming survey will be done through a local newspaper, TV and/or social media to ensure the public are aware of the activity. Announcement on radio and TV in necessary will be continued during the survey outlining the specific areas to be visited during the survey period.
- **Field Surveys and Data Screening:** During the field survey activities, data screening and editing will be carried out on a continuous basis, and necessary modifications shall be undertaken to ensure the quality of the surveys. These include checking missing/omitted responses, refusal to participate, and possible errors that might have been committed during field works.

## Analysis of Data

The data will be collected by the data entry/coders using appropriate software (e.g., SPSS software or Microsoft Excel). The results will show usage and average electricity consumption, appliances saturation, typical types of appliances, safety and energy performance, product specifications and qualitative results of the public awareness on energy efficiency.

Development and implementation of MEPS and labeling programs require interactions among government agencies and private sector organizations involved in the programs, including but not necessarily limited to the national

standard and testing body, energy regulatory body, customs department and suppliers. In Myanmar, necessary government agencies and authorities required to support MEPS and labeling programs have already been established, for example the Ministry of Education (Science and Technology) is designated as the national standard body in Myanmar and EECD has been appointed as the national regulatory body for energy efficiency. However, there have been limited cooperation among these national agencies to date, specifically in the area of energy efficiency. In view of this, the project will support EECD in strengthening collaboration among these agencies and also building capacity for design and implementation of MEPS and labeling programs.

A comprehensive capacity building programme, for up to 50 officials in total, on the development and implementation of MEPS and labeling programmes for the Ministry of Education (MOE) (Science and Technology) and the Energy Efficiency and Conservation Division (EECD), Ministry of Industry (MOI), the National Statistics Office and the Customs Department, Ministry of Planning and Finance (MPF), will be developed with the primary focus on the two priority products – lighting products and room air-conditioners. Multiple training modules will be developed to address all the key elements of MEPS and labeling programs, including: data collection and registry database; standard and energy performance matrix setting; product testing and certification; MVE; communication and awareness; and program evaluation. The capacity building program will be conducted at the early stage of project implementation and implementation will be in a phase-step manner, following the steps in development and implementation of MEPS and labeling programs. Each training module will be designed to link with relevant activities to be implemented by the project and other baseline activities, for example, the training module on data collection and analysis will be developed based on experience and lessons learned from the nationwide household appliance saturation survey to be carried out under this component.

To ensure effectiveness of the capacity building program, each training module will target no more than 15 trainees. Criteria of selection of trainees will be consulted with relevant agencies, and trainees nominated by each agency (e.g. staff from EECD, Ministry of Education, National Statistics Office and Customs department) will be assessed for their basic skills and knowledge for each training module.

Post-training surveys and evaluations of individuals that participated in the capacity building program will be conducted with the main objective to evaluate effectiveness and impact of the capacity building program, and it will comprise multiple evaluation stages as follows:

- Stage 1: Participants' reaction – This measures the participants' satisfaction to the training module, conduct of the training, contents, etc. and provides an immediate feedback on successes and failures of the training module. A one-page feedback form will be prepared to ensure feedback from all participants;
- Stage 2: Learning from training – This is to measure the benefits the participants received (learning) from the training module. This includes concepts, facts and techniques absorbed by the participants for use, which gives detailed benefits and evidence that the training module has been useful. A multiple choice questionnaire or exercise sheet will be provided at the end of the course with key questions on the training provided to evaluate knowledge gained from each participant and ensure the training was successfully interpreted by the participants;
- Stage 3: Application/Transfer of skills acquired from training – This measures how the knowledge, skills, and concepts learned during the training are used on the job;
- Stage 4: Impacts/results of training – This measures the actual impact of the training course: performance & quality improvements and number of projects completed which will provide accurate evidence of program achievements/successes.

Immediately after the conduct of the training module, the project will carry out an evaluation to assess the participants' reaction to the training and also assess the amount of learning that has taken place. The Stage 1 and 2 evaluation will be conducted, and trainee's responses will also be considered in the evaluation process. Stage 3 and 4 evaluation should be conducted at the later stage and the evaluation plan should be developed in collaboration with the trainees, and will be conducted towards the end of project.

With knowledge and experience gained from the data collection activities and the capacity building program, the project will support EECD and key stakeholder involved in finalizing scopes of lighting products and room air-conditioners to be included in the first ever MEPS and labeling program in Myanmar. Although there is no detailed market data on popular types of lighting products and typical cooling capacities of room air-conditioners in Myanmar, it is envisaged that the screw-based lighting products (incandescent lamps, CFLs and LED bulbs) and room air-conditioners with cooling capacities less than 3.52 kW (or 12,000 Btu/hr) will be the primary focus of the MEPS and labeling programs in Myanmar. The project will work with EECD to undertake the following steps to introduce the MEPS and labeling programs in Myanmar.

- Finalization the scope of the first product for the MEPS and labeling program;
- Conclusion of implementation approach – it is envisaged that the initial voluntary implementation will be adopted with a specific timeline for transition to mandatory implementation;
- Conclusion of product testing and labeling certification approach – Myanmar does not have any in-country testing facilities and cost-effective implementation approaches will be devised to support testing requirements and certification task;
- Development of procedure and guideline documents (e.g. testing, certification, evaluation) – documents related to MVE, and communication will be developed under Component 2 and 3 respectively;
- Adoption of testing standards and energy performance matrices – The ambitious levels of MEPS for lighting products will be proposed and the MEPS levels for room air-conditioners will be in line with the National Policy Roadmap for Harmonization of Energy Performance Standard for Air-Conditioners endorsed by EECD in 2016;
- Conduct of pilot certification and modification of implementation timeframe as required;
- Launch of the MEPS and labeling program for the first product;
- Evaluation of the MEPS and labeling program for the first product;
- Evaluation of suitable regulatory frameworks for mandatory implementation.

Specific outputs and activities under Component 1 are described below.

Output 1.1: Assessment of market baseline for lighting products and air-conditioners completed and other target appliances prioritized based on saving estimates

Activity 1.1.1: Assessment of market baseline through implementation of a nationwide household appliance saturation survey

- Design and implement a nationwide household appliance saturation survey;

- Conduct evaluation and assessment of market baseline data, including but not limited to installed stock of different types of lighting, AC and other household appliances (i.e. refrigerator, television, fan and rice cooker), annual market sizes and energy consumption;

Activity 1.1.2: Evaluation of impacts of adoption of more efficient household appliances

- Review and validating Myanmar U4E country assessment report;
- Conduct detailed evaluation of economic, financial and environmental benefits of adoption of more efficient lighting products and household appliances in Myanmar;

Activity 1.1.3: Identification of additional priority appliances for inclusion in MEPS and labeling programs

- Establish criteria for selection of priority appliances for MEPS and labeling programs including the benefits estimated;
- Prioritize types and scope of target appliances based on the selection criteria (in addition to lighting products and room air-conditioners pre-identified during the PPG phase, the project could include refrigerator, television, fan and/or rice cooker as the additional priority appliances);
- Conduct a consultation workshop and finalizing the priority products for MEPS and labeling programs in Myanmar;

Activity 1.1.4: Evaluation of survey results to support the MVE and the Awareness raising and demonstration projects components

- Conduct detailed evaluation of the survey results and identifying key parameters to support implementation of the MVE and the awareness raising and demonstration projects component, such as popular products, consumer behaviors, etc.;

Activity 1.1.5: Recommendation of an implementation plan for follow-on collection and update of market data

- Review roles and responsibility of relevant stakeholders (e.g., Central Statistical Organization, Customs department under the Ministry of Planning and Finance, Department of Trade under the Ministry of Commerce) and identifying possible synergy in collection and update of market data;
- Develop recommendations on an implementation plan for follow-on collection and update of market data;

Output 1.2: Training program for responsible government entities and involved stakeholders to understand, design and implement MEPS and labeling programs implemented

Activity 1.2.1: Conduct training needs assessment of stakeholders involved in design and implementation of MEPS and labeling programs

Activity 1.2.2: Development and implementation of a training program

- Develop training modules targeting each key element of development and implementation of MEPS and labeling programs including the main four components of the integrated policy approach. The contents of each training module will be designed to address different levels of training needs of different stakeholders;

### Activity 1.2.3: Conduct of post-training surveys and evaluation

- Conduct surveys and evaluation to assess participations' reaction and the amount of learning taken place;
- Develop a plan to conduct surveys and evaluation of application/transfer of skill acquired from the training and impacts/results of the training, and implementing the surveys and evaluation activities;

### Output 1.3: MEPS and labeling for target products developed and piloted on a voluntary basis

#### Activity 1.3.1: Finalization of implementation approach and detailed work plan for MEPS and labeling programs in Myanmar

- Select and finalize products for the MEPS and labeling program;
- Conclude implementation approach including product testing, certification as well as finalizing a detailed work plan with consideration of amending/developing regulatory frameworks for future mandatory implementation as well as planned MVE and awareness activities under Component 2 and 3 of the project;
- Develop necessary documents, e.g., procedures and guidelines for testing and certification, application forms, disposal guideline for discarded and end-of –life lamps and room air-conditioners based on the global best practice and the U4E policy guides, etc.;
- Fluorescent lamp waste will be properly stored for safe disposal and ACs with HCFCs will be degassed and recycled by qualified contractors.
- Develop a roadmap for collection with the MoE and other stakeholders on discarded and end-of –life the collection of lamps and air conditioners

#### Activity 1.3.2: Adoption of testing standards and energy performance matrices

- Evaluate and select appropriate testing standards and energy and non-energy performance matrices, such as safety, lighting quality, and low global warming potential (GWP) refrigerants that fit well with the Myanmar context and also in line with the ASEAN regional approach;

#### Activity 1.3.3: Implementation of MEPS and Labeling Programs

- Conduct pilot certification and launch the MEPS and labeling program for the first product as a voluntary program;
- Evaluate impacts of the MEPS and labeling program for the first product;
- Facilitate preparation and adoption of supporting regulatory frameworks under the upcoming EC law and necessary implementation guidelines to ensure transition from voluntary implementation to mandatory implementation;
- Support EECD to develop a work plan for implementation the mandatory MEPS and labeling programs.
- Draft MEPs for the GoM to consider for adoption and implementation.



- Support EECD to develop a work plan for implementation the mandatory MEPS and labeling programs, including improvement of the EE&C laws to allow for mandatory implementation of MEPS.

## **Component 2: Market Monitoring, Verification and Enforcement**

### ***Expected Outcome 2: Strengthened national systems to implement market monitoring, verification and enforcement activities***

This component will support Myanmar in developing a well-functioning system of market monitoring, verification and enforcement (MVE) or MVE system through better capacity of all the key stakeholders involved in implementation of MEPS and labeling. An effective MVE system helps protect end-users from products that fail to perform as expected. Additionally, they ensure that government entities fulfil the objectives of their MEPS and labeling programs, implemented either as voluntary or mandatory programs. The same MVE activities also protect suppliers by ensuring that each supplier/manufacturer is subject to the same conditions for product certification. The expected outcome will be realized through implementation of various activities that will support establishment and strengthening of necessary regulatory frameworks as well as design and implementation of capacity building programs for responsible government authorities.

It is envisioned that the MEPS and labeling programs for priority lighting products and room air-conditioners in Myanmar will be implemented initially as voluntary programs with milestones specified for transition to mandatory implementation. Although enforcement will not be required during the voluntary implementation, many elements within the MVE system are interrelated, therefore the project will ensure that planning, development and implementation of the MVE system for Myanmar will encompass all elements that will support both voluntary and mandatory implementation of MEPS and labeling programs, including:

- A well designed legal and administrative framework;
- Processes to facilitate compliance, including a communication plan to educate stakeholders about their obligations and the results of compliance activities to build a culture of compliance and to highlight the risks of non-compliance;
- A plan for monitoring and market surveillance;
- Verification processes to ensure products perform as claimed;
- Practical enforcement procedures that can respond rapidly to identified violation and include a range of appropriate sanctions;
- Evaluation processes so that policy makers can assess program outcomes, facilitate accountability of all participants, and guide improvements in program design.

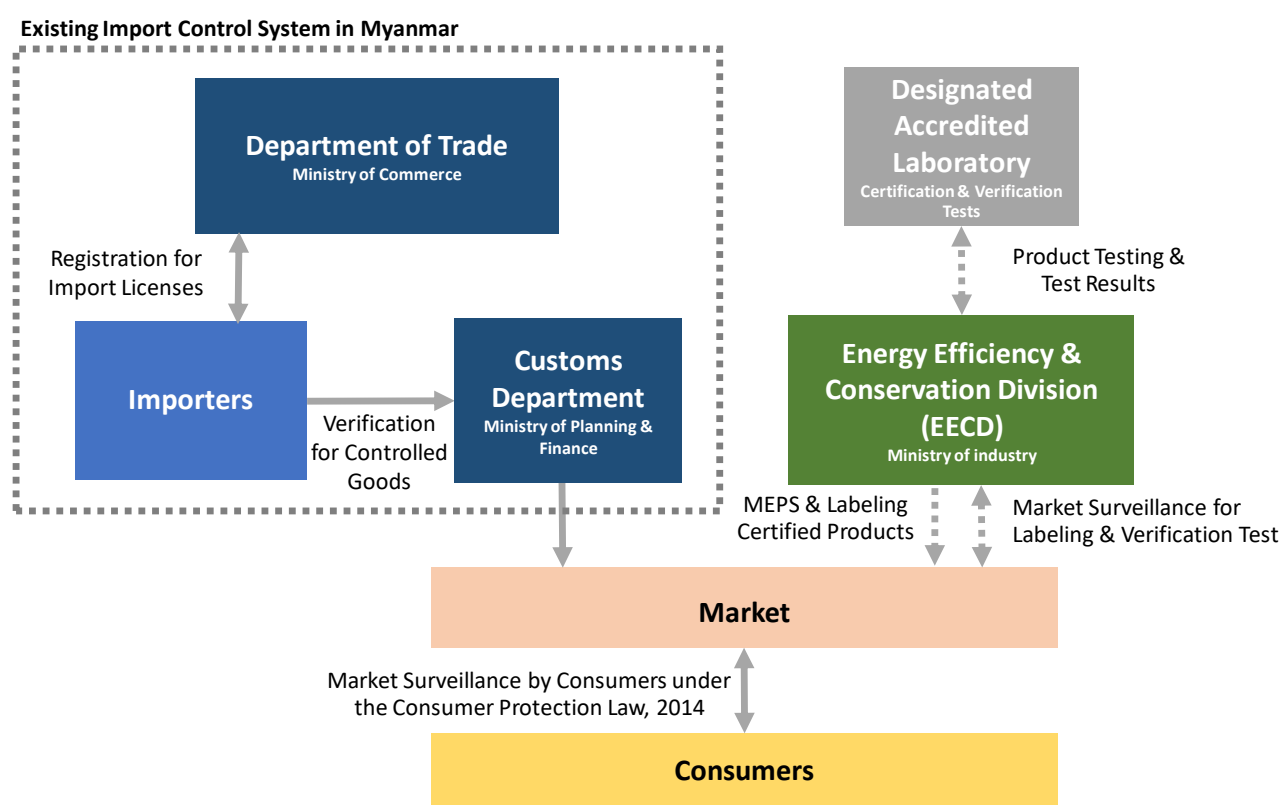
Development and implementation of the effective MVE system comprising the above elements require coordination among multiple agencies and more importantly sufficient infrastructure (e.g., testing facilities) and institutional capacities are critical to the success of implementation of activities within each element. EECD has been mandated to oversee and implement relevant MVE activities for MEPS and energy labeling in Myanmar. In addition, the Energy Efficiency and Conservation Law is being reviewed and discussed among local stakeholders. Although the existing infrastructure and institutional capacity which can be utilized to establish an effective MVE system are considered to be limited, relevant existing legislative frameworks that can support EECD to quickly establish and operationalize a MVE system include:

- Export and Import Law, 2012 issued by Ministry of Commerce;
- Consumer Protection Law, 2014;

With respect to the existing institutional framework, the following agencies and authorities will play key roles in supporting EECD in establishment of the MVE system and implementation of MVE activities:

- Ministry of Education (Science and Technology) – Myanmar national standard body;
- Department of Trade, Ministry of Commerce – Licensing for import/export;
- Customs Department, Ministry of Planning and Finance – Import inspections;

The project will support Myanmar to explore the most appropriate alternative to establish an effective MVE system based on the existing legal and institutional frameworks which are being used to control imported goods and market surveillance by consumers, as shown in the diagram below. The project will conduct detailed review and assessment of the existing and upcoming relevant legal frameworks (e.g., the new EC law) and identify possible improvements as well as development of additional legal and administrative documents to support the MVE system for MEPS and labeling in Myanmar. Design and planning of monitoring procedures and activities for the market entry conditions will be undertaken in coordination with the development of procedures and guidelines for testing and certification and application forms for MEPS and labeling under Component 1.



**FIGURE 9: EXISTING FRAMEWORKS FOR MARKET ENTRY AND MARKET SURVEILLANCE IN MYANMAR**

The project will ensure that amendments and development of legal and administrative documents will provide details on roles, responsibilities, authorities, and obligations of stakeholders involved in MVE activities and the following elements are considered in the legal and administrative frameworks for supporting the MVE system in Myanmar.

- Parties affected and their obligations;
- Powers of regulator and appointed officials;
- Administrative procedures;
- Compliance and penalties.

Additional descriptions for each of the above are given in the text box below.

## **Box 2: Key Elements of a Sound Regulatory Framework for Effective Implementation of the MVE System**

Basic guidelines for drafting a sound regulatory framework for effective implementation of MVE activities are as follows:

*Parties affected and their obligations:* Parties who import/export/manufacture/sell or re-sell lighting products and household appliances subject to requirements in voluntary and/or mandatory MEPS and labeling programs must establish their formal requests to the licensing body for registration/certification of the brand and model of the product.

*Power of regulator and appointed officials:* The regulatory framework shall:

- Empower government agency/ies to be the regulator/s who take responsibility for registration/certification of lighting products and household appliances in the market entry process; and to carry out market surveillance of lighting products and target appliances in the monitoring, verification and enforcement processes.
- Specify scope of activities and tasks of key responsible organizations and authorize such government agencies to undertake, including: Perform market surveillance of lighting products and selected household appliances in retailers or elsewhere, Audit statement of compliance; Inform customs department of products meeting/failing in performance standards; Gather evidence (including samples); Undertake/commission tests on samples; Issue compliance notices, initiate proceedings; De-register products that against imposed regulations, order withdrawal from sale; Publish information to the public

*Administrative procedures:* The administrative procedures shall cover but not limited to the followings: Registration/certification arrangements (such as mandatory up-front registration and submission of test results demonstrating compliance with MEPS requirements, self-certification); Issuing of notices; Time allowed for responses; Type market surveillance and frequency; Verification scheme and check testing; Partner accredited laboratory and procedures for sending lamps and household appliances to the laboratory (when required); Commencement of the regulations with respect to each scheduled product. *Compliance and penalties:* All commercially imported lighting and electrical appliances must meet imposed MEPS requirements, but the regulation should exempt non-commercial (not intentionally for sale or resale) imports. Criteria regarding violations against imposed regulations in terms of product registration, energy requirements, safety, counterfeit or forging of certified products, illegal importation shall be specified and response strategies for violation and non-compliance (e.g., informal and formal responses) should be developed together with penalties schemes based on gravity of offense to imposed regulations.

The project will also design and implement capacity building and knowledge sharing on MVE for up to 50 policy makers and government officials from the Department of Trade, Ministry of Commerce (MOC) and the Customs Department, Ministry of Planning and Finance (MPF), the Ministry of Education (MOE) (Science and Technology)

as well as the Energy Efficiency and Conservation Division (EECD), Ministry of Industry (MOI), to ensure that the effective MVE system established will be maintained for enforcement of MEPS and that no non-compliant products could enter the market. It is envisaged that the initial implementation of the MVE system will focus on simple market surveillance activities for voluntary implementation (e.g., market surveillance for labeling compliance), and will gradually expand its scope and increase its stringency as additional infrastructures and institutional capacities become available (e.g., market surveillance and sampling for verification testing).

Specific outputs and activities under Component 2 are described below.

Output 2.1: Legislative and institutional framework developed for effective market monitoring, verification and enforcement (MVE)

Activity 2.1.1: Establishment of an interim MVE system based on the existing legislative and institutional frameworks

- Establish agreements among relevant government agencies to set up and operationalize the interim MVE system to support MEPS and labeling for the first product;
- Develop a product registration system to support compliance monitoring and product verification;

Activity 2.1.2: Implementation of the interim MVE system

- Consult with the stakeholders involved, developing procedures, guidelines, response strategies and detailed work plans outlining timeline for MVE activities, roles and responsibility of each stakeholder involved in the implementation of the MVE system;
- Implement the interim MVE system in accordance with the agreed work plans;

Activity 2.1.3: Preparation of recommendations on the key features for establishment of an effective MVE system in Myanmar

- Compile and review lessons learned from implementation of the interim MVE system;
- Identify the key features of an effective MVE system for mandatory implementation of MEPS and labeling in Myanmar;
- Recommend improvements of the existing legislative and institutional frameworks including key provisions and recommended procedures for administration of and compliance with MEPS and labeling programs;

Activity 2.1.4: Provision of support to EECD to develop and adopt an effective MVE system for MEPS and labeling in Myanmar

- Develop by-law to enable EECD to enforce MEPs and labeling programs and subsequent MVE systems including and any other necessary legislative and institutional frameworks to support mandatory implementation and enforcement process;
- Support EECD with the development and drafting the EE&C law.
- Adopt an improved MVE system for implementation;

Output 2.2: MVE training program for the responsible government entities including policy makers, enforcement officials and customs officials designed and delivered

Activity 2.2.1: Conduct of training needs assessment of stakeholders involved in implementation of the interim MVE system

Activity 2.2.2: Development and implementation of a comprehensive training program on MVE

- Develop training modules targeting each key element of the MVE system. The contents of each training module will be designed to build awareness and address different levels of training needs of different stakeholders. Best practices and guidelines developed by U4E and other institutions will be referenced as appropriate;
- Conduct a specific training module for legal experts will highlight the importance of legislation for the implementation of an effective MVE system and to assist with the transcription of the key provisions of the guideline described above in their respective national legal frameworks;
- Preparing a detailed work plan and implementing the training program;

Activity 2.2.3: Conduct of post-training surveys and evaluation

- Conduct surveys and evaluation to assess participations' reaction and the amount of learning taken place;
- Develop a plan to conduct surveys and evaluation of application/transfer of skill acquired from the training and impacts/results of the training, and implementing the surveys and evaluation activities;

Output 2.3: Training program for relevant national authorities to test products or collaborate with external accredited test laboratories designed and delivered

Activity 2.3.1: Conduct of assessment of resources and training needs for stakeholders involved in implementation of the market surveillance for verification testing

- Assess resources and knowledge required by key stakeholders involved in monitoring and verification of product compliance;

Activity 2.3.2: Development and implementation of a comprehensive training program for verification testing

- Develop a training program on market surveillance for verification and verification testing. The training program will focus on both building capacity of relevant national authorities to test priority products for MEPS and labeling and establishing and strengthening collaboration with accredited third-party testing laboratories;
- Prepare a detailed work plan and implementing the training program including provision of recommendation on investments for local testing facilities by the Myanmar Government;

Activity 2.3.3: Conduct of post-training surveys and evaluation

- Conduct surveys and evaluation to assess participations' reaction and the amount of learning taken place;
- Develop a plan to conduct surveys and evaluation of application/transfer of skill acquired from the training and impacts/results of the training, and implementing the surveys and evaluation activities.

### **Component 3: Awareness raising and demonstration projects**

***Expected Outcome 3:** Government actions for an increased awareness, availability and use of efficient lighting products and appliances are in place*

Transformation of the lighting and appliance markets in Myanmar to the markets of high efficiency products will result in multiple benefits to the country including reduction of electricity consumption for end-users and related GHG emissions, and enable better management of peak power demand. Myanmar has a particular interest in the latter aspect as the demand for power exceeded the available capacity of the system and coupled with unstable frequency control, frequent load shedding<sup>21</sup>. This component will support development and implementation of supporting policies and activities to promote energy efficient lighting products and air-conditioners. These supporting actions will be synchronized with activities under Component 1 and 2. The key supporting policies and activities focusing on consumer awareness and communication campaigns, demonstration projects coupled with financing mechanisms, as well as awareness and capacity building for suppliers will collectively deliver the expected outcome.

The consumer awareness and communication campaigns will aim at persuading end-users to change or modify their behavior by providing information about energy efficient lighting and appliances and their benefits. The project will design a communication strategy for enhancing awareness of target audiences in the residential, commercial and government sectors about the MEPS and labeling scheme for energy efficient lighting and appliances as well as energy efficiency as the whole will be prepared based on the toolkits and guidelines that have been developed by UN Environment, for example UN Environment's Energy Efficient Lighting Toolkit (UN Environment, 2012) and other existing resources will be reviewed and referenced as appropriate. The communication strategy will develop key messages tailored for each target audience, addressing the economic implications of energy efficiency versus inefficiency of lighting products and appliances, the environmental and social benefits of energy efficient products, issues associated with management of end-of-life and discarded product wastes and potential contribution of women in energy efficiency.

Effective communication channels in Myanmar will be identified and selected for each target audience segment. Possible channels include mass media (radio, TV, mobile), online and social media, electricity bill inserts, supply chain (e.g. point-of-sales) communications, and national educational systems (e.g. schools and colleges). Communication opportunities related to national and international events (e.g. Earth Day and World Environment Day) will also be leveraged. The project will develop and implement a communication and awareness campaign based on the communication strategy and effective communication channels identified. Relevant stakeholders will be engaged during the development phase to establish strategic alliances in the communication strategy for energy-efficient lighting and appliances. For example, electric utilities will be engaged to arrange electricity bill inserts, and the Ministry of Education will be a key partner in school programs on energy efficiency.

In parallel with the design and development of the communication and awareness campaign, the project will implement energy efficiency projects in the public and commercial sector covering both retrofit and new installation of energy efficient lighting and room air-conditioners and will develop in parallel the innovative financing mechanisms in collaboration with the private sector and utilities. The energy efficiency projects will serve Myanmar as the local showcases for different aspects of energy efficiency implementation, including but not limited operation and maintenance of energy efficiency technologies/applications, and feasible implementation and financing models for energy efficiency projects. Internationally recognized measurement and verification (M&V) protocols will be referenced in determining results of each demonstration project.

The detailed design and implementation of the demonstration projects will be guided by detailed energy audits and

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<sup>21</sup> ADB. Power Sector Development in Myanmar, 2015.

the proposed activities will include: collection and validation of data of the selected project sites, design of efficient lighting and cooling demonstration projects including M&V activities; conclusion of financial mechanisms (if any); development of technical specifications; procurements; installation of high quality energy efficient lighting and cooling equipment; conduct of M&V activities for the pilot projects; management of existing inefficient equipment being retrofitted in accordance with the disposal guideline developed under output 1.3 of Component 1. Following the implementation and M&V activities, the results such as improved lighting quality and cooling efficiency, savings, and reduced electricity bills will be showcased and integrated into the communication and awareness campaign. Implementation of the pilot demonstration project will also serve as a training program for the private sector (suppliers as well as lighting and cooling equipment designers) on implementation of similar energy efficiency projects. Two pilot demonstration projects in government buildings have been confirmed during the PPG phase as briefly described in the table below. Additional pilot demonstration projects in commercial buildings will be identified during the project implementation phase.

No.	Title	Description
1	LED lighting and energy efficient AC retrofits in MOI buildings, Nay Pyi Taw	<ul style="list-style-type: none"> <li>- Installation of 550 LED lamps and 150 energy efficient ACs</li> <li>- Conduct of M&amp;V activities</li> <li>- Safe disposal of equipment being replaced</li> </ul>
2	LED lighting and energy efficient AC retrofits in Yangon general hospital, Yangon	<ul style="list-style-type: none"> <li>- Installation of 1,000 LED lamps and 40 energy efficient ACs</li> <li>- Conduct of M&amp;V activities</li> <li>- Safe disposal of equipment being replaced</li> </ul>

Sustainability and scaling-up of successes in implementation of energy efficiency projects in Myanmar will be assured through design and development of market-based mechanisms to facilitate investments in energy efficiency projects in the commercial sector. For each demonstration project an appropriate financial structure and range of co-financing partners will be identified, such as on-bill financing in partnership with power utility or energy service performance contracting with ESCO. For public sector buildings, the project will utilize procurement specifications and procedures implemented in the pilot projects in public facilities to prepare relevant public procurement specifications and guidelines for additional public procurements for energy efficiency.

The project will strengthen the supply chain of energy efficient lighting and appliance in Myanmar. Virtually all energy efficient lighting and appliances in Myanmar are imported and it is recommended that the awareness and capacity building program to strengthen the energy efficient supply chain in Myanmar be implemented in a phase-step manner. In the first phase, the capacity building program will be designed to enhance awareness of importers on the upcoming MEPS and labeling programs for energy efficient lighting and appliances and also increase their access to manufacturers of cost-effective and high quality energy efficient lighting and appliances. In the second phase, the capacity building program will specifically focus on selective importers and/or local manufacturers with potential to produce energy efficient lighting and electrical appliances and enhance their capacities in assembling or manufacturing of appliances in an environmentally sound manner. The project will focus on implementation of the first phase of the capacity building program and develop a work plan for implementation of the second phase.

Design and development of the first phase capacity building program will be carried out in collaboration with government and private sector stakeholders (e.g., UFMCCI, Myanmar Industries Association, Myanmar Engineering Society and Directorate of Investment and Company Administration - DICA under the Ministry of National Planning and Economic Development). The primary focus of the capacity building program will be on establishment of trade partnerships between the Myanmar importers and manufacturers/suppliers of high quality energy efficient products in the region, specifically China and Thailand. In addition, the training program for other stakeholders across the whole value chain, such as designers of lighting and AC systems, distributors/retailers, large

end-users will be designed and delivered to ensure that energy efficient lighting and AC systems are properly selected, installed and maintained.

The awareness and capacity building program will also discuss international experience on various fiscal instruments and incentive mechanisms that could be introduced by the government in Myanmar to stimulate greater adoption of energy efficient lighting and appliances, such as tax incentives for purchasing efficient equipment (or disincentives for purchasing inefficient equipment), or rebate programs to overcome initial cost differences. Development of such fiscal instruments and incentives requires strong advocacy from the private sector and it is crucial for the suppliers/manufacturers in Myanmar to create and maintain the momentum of the development effort with the government.

Specific outputs and activities under Component 3 are described below.

#### Output 3.1: Public awareness raising through multi-media communication and mass media campaigns implemented

##### Activity 3.1.1: Design and development of a communication strategy

- Define target audiences in the residential, commercial and government sector;
- Develop key messages for each target audience, including appropriate gender sensitive communication messages based on the gender analysis;
- Identify effective communication channels in Myanmar;
- Define cost-effective quantitative and qualitative evaluation techniques, together with templates and tools for data collection;

##### Activity 3.1.2: Development and implementation of a communication and awareness campaign

- Establish strategic alliances with relevant stakeholders (e.g., electric utilities, Ministry of Education, suppliers);
- Develop the communication and awareness campaign for the MEPS and labeling program and integrating findings from the pilot project into the campaign;
- Implement the campaign;

##### Activity 3.1.3: Evaluation of the campaign based on the communication strategy

#### Output 3.2: Small scale pilot demonstration projects in public and commercial building designed and implemented

##### Activity 3.2.1: Conduct of detailed energy audits and finalization of detailed designs of the pilot demonstration projects

- Conduct detailed energy audit of each selected facility;
- Prepare detailed design, technical specifications, M&V, implementation plans and safe-disposal plan including existing products/equipment. The safe-disposal plan will address environmentally sound management of used lamps and ACs, and the plan will include properly storage, degassing of refrigerant and disposal (per the safe-disposal guideline prepared under Output 1.3) for each demonstration project;



- Finalize financial structure and arrangement for each pilot demonstration project, including agreements with co-financiers (building end-users, utility company, ESCO, equipment suppliers, etc.);
- Develop specific guidance on how to properly procure, install and operate energy efficient technologies/applications;
- Prepare recommendation on financial structure and arrangement for local financial institution (FIs) to support the scaling up phase;

Activity 3.2.2: Procurement of energy efficient technologies and energy monitoring systems

Activity 3.2.3: Installation and commissioning of energy efficient technologies/applications for the pilot demonstration projects

- Install and commission energy efficient technologies/applications per the implementation plans;
- Ensure safe-disposal and storage of inefficient products/equipment being replaced by energy efficient models. Discarded and end-of-life lighting products and ACs generated by the project will be managed in accordance with the safe and environmentally sound disposal guideline developed under Output 1.3 of Component 1. Fluorescent lamp waste will be properly stored for safe disposal and ACs with HCFCs will be degassed and recycled by qualified contractors;

Activity 3.2.4: Conduct of M&V activities for the pilot demonstration project

Activity 3.2.5: Integration of M&V results and lessons learned with the communication and awareness campaign

### Output 3.3: Awareness and capacity building program of importers and local industry on new MEPS and labeling requirements implemented

Activity 3.3.1: Conduct of needs assessment of importers and local industry stakeholders involved in supply of lighting and electrical appliances

Activity 3.3.2: Development and implementation of an awareness and capacity building program

- Collaborate with government and private sector stakeholders (e.g., UFMCCI, Myanmar Industries Association, Myanmar Engineering Society and Directorate of Investment and Company Administration – DICA under the Ministry of National Planning and Economic Development) in developing the capacity building program which would include but not limited to awareness seminars, technical training workshops and study visits;
- Coordinate with regional manufacturers/suppliers of energy efficient lighting and appliances that meet the new MEPS and labeling requirements in China and Thailand;
- Identify international experience on fiscal instruments and incentive mechanisms relevant to Myanmar;
- Develop a work plan and implementing the awareness and capacity building program;

Activity 3.3.3: Evaluation of the awareness and capacity building program

- Define criteria for evaluation (such as number of trade partnership established, availability of energy efficient lighting and appliances in the Myanmar market), and evaluating the capacity building program.

#### **4) Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTE, LDCF, SCCF, CBIT and co-financing**

Myanmar has made a significant progress over the past few years in establishment of policy and institutional frameworks to support development and implementation of energy efficiency in the country. In addition, participation in various regional and international initiatives on energy efficiency, such as ASEAN SHINE, has provided good opportunities for Myanmar to collaborate with and learn from their neighboring countries and international partners in promoting energy efficiency in the country. However, the overall progress of implementing energy efficiency in Myanmar is still slow, and it is very unlikely for Myanmar to formulate and introduce a national-scale energy efficiency program to transform the domestic markets of lighting and household appliances to energy efficiency markets. This is due to the lack of a clear and effective coordination framework for all government agencies/authorities involved in promoting energy efficiency, ambiguity in legal authority of EECD in regulating energy efficiency, and limited awareness and knowledge concerned government agencies, private sector and general consumers. The stakeholder consultations and meetings during the project preparation stage found that there have been limited efforts in addressing these pertinent barriers which continue to hamper energy efficiency promotions in Myanmar.

The associated baseline activities previously discussed are only expected to contribute marginally to the urgent needs of energy efficiency promotions in Myanmar. Although the EC Law is an important foundation to the energy efficiency promotion and regulation in Myanmar, it is the high level regulatory framework which will not be effectively implemented without implementing rules and regulations. Some of the baseline activities were designed to respond to the requirements for harmonization with the regional initiatives, and these activities are expected to be implemented by EECD and other local government agencies and authorities. It is unclear how EECD and relevant stakeholders would acquire additional knowledge and resources necessary for the implementation of the activities.

Without the GEF intervention actions that will remove barriers to promotion of energy efficiency, it will likely take several more years for Myanmar to build in-country capacity and establish a clear and effective coordination framework to achieve benefits of energy savings and corresponding GHG emission reductions from the widespread adoption energy efficient lighting and household appliance. GEF incremental activities in this project are built on the baseline activities, and they will support establishment of coordination frameworks for all stakeholder involved, development and implementation of capacity building programs, pilot demonstration socio-economic benefits of energy efficient technologies, enhancing awareness of government agencies/authorities, industries and consumers, and strengthening in-country chains for energy efficient lighting and appliances. The Government of Myanmar will provide co-financing for implementation of all the project components, specifically on activities that will collectively deliver Output 1.3, 2.1, 3.1 and 3.2. The local private sector project partners will provide co-financing in implementation of the pilot demonstration projects (Component 3, Output 3.2), and the international project partners (GELC and IIEC) will provide co-financing in implementation of activities under Component 2, Output 2.2, and Component 3, Output 3.2. UN Environment will provide co-financing in project management and advisory support and coordination with ongoing UN Environment initiatives and projects in the regional, as well as in-kind resources on cooling efficiency. Overall, the project will provide vital support to EECD and other local stakeholders in effectively developing and implementing MEPS and labeling programs for lighting and household appliances.

## 5) Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF)

The project is expected to contribute to both global environmental and national benefits, and the direct emission reduction of 136,958 tCO<sub>2</sub> is estimated from adoption of energy efficient lighting products and air conditioners through implementation of MEPS and labeling programs and pilot demonstration projects directly financed by the project using GEF funding and Government co-financing. Additionally, the project has direct post-project GHG emissions savings of 447,389 tCO<sub>2</sub> as a result of MEPS and labeling programs that will lead to the transition of the market towards more efficient lighting products and air-conditioners (cumulatively over the period 2022 - 2031). The project's expected overall Direct emission savings (i.e. direct + direct post-project) are therefore 584,348 tCO<sub>2</sub> between 2018 and 2031.

Concerning the Indirect impacts, using a top-down approach the emission savings are estimated to 491,238 tCO<sub>2</sub> (between 2020 and 2030). Details of these impact estimations using the GEF Energy Efficient Tool (2016) are detailed in Annex J-2 – Estimates of Direct and Indirect GHG Emission Reduction.

Summarized in the table below are the target implementation timeline and estimated impacts of MEPS and labeling programs on penetration of energy efficient lighting and RACs in Myanmar, as well as estimated annual energy savings from implementation of the pilot demonstration projects.

No.	Description	Scope/Target Effective Date	Expected Impacts
1	Voluntary labeling program for screw-base lamps	Incandescent lamps (ILs), CFLs, LED lamps /Target Effective Date: January 2020	Annual market share of LED lamps in IL and CFL markets before labeling program: 5%  Annual market share of LED lamps in IL and CFL markets after labeling program: 20% and 40% respectively
2	Voluntary labeling program for tube lamps	Fluorescent tube lamps, LED tubes /Target Effective Date: January 2021	Annual market share of LED tubes in tube lamp markets before labeling program: 5%  Annual market share of LED tubes in tube lamp markets after labeling program: 20%
3	Voluntary labeling program for RACs	Single-speed RACs, Inverter-type RACs/Target Effective Date: January 2022	Annual market share of inverter-type RACs in the RAC market before labeling program: 5%  Annual market share of inverter-type RACs in the RAC market after labeling program: 25%
4	Implementation of pilot demonstration projects on energy efficient lighting and air-conditioning retrofits in public buildings in Myanmar	LED lamps and Inverter-type RACs/Target implementation date: June 2019 for MOI buildings and January 2020 for Yangon general hospital	Annual energy savings: 110,000 kWh for MOI buildings, 166,000 kWh for Yangon general hospital; and 220,000 kWh commercial buildings

As mentioned above, the cumulative total amount for Direct savings is 584,348 tCO<sub>2</sub>. However, as agreed with the GEF Secretariat, the Direct benefits attributable to each of the child projects under the “Leapfrogging markets to high efficiency products (appliances, including lighting and electrical equipment)” Program shall represent 50% of the projects’ estimated Direct GHG emission reductions. Under this condition, the project’s target is 292,174 tCO<sub>2</sub> of Direct GHG emission reductions by year 2031. This represents a cost effectiveness of 7.61 US\$ / tCO<sub>2</sub>. This estimation does not take into account indirect emissions reductions achieved through replication of technology investments and additional demonstration projects.

*Table 1: Aggregated GHG Emission Reductions: Direct and Consequential*

<b>GHG Emission Savings (tCO<sub>2</sub>)</b>	<b>2018-2021</b>	<b>2022-2031</b>	<b>TOTAL</b>
<b>Direct</b>	<b>33,399</b>	<b>103,559</b>	<b>584,348</b>
Component 1: MEPS and Labels	32,995	102,127	
Component 3: Demo & Diffusion	404	1,423	
<b>Consequential</b>			
Bottom-up		11,926	11,926
Top-down		491,238	491,238

In addition to GHG emission reduction, energy efficient lighting and RACs promoted by the project are more environmentally friendly compared with the fluorescent lighting and RAC technologies commonly used in Myanmar. Unlike the fluorescent technologies, LED lighting technologies do not contain mercury and energy efficient RACs promoted by the project will be RACs with low GWP refrigerants. Moreover, discarded and end-of-life fluorescent and LED lighting and RACs will be disposed and recycled in accordance with the best practices and guidelines for energy efficient lighting and RACs prepared by UN Environment. This will reduce volumes of mercury and other harmful electrical and electronic wastes being sent to the land fill, reduce usage and leakage of refrigerants and their ozone depletion potential (ODP) and global warming potential (GWP), and minimize any long-term environmental or health impact in Myanmar.

## **6) Innovativeness, sustainability and potential for scaling up**

The proposed project features, among others, work towards the introduction of one of the most cost-effective energy efficiency programs, MEPS and energy labeling programs for lighting products and appliances (air conditioners in particular) in Myanmar. Although the MEPS and energy labeling are recommended as the priority actions in the national energy efficiency roadmap to curb growing electricity demand and to release some of the available generation capacity for additional electrification, these cost-effective actions have not yet been addressed by any donor-supported programs in Myanmar. It is very important for Myanmar to ensure that the ongoing power sector development is coupled with energy efficiency to achieve its targets on rural electrification and economic development in a cost-effective manner. The proposed project will also introduce for the first time in Myanmar the pilot demonstration projects on energy efficient lighting and air conditioning with robust M&V frameworks and the economic and environmental impacts of these pilot demonstrations will be properly documented to establish reference data for relevant capacity building and communication activities.

The proposed project is designed to have a balanced mix of activities tailored to country’s specific conditions to create enabling regulatory and market environments. Sustainability of the project will be ensured through different outputs of the project, e.g., effective institutional and regulatory frameworks, an operationalized MEPS and labeling program, enhanced capacity of government and private sector stakeholder in energy efficiency and greater awareness and knowledge on energy efficiency among key stakeholders and general consumers. These outputs will

serve as a long-term foundation for Myanmar to sustain and scale up the impacts generated by the proposed project through inclusion of more appliances and equipment in the MEPS and labeling program, including but not limited to refrigerators, rice cookers, water heaters/boilers and motors & pumps. In addition, the combination of these enabling environments and pilot demonstration projects with bankable financial structure and arrangement will also help catalyzing greater levels of energy efficiency investments by Myanmar households, commercial and industrial consumers, as well as the public sector, and eventually leapfrog Myanmar's lighting and appliance markets to high efficiency markets.

**A.2. Child Project?** If this is a child project under a program, describe how the components contribute to the overall program impact.

The current project is hosted under the program "Leapfrogging markets to high efficiency products (appliances, including lighting, and electrical equipment)" lead by UN Environment. The Program builds on the UN Environment-GEF global project "Establishing the Foundations of a Partnership to Accelerate the Global Market Transformation for Efficient Appliances and Equipment" (UN Environment Project #5831), hereinafter called the "SE4ALL Global Project". The project is called this due to its contribution to the UN Secretary General's Sustainable Energy for All (SE4ALL) initiative's Lighting and Appliance & Equipment Accelerators. The SE4ALL Global Project has formed a global partnership, recently named United for Efficiency (U4E), which compiles international organizations, like-minded organizations, and private sector companies. Further, by the end of the project, it will have the commitment from at least thirty countries to transform their markets to energy efficient lighting, appliances, and equipment.

The program "Leapfrogging markets to high efficiency products (appliances, including lighting, and electrical equipment)" proposed GEF program, hereinafter called the "Global Leapfrogging Program" utilizes the resources already developed under SE4ALL Global Project, such as country assessments and best practice policy guides to increase the number of countries committing to advance energy efficient products. Further, it follows the consensus recommendations on the policy framework when developing technical guides and training under the Global Leapfrogging Program. This relationship is reflected in the Figure 10 below and the text describing each component.

## SE4ALL Global Project



**FIGURE 10: RELATIONSHIP BETWEEN SE4ALL GLOBAL PROJECT AND GLOBAL LEAPFROGGING PROGRAM**

The Global Leapfrogging Program was originally submitted (GEF Council October 2015) with child projects of Costa Rica, Kazakhstan, and Sudan and a projected eight additional countries are expected to join. The project was re-submitted (GEF Council March, 2016) with child projects in Myanmar, Indonesia, Tunisia, South Africa, and Chile. Other countries interested in submitting a child project under Global Leapfrogging Program, include China and Lesotho. For each child project, a concept note including national background, policy status, baseline scenario, description of individual national components, and potential savings.

The Leapfrogging Program is divided into three components:

- Component 1: National child projects on lighting, appliances, and equipment
- Component 2: Global services for partner countries
- Component 3: Outreach on Efficient Appliances and Equipment

The 3 components of this project were carefully designed to contribute to the program-level results framework of the Global Leapfrogging Program as following:

- Project Component 1: Minimum energy performance standards (MEPS) and labeling – This component is directly linked with Component 1 of the Global Leapfrogging Program, and the project will promote energy efficient LED lighting, energy efficient and climate-friendly air-conditioners and other appliances.
- Project Component 2: Market monitoring, verification and enforcement – This component was designed to benefit from Component 2 of the global program as MVE is new to Myanmar and access to relevant international experience will help Myanmar to achieve its goal in effective implementation of MEPS and labeling programs.
- Project Component 3: Awareness raising and demonstration projects – This component directly contributes to Component 3 of the global program its nationwide public awareness and communication campaigns on energy efficient lighting, air-conditioners and other appliances.

The Global U4E Program has put in place a monitoring framework to track the progress of the child projects and market transformation. During the inception phase and taking into account the findings of the new market study, MOI will fill in this monitoring framework with mid-term and final project targets for the separate elements of the integrated approach and will validate this during the first Steering Committee Meeting:

Country	U4E Integrated Policy Approach	Baseline	Mid-term of project	Final of project
Myanmar (lighting)	Regulations and standards	• Action plan in place to develop MEPS		
	Supporting Policies	• Action plan in place to develop labeling		
	Finance	• None		
	MVE	• None		
	Environmental sustainability	• None		

**A.3. Stakeholders.** Identify the key stakeholders and elaborate on how their engagement is incorporated in the preparation and implementation of the project. Mention whether they include [civil society organizations](#) and [indigenous peoples](#).

During project preparation, stakeholder analysis was undertaken in order to identify key stakeholders, assess their interests in the project and define their roles and responsibilities in project implementation. The focal government agencies with mandates to promote energy efficiency in Myanmar is the Energy Efficiency and Conservation Division (EECD) under the Ministry of Industry. In addition to EECD, the project will involve other concerned stakeholders as discussed in the table below.

Stakeholders	Roles
Energy Efficiency and Conservation Division (EECD), Ministry of Industry (MOI)	EECD under MOI will serve as the executing partner for the GEF Project. EECD is the main partner in the preparation phase of this project and during the implementation phase, EECD will house the Project Management Unit which will be responsible for the overall management of the project including day-to-day project implementation, communication and coordination with the GEF agency, UN Environment, and other key partners, providing staff and administrative support, liaison with local governments, monitoring and project financial management. MOI will also chair the project steering committee.
Ministry of Electricity and Energy (MOEE)	MOEE, through its electric power enterprises, will provide support in Development and implementation of a communication and awareness campaign for consumers in different end-use sectors. MOEE will also support implementation of M&V activities through provision electricity consumption data for the pilot demonstration and other energy efficiency projects undertaken by the project. In addition, MOEE will provide updates on data related electricity generation, consumption and energy access to support validation of the project indicators
Ministry of Education (MOE)	MOE (Science and Technology) is the national standard body in Myanmar, and it will play a key role in supporting the project to develop and implement the MEPS and labeling program in Myanmar. Specifically, MOE (Science and Technology) will support the project with regard to (i) development or new testing standards, or



Stakeholders	Roles
	<p>harmonization of existing testing standards with IEC standards or other standards commonly used in the ASEAN region for lighting products and air conditioners, and (ii) development of MEPS and energy performance matrices for priority products identified for the MEPS and labeling program in Myanmar. MOE (Science and Technology) will also support the project in determination and establishment of an appropriate mechanism for implementation a mandatory MEPS and labeling program in Myanmar.</p>
<p>Ministry of Natural Resources and Environmental Conservation (MONREC)</p>	<p>MONREC is the leading government body for climate change mitigation and environmental protection activities in Myanmar and it also serves as the GEF focal point for Myanmar. MONREC will support activities related to development of mechanisms for collection, recycling and safe disposal of discarded and end-of-life lighting products and appliances, specifically discarded fluorescent lamps which contain mercury, electronic waste components of CFLs and LED lamps and Global Warming Potential refrigerants from old RACs.</p>
<p>Department of Trade, Ministry of Commerce (MOC)</p>	<p>The Department of Trade under MOC is the key government agency in regulating importation of controlled goods to Myanmar and it has the responsibility to issue import/export licenses for importers under the Import and Export Law 2012. The Department of Trade will coordinate MOE (Science and Technology) and the project in development and implementation of an effective MVE system for the MEPS and labeling program in Myanmar. The Department of Trade will also support implementation of the capacity building program related to ongoing MVE activities undertaken in Myanmar.</p>
<p>Customs Department, Ministry of Planning and Finance (MPF)</p>	<p>The Customs Department plays a critical role in monitoring imported goods for Myanmar and it will be one of the key agencies in delivering effective implementation of MVE activities for the MEPS and labeling program in Myanmar. The project will coordinate with the Customs Department in in monitoring importation of lighting products and appliances subject to the requirements of the MEPS and labeling program. In addition, the department will support implementation of the capacity building program related to ongoing MVE activities undertaken in Myanmar. And be involved in market data collection activities under the project.</p>
<p>Department of Social Welfare, Ministry of Social Welfare, Relief and Resettlement</p>	<p>The department of Social welfare will support gender equality and women's rights issue to be addressed by the project.</p>
<p>The Union of Myanmar Federation of Chambers of Commerce and Industry (UMFCCI)</p>	<p>UMFCCI is the main industry association and importers are required to join UMFCCI to be eligible for import/export licenses issued by the Department of Trade under MOC. UMFCCI can play a lead role in consultation and dialogue with the private sector and it will be engaged in implementation of communication and awareness programs as well as capacity building program. UMFCCI will also support the project in collecting and updating market data on lighting and appliances.</p>



Stakeholders	Roles
Myanmar Engineering Society (MES)	<p>MES is the key professional association in Myanmar. Considering its multiple branches and large individual (engineers and architects) and corporate membership base nationwide, MES will be involved in data collection activities, communication and awareness activities, and various technical activities including technical training and development and implementation of energy efficiency projects. MES will also be instrumental in reaching out to female engineers and architects and engaging them in relevant design and implementation of energy efficiency lighting and air conditioning projects in Myanmar.</p>
Non-governmental Organization and Consumer/Gender Groups	<p>Non-governmental organizations and consumer/gender groups that advocate responsible for consumer welfare will contribute their perspectives during the development of MEPS and labeling programs. They will provide a balancing perspective to importers/manufacturers with regard to the stringency of MEPS and labeling programs and MVE schemes. Input from civil society consumer groups can ensure that MEPS and labeling programs fit well with the consumers' needs and capacity of the domestic suppliers.</p> <p>Relevant women associations and ministerial gender focal points will participate actively in project implementation, providing advice on effective gender mainstreaming and outreach to women in promoting.</p> <p>For instance, coordination with the Myanmar Women Entrepreneur's Association or other such associations will be sought out during the implementation phase.</p>
Manufacturers and Importers of Energy Efficient Lighting Products and Appliances (e.g., Changi-Light Myanmar, Peace Myanmar Electric, Midea)	<p>Suppliers (manufacturers and importers) of energy efficient lighting products and appliances in Myanmar will be involved in implementation of capacity building program on commercially available technologies, and co-financing on energy efficient technologies and application in pilot demonstration projects. The suppliers will be fully engaged and informed during the development phase of the MEPS and labeling program in Myanmar to ensure that the supply chain of energy efficient lighting and appliances in the country can be strengthened in a timely manner. The suppliers are expected to support the project on information about energy efficient products and market structures.</p>
Local banks/ Financial Institutions	<p>Banks and financial institutions will participate in development of financial mechanisms for energy efficiency investments under Component 3 and will receive training from the project in identification and evaluation of energy efficiency projects. It is envisaged that participating banks and financial institutions will provide financial supports for demonstration projects in the commercial sector and purchasing of energy efficient lighting and appliances by Myanmar households.</p>
UN Environment	<p>As a GEF Implementing Agency, UN Environment will be responsible for the provision of technical and operational oversight support throughout the project implementation phase. If the GoM requests, the U4E team can provide additional bespoke directly to the project in collaboration with international initiatives, such as U4E, and developing partners in the region.</p>

Stakeholders	Roles
ASEAN Center for Energy (ACE)	As the main focal point in coordinating relevant regional initiative on energy efficiency for ASEAN member countries, ACE will support EECD in harmonizing the proposed MEPS and labeling programs in Myanmar with the other ASEAN member countries. ACE will also support outreach activities for EECD through its regional workshops and meetings.

**A.4. Gender Equality and Women's Empowerment.** Elaborate on how gender equality and women's empowerment issues are mainstreamed into the project implementation and monitoring, taking into account the differences, needs, roles and priorities of women and men.

- *Overall global context*

The link between energy access to women's economic and social development is now well established globally. Communities who do not have access to electricity tend to rely on locally source biomass for their daily energy needs. Rural women and girls in particular are the primary energy producers responsible for providing lighting, heating and cooking in households. Energy poverty (including the lack of access to technologies such as lighting and appliances) leads to drudgery, greater health risks and a lack of time to focus on income-generating, educational or other activities.

- *Country context*

Although Myanmar is a country that is rich in energy resources, a large share of its population lacks access to electricity. In fact, it has the poorest level of energy access in the Asia and Pacific region. It is that estimated quarter of Myanmar's population currently has access to a regular supply of electricity. While social sources put the electrification rate at 13%, other data sources reveal that less than 1% of the country's population has access to uninterrupted electricity. In rural areas, the national power grid network covers only 7% (4,550 villages) of the country's 65,000 villages. Thus, the majority of households (88%) depend on solid fuels, such as wood and rice husks, for cooking and heating; while more than two-thirds (70%) of the population depend on diesel lamps, batteries, or candles for lighting.

The recent census data; however, maintains that a sizable proportion of households in Myanmar use electricity (32.4%) as their main source of energy for lighting, followed by candles (20.7%). There is a big difference between urban (77.5%) and rural areas (14.9%) in the use of electricity as the main source of lighting. The proportion of households using batteries, generators, and solar systems as the main source of lighting is considerable. Four out of five households use wood or charcoal, while in rural areas up to 80% use wood or charcoal for cooking. Overall, only 17% of households use energy, such as electricity or liquefied petroleum gas, for cooking. The proportion is larger in urban areas (46%) but very low in rural areas (6%).

Although the entire household is adversely affected by energy constraints, it is particularly damaging to women because they are primarily responsible for food preparation and cooking. Without access to energy, they are typically forced to spend significant amounts of time searching for firewood to meet their cooking and heating needs. According to some estimates, women spend three times the amount of time spent by men in transporting fuel and water. Thus, the opportunity costs for women are much higher.

Inefficient lighting and appliances means electricity losses occurring, thus making a greater portion of the electricity generated unavailable for final consumption. This has a direct impact on energy access, which, for the reasons mentioned above, adversely affect the situation of women.

Although progress has been made in recent years, continued efforts are needed to strengthen the policy and institutional framework to accelerate gender equality and to support women's economic empowerment in Myanmar.

Women must also be recognized and involved as leaders in local and national energy planning and policy processes. Recognizing women as stakeholders in energy projects and furthering their participation at all levels of decision making is central to the agenda of promoting a gender-aware approach to energy policy and promoting cleaner, more efficient energy systems for all.

It is also recommended that the skill development of women be promoted so that they can access better employment opportunities at different levels and in different sectors, including in non-traditional fields such as installation of energy systems, technicians and operators<sup>22</sup>.

In terms of gender, the Ministry of Energy has initiated an inclusive approach. There are thus certain policies and policy strategies such as the Renewable Energy Policy, Strategy and Roadmap, which include some gender considerations concerning hiring and participation of women in community renewable energy projects through the village electrification committees. Similarly, the Energy Efficiency & Conservation Policy, Strategy and Roadmap, envisions 18 staff positions to be approved for the Energy Efficiency Conservation Division (EECD), and recommends that the recruitment of staff is managed carefully to include social and gender specialists required for residential programs.

However, there are no specific programs within the government's energy policy that focus particularly on women. Myanmar's Intended Nationally Determined Contributions (INDC), which contains initiatives in energy efficiency (clean cook stoves, institutional capacity building) and renewable energy (hydro energy and off-grid solar), also states Myanmar's aim to include gender considerations in climate change policy design, although it does not name specific strategies for doing so<sup>23</sup>.

▪ *Gender action plan:*

CROSS-COMPONENT		
	Gender Design Features/activities	Gender output indicators
PMU	<ul style="list-style-type: none"> <li>• Provide equal employment opportunities for women in project activities across project utilities (PMU/PMC/PIUs/distribution agencies/marketing teams. etc.) [Target: at least 25% women are engaged in project activities]</li> <li>• Allocate resources to implement the gender activities/activities in the Gender mainstreaming framework</li> <li>• Designate a gender focal point in EECD to oversee gender inclusion in project activities</li> </ul>	<ul style="list-style-type: none"> <li>• At least 25% women participate/engaged in project activities</li> <li>• Resources allocated to implement the gender activities A gender focal point appointed in EECD</li> <li>• A gender specialist recruited Consideration of gender is mainstreamed in institution (EECD) and Program Management</li> </ul>

<sup>22</sup> Gender Equality and Women's Rights in Myanmar, A situation Analysis, ADB, 2016

<sup>23</sup> Women's Entrepreneurship for Sustainable Energy (WESE) Draft Myanmar Roadmap: Phase I. UN Environment – UN Women. 2016.

	<ul style="list-style-type: none"> <li>• Appoint a gender expert to guide and support gender inclusion in project activities</li> </ul>	
PMU	<ul style="list-style-type: none"> <li>• Include gender section in each PMU reports</li> </ul>	<ul style="list-style-type: none"> <li>• Periodic assessment of the impact of the project on gender equality</li> </ul>
<b>COMPONENT 1: MEPS AND LABELING</b>		
Output 1.1: Assessment of market baseline for lighting products and air-conditioners completed and other target appliances prioritized based on saving estimates		
Activity 1.1.1: Assessment of market baseline through implementation / Conduct of a nationwide household appliance saturation survey	<ul style="list-style-type: none"> <li>• Include social assessment, including gender analysis and sex disaggregated data to assess the situation of women with regards to household appliance selection and use</li> <li>• Interview at least 50% of women</li> </ul>	<ul style="list-style-type: none"> <li>• Social assessment, including gender analysis conducted with sex disaggregated data</li> <li>• At least 50% of interviewees are women</li> </ul>
Activity 1.1.2: Evaluation of impacts of adoption of more efficient household appliances	<ul style="list-style-type: none"> <li>• Include social assessment, including gender analysis to assess the potential roles, benefits, impacts and risks for women and men in the existing/new EE technologies</li> </ul>	<ul style="list-style-type: none"> <li>• Social impact assessment/social audits conducted</li> </ul>
Activity 1.1.5: Recommendation of an implementation plan for follow-on collection and update of market data	<ul style="list-style-type: none"> <li>• Include gender data as part of the market data to be collected</li> </ul>	<ul style="list-style-type: none"> <li>• Updating of gender data is included in the plan for update of market data</li> </ul>
Output 1.2: Training program for responsible government entities and involved stakeholders to understand, design and implement MEPS and labeling programs implemented		
	<b>Gender Design Features/activities</b>	<b>Gender output indicators</b>
Activity 1.2.1: Conduct of training needs assessment of stakeholders involved in design and implementation of MEPS and labeling programs	<ul style="list-style-type: none"> <li>• Conduct interviews with 50% of women</li> </ul>	<ul style="list-style-type: none"> <li>• Training needs assessed based on opinion of 50% of women</li> </ul>
Activity 1.2.2: Development and implementation of a comprehensive capacity building program	<ul style="list-style-type: none"> <li>• Design training material to avoid gender stereotypes, to employ inclusive language and to use appropriate illustrations;</li> <li>• Submit the training materials to the gender expert to make sure that such stereotypes are avoided, and the proper language and illustration are used</li> <li>• Invite 50% of participants to be women</li> <li>• Invite at least 25% of trainers to be women</li> <li>• Include information related to the linkages between gender and energy in the training curriculum</li> </ul>	<ul style="list-style-type: none"> <li>• Training material avoid gender stereotypes, employ inclusive language and use appropriate illustrations</li> <li>• Approval of the materials by the gender expert</li> <li>• 50% of participants are women</li> <li>• At least 25% of trainers are women</li> <li>• Stakeholders awareness strengthened on linkages between energy and gender</li> </ul>
Activity 1.2.3: Conduct of post-training surveys and evaluation	<ul style="list-style-type: none"> <li>• Interview 50% of women</li> <li>• Include gender section in the evaluation report</li> </ul>	<ul style="list-style-type: none"> <li>• 50% women interviewed</li> <li>• Gender section is an integral part of the post-training evaluation report</li> </ul>
Output 1.3: MEPS and labeling for target products developed and piloted on the voluntary basis		

Activity 1.3.1: Finalization of implementation approach and detailed work plan for MEPS and labeling programs in Myanmar	<ul style="list-style-type: none"><li>• Ensure the % of women stakeholders consulted are representative of the sample set.</li><li>• Involve women in the technical and policy working groups on MEPS and labeling</li></ul>	<ul style="list-style-type: none"><li>• % of women stakeholders consulted are representative of the sample set</li><li>• 50% of TWG and PWG are women</li></ul>
Activity 1.3.2: Adoption of testing standards and energy performance matrices		
Activity 1.3.3: Implementation of MEPS and labeling programs		
COMPONENT 2: MV&E		
Output 2.1: Legislative and institutional framework developed for effective market monitoring, verification and enforcement (MVE)		
	Gender Design Features/activities	Gender output indicators
Activity 2.1.1: Establishment of an interim MVE system based on the existing legislative and institutional frameworks	<ul style="list-style-type: none"><li>• Assessment of women involvement in the current decision-making process related to legislation and institutions</li></ul>	<ul style="list-style-type: none"><li>• Gender analysis conducted with sex disaggregated data</li></ul>
Activity 2.1.3: Preparation of recommendations on the key features for establishment of an effective MVE system in Myanmar	<ul style="list-style-type: none"><li>• Integrate gender equality as a criterion for formulation of the recommendations</li></ul>	<ul style="list-style-type: none"><li>• Gender sensitive recommendations</li></ul>
Output 2.2: MVE training program for the responsible government entities including policy makers, enforcement officials and customs officials designed and delivered		
Activity 2.2.2: Development and implementation of a comprehensive training program on MVE	<ul style="list-style-type: none"><li>• Select trainees to reflect the assessment of women's situation in the current decision-making process and institutions and the related recommendations</li><li>• Design training material to avoid gender stereotypes, to employ inclusive language and to use appropriate illustrations;</li><li>• Submit the training materials to the gender expert to make sure that such stereotypes are avoided, and the proper language and illustration are used Include information related to the linkages between gender and energy in the training curriculum</li></ul>	<ul style="list-style-type: none"><li>• Sex of the trainees reflects the assessment of women's situation in the current decision-making process and institutions and the related recommendations</li><li>• Training material avoid gender stereotypes, to employ inclusive language and to use appropriate illustrations;</li><li>• Approval of the training materials by the gender expert The training curriculum includes information related to the linkages between gender and energy</li></ul>
Activity 2.2.3: Conduct of post-training surveys and evaluation	<ul style="list-style-type: none"><li>• Interview 50% of women Include gender section in the evaluation report</li></ul>	<ul style="list-style-type: none"><li>• 50% of the interviewees are women</li><li>• The evaluation report includes a specific section on gender</li></ul>
COMPONENT 3: AWARENESS RAISING AND DEMONSTRATION PROJECTS		
Output 3.1: Public awareness raising through multi-media communication and mass media campaigns implemented		
	Gender Design Features/activities	Gender output indicators
Activity 3.1.1: Design and development of a communication strategy	<ul style="list-style-type: none"><li>• Use the gender-specific social assessment made for estimating the market baseline to make recommendations for the communication strategy</li></ul>	<ul style="list-style-type: none"><li>• Recommendations to make the communication strategy adapted with regards to the situation of women in the lighting and air conditioning market</li></ul>

Activity 3.1.2: Development and implementation of a communication and awareness campaign	<ul style="list-style-type: none"> <li>Design the communication materials to avoid gender stereotypes, to employ inclusive language and to use appropriate illustrations; Submit the communication materials to the gender expert to make sure that such stereotypes are avoided, and the proper language and illustration are used</li> <li>Include information related to the linkages between gender and energy in the communication materials</li> </ul>	<ul style="list-style-type: none"> <li>The communication materials avoid gender stereotypes, employ inclusive language and use appropriate illustrations; Approval note from the gender expert on the communication materials</li> <li>Information related to the linkages between gender and energy is included in the communication materials</li> </ul>
Activity 3.1.3: Evaluation of the campaign based on the communication strategy	<ul style="list-style-type: none"> <li>Interview at least 50% of women in the evaluation campaign</li> </ul>	<ul style="list-style-type: none"> <li>At least 50% of the interviewees are women</li> </ul>
<b>Output 3.2: Small scale pilot demonstration projects in public and commercial building designed and implemented</b>		
Activity 3.2.3: Installation and commissioning of energy efficient technologies/applications for the pilot demonstration projects	<ul style="list-style-type: none"> <li>Provision for women's participation at decision level in O &amp; M, of the pilot projects</li> </ul>	<ul style="list-style-type: none"> <li>At least two women have decision-making positions in the operation and management of the pilot projects</li> </ul>
Activity 3.2.4: Conduct of M&V activities for the pilot demonstration project		
Activity 3.2.5: Integration of M&V results and lessons learned with the communication and awareness campaign	<ul style="list-style-type: none"> <li>Give visibility to women in charge of pilot projects (in communication materials and public presentations)</li> </ul>	<ul style="list-style-type: none"> <li>The communication materials include women success stories and these women have the opportunity to share their experience in public events</li> </ul>
<b>Output 3.3: Awareness and capacity building program of importers and local industry on new MEPS and labeling requirements implemented</b>		
	<b>Gender Design Features/activities</b>	<b>Gender output indicators</b>
Activity 3.3.1: Conduct of needs assessment of importers and local industry stakeholders involved in supply of lighting and electrical appliances	<ul style="list-style-type: none"> <li>Include gender-specific social assessment of women representation among importers and local industry</li> <li>Prepare gender specific recommendations</li> </ul>	<ul style="list-style-type: none"> <li>The representation and situation of women among importers and local industry is assessed</li> <li>Specific recommendations are formulated to improve women's employment and situation</li> </ul>
Activity 3.3.2: Development and implementation of an awareness and capacity building program	<ul style="list-style-type: none"> <li>Design the training and awareness materials to avoid gender stereotypes, to employ inclusive language and to use appropriate illustrations</li> <li>Submit the communication materials to the gender expert to make sure that such stereotypes are avoided, and the proper language and illustration are used</li> <li>Include information related to gender in the training and awareness materials</li> </ul>	<ul style="list-style-type: none"> <li>The training and awareness materials avoid gender stereotypes, employ inclusive language and use appropriate illustrations</li> <li>The communication materials are approved by the gender expert Information related to gender is included in the training and awareness materials</li> </ul>
Activity 3.3.3: Evaluation of the awareness and capacity building program	<ul style="list-style-type: none"> <li>Interview at least 50% of women in the evaluation campaign</li> </ul>	<ul style="list-style-type: none"> <li>Interview at least 50% of women in the evaluation campaign</li> </ul>

- *Expected results.*

Improved efficiency of lighting and appliances will help to reduce the losses occurring when electricity is used in Myanmar thus making aggregator portion of the electricity generated available for final consumption. In turn, this will allow to improve energy access. For the reasons mentioned above, such improvement of the access to electricity will directly benefit women.

The project will contribute to the strengthening and enhancement of the involvement of women in multiple areas, including design and development institutional coordination and regulatory frameworks, development and implementation of the MEPS and labeling program, design and implementation of the pilot demonstration projects, development and implementation of capacity building and awareness programs. Gender relevant issues will also be considered throughout the project implementation phase, including in management arrangements, gender-sensitization training for the project team, collected of gender-disaggregated data where relevant, as well as the inclusion of a gender analysis in the annual, midterm and final reporting requirements.

Thus the project will allow to include specific activities addressing gender equality issues in implementation of the MEPS and labeling program in Myanmar, and the project is designed in such a way that gender equality considerations are embedded in all project components. Female and male stakeholders will be equally engaged in the decision making process during project implementation and formulation of subsequent project activities. Female staff will be more involved in some possible areas such as design and implementation of data collection and also capacity building activities. Through implementation of project activities, the project will help broaden knowledge and strengthen commitment of the executing agency to gender issues in the subsequent energy efficiency projects.

**A.5 Risk.** Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation:

The project is subject to possible risks that can be managed and mitigated to ensure successful project implementation. In addition, lighting products and air conditioners contain some materials that could be hazardous if not properly disposed. Fluorescent lamps contain mercury which can be harmful to the environment and human health when not appropriately managed. Electronic ballasts for CFLs and linear fluorescent lamps have printed circuit boards and other electronic components, and these electronic components are considered as electronic waste at their end-of-life. Air conditioners contain materials that can be recycled/ recovered/ reused, as well as some materials that could be hazardous if simply dumped in a landfill. The refrigerants used by air conditioners can have major impacts on the climate as some are potent greenhouse gases and thus require appropriate end-of-life treatment. The possible risks and mitigation measures are summarized in the table below.

Risk Description	Category	Likelihood	Impacted Component/ Output	Risk Management Strategy & Safeguards	By When/ Whom?
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Risk Description		Category	Likelihood	Impacted Component/ Output	Risk Management Strategy & Safeguards	By When/ Whom?
1	Weak government support, which leads to inadequate and ineffective implementation of energy efficiency roadmap and enforcement of regulations	Political	Low	All project components and all outputs	<ul style="list-style-type: none"> <li>Conduct direct consultation with key policy makers to secure commitments in strengthening institutional coordination and development regulatory framework to support implementation of the MEPS and labeling program</li> <li>Increase capacities of key agencies in the Myanmar's MVE system to allow for effective enforcement and sustainability</li> </ul>	Throughout the project. UN Environment/EECD/ International & National Experts
2	Delayed implementation of baseline activities (including approval of the EC Law by the Myanmar Government) for specific incremental activities of the proposed project	Political and Institutional	Medium	Comp. 1 (Output 1.3), Comp. 2 (Output 2.1)	<ul style="list-style-type: none"> <li>During the project preparation phase, implementation partners has been identified and confirmed, and a realistic implementation schedule was established based on planned resources among responsible agencies</li> <li>During the project implementation phase, EECD will ensure ongoing and smooth coordination with all implementation partners and project proponents and provide all clarifications to any issues and concerns raised by stakeholders in a timely manner so that any possible delays due to stakeholders' disagreements will be minimized.</li> </ul>	Throughout the project UN Environment/EECD/ Steering Committee
3	Limited capacities of project personnel and technical experts for project management and implementation	Institutional	Low	All project components and all outputs	<ul style="list-style-type: none"> <li>EECD will put in place a solid project management unit (PMU) to ensure sufficient project management personnel and technical advisers to ensure effective project management and implementation.</li> <li>PMU will coordinate with UN Environment and project partners to ensure synergy in implementing baseline and GEF incremental activities.</li> <li>UN Environment through its international initiative (e.g., U4E) can support EECD to address weakness in institutional capacities. This includes implementation of capacity building programs; &amp; setting up robust knowledge management system to ensure that project can be implemented continuously in case of change of personnel and/or experts.</li> </ul>	Throughout the project. UN Environment/EECD



	Risk Description	Category	Likelihood	Impacted Component/ Output	Risk Management Strategy & Safeguards	By When/ Whom?
4	Low level participation from the private sector actors including banks/ financial institutions and suppliers of energy efficient lighting products and appliances	Institutional and Financial	Medium	Comp. 1 (Output 1.3), Comp. 2 (Output 2.1), Comp. 3 (All outputs)	<ul style="list-style-type: none"> <li>• Involve the private sector key players from the project detailed design stage</li> <li>• Disseminate latest information through appropriate private sector channels</li> <li>• Identify needs and demands through continuous dialogue with the private sector partners</li> <li>• Engagement in the planning and implementation of the communication and awareness programmes as well as in the capacity building programmes;</li> <li>• Private sector involvement in the project's data collection activities and in updating the market data and forecasts;</li> <li>• Supporting the various technical activities including the technical training and the development and implementation of the energy efficiency demonstration projects;</li> <li>• Engagement in the validation of current market barrier information and on market structures;</li> <li>• Supporting the development of financial mechanisms for energy efficiency investments including the provision of financial supports for demonstration projects in the commercial sector and for the purchasing of energy efficient lighting and appliances by Myanmar households.</li> </ul> <p>The channels of communication for consultation and dialogue with the private sector will be through the principle Myanmar Private Sector Stakeholders:</p> <ul style="list-style-type: none"> <li>- The Union of Myanmar Federation of Chambers of Commerce and Industry (UMFCCI) which is the main industry association;</li> <li>- The Myanmar Engineering Society (MES) which is a key professional association in Myanmar;</li> <li>- The Manufacturers and Importers of Energy Efficient Lighting Products and Appliances (including Changi-Light Myanmar, Daikin, Electrolux, Peace Myanmar Electric, Midea)</li> <li>- The Local banks/ Financial Institutions who will participate in the development of financial mechanisms for energy efficiency investments under Component 3 and will receive training from the project.</li> </ul>	Throughout the project UN Environment/ EECD/ International & National Experts

	<b>Risk Description</b>	<b>Category</b>	<b>Likelihood</b>	<b>Impacted Component/ Output</b>	<b>Risk Management Strategy &amp; Safeguards</b>	<b>By When/ Whom?</b>
5	Development demonstration projects in the commercial sector gets delayed due to financial constraint of the project hosts	Financial	Medium	Comp. 3 (Output 3.2)	<ul style="list-style-type: none"> <li>Secure implementation agreements with the project hosts prior to the design, planning and implementation of demonstration project.</li> <li>Support the project hosts to access to financial supports to be provided by the project.</li> </ul>	Throughout the project EECD/ International & National Experts
6	Lack of proper disposal mechanisms for discarded and end-of-life lamps and appliances	Environmental and Institutional	Medium	Comp. 1 (Output 1.3), Comp. 3 (All outputs)	<ul style="list-style-type: none"> <li>Follow the global best practice and the U4E Policy Guides for energy-efficient lighting and air conditioners on safe disposal of discarded and end-of-life lighting products and air conditioners from the pilot demonstration projects and other energy efficiency implementation under the project</li> <li>Coordinate with relevant government agencies to initiate dialogue on establishment of policy and legal frameworks for electronic waste and hazardous waste management to ensure safe disposal of discarded and end-of-life lamps and appliances in a long-term.</li> </ul>	Throughout the project UN Environment/ EECD/ Steering Committee
7	Project partners withdraw co-financing support for the project.	Financial and Institutional	Low	All project components and all outputs	<ul style="list-style-type: none"> <li>Secure signed co-finance letters prior to project implementation</li> <li>Ensure visibility and recognition of project partners throughout the project period through implementation of relevant activities (e.g., communication and awareness, training and workshops)</li> </ul>	Throughout the project UN Environment/ EECD/ Steering Committee

**A.6. Institutional Arrangement and Coordination.** Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

Institutional Arrangements (refer to Annex H for more details)

The project is funded by the Global Environment Facility (GEF), with co-finance from the Ministry of Industry (MOI), Government of Myanmar, UN Environment, the Global Efficient Lighting Center, the International Institute for Energy Conservation (IIEC), the International Copper Association (ICA), Daikin and the Small & Medium Industrial Development Bank (SMIDB).

UN Environment will be acting as the GEF Implementing Agency and will be responsible for the following:

- Ensure timely disbursement/sub-allotment to executing agency, based on agreed legal document and in accordance with UN Environment and GEF fiduciary standards;
- Follow-up with Executing Agency for progress, equipment, financial and audit reports;

- Provide consistent and regular oversight on project execution and conduct project supervisory missions as per Supervision Plans and in doing so ensures that all UN Environment and GEF criteria, rules and regulations are adhered to by project partners;
- Technically assess and oversee quality of project outputs, products and deliverables – including formal publications;
- Provide non-objection to main TORs and subcontracts issued by the project, including selection of Project Manager or equivalent;
- Attend and facilitate inception workshops, field visits where relevant, and steering committee meetings;
- Assess project risks, and monitor and enforce a risk management plan;
- Regularly monitor project progress and performance and rates progress towards meeting project objectives, project execution progress, quality of project monitoring and evaluation, and risk;
- Monitor reporting by project executing partners and provides prompt feedback on the contents of the report;
- Promptly informs management of any significant risks or project problems and takes action and follows up on decisions made;
- Apply adaptive management principles to the supervision of the project;
- Review of reporting, checking for consistency between execution activities and expenditures, ensuring that it respects GEF rules;
- Clearance of cash requests, and authorization of disbursements once reporting found to be complete;
- Approve budget revision, certify fund availability and transfer funds;
- Ensure that GEF and UN Environment quality standards are applied consistently to all projects, including branding and safeguards;
- Certify project operational completion;
- Link the project partners to any events organized by GEF and UN Environment to disseminate information on project results and lessons;
- Manage relations with GEF.

The Energy Efficiency and Conservation Division (EECD) under the Ministry of Industry (MOI) will be the lead Executing Agency and will be responsible for the following:

- Ensure technical execution according to the execution plan laid out in the project document;
- Ensure technical quality of products, outputs and deliverables;
- Ensure compilation and submission of progress, financial and audit reporting to IA;
- Submission of budget revisions to IA for approval;
- Addressing and rectifying any issues or inconsistencies raised by the IA;
- Bringing issues raised by or associated with clients to the IA for resolution;
- Facilitating Steering Committees and other oversight bodies of the project;
- Day to day oversight of project execution;
- Submit all technical reports and completion reports to IA (realized outputs, inventories, verification of co-finance, terminal reporting, etc.)
- Proper achievement of the objectives of the Project;
- Monitoring and evaluation of the project outputs and outcomes;
- Effective use of both international and national resources allocated to it;
- Timely availability of financing to support project execution;
- Proper coordination among all project stakeholders; in particular national parties;
- Timely submission of all project reports, including work plans and financial reports.

The main project bodies are the following (refer to Annex H for more details):

A *Project Management Unit (PMU)* will also be established under EECD to manage day-to-day operation of the project.

A *Project Steering Committee (PSC)* will be established to provide overall guidance and oversee the progress and performance of the project as well as to enhance and optimize the coordination and contribution with various project partners.

A *Technical Committee (TC)* will also be established to facilitate relevant technical discussions during the project implementation. TC will support PMU to establish a Technical Working Group (TWG) to work on a specific technical matter as needed, such as technical issues related to testing of lighting and appliances, establishment of performance metrics, and implementation of MVE activities. TWG's members are invited representatives from international project partners, relevant government agencies/authorities, power distribution utilities, private sector (manufacturer, importers/distributors, retailers, designers and contractors) as well as consumer organizations, universities/institutes and NGOs. More details on coordination among UN Environment, EECD and other project partners for project implementation are provided in Annex H: Project Implementation Arrangements.

The project will work closely with other GEF projects in Myanmar, specifically the Improvement of Industrial Energy Efficiency project which is being implemented by UNIDO and MOI to promote sustained GHG emissions reduction in the Myanmar industry by improving policy and regulatory frameworks and institutional capacity building for industrial EE and the implementation of energy management systems, based on ISO 50001, EnMS and optimization of energy systems in industry. While the ongoing UNIDO/GEF project does not target the residential and commercial sector which are the primary target end-use sector of this project, relevant lessons learned pertaining to development of regulatory frameworks, awareness campaigns and institutional capacity building will be cultivated to support the project implementation. The project will also seek synergy with the UN Environment/GEF project, entitled "Development of Minamata Initial Assessment and National Action Plan for Artisanal and Small Scale Gold Mining in Myanmar" on the environmental sound management of lamp wastes containing mercury. In addition, the project through EECD will continue collaborating with the ASEAN SHINE program co-implemented by UN Environment and ACE in supporting energy efficient market transformation for room air-conditioners and lighting through harmonization of testing standards and adoption of harmonized MEPS.

#### Coordination with other initiatives

##### **Australia's MVE project and [lites.asia](#)**

The project will build-upon and utilize resources developed under the Australian Government funded and en.lighten initiative's Southeast Asia and the Pacific Monitoring, Verification and Enforcement Project. This project helped countries improve energy efficiency, reduce electrical demand, and lower greenhouse gas emissions across Asia and the Pacific. Efforts of the project focused on monitoring, verification and enforcement (MVE) activities of lighting products and increasing compliance, which are essential parts of ensuring a sustainable transition to efficient lighting. Similarly, the project will also utilize the tools and resources developed under [lites.asia](#) which operated between 2009 and 2017. Lites.asia acted as network of lighting stakeholders in Asia in order to improve knowledge on lighting standards in force and enhance capacities for compliance in standards and labeling in the region. Some of the resources and tools developed under both projects include the following:

- Six en.lighten Guides on Monitoring, Verification, and Enforcement for Energy Efficient Lighting, including:
  - Developing Lighting Product Registration Systems
  - Efficient Lighting Market Baselines and Assessment
  - Enforcing Efficient Lighting Regulations
  - Good Practices for Photometric Laboratories

- Performance Testing of Lighting Products
- Product Selection and Procurement for Lamp Performance Testing
- ASEAN Regional Efficient Lighting Market Assessment
- Policy Analysis Model for ASEAN (PAMA) which was developed to project lamp stocks and shipments in each ASEAN member states up to 2030.

**A.7 Benefits.** Describe the socioeconomic benefits to be delivered by the project at the national and local levels. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF)?

The proposed project aims to provide socioeconomic benefits at the national and local level. Proliferation of power shortages and black-out in Myanmar has been the serious concerns for the Myanmar Government and local stakeholders in meeting its economic development targets. While developing additional power generation capacity and connecting more households to the electricity grid are important, construction of new power plants is the major financial burden for the country, and the lead time can be several years. Transition to energy efficient lighting and cooling is one of the cost-effective and the quickest solutions to reduce peak power demand, and maximize the existing generation capacity. Transformation of lighting and appliance markets in Myanmar to energy efficient markets will maximize the use of existing electricity generation capacity without having to build excessive new generation and distribution facilities. The project will also deliver economic productivity benefits to all Myanmar citizens as, in addition to energy efficiency, the MEPS and labeling program will ensure high levels of product quality for better lighting and cooling services. Energy savings coupled with better service qualities will improve living and working environment, quality of life and also social well-being as a whole.

In addition to the socioeconomic benefits, the technology offers great potential to avoid CO<sub>2</sub> emissions from direct fossil fuel burning for electricity generation. Environmentally sound management of hazardous wastes from discarded and end-of-life lighting products and air conditioners will significantly reduce the risk of mercury contamination and other hazardous substances for all citizens as well as global warming potential from refrigerant gasses. This project will support the country to establish an integrated waste management system that could as the foundation for management of other types of wastes. Moreover, there is an important reduction of mercury emissions related to the energy savings.

**A.8 Knowledge Management.** Elaborate on the knowledge management approach for the project, including, if any, plans for the project to learn from other relevant projects and initiatives (e.g. participate in trainings, conferences, stakeholder exchanges, virtual networks, project twinning) and plans for the project to assess and document in a user-friendly form (e.g. lessons learned briefs, engaging websites, guidebooks based on experience) and share these experiences and expertise (e.g. participate in community of practices, organize seminars, trainings and conferences) with relevant stakeholders.

Capacity building is the core element in the proposed implementation approach for each project component. The knowledge gained from implementation of various project activities such as the nationwide household appliance saturation surveys, design and development of MEPS and labeling schemes, design and implementation of communication and awareness campaigns, design and implementation of energy efficiency pilot demonstration projects, will be properly documented and integrated into the capacity building programs for local government agencies/authorities and private sector stakeholders. Although energy efficiency is relative new in Myanmar, a number of successful implementation case studies and lessons learned on energy efficiency, specifically on MEPS

and labeling, are available from neighboring countries (e.g., China and Thailand) and elsewhere, and learning from these relevant knowledges is integrated in the project activities and implementation plan. In addition, all relevant documents developed by U4E (such as the U4E Policy Guide series) and best practices guidelines developed by other institutions will be assessed and referenced as appropriate in the project implementation.

During the development process of the MEPS and labeling program, the project will develop two database systems for compilation of the nationwide household appliance saturation survey results, and for registration of lighting products and appliances certified by the MEPS and labeling program in Myanmar. These database systems will be developed as the online database platforms with different layers of accessibility and management by concerned stakeholders and general public. Development of the database systems will be undertaken the PMU in collaboration the National Statistic Office, the Ministry of Commerce and the Customs Department, and this will enable sharing of experiences and expertise with relevant stakeholders. Moreover, sharing of knowledge will also be undertaken through regular meetings organized by the PMU for the Project Board, Steering Committee and other stakeholders.

Project outputs and materials produced by GEF incremental activities and in-kind contributions from project partners, such as results of the pilot demonstration projects and M&V approaches will be compiled and disseminated through the project website which will be established as part of in-kind contribution from EECD. Ongoing cooperation with ASEAN member countries and other international initiatives on energy efficiency by EECD will also serve as the platform for the project share and exchange these knowledge materials international energy efficiency communities.

## **B. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH NATIONAL PRIORITIES:**

Describe the consistency of the project with national strategies and plans or reports and assessments under relevant conventions such as NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.:

As a non-annex I party, the Initial National Communication (INC) for Myanmar submitted to the UNFCCC in 2012 clearly identifies energy efficiency as a critical path to reduce CO<sub>2</sub> emissions from the energy sector. The proposed project is also in line with the National Energy Efficiency and Conservation Policy, Strategy and Roadmap for Myanmar approved by the cabinet in 2016. Strong alignment of the project with the national priorities are briefly described below:

- **Initial National Communication (2012):** INC has identified that energy conservation, efficiency and production and ensure energy security as the key policy measures for integration into the national and sectoral development plans and programs. The following mitigation measures are highlighted:
  - Set energy efficiency standards and label efficiency grades on products;
  - Provide advices, inspection, incentives for energy conservation and efficiency;
  - Capture fugitive gaseous emissions;
  - Develop voluntary agreements for increased use of energy efficient products;
  - Invest more for and promote the use of cleaner and zero-emission energies;
  - Construct more hydropower facilities where EIA permits;
  - Upgrade existing power-generation and transmission systems;

- Extract coal-bed methane;
  - Promote bio-energy production from available sources without compromising food security and viability of forests and soils;
  - Further promote and expand CNG-used vehicles, CNG pipelines and stations;
  - Improve all transport modes and traffic demand management, including cycling and containerized freight transport;
  - Install more light-emitting diodes (LED) for traffic lighting.
- **National Energy Policy (2014):** The National Energy Policy aims to systematically explore the available energy resources in order to supply the demand of the country, so Myanmar formulate effective policy and programs in order to achieve sustainable energy supply and measures to minimize impacts on environment resulting from the energy resources exploration works. Thus, the national energy policy has identified energy policy, objective and work program relevant to energy efficiency and conservation. The following relevant work programs are set by the national energy management committee:
    - Promote efficient use of energy;
    - Policy to conduct awareness raising campaign and capacity building regarding energy efficiency and conservation programs;
    - Develop human resources in order to implement the energy efficiency and conservation program;
    - Formulate and implement laws, rules and regulations in order to implement contribution of energy by the way of efficient energy use and conservation counter acting the demand growth caused by social economic development;
    - Seek ways and means for the successful implementation of projects and program beneficial to a country by coordinating with regional and international organizations having experiences in energy efficiency program;
    - Formulate funding mechanism in order to successfully implement energy efficiency and conservation program.
  - **Myanmar's Intended Nationally Determined Contribution (2015):** INDC highlights that to realize a 20% electricity saving potential by 2030 of the total forecast electricity consumption, Myanmar has and will implement a number of climate change mitigation policies and strategies, including the National Energy Policy (2014), the National Energy Efficiency and Conservation Policy, Strategy and Roadmap for Myanmar (2016), the Long Term Energy Master Plan (draft) and the National Electricity Master Plan (draft). Implementation of these policies and strategies will not only make the mitigation contributions feasible, but also help to identify other mitigation actions for future implementation.
  - **National Energy Efficiency and Conservation Policy, Strategy and Roadmap for Myanmar (2016):** The roadmap has recommended implementation of a nationwide MEPS and energy labeling strategy for the residential covering urban and rural households. The objective of the strategy is to reduce household energy costs through energy performance standards for appliances, and the following activities have been proposed:
    - Introduce EE performance standards and labeling for appliances;

- Testing and certification facilities for appliances;
- Introduction of incentives for EE equipment;
- Phasing out of inefficient appliances from the market;
- Promote efficient biomass cook stoves.

A preliminary Technology Needs Assessment (TNA) was completed by Ministry of Environmental Conservation and Forestry (MOECF) as part of the preparation of the INC. There is a clear need for the transfer of Environmentally Sound Technologies (ESTs) such as renewable energy and energy efficiency technologies for mitigation technology. Myanmar's technology development and transfer needs also include technologies and skills transfer which support the implementation and operation of ESTs such as those that ensure the operation, repair and maintenance of ESTs. The understanding of technology development and transfer needs in Myanmar is still developing and an additional TNA should be completed with international support to better understand these requirements.

The UN is developing the first United Nations Development Assistance Framework (UNDAF) 2018-2022 in Myanmar. UNDAF outcomes are framed around the five 'P's of the Sustainable Development Goals – people, prosperity, planet, peace and partnerships – and reflect national priorities. The proposed GEF project can directly contribute to SDG Goal 7: “Affordable and clean energy- Ensure access to affordable, reliable, sustainable and modern energy for all”. Indirectly, the expanded use of more efficient lighting and air-conditioners in residential and commercial sectors can help strengthen achievements under “Goal 11: Sustainable cities and communities - Make cities inclusive, safe, resilient and sustainable” and “Goal 12: Responsible consumption, production - Ensure sustainable consumption and production patterns”. Finally, the project, given its explicit gender-related outputs can also be one way to achieve “Goal 5: Gender equality - Achieve gender equality and empower all women and girls”.

### **C. DESCRIBE THE BUDGETED M&E PLAN:**

M&E activities and related costs are presented in the costed M&E Plan (Annex G) and are fully integrated in the overall project budget.

The project will comply with the UN Environment standard monitoring, reporting and evaluation procedures. Reporting requirements and templates are an integral part of the UN Environment legal instrument to be signed by the Executing Agency and UN Environment.

The project M&E plan is consistent with the GEF Monitoring and Evaluation policy. The Project Results Framework presented in Annex A includes SMART indicators for each expected outcome as well as mid-term and end-of-project targets. These indicators along with the key deliverables and benchmarks included in Annex I will be the main tools for assessing project implementation progress and whether project results are being achieved. The means of verification and the costs associated with obtaining the information to track the indicators are summarized in Annex A. Other M&E related costs are also presented in the Costed M&E plan (Annex G) and are fully integrated in the overall project budget.

The M&E plan will be reviewed and revised as necessary during the Inception Workshop (IW) to ensure project stakeholders understand their roles and responsibilities vis-à-vis project monitoring and evaluation. Indicators and their means of verification may also be fine-tuned at the IW. General project monitoring is the responsibility of the Project Management Unit but other project partners will have responsibilities to collect specific information to track the indicators. It is the responsibility of the Project Manager to inform UN Environment of any delays or difficulties



faced during implementation so that the appropriate support or corrective measures can be adopted in a timely fashion.

The project Steering Committee will receive periodic reports on progress and will make recommendations to UN Environment concerning the need to revise any aspects of the Results Framework or the M&E Plan. Project oversight to ensure that the project meets UN Environment and GEF policies and procedures is the responsibility of the UN Environment Task Manager. The Task Manager will also review the quality of draft project outputs, provide feedback to the project partners, and establish peer review procedures to ensure adequate quality of scientific and technical outputs and publications.

Project supervision will take an adaptive management approach. The Task Manager will develop a project supervision plan at the inception of the project, which will be communicated to the Project Management Unit and other partners during the IW. The emphasis of the Task Manager supervision will be on outcome monitoring but without neglecting project financial management and implementation monitoring.

Progress vis-à-vis delivering the agreed project global environmental benefits will be assessed with the Steering Committee at agreed intervals. Project risks and assumptions will be regularly monitored by the Project Management Unit, the project partners and UN Environment. Risk assessment and rating is an integral part of the Project Implementation Review (PIR). The PIR will be completed by the Project Manager and ratings will be provided by UN Environment's Task Manager. The quality of project monitoring and evaluation will also be reviewed and rated as part of the PIR. UN Environment's Task Manager will have the responsibility of verifying the PIR and submitting it to the GEF. Key financial parameters will be monitored quarterly to ensure cost-effective use of financial resources.

In-line with UN Environment Evaluation Policy and the GEF's Monitoring and Evaluation Policy the project will be subject to a Terminal Evaluation (TE) commissioned by the UN Environment Evaluation Office. At mid-point of project implementation, the Task Manager will initiate a Mid-Term Review (MTR), or a Mid-Term Evaluation (MTE) if the project is rated as being at risk. The latter will be conducted by the UN Environment Evaluation Office (EOU).

Resources will be set aside for the Mid-Term Review (MTR) or Mid-Term Evaluation (MTE). The Task Manager will decide when the MTR/MTE shall be initiated. The purpose of the Mid-Term Review (MTR) or Mid-Term Evaluation (MTE) is to provide an independent assessment of project performance at mid-term, to analyze whether the project is on track, what problems and challenges the project is encountering, and which corrective actions are required so that the project can achieve its intended outcomes by project completion in the most efficient and sustainable way. The review will include all parameters recommended by the GEF Evaluation Office for Terminal Evaluations and will verify information gathered through the GEF tracking tools, as relevant. The review will be carried out using a participatory approach whereby parties that may benefit or be affected by the project will be consulted. Such parties were identified during the stakeholder analysis (see previous section A.3 and Annex H). Members of the project Steering Committee could be interviewed as part of the MTR/MTE process and the Project Management Unit will develop a management response to the evaluation recommendations along with an implementation plan. Results of the MTR/MTE will be presented to the Project Steering Committee. It is the responsibility of the UN Environment Task Manager to monitor whether the agreed recommendations are being implemented.

An independent Terminal Evaluation (TE) will take place at the end of project implementation. The EOU will be responsible for the Terminal Evaluation and will liaise with the Task Manager and Executing Agency throughout the process. The TE will provide an independent assessment of project performance (in terms of relevance, effectiveness and efficiency), and determine the likelihood of impact and sustainability. It will have two primary purposes: (i) to provide evidence of results to meet accountability requirements, and (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UN Environment, the GEF, executing

partners and other stakeholders. The direct costs of the evaluation will be charged against the project evaluation budget. The Terminal Evaluation will be initiated no earlier than 6 months prior to the operational completion of project activities and, if a follow-on phase of the project is envisaged, should be completed prior to completion of the project and the submission of the follow-on proposal. Terminal Evaluations must be initiated no later than 6 months after operational completion.

The draft TE report will be sent by the UN Environment Evaluation Office to project stakeholders for comments. Formal comments on the report will be shared by the Evaluation Office in an open and transparent manner. The project performance will be assessed against standard evaluation criteria using a six point rating scheme. The final determination of project ratings will be made by the Evaluation Office when the report is finalized and further reviewed by the GEF Independent Evaluation Office upon submission. The evaluation report will be publicly disclosed and may be followed by a recommendation compliance process. A review of the quality of the evaluation report will be done by EOU and submitted along with the report to the GEF Evaluation Office not later than 6 months after the completion of the evaluation.

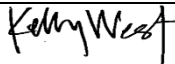
The GEF tracking tools are attached as Annex J-1. These will be updated at mid-term and at the end of the project and will be made available to the GEF Secretariat along with the project PIR report. As mentioned above the MTE and TE will verify the information of the tracking tool.

The direct costs of reviews and evaluations will be charged against the project evaluation budget. A summary of M&E activities envisaged is provided in Annex G. The GEF contribution for this project's M&E activities (including audits and evaluations) is US\$ 90,000.

### **PART III: CERTIFICATION BY GEF PARTNER AGENCY(IES)**

#### **GEF Agency(ies) certification**

**This request has been prepared in accordance with GEF policies<sup>24</sup> and procedures and meets the GEF criteria for CEO endorsement under GEF-6.**

<b>Agency Coordinator, Agency Name</b>	<b>Signature</b>	<b>Date (MM/dd/yyyy)</b>	<b>Project Contact Person</b>	<b>Telephone</b>	<b>Email Address</b>
Kelly West, Senior Programme Manager & Global Environment Facility Coordinator Corporate Services Division UN Environment		June 19, 2018	Ruth Coutto Task Manager Climate Mitigation Unit UN Environment	+33144371634	ruth.coutto@ un.org

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<sup>24</sup> GEF policies encompass all managed trust funds, namely: GEFTF, LDCF, SCCF and CBIT

## ANNEX A: PROJECT RESULTS FRAMEWORK

Project Objective	Objective level Indicators	Baseline	Targets and Monitoring Milestones	Means of Verification	Assumptions & Risks	UN Environment MTS reference*
To facilitate a market transformation toward high efficiency lighting and electrical appliances through the integrated policy approach, thereby reducing growth in electrical demand and greenhouse gas (GHG) emissions, while simultaneously increasing energy access	Indicator A: Increased share of high efficient lighting products and electrical appliances in Annual Sales	Baseline A: 2018: IL, CFL, LED Lamp, TFL, LED Tube: 9.6%, 46.6%, 7.6%, 34.5%, 1.8%  2022 (BAU): IL, CFL, LED Lamp, TFL, LED Tube: 9.6%, 35.7%, 18.4%, 27.2%, 9.1%  2018: Single-Speed RACs, Inverter-Type RACs: 90%, 10%  2022 (BAU): Single-Speed RACs, Inverter-Type RACs: 70%, 30%	Target A:  2022: IL, CFL, LED Lamp, TFL, LED Tube: 6.7%, 27.1%, 29.9%, 25.4%, 10.9%  2022: Single-Speed RACs, Inverter-Type RACs: 50%, 50%	<ul style="list-style-type: none"> <li>Official document issued by the MOI (Annual progress reports, Activities reports, M&amp;E documents)</li> <li>Official import statistics</li> <li>National statistics of lighting and target electrical appliances</li> <li>Market assessment report</li> <li>Nationwide saturation survey report</li> <li>Mid-term and terminal evaluation reports</li> </ul>	<u>Assumption</u> <ul style="list-style-type: none"> <li>Commitment and efficient collaboration of all the relevant ministries and national agencies to carry out the project activities</li> </ul> <u>Risks</u> <p>The following risks can be mitigated with the proposed mitigation measures:</p> <ul style="list-style-type: none"> <li>Policies might be recommended and reconciled but not implemented;</li> <li>Weak government support</li> <li>Delayed implementation of activities</li> <li>Low participation from the private sectors (lighting and target electrical appliance manufacturers, distributors and importer)</li> </ul>	Sub program 1: Climate Change Expected Accomplishment (b) – Output 2.b Indicator: (ii) Increased percentage of countries meeting energy efficiency standards in specific sectors, with support from UN Environment.
	Indicator B: Direct energy savings and GHG emission reductions (cumulative, EOP)	Baseline B: 0 GWh 0 tCO <sub>2</sub> e	Target B: Direct energy saving: 205,568 MWh  Direct GHG emission reduction: 292,174 tCO <sub>2</sub> <sup>25</sup> (Standards & Labeling components: 291,256 tCO <sub>2</sub> , Demonstration & Diffusion components: 918 tCO <sub>2</sub> )  Indirect savings: 491,238 tCO <sub>2</sub>			

<sup>25</sup> This figure represents 50% of the Direct GHG emission reductions calculated in Annex J-2. Indeed, as agreed with the GEF Secretariat, the Direct benefits to be attributable to a child project under the “Leapfrogging markets to high efficiency products (appliances, including lighting and electrical equipment)” Program shall represent 50% of the project’s estimated Direct GHG emission reductions.

## COMPONENT 1: MINIMUM ENERGY PERFORMANCE STANDARD (MEPS) AND LABELING

Project Outcome	Outcome Indicators	Baseline	Targets and Monitoring Milestones	Means of Verification	Assumptions & Risks	MTS Expected Accomplishment
1. Adoption by government of MEPS and label requirements	Indicator 1: Number of MEPS programs for lighting products and appliances adopted	Baseline 1: 0 (No MEPS)	Target 1: 3 (MEPS for fluorescent tube lamps, screw-based light bulbs and room air-conditioners, conditional on approval of the EE&C Law)	<ul style="list-style-type: none"> <li>Official government journals, publications, documents and news bulletins issued by MOI and the national standard body</li> <li>Project mid-term and terminal evaluation reports</li> </ul>	<p>The following risks can be mitigated with the proposed mitigation measures:</p> <ul style="list-style-type: none"> <li>Policies might be recommended and reconciled but not implemented;</li> <li>Delayed implementation of baseline activities including relevant legal frameworks</li> </ul>	Expected Accomplishment (EA) 2: Low emission growth
	Indicator 2: Number of labeling programs for lighting products and appliances adopted	Baseline 2: 0 (No labeling program)	Target 2: 3 (Voluntary labeling programs for fluorescent tube lamps, screw-based light bulbs and room air-conditioners)			

## COMPONENT 2: MARKET MONITORING, VERIFICATION AND ENFORCEMENT

Project Outcome	Outcome Indicators	Baseline	Targets and Monitoring Milestones	Means of Verification	Assumptions & Risks	MTS Expected Accomplishment
2. Strengthened national systems to implement market monitoring, verification and enforcement activities	Indicator 3: Number of regulatory documents to support implementation of monitoring, verification and enforcement (MVE) activities approved	Baseline 3: 0 (Implementation of MVE activities will be based on the existing regulatory frameworks)	Target 3: 3 regulatory documents and guidelines approved: - a by-law on compliance with MEPS and labeling program, developed and adopted (conditional on approval of the EE&C law); - a response strategy for non-compliance; - guidelines and procedures for implementation of MVE activities	<ul style="list-style-type: none"> <li>Official government journals, publications, documents and news bulletins issued by MOI, MOC and Customs Department</li> <li>Project mid-term and terminal evaluation reports</li> <li>Activities reports</li> <li>M&amp;E report of the program</li> <li>Regulatory documents</li> <li>Agreement documents</li> <li>Compliance report</li> </ul>	<p>The following risks can be mitigated with the proposed mitigation measures:</p> <ul style="list-style-type: none"> <li>Policies might be recommended and reconciled but not implemented</li> <li>Delayed implementation of activities</li> <li>High demand on illegal crossing of low efficient products</li> </ul>	Expected Accomplishment (EA) 2: Low emission growth
	Indicator 4: Number of agreements and compliance reports to support implementation of MVE activities	Baseline 4: 0 (No)	Target 4: 2 agreements including: - an agreement established among EECD and other responsible agencies to implement MVE activities for MEPS and labeling programs - an agreement with 3 <sup>rd</sup> party accredited testing facilities to support MVE activities 1 compliance report			

### COMPONENT 3: AWARENESS RAISING AND DEMONSTRATION PROJECTS

Project Outcome	Outcome Indicators	Baseline	Targets and Monitoring Milestones	Means of Verification	Assumptions & Risks	MTS Expected Accomplishment
3. Government actions for an increased awareness, availability and use of efficient lighting products and appliances are in place	Indicator 5: % of residential and commercial consumer interested to purchase energy efficient lighting products and electrical appliances	Baseline 5: Baseline to be determined as part of the awareness raising activity.	Target 5: At least 30% increase in consumer interest to purchase energy efficient lighting products and electrical appliances	<ul style="list-style-type: none"> <li>Project activity report</li> <li>M&amp;E report of the program</li> <li>Reports of M&amp;V of each project and lessons learned</li> <li>Nationwide appliance saturation survey report</li> <li>Interview with retailers and distributors of lighting and appliances</li> <li>Evaluation report of communication campaign</li> <li>Report of pilot demonstration projects</li> <li>Financial mechanism recommendation report</li> <li>Project stakeholder agreement to adopt a recommended financial mechanism</li> </ul>	<u>Risks</u> The following risks can be mitigated with the proposed mitigation measures: <ul style="list-style-type: none"> <li>Policies might be recommended and reconciled but not implemented;</li> <li>Delayed implementation of activities</li> <li>Low participation from the private sectors (lighting and target electrical appliance manufacturers, distributors and importer)</li> </ul>	Expected Accomplishment (EA) 2: Low emission growth
	Indicator 6: Increase in the number of Male & Female beneficiaries that are employed through implementation of MEPS and labeling and pilot demonstration projects	Baseline 6: 0 (No)	Target 6: 20 Male and 20 Female employed by government and private sector (through implementation of project activities (market survey, MEPS and labeling program, awareness programs, pilot demonstration projects, etc.)			
	Indicator 7: # of financial mechanisms recommended for lighting products and appliances as a result of the learning of the pilot demonstration adopted by a project stakeholder (i.e. bank, ESCO, utility, etc.)	Baseline 7: 0 (No financial mechanism)	Target 7: At least 1 financial mechanism adopted by a project stakeholder			

## ANNEX B: RESPONSES TO PROJECT REVIEWS

### Scientific and Technical Advisory Panel

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The Scientific and Technical Advisory Panel, administered by UN Environment, advises the Global Environment Facility (Version 5)

#### STAP Scientific and Technical screening of the Project Identification Form (PIF)

Date of screening: May 07, 2016  
Screener: Thomas Hammond  
Panel member validation by: Ralph E. Sims  
Consultant(s):

##### I. PIF Information (Copied from the PIF)

**Full Size Project**      **GEF Trust Fund**

**GEF Project ID:** 9436

**Project Duration:** 5.5

**Countries:** Global (Chile, Indonesia, Myanmar, Tunisia, South Africa)

**Project Title:** Leapfrogging Markets to High Efficiency Products

(Appliances, including Lighting, and Electrical Equipment)

(PFD Resubmission of #9083)

**GEF Agencies:** UN Environment, DBSA and UNDP

**Other Executing Partners:**

**GEF Focal Area:** Climate Change

##### II. STAP Advisory Response (see table below for explanation)

Based on this PIF screening, STAP's advisory response to the GEF Secretariat and GEF Agency(ies):

**Concur**

##### III. Further guidance from STAP

1. The project aim is to increase the uptake of more efficient lighting and appliances in a number of countries by market transformation and building on an earlier UN Environment SE4All project. Substantial private sector support is evident. This is a well formulated project proposal with few comments needed.

**UN Environment Response:** Noted.

2. Gaining success and harmonization by targeting nine specific countries and a wide range of others should prove to be a beneficial approach. Training of trainers is a key component. National and non-national child projects are planned. However, it is not clear how the city level child projects (assuming that is what is meant here by "non-national") will be selected? Will there be only one per nation? Discussion on the non-national child projects does not appear in section 9 so it is not exactly clear what is intended for this initiative. Or perhaps the term "non-national" here implies global as in "Global child project".

**UN Environment Response:** The term "non-national child project" was to refer to 15 partner countries that will receive in-region training, however do not have a GEF national project (child project). The wording has been updated to "15 additional partner projects".



2. If so, then it is certainly confusing for the reader not to stick to using the same terminology throughout the proposal.

**UN Environment Response:** Noted. Terms and wording has been defined at the start and now consistent throughout.

3. The MEPS approach has been well tested in many countries and is sound as is labeling but educating the public as is proposed is key. Not only the public but more important are retail sales staff who frequently turn over so continual updating is required. Surveys elsewhere have shown it to be a weak link in the process when the retailers fail to understand the reason for the labels.

**UN Environment Response:** Noted. This topic has been raised in the Expert Taskforces under the SEforALL Global Project and included in the policy recommendation to countries. It will be in supporting policies alongside labels and consumer campaigns.

4. It is not easy to assess GHG emission reductions in a project like this as there are wide variations and uncertainties. Hence the wide range of 69-150 Mt CO<sub>2</sub> is understandable. Taking refrigerators, air conditioners and transformers as examples is OK but of course, a very simplified approach. It is assumed different emission factors where used for electricity grids in each of the participating countries. But are all the appliances in the project assumed to be electrical? What about LPG stoves or water heaters for example? And domestic cook stoves? Are these all included? More robust calculations should be provided for child projects. The revised GHG manual and guidelines could be considered: <https://www.thegef.org/gef/ghg-accounting>.

**UN Environment Response:** The GHG estimates have been recalculated and prepared using an updated methodology, which is described in section A.1.5) of the “Global Project to leapfrog markets to energy efficient lighting, appliances and equipment” (GEF ID 9337). The national projects conduct a more detailed analysis that takes into account the specific products included in the national project, emission factor and local circumstances (weather, behavioral differences, etc.). The project focuses on on-grid lighting, appliances and equipment. LPG stoves and water heaters are not part of the focus of the project.

5. Due to the complexity, consideration should be given to the Programme Steering Committee meeting more regularly than the proposed once a year at least in the initial stages.

**UN Environment Response:** Agreed. The number of meetings of the project steering committee has been increased to 6.



**GEF-6 GEF SECRETARIAT REVIEW FOR PROGRAMMATIC FRAMEWORK DOCUMENT\* THE  
GEF/LDCF/SCCF TRUST FUNDS**

GEF ID:	<b>9436</b>		
Country/Region:	<b>Global (Chile, Costa Rica, Indonesia, Kazakhstan, Myanmar, Sudan, Tunisia, South Africa)</b>		
Program Title:	<b>Leapfrogging Markets to High Efficiency Products (Appliances, including Lighting, and Electrical Equipment) (Resubmission of #9083)</b>		
GEF Agency:	<b>UNEP, DBSA and UNDP</b>	GEF Agency Project ID:	
Type of Trust Fund:	<b>GEF Trust Fund</b>	GEF Focal Area (s):	<b>Climate Change</b>
GEF-6 Focal Area/ LDCF/SCCF Objective (s):	<b>CCM-1 Program 1;</b>		
Anticipated Financing PPG:		Program Grant:	<b>\$30,362,753</b>
Co-financing:	<b>\$149,941,000</b>	Total Program Cost:	<b>\$180,303,753</b>
PIF Approval:		Council Approval/Expected:	
Program Manager:	<b>David Elrie Rodgers</b>	Agency Contact Person:	

<b>Review Criteria</b>	<b>Questions</b>	<b>Secretariat Comments</b>	<b>Agency Response</b>
<b>Program Consistency</b>	1. Is the program aligned with the relevant GEF strategic objectives and results framework? <sup>1</sup>	DER, March 21, 2016. Yes. This program is a re-submission of PFD #9083 which has been approved by Council. The program is fully aligned with GEF-6 focal area objectives. The PFD is being re-submitted to add additional child projects.	

<sup>1</sup> For BD projects: has the project explicitly articulated which Aichi Target(s) the project will help achieve and are SMART indicators identified, that will be used to track the project's contribution toward achieving the Aichi Target(s)?

	2. Is the description of the baseline scenario reliable, and based on sound data and assumptions? Are the activities that will be financed using GEF/LDCF/SCCF funding based on incremental/ additional reasoning?	DER, March 21, 2016. Yes. This program is a re-submission of PFD #9083 which has been approved by Council. The program is fully aligned with GEF-6 focal area objectives. The PFD is being re-submitted to add additional child projects. The following new child projects are being submitted: Chile; Indonesia; Myanmar; Tunisia; and South Africa	
<b>Program Design</b>	3. Is the program framework (Table B) sound and sufficiently clear and appropriate to achieve program objectives and the GEBs?	<p>DER, March 21, 2016. This program is a re-submission of PFD #9083 which has been approved by Council. Table B reflects the inclusion of additional child projects.</p> <p>Please address the following comments:</p> <p>1) Please clarify if any of the project components have changed since the submission of the first PFD, and if so, please explain.</p> <p>2) Based on the large number of child projects, please provide a one-page summary table those shows each child project, including the global project; the responsible agency; the funding amounts; and a very brief summary of the top priorities for the child project, including which appliances or technologies will be the focus.</p> <p>3) For Indonesia, please justify why two agencies will be implementing the project. Please describe the division of labor and responsibilities of the UNDP and UNEP in the child project.</p> <p>4) For South Africa, please justify why two agencies will be implementing the project. Please more fully describe the division of labor and responsibilities of</p>	<p>1. The components have remained the same.</p> <p>2. Please see Annex I below for our response to this comment.</p> <p>3. The project was submitted with two GEF agencies due to the complementary strengths of both agencies. UNEP, with its en.lighten initiative, has strong technical capacities and experience in implementing national projects to develop the policy framework for energy efficient lighting. While UNDP has the experience and country presence in Indonesia to work with local industry and development of demonstration projects and financial mechanisms. Therefore it has been</p>

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		<p>the UNDP and DBSA in the child project. The GEB estimate on page 19 appears to be consistent with the first PFD submission, which only included 3 child projects. Please clarify if the in the PFD should be updated as the GHG figure matches the figure on page 18 for all eight child projects.</p> <p>6) Please indicate if PPGs will be requested for the child projects and if those requests will come before or after June 2016</p>	<p>agreed that UNDP will implement Component 1 (Support to local industry) and 2 (High efficiency lighting technology penetration), while UNEP will implement Component 2 (policy framework). UNDP will be the lead agency and receive the PPG.</p> <p>4. The project was submitted with two GEF agencies due to the complementary strengths of both agencies. UNDP and DBSA will be jointly implementing the project so that South Africa benefits from the complementary strengths of both institutions:</p> <ul style="list-style-type: none"> <li>• UNDP's proven experience with supporting countries to establish Energy Efficiency policies, including its experience in South Africa for the implementation of the GEF-financed project "Market transformation through energy efficiency standards and labeling of appliances in South Africa". UNDP is therefore best positioned to lead the implementation of the policy components of the project (Components 1, 2, 3 and 5) building on the experiences/lessons-learned from previous energy efficiency projects.</li> <li>• DBSA's proven experience with establishing and managing financial mechanisms (including South Africa's Green Fund) and implementing investment projects.</li> </ul>
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		<p>DBSA is therefore uniquely positioned to lead the development of a financial mechanism and support to local industry (Component 4).</p> <p>5. The CO2 emissions were already updated for the child project, previously they were 1,530,245 tons with 3 child projects and now they are 10,158,095 tons with 8 child projects. The text in table incorrectly stated "only 3 child country projects" this has now been updated to "only 8 child country projects".</p> <p>6. PPG requests will be submitted to all 5 child projects before June 2016.</p>
	4. Are socio-economic aspects, including relevant gender elements, indigenous people, and CSOs considered?	DER, March 21, 2016. Yes.
	5. Does the program take into account potential major risks, including the consequences of climate change, and describes sufficient risk response measures? (e.g., measures to enhance climate resilience)	DER, March 21, 2016. Yes
	6. If there is a non-grant instrument in the program, is the GEF Agency(ies) capable of managing it?	DER, March 21, 2016. NA

7. Is the program coordinated with other related initiatives and national/regional plans in the country or in the region?	DER, March 21, 2016. Yes. Please ensure that child projects are developed in coordination with countries INDCs.	
8. Is the program implementation/execution arrangement adequate?	DER, March 21, 2016. As there are many agencies involved in this program, please explicate the responsibilities for submission of PPGs, CEO endorsements, tracking tools, PIRs, and other GEF required reports.	Please see Annex II below for our response to this comment.
9. Does the program include a budgeted M&E Plan that monitors and measures results with indicators and targets?	DER, March 21, 2016. Yes.	
10. Does the program have description of knowledge management plan?	DER, March 21, 2016. Yes.	

<b>Resource Availability</b>	11. Is the proposed Grant (including the Agency fee) within the resources available from (mark all that apply):		
	<input type="checkbox"/> the STAR allocation?  <input type="checkbox"/> the focal area allocation?	<p>DER, March 21, 2016. Yes. This program is a re-submission of PFD #9083 which has been approved by Council. The program is fully aligned with GEF-6 focal area objectives. The PFD is being re-submitted to add additional child projects. The following new child projects are being submitted: Chile; Indonesia; Myanmar; Tunisia; and South Africa.</p> <p>STAR Allocation and CCM allocation for the five new child projects is sufficient to cover the amount requested.</p> <p>DER, March 21, 2016. Yes. This program is a re-submission of PFD #9083 which</p>	

		has been approved by Council. The program is fully aligned with GEF-6 focal area objectives. The PFD is being re-submitted to add additional child projects. The following new child projects are being submitted: Chile; Indonesia; Myanmar; Tunisia; and South Africa.	
		<p>STAR Allocation and CCM allocation for the five new child projects is sufficient to cover the amount requested: Chile has \$6.4 million CCM STAR allocation remaining; the requested child project is within that amount.</p> <p>Indonesia has \$14 million CCM STAR allocation remaining; the requested child project is within that amount.</p> <p>Myanmar has \$14.9 million CCM STAR allocation remaining; the requested child project is within that amount.</p> <p>Tunisia has \$2.6 million CCM STAR allocation remaining; the requested child project is within that amount and will consume all remaining CCM resources.</p> <p>South Africa has \$12.7 million CCM STAR allocation remaining; the requested child project is within that amount, leaving a balance of approximately \$1 million.</p>	
	<input type="checkbox"/> the LDCF under the principle of equitable access?	NA	

	<input type="checkbox"/> the SCCF (Adaptation or Technology Transfer)?	NA	
	<input type="checkbox"/> focal area set-aside?	NA	
<b>Secretariat Recommendation</b>			
<b>PFD Clearance</b>	<b>Is the PFD recommended for clearance to include in the work program?</b>	DER, March 21, 2016. not at this time. Please address the comments in boxes 3 and 8.	
<b>Review Date (s)</b>	Review*	March 21, 2016	
	Additional Review (as necessary)		
	Additional Review (as necessary)		

\* This is the first time the Program Manager provides full comments for the program. Subsequent follow-up reviews should be recorded. For specific comments for each section, please insert a date after comments.

#### Annex I – Response to Comment on box 3:

### Child Projects under the Leapfrogging markets to high efficiency products (appliances, including lighting, and electrical equipment)

Country (GEF agency)	Product(s) of focus	Project Cost (US\$)	Top priorities
Global (UNEP)	Lighting, appliances and equipment	3,100,000	<ul style="list-style-type: none"> <li>Development of tools and resources to support country officials in implementing projects on energy efficient appliances and equipment.</li> <li>Providing training to 10 child project countries and 15 non-child project countries.</li> <li>Holding of outreach events in order to increase the number of countries and companies committing to advance energy efficient</li> </ul>
Costa Rica (UNEP)	Lighting, air conditioners and refrigerators	2,000,000	<ul style="list-style-type: none"> <li>Demonstration projects with energy efficient appliances in public institutions.</li> <li>Training and information program for market actors on the country's obligations to procure efficient appliances.</li> <li>Establishment of a revolving loan fund for the financing of large-scale replacement programs in the public sector.</li> </ul>
Sudan (UNDP)	Lighting and air conditioners	1,770,000	<ul style="list-style-type: none"> <li>Development of a national strategy to advance energy efficiency as part of the National Energy Efficiency Action plan (NEEAP)</li> <li>Development of the policy framework with minimum energy performance standards (MEPS); monitoring, verification, and enforcement (MVE) system; supporting policies; and environmentally sound management.</li> </ul>

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<b>Kazakhstan (UNDP)</b>	Domestic appliances (except lighting)	3,500,000	<ul style="list-style-type: none"> <li>Development of the policy framework with minimum energy performance standards (MEPS); monitoring, verification, and enforcement (MVE) system; supporting policies; and environmentally sound management. Boosting demand for energy efficient appliances and equipment</li> </ul>
<b>Myanmar (UNEP)</b>	Lighting and appliances	2,223,578	<ul style="list-style-type: none"> <li>Development of the policy framework with minimum energy performance standards (MEPS); monitoring, verification, and enforcement (MVE) system; supporting policies; and environmentally sound management.</li> </ul>
<b>Indonesia (UNEP, UNDP)</b>	Lighting	3,895,873	<ul style="list-style-type: none"> <li>Support to local lighting industry to improve the efficiency of lamps and ballasts</li> <li>Development of the policy framework with minimum energy performance standards (MEPS); monitoring, verification, and enforcement (MVE) system; supporting policies; and environmentally sound management.</li> <li>High efficiency lighting technology penetration with the development of financial mechanisms and distribution campaigns.</li> </ul>
<b>South Africa (UNDP, DBSA)</b>	LED lighting and distribution transformers	10,000,000	<ul style="list-style-type: none"> <li>Development of a national strategy to advance energy efficiency</li> <li>Development of the policy framework with minimum energy performance standards (MEPS); monitoring, verification, and enforcement (MVE) system; supporting policies; and environmentally sound management.</li> </ul>
<b>Tunisia (UNEP)</b>	Lighting	2,500,000	<ul style="list-style-type: none"> <li>Development of the policy framework with minimum energy performance standards (MEPS); monitoring, verification, and enforcement (MVE) system; supporting policies; and environmentally sound management.</li> </ul>
<b>Chile (UNEP)</b>	Refrigerators	1,473,762	<ul style="list-style-type: none"> <li>Development of the policy framework with updated minimum energy performance standards (MEPS); monitoring, verification, and enforcement (MVE) system; supporting policies; and environmentally sound management.</li> </ul>

## Annex II – Response to comment on box 8:

*As there are many agencies involved in this program, please explicate the responsibilities for submission of PPGs, CEO endorsements, tracking tools, PIRs, and other GEF required reports.*

PPGs	Each child project agency will submit their own PPG requests independently of the lead agency. This precedent was set by UNDP at the request of the GEF Secretariat.
CEO endorsements	Each child project agency will submit their own CEO endorsement documents to the GEF. However, the Lead agency will discuss the programme monitoring framework, programme tracking tool and the institutional arrangements to ensure: (a) consistency in reporting against the programme tracking tool and programme monitoring framework; and (b) coordination or technical input to the child projects from the different agencies.
PIRs,	Each child project agency will prepare and submit directly to the GEF, its own Project Implementation Review every year.
tracking tools,	<ul style="list-style-type: none"> <li>Programme tracking tool: the lead agency will develop and submit the baseline for the programme monitoring framework and programme tracking tool at the program commitment deadline.</li> </ul>

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	<ul style="list-style-type: none"> <li>• Project tracking tools: each child project agencies will be responsible for developing and submitting progress reports on, their own tracking tools, as per the GEF guidelines.</li> </ul>
Other GEF required reports.	<ul style="list-style-type: none"> <li>• Reports from each child project will also contribute to the programme level results and impacts. Each child project agency will report to the lead programme agency: programme tracking tool and programme monitoring framework, at the following points: (a) at CEO endorsement, (b) at midterm and (c) at project completion.</li> <li>• The Program Lead Agency will consolidate and send to the GEF Secretariat a report (a) at program baseline when all child projects are CEO endorsed/approved (i.e. program commitment deadline), (b) at midterm on progress toward program outcomes, and (c) at program completion on progress towards the programme indicators.</li> </ul>

## Comments and Responses at GEF Council – October 2015

### U.S.

1. *What is the rationale for pursuing this project as a Programmatic Approach, rather than as a single global project?*

**Response:** Markets for the appliances that will be targeted are increasingly global, with production/manufacturing concentrated in a few countries and then traded to the rest of the world. As such, there is a need for policy harmonization and consistency across countries and this is much easier achieved in a programmatic approach than in a country by country series of not connected national level projects. The programmatic approach proposes the U4E integrated policy approach to meet individual countries' policy needs and priorities. U4E integrated policy approaches (minimum standards, MVE, supporting policies, and environmentally sound management) have been demonstrated to permanently transition markets to energy efficient products while addressing environmental concerns. The programmatic approach allows for the use of a coherent and consistent integrated approach, providing greater likelihood of a true market transformation success and increased harmonization between countries. Further, child projects under the programmatic approach allow for the best practices to be implemented in the country, such as developing/agreeing to minimum energy performance standards, increasing market surveillance capacities, and/or implementing demonstration projects for energy efficient products.

Countries are at varying levels in developing policies that advance energy efficiency of lighting, appliances and equipment. Some countries do have minimum energy performance standards in place and will be complete a project to enhance those standards and ensure their compliance. Additionally, countries have different priorities in terms of products, with some having larger savings potential for lighting while other countries might prioritize air conditioners due to the savings in their country. The programmatic approach accommodates this as it develops common resources with global funding, such as step-by-step guides on advancing markets to energy efficient products and supporting country officials with training. The child projects allow countries to utilize their STAR allocation under the framework of the programmatic approach yet still crafting the child project to meet the individual countries needs. The child projects are customized to meet the needs of policy development and product prioritization of each country.

2. *In addition to the three countries with child projects included in the proposal, we see that an additional fifteen countries may be receiving funding for capacity building through the SEforALL program. Which countries will be funded? How will countries be selected?*

**Response:** The criteria to receive this support will be based on the country being a partner to initiative, commitment to advance energy efficiency is shown through national communications; funding for project implementation is available (for example GEF projects not falling under the programmatic approach, and other sources of funding, including domestic funding, Germany's International Climate Initiative, European Commission); regional diversity of countries supported. These prioritization of countries are currently be reviewed under GEF5 Project 5831: "Foundations of a Partnership to Accelerate the Global Market Transformation for Efficient Appliances and Equipment".

3. *We note that there may be a plan to expand this program to include significantly more countries (as many as 100).*

**Response:** There is within the global child project an anticipated light touch support for up to 75 countries, However, the number of child projects that may be added to the programmatic approach is much smaller. Currently, additional child projects are being considered in roughly 5-8 countries. These child projects would be proposed within a revised PFD which would be presented to Council for consideration.

- a. *What is the commitment deadline for additional child projects?*

**Response:** April 2019 (for submission of full CEO endorsement documents).

- b. *Will the Council have the opportunity to review a revised project framework document with more details for child projects and country participation prior to GEF CEO Endorsement of new child projects?*

**Response:** All child projects, including the three currently in the PFD and any future child projects added with Council approval of a revised PFD, would be submitted for CEO endorsement no later than the commitment deadline of April 2019.

4. *Will countries be able to revise their support of the Program after review of the final PFD document?*

**Response:** Countries will work with agencies during the project design period to reflect any changes in project scope in the CEO endorsement request. Revisions to the PFD would be for the purpose of adding child projects; therefore Countries will have ample opportunity to ensure the project designs align country priorities with the PFD objectives.

## **Germany**

Germany welcomes the program proposal in support of a global approach to introducing high-efficiency appliances and electrical products. The ambitious proposal builds on an existing GEF program (SEforALL) and will make a significant contribution to GHG reductions, as well as market transformation, if risks are well-managed and implementation is well-coordinated across a broad spectrum of stakeholders. Germany requests that the following requirements are taken into account during the design of the final project proposal:

**General response:** All comments will be taken into account during the project development and will be incorporated into the final project proposal.

*With regard to Menu Option 4:* Supporting policies for the market transformation to energy efficient products. For this menu option, it is written that “campaigns may include working with retailers to train staff to help and advise consumers.” A perhaps more efficient alternative would be to make sure that appliance manufacturers have the capacity to provide trainings to their distributors/retailers rather than the program attempting to train personnel at points of sale.

**Response:** Thanks for this good suggestion. This is a better approach offering longer-term sustainability and the project can use best practices from the manufacturing partners to the project (OSRAM, Philips, BSH, Mabe, etc). This suggestion will be integrated into project design.

*With regard to demonstration projects:* such projects should make energy and monetary savings public knowledge, with for example a digital meter (or low-tech alternative) in the lobby of the targeted ministry building, which compares costs and energy usage between efficient and inefficient systems. The program also intends to enable local manufacturers to produce energy-efficient appliances. It would be helpful to include information as to what extent patent-holders elsewhere may impede this objective, and to what extent lesser-efficient technologies are to be utilized because of high costs for super-efficient technologies?

**Response:** We have not yet encountered patent issues blocking the way for energy efficient products, contrarily it is often more expensive material or design that makes the product more expensive. For example, using more efficient material (such as copper) and/or using more insulation in refrigerators. Patent issues and clear measures to transparently and effectively present energy and financial savings will be fully integrated during

project development. In regards to the lower efficient technologies being used instead of higher cost super-efficient technologies: the project will support countries to make the transition based on their national circumstances. For example, minimum energy performance standards (MEPS) could be put in place to remove the lower performing products (for example inefficient incandescent lamps) from the market to shift to higher efficient (for example CFLs), and also promoting awareness/demand for highly efficient products (for example LEDs) through demonstration or distribution campaigns of highly efficient products.

*Regarding gender:* during the consultations with end-users, it should be determined if priorities for efficient appliances differ across the gender spectrum in order to pinpoint the priorities at the family-level vs. at a business or institutional level.

**Response:** Thanks for this good suggestion. This will be integrated into project design.

*The benefits section needs clarifications for greater coherence* as it is not clear from the outset that the higher emission reduction numbers include the SEforALL Project's emission reductions.

**Response:** The savings presented are only for this project. Further clarification will be given during the project design.

*A further point of confusion is related to the pie chart on page 14*, which does not depict “total potential CO<sub>2</sub> Savings” as it is labelled, but rather shows the share of CO<sub>2</sub> savings that will come from the Leapfrogging (34%) vs. the SEE4ALL (66%) Programs. The chart should be labelled accordingly. When one gets to the chart on page 15, then the percent allocations are switched, with 33% of the CO<sub>2</sub> reductions attributed to SEforALL and 67% attributed to the Leapfrogging Program, which creates more confusion when compared with the previous pie chart. The section could generally benefit from more coherent language, as it is difficult to follow.

**Response:** Comment well noted. The pie chart should have Leapfrogging 33% and SEforALL as 67%. This will be fixed and further clarity on this will be integrated in the final proposal.

*A general consideration:* experience with switching consumers from, for example, cheap disposable batteries to long-life, rechargeable batteries has shown that in order to have a successful transition, the consumer needs to see the benefit of making the switch, both in terms of money saved and a superior product. Getting consumers hooked on the energy-efficient appliances will require not only innovative financing to overcome higher upfront costs but also clarity that the product is the better choice in the long-run. Communication, training and outreach are, therefore, as crucial as having the product itself available.

**Response:** Agreed. This is an excellent point in relation to consumer's confidence. It should be noted that consumer confidence also relates to the actual real life performance of a product compared to what is written on the packaging. Monitoring, verification, and enforcement (MVE), which is included in the project of standards and energy performance claims, is also needed to ensure that consumer confidence in energy efficient. For example, without MEPS and MVE, it is likely that poor performing LEDs will enter the market, which will result in consumers not believing in the energy and lifetime claims on the packaging. With a strong MVE regime, it will ensure that products meet defined criteria (energy efficiency, lifetime, and a defined performance such as amount light provided) and consumers will have strong confidence in the claims on the package. Communication, training and outreach will also be strengthened in the project design.

## ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS<sup>26</sup>

Provide detailed funding amount of the PPG activities financing status in the table below:

PPG Grant Approved at PIF: US\$ 70,000			
<i><b>Project Preparation Activities Implemented</b></i>	<i><b>GEF/LDCF/SCCF Amount (\$)</b></i>		
	<i><b>Budgeted Amount</b></i>	<i><b>Amount Spent To date</b></i>	<i><b>Amount Committed</b></i>
Staff and Other Personnel	19,500	9,090.00	11,234.94
Supplies Commodities and Materials			
Equipment, Vehicles and Furniture			
Contractual Services	45,500	45,434.00	
Travel	5,000	4,241.06	
General Operating and other direct Costs			
<b>Total</b>	<b>70,000</b>	<b>58,765.06</b>	<b>11,234.94</b>

<sup>26</sup> If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue to undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities. Agencies should also report closing of PPG to Trustee in its Quarterly Report.

**ANNEX D: CALENDAR OF EXPECTED REFLOWS** (if non-grant instrument is used)

Provide a calendar of expected reflows to the GEF/LDCF/SCCF/CBIT Trust Funds or to your Agency (and/or revolving fund that will be set up)

Not Applicable.

## ANNEX E: CONSULTANTS TO BE HIRED FOR THE PROJECT USING GEF/LDCF/SCCF RESOURCES

<i>Position Titles</i>	<i>\$/ Person Week</i>	<i>Estimated Person Weeks</i>	<i>Tasks To Be Performed</i>
<b>For Technical Assistance</b>			
Local			
<i>National Energy Efficiency Specialist</i>	US\$875	107	National Energy Efficiency Specialist will support the implementation of project component 1 and 3 on MEPS and labeling and development of communication and awareness campaign, respectively. And the consultant will be appointed to <u>lead implementation of pilot demonstration projects</u> with international consultants. The National Energy Efficiency Specialist will also coordinate with public and private sectors and conduct of training needs assessment of importers and local industry stakeholders involved supply of lighting and electrical appliances.
<i>National Standard Specialist</i>	US\$875	75	National Standard Specialist will support international S&L specialist to identify of additional priority appliances for inclusion in MEPS and labeling program. This consultant will also support the implementation of MEPS and labeling programs.
<i>National Legal Specialist</i>	US\$875	34	The National Legal Specialist will be appointed to support setting the well-functioning monitoring verification and enforcement (MVE) under component 2.
<i>National Financial Specialist</i>	US\$875	13	The National Financial Specialist will be appointed to the procurement of energy efficient technologies of demonstration projects under output 3.2 of the project. And this consultant will also support the development and implementation of an awareness and capacity building program of importers and local industry to supply energy efficient appliances.
<i>National Communication &amp; Marketing Specialist</i>	US\$875	68	The national communication & Marketing Specialist will be appointed to support the communication strategy, development and implementation of communication and awareness campaigns, evaluations of the campaigns, and the integration of M&V results and lessons learned.
<i>National Gender Mainstreaming Specialist</i>	US\$875	10	The Gender Mainstreaming Specialist will be appointed to support the design and development of communication strategy, and a communication and awareness campaign. And this consultant will also develop the Gender Action Plan to be implemented during the project's execution.
International			
<i>International Energy Efficiency Specialist</i>	US\$3,000	83	International Energy Efficiency Specialist will lead <u>the evaluation impacts of adoption of more efficient household appliances and conduct the detailed energy audits and finalization of detailed designs of the pilot demonstration projects</u> . This consultant will be appointed to conduct M&V activities for the pilot demonstration projects, support the detailed design of energy audits and the integration of the M&V results and lesson learned. The International Energy Efficiency Specialist will also support evaluation market baseline for household lighting and electrical appliances. This consultant will support the nationwide HH Appliance Saturation Survey on the recommendation of an implementation plan for follow-on collection and update of market data.



<i>Position Titles</i>	<i>\$/ Person Week</i>	<i>Estimated Person Weeks</i>	<i>Tasks To Be Performed</i>
			The International Energy Efficiency Specialist will coordinate with International Standard and Labeling (S&L) Specialist to develop needs assessment, implement and evaluate of capacity building programs under component 1.
<i>International Standard and Labeling (S&amp;L) Specialist</i>	US\$3,000	54	The International S&L Specialist will be appointed to lead the <u>identification of additional priority appliances for inclusion in MEPS and labeling programs, finalization of implementation approach, adopting of testing standards and energy performance matrices, and detailed work plan for MEPS and labeling program and implementation of MEPS and labeling program</u> . And this consultant will lead needs assessment, implementation and evaluation of capacity building programs on MEP and Labeling programs under component 1, and will also support international MVE specialist on the implementation of market MVE under Component 2.
<i>International Legal &amp; MVE Specialist</i>	US\$3,000	47	International Legal Specialist will be appointed to lead market MVE under Component 2, and evaluation of survey result to support MV&E under Component 1. This consultant will lead the establishment of an interim MVE system based on the existing legislative and institutional frameworks, and preparation of recommendations on the key features for establishment of an effective MVE system in Myanmar. The International Legal & MVE Specialist will also support in developing a well-function system of market MVE or MVE system under Component 2 and will also support the development, implementation of a comprehensive capacity building program and conduct of post-training surveys on market MVE under Component 2.
<i>International Lighting (Testing Standards &amp; MEPS) Specialist</i>	US\$3,000	26	The international Lighting Specialist will be appointed to lead the <u>development and implementation of a comprehensive capacity building program for verification testing</u> . This consultant will also provide the technical assistant on lighting in related activities, including the implementation of MEPS and labeling for the first product.
<i>International Air-Conditioning Specialist</i>	US\$3,000	26	The international Air-conditioning Specialist will be appointed to lead <u>the development and implementation of a comprehensive capacity building program for verification testing</u> . This consultant will also provide the technical assistant on air-conditioning in related activities.
<i>International Market &amp; Communication Specialist</i>	US\$3,000	34	The international Market & Communication Specialist will be appointed to lead the design and development of a communication strategy, <u>development and implementation of a communication and awareness campaign</u> , Evaluation of the campaign, and integration of M&V results and lessons learned with the communication and awareness campaign.
<i>International Financial Specialist</i>	US\$3,000	10	The National Financial Specialist will corporate with National Financial Specialist to support the procurement of energy efficient technologies of demonstration projects under output 3.2 of the project. And this consultant will also support the development and implementation of an awareness and capacity building program of importers and local industry to supply energy efficient appliances.
Justification for travel, if any:			

ANNEX F-1: DETAILED GEF BUDGET

ANNEX F-1 - RECONCILIATION BETWEEN GEF ACTIVITY BASED BUDGET AND UNEP BUDGET LINE (GEF FUNDS ONLY US\$)												
Project title: Leapfrogging Myanmar's market to high efficiency lighting and appliances												
Project number: 9499												
Project executing partner: Ministry of Industry												
Project implementation period:												
From:	2018											
To:	2022											
			Planned budget per project Component					Planned budget by calendar year				
UNEP Budget Line			1. MEPS & labeling	2. MVE	3. Awareness raising & Demo	PMC	Total	Year 1	Year 2	Year 3	Year 4	Total
10	PERSONNEL COMPONENT											
	1100	Project personnel										
	1101	Project Manager				96,000	96,000	24,000	24,000	24,000	24,000	96,000
	1102	Technical Advisor					-					-
	1103	MOI Technical Support					-					-
	1199	Sub-total	-	-	-	96,000	96,000	24,000	24,000	24,000	24,000	96,000
	1200	Consultants										
	1201	National EE Specialist	49,000	3,500	41,125		93,625	35,000	32,375	21,000	5,250	93,625
	1202	National Standard Specialist	26,250	39,375	-		65,625	21,875	26,250	7,000	10,500	65,625
	1203	National Legal Specialist	-	29,750	-		29,750	11,375	14,875	1,750	1,750	29,750
	1204	National Financial Specialist	-	-	11,375		11,375	7,875	1,750	1,750	-	11,375
	1205	National Communication & Marketing Specialist	-	-	59,500		59,500	1,750	28,000	14,000	15,750	59,500
	1206	National Gender Mainstreaming Specialist	-	-	8,750		8,750	-	6,125	2,625	-	8,750
	1207	International EE and M&V Specialist	129,000	21,000	99,000		249,000	99,000	84,000	51,000	15,000	249,000
	1208	International S&L Specialist	96,000	66,000	-		162,000	54,000	63,000	21,000	24,000	162,000
	1209	International Legal and MVE Specialist	21,000	120,000	-		141,000	39,000	78,000	15,000	9,000	141,000
	1210	International Lighting (Testing Standards & MEPS) Specialist	33,000	18,000	27,000		78,000	24,000	36,000	18,000	-	78,000
	1211	International Air-Conditioning Specialist	36,000	15,000	27,000		78,000	27,000	27,000	18,000	6,000	78,000
	1212	International Market & Communication Specialist	-	-	102,000		102,000	6,000	48,000	21,000	27,000	102,000
	1213	International Financial Specialist	-	-	30,000		30,000	18,000	6,000	6,000	-	30,000
	1299	Sub-total	390,250	312,625	405,750	-	1,108,625	344,875	451,375	198,125	114,250	1,108,625
	1300	Administrative Support										
	1301	Project Assistant	11,000	11,000	11,000	5,400	38,400	9,600	9,600	9,600	9,600	38,400
	1399	Sub-total	11,000	11,000	11,000	5,400	38,400	9,600	9,600	9,600	9,600	38,400
	1600	Travel on official business										
	1601	National consultant travel cost	31,000	14,000	22,000		67,000	28,000	25,000	10,000	4,000	67,000
	1602	International consultants travel cost	67,200	27,300	35,700		130,200	48,300	50,400	23,100	8,400	130,200
	1603	Project personnel travel cost	8,000	8,000	8,000		24,000	6,000	6,000	6,000	6,000	24,000
	1699	Sub-total	106,200	49,300	65,700	-	221,200	82,300	81,400	39,100	18,400	221,200
1999	Component total		507,450	372,925	482,450	101,400	1,464,225	460,775	566,375	270,825	166,250	1,464,225
20	SUB-CONTRACT COMPONENT											
	2100	Sub-contracts (MOUs/LOAs for cooperating agencies)										
	2101	Product testing support					-					-
	2199	Sub-total	-	-	-	-	-	-	-	-	-	-
	2200	Sub-contracts (MOUs/LOAs for supporting organizations)										
	2201						-					-
	2299	Sub-total	-	-	-	-	-	-	-	-	-	-
	2300	Sub-contracts (for commercial purposes)										
	2301	Nationwide HH Appliance Saturation Survey	78,753				78,753	78,753	-	-	-	78,753
	2302	Product registry database	15,000	20,000			35,000	20,500	11,500	1,500	1,500	35,000
	2303	Pilot demonstration project			410,000		410,000	130,000	180,000	100,000	-	410,000
	2304	Market Awareness campaign			61,750		61,750	-	30,875	18,525	12,350	61,750
	2399	Sub-total	93,753	20,000	471,750	-	585,503	229,253	222,375	120,025	13,850	585,503
2999	Component total		93,753	20,000	471,750	-	585,503	229,253	222,375	120,025	13,850	585,503
30	TRAINING COMPONENT											
	3200	Group training										
	3201	Comprehensive capacity building program for government entities and stakeholders on understanding, design and implementation of MEPS and Labeling	11,000				11,000	5,500	5,500	-	-	11,000
	3202	Workshops on the post-training evaluatuion of capacity building for responsible government entities on MEPS and Labelling program	8,250				8,250	2,750	2,750	2,750	-	8,250
	3203	Needs assessment of stakeholders involved in implementation of the interim MVE system		2,750			2,750	2,750	-	-	-	2,750
	3204	Comprehensive capacity building program on MVE for stakeholders		2,750			2,750	-	2,750	-	-	2,750
	3205	Assessment of resources and training needs for stakeholders involved in implementation of the market surveillance for verification testing		2,750			2,750	-	2,750	-	-	2,750
	3206	Comprehensive capacity building program for verification testing		5,500			5,500	-	2,750	2,750	-	5,500
	3207	Needs assessment of importers and local industry stakeholders involved supply of lighting and electrical appliances			2,750		2,750	2,750	-	-	-	2,750
	3208				-		-			-		-
	3299	Sub-total	19,250	13,750	2,750	-	35,750	13,750	16,500	5,500	-	35,750
	3300	Meetings/Conferences										
	3301	Inception Workshop				2,750	2,750	2,750	-	-	-	2,750
	3302	Meeting for adoption of more efficient household appliances	2,750				2,750	2,750	-	-	-	2,750
	3303	Meeting on Identification and prioritization of HH appliances for MEPS and Labeling	2,750				2,750	-	2,750	-	-	2,750
	3304	Meeting for needs assessment on implementation of MEPS and labeling programs	2,750				2,750	2,750	-	-	-	2,750
	3305	Meeting on Finalization of implementation approach and detailed work plan for MEPS and labeling programs	2,750				2,750	2,750	-	-	-	2,750
	3306	Meetings on MEPS and Labeling program (Implementation of MEPS and Labeling program kick-start, update status of the program annually)	8,250				8,250	-	2,750	2,750	2,750	8,250
	3307	Meeting on interim MVE system based on the existing legislative and institutional frameworks		2,750			2,750	2,750	-	-	-	2,750
	3308	Meeting on Implementation of the interim MVE system		2,750			2,750	-	2,750	-	-	2,750
	3309	Meeting on design and development of a communication strategy			2,750		2,750	-	2,750	-	-	2,750
	3310	Meeting on detailed designs of the pilot demonstration projects			2750		2,750	2,750	-	-	-	2,750
	3311	Meeting on development and implementation of awareness and communication campaign/Capacity building program on supply EE products			5,500		5,500	-	2,750	2,750	-	5,500
	3399	Sub-total	19,250	5,500	11,000	2,750	38,500	16,500	13,750	5,500	2,750	38,500
3999	Component total		38,500	19,250	13,750	2,750	74,250	30,250	30,250	11,000	2,750	74,250
40	EQUIPMENT AND PREMISES COMPONENT											
	4100	Expendable equipment										
	4101						-					-
	4199	Sub-total	-	-	-	-	-	-	-	-	-	-
	4200	Non-expendable equipment										
	4201						-					-
	4299	Sub-total	-	-	-	-	-	-	-	-	-	-
4999	Component total		-	-	-	-	-	-	-	-	-	-
50	MISCELLANEOUS COMPONENT											
	5100	Operation and maintenance of equipment										
	5101						-					-
	5199	Sub-total	-	-	-	-	-	-	-	-	-	-
	5200	Reporting costs										
	5201	Audits	6,000	8,000	6,000		20,000	5,000	5,000	5,000	5,000	20,000
	5299	Sub-total	6,000	8,000	6,000	-	20,000	5,000	5,000	5,000	5,000	20,000
	5300	Sundry										
	5301	Office Equipment, IT and Communication	3,200	3,200	3,200		9,600	2,400	2,400	2,400	2,400	9,600
	5399	Sub-total	3,200	3,200	3,200	-	9,600	2,400	2,400	2,400	2,400	9,600
	5400	Hospitality and entertainment										
	5401						-					-
	5499	Sub-total	-	-	-	-	-	-	-	-	-	-
	5500	Evaluation										
	5501	Mid-term evaluation	8,333	8,334	8,333		25,000		25,000			25,000
	5502	Terminal Evaluation	15,000	15,000	15,000		45,000				45,000	45,000
	5599	Sub-total	23,333	23,334	23,333	-	70,000	-	25,000	-	45,000	70,000
5999	Component total		32,533	34,534	32,533	-	99,600	7,400	32,400	7,400	52,400	99,600
99	GRAND TOTAL		672,236	446,709	1,000,483	104,150	2,223,578	727,678	851,400	409,250	235,250	2,223,578

## ANNEX F-2: DETAILED CO-FINANCE BUDGET

ANNEX F-2 - RECONCILIATION BETWEEN GEF BUDGET AND CO-FINANCE BUDGET (TOTAL GEF & CO-FINANCE US\$)																						
Project title: Leapfrogging Myanmar's market to high efficiency lighting and appliances																						
Project number: 9499																						
Project executing partner: Ministry of Industry																						
Project implementation period:																						
From: 2018		GEF Cash	GELC		UN Environment		MOI		Co-finance partners commitments				ICA		MOE		DAIKIN		Total co-finance		Total project budget	
To: 2022			Cash	In-kind	Cash	In-kind	Cash	In-kind	Cash	In-kind	Cash	Loans	Cash	In-kind	Cash	In-kind	Cash	In-kind	Cash	In-kind	Cash	In-kind
UNEP Budget Line		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
10	PERSONNEL COMPONENT																					
	1100 Project personnel																		-	-	96,000	-
	1101 Project Manager	96,000																	-	-		-
	1103 Technical Advisor	-				20,000		293,700						50,000		47,500		85,000	-	496,200	-	496,200
	1104																		-	-		-
	1199 Sub-total	96,000	-	-	-	20,000	-	293,700	-	-	-	-	-	50,000	-	47,500	-	85,000	-	496,200	96,000	496,200
1200	Consultants																					
	1201 National EE Specialist	93,625						100,000								200,000			-	300,000	93,625	300,000
	1202 National Standard Specialist	65,625						70,000								150,000			-	220,000	65,625	220,000
	1203 National Legal Specialist	29,750																	-	-	29,750	-
	1204 National Financial Specialist	11,375																	-	-	11,375	-
	1205 National Communication & Marketing Specialist	59,500						100,000											-	100,000	59,500	100,000
	1206 National Gender Mainstreaming Specialist	8,750																	-	-	8,750	-
	1207 International EE and M&V Specialist	249,000												37,500					-	37,500	249,000	37,500
	1208 International S&L Specialist	162,000				20,000								75,000					-	95,000	162,000	95,000
	1209 International Legal and MVE Specialist	141,000		50,000															-	50,000	141,000	50,000
	1210 International Lighting (Testing Standards & MEPS) Specialist	78,000																	-	-	78,000	-
	1211 International Air-Conditioning Specialist	78,000				50,000												50,000	-	100,000	78,000	100,000
	1212 International Market & Communication Specialist	102,000												75,000				50,000	-	125,000	102,000	125,000
	1213 International Financial Specialist	30,000																	-	-	30,000	-
	1299 Sub-total	1,108,625	-	50,000	-	70,000	-	270,000	-	-	-	-	-	187,500	-	350,000	-	100,000	-	1,027,500	1,108,625	1,027,500
1300	Administrative support																					
	1301 Project Assistant	38,400																	-	-	38,400	-
	1302 Administrative support							76,800											-	76,800	-	76,800
	1399 Sub-total	38,400	-	-	-	-	-	76,800	-	-	-	-	-	-	-	-	-	-	-	76,800	38,400	76,800
1600	Travel on official business																					
	1601 Domestic travel cost	67,000																	-	-	67,000	-
	1602 International travel cost	130,200																	-	-	130,200	-
	1603 Project personnel travel cost	24,000																	-	-	24,000	-
	1699 Sub-total	221,200	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-	-	221,200	-
1999	Component total	1,464,225	-	50,000	-	90,000	-	640,500	-	-	-	-	-	237,500	-	397,500	-	185,000	-	1,600,500	1,464,225	1,600,500
20	SUB-CONTRACT COMPONENT																					
	2100 Sub-contracts (for cooperating agencies)																					
	2101 Product testing support	-		100,000				30,000											-	130,000	-	130,000
	2199 Sub-total	-	-	100,000	-	-	-	30,000	-	-	-	-	-	-	-	-	-	-	-	130,000	-	130,000
	2200 Sub-contracts (for supporting organizations)																					
	2201	-																	-	-	-	-
	2299 Sub-total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2300 Sub-contracts (for commercial purposes)																					
	2301 Nationwide HH Appliance Saturation Survey	78,753						15,000											-	15,000	78,753	15,000
	2302 Product registry database	35,000						35,000												35,000	35,000	35,000
	2303 Pilot demonstration project	410,000						90,000		5,000		500,000								595,000	410,000	595,000
	2304 Market Awareness campaign	61,750						700,000		5,000				62,500				200,000		967,500	61,750	967,500
	2399 Sub-total	585,503	-	-	-	-	-	840,000	-	10,000	-	500,000	-	62,500	-	-	-	200,000	-	1,612,500	585,503	1,612,500
2999	Component total	585,503	-	100,000	-	-	-	870,000	-	10,000	-	500,000	-	62,500	-	-	-	200,000	-	1,742,500	585,503	1,742,500
30	TRAINING COMPONENT																					
	3200 Group training																					
	3201 Comprehensive capacity building program for government entities and stakeholders on understanding, design and implementation of MEPS and Labeling	11,000						10,000								40,000			-	50,000	11,000	50,000
	3202 Workshops on the post-training evaluation of capacity building for responsible government entities on MEPS and Labelling program	8,250						7,500								30,000				37,500	8,250	
	3203 Needs assessment of stakeholders involved in implementation of the interim MVE system	2,750						5,000												5,000	2,750	
	3204 Comprehensive capacity building program on MVE for stakeholders	2,750						5,000												5,000	2,750	
	3205 Assessment of resources and training needs for stakeholders involved in implementation of the market surveillance for verification testing	2,750						5,000												5,000	2,750	
	3206 Comprehensive capacity building program for verification testing	5,500						10,000												10,000	5,500	
	3207 Needs assessment of importers and local industry stakeholders involved supply of lighting and electrical appliances	2,750						2,500												2,500	2,750	
	3208																					
	3299 Sub-total	35,750	-	-	-	-	-	45,000	-	-	-	-	-	-	-	70,000	-	-	-	115,000	35,750	115,000
	3300 Meetings/Conferences																					
	3301 Inception Workshop	2,750						2,000								2,500			-	4,500	2,750	4,500
	3302 Meeting for adoption of more efficient household appliances	2,750						2,500								2,500			-	5,000	2,750	5,000
	3303 Meeting on Identification and prioritization of HH appliances for MEPS and Labeling	2,750						2,500								2,500			-	5,000	2,750	5,000
	3304 Meeting for needs assessment on implementation of MEPS and labeling programs	2,750						2,500								5,000			-	7,500	2,750	7,500
	3305 Meeting on Finalization of implementation approach and detailed work plan for MEPS and labeling programs	2,750						2,500								5,000			-	7,500	2,750	7,500
	3306 Meetings on MEPS and Labeling program (Implementation of MEPS and Labeling program kick-start, update status of the program annually)	8,250						7,500								15,000			-	22,500	8,250	22,500
	3307 Meeting on interim MVE system based on the existing legislative and institutional frameworks	2,750						2,500											-	2,500	2,750	2,500
	3308 Meeting on Implementation of the interim MVE system	2,750						2,500											-	2,500	2,750	2,500
	3309 Meeting on design and development of a communication strategy	2,750						2,500											-	2,500	2,750	2,500
	3310 Meeting on detailed designs of the pilot demonstration projects	2,750						2,500											-	2,500	2,750	2,500
	3311 Meeting on development and implementation of awareness and communication campaign/Capacity building program on supply EE products	5,500						5,000											-	5,000	5,500	5,000
	3399 Sub-total	38,500	-	-	-	-	-	34,500	-	-	-	-	-	-	-	32,500	-	-	-	67,000	38,500	67,000
3999	Component total	74,250	-	-	-	-	-	79,500	-	-	-	-	-	-	-	102,500	-	-	-	182,000	74,250	182,000
40	EQUIPMENT AND PREMISES COMPONENT																					
	4100 Expendable equipment																					
	4101	-																	-	-	-	-
	4199 Sub-total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4200 Non-expendable equipment																					
	4201	-																	-	-	-	-
	4299 Sub-total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4300 Premises																					
	4301	-																	-	-	-	-
	4399 Sub-total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4999	Component total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	MISCELLANEOUS COMPONENT																					
	5100 Operation and maintenance of equipment																					
	5101	-																	-	-	-	-
	5199 Sub-total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5200 Reporting costs																					
	5201 Audits	20,000																				

## ANNEX G: M&E BUDGET AND WORK PLAN

M&E Activity	Description	Responsible Parties	Timeframe	Indicative budget (USD)
Inception Workshop (IW) and Report	Report prepared immediately following the IW; it includes: - Detailed Work Plan and budget for the first year, as well as an overview of AWP's for subsequent years, divided per output and inputs (budget lines). - A more detailed narrative of roles of UN Environment, PMU and PSC: institutional responsibilities, coordinating actions and feedback mechanisms - Detailed Procurement and M&E Plans	Execution: Project Manager  Support: PMU MOI UN Environment	Immediately following, within 2 months of project start-up	GEF: Part of the project management  Co-fin: USD 2,000
Half-yearly progress report	Part of UN Environment procedures for project monitoring. - Analyzes project performance over the reporting period UN Environment; - Describes constraints experienced in the progress towards results and the reasons. - Describes Work Plan for the next period in an Annex and the detailed budget divided per output and inputs (budget lines)	Execution: Project Manager  Support: PMU MOI	Two (2) half-yearly progress reports for any given year (July 31 and January 31)	GEF: Part of the project management  Co-fin: USD 5,000
Quarterly expenditure reports	Detailed expenditure reports (in Excel), with justification of any change	Execution: Project Manager MOI Financial officer  Support: PMU	Four (4) quarterly expenditure reports for any given year (January 31, April 30, July 31 and October 31)  Final financial Report within 60 days of project completion	GEF: Part of the project management  Co-fin: USD 5,000
Technical and thematic Reports; Communication of lessons learnt	Technical and thematic periodic reports could also be prepared to focus on specific issues or areas of activity covered by the project,	Execution: PMU  Support: MOI UN Environment	As necessary for the thematic reports	GEF: Part of the project management  Co-fin: USD 10,000



<b>M&amp;E Activity</b>	<b>Description</b>	<b>Responsible Parties</b>	<b>Timeframe</b>	<b>Indicative budget (USD)</b>
Project Implementation Review (PIR)	Analyzes project performance over the reporting period UN Environment. Describes constraints experienced in the progress towards results and the reasons. Draws lessons and makes clear recommendations for future orientation in addressing the key problems in the lack of progress. The PIR is discussed at PSC meetings.	Execution: Project Manager Task Manager  Support: PMU Co-finance partners Government entities	Yearly, by 31 July latest	GEF: Part of the project management  Co-fin: USD 10,000
Co-financing Report	Report on co-financing (cash and/or in-kind) fulfilled contributions from all project partners that provided co-finance letters.	Execution: Project Manager  Support: Co-financing partners	Yearly, by 31 July latest	GEF: Part of Project Manager tasks  Co-fin: USD 2,000
Medium-Term Evaluation / Medium-Term Review (MTE/MTR)	The purpose of the Mid-Term Evaluation (MTE) or Mid-Term Review (MTR) is to provide an independent assessment of project performance at mid-term, to analyze whether the project is on track, what problems and challenges the project is encountering, and which corrective actions are required so that the project can achieve its intended outcomes by project completion in the most efficient and sustainable way. In addition, it will verify information gathered through the GEF tracking tools. Since for short duration projects, PIR can serve as the optional MTR/MTE.	Execution: UN Environment Evaluation Office (EOU)  Support: Project Manager Task Manager PMU MOI Co-finance partners Government entities	Could take place around mid-point of the project's start, whenever deemed needed by the Task Manager.	GEF: USD 25,000  Co-fin: USD 5,000
Final Report	The project team will draft and submit a Project Final Report, with other docs (such as last PIR), at least two weeks before the PSC meeting for their review and comments; this meeting decides whether any action is needed to achieve the sustainability of project results; and draws lessons to be captured into other projects; Comprehensive report summarizing all activities, achievements, lessons learned, objectives met or not achieved structures and systems implemented, etc. Lays out recommendations for any further steps that may need to be taken	Execution: Project Manager  Support: PMU MOI UN Environment	Final report no later than three (3) months after the technical completion date	GEF: Part of the project management  Co-fin: USD 5,000

M&E Activity	Description	Responsible Parties	Timeframe	Indicative budget (USD)
	to ensure the sustainability and replication of project activities.			
Terminal Evaluation	Further review the topics covered in the mid-term evaluation. Looks at the impacts and sustainability of the results, including the contribution to capacity development and the achievement of global environmental goals. The project performance will be assessed against standard evaluation criteria using a six point rating scheme. In addition, it will verify information gathered through the GEF tracking tools.	Execution: EOU  Support: Project Manager Task Manager PMU MOI Co-finance partners Government entities	Can be initiated within six (6) months prior to the project's technical completion date	GEF: USD 45,000  Co-fin: USD 5,000
Audits	Financial audits	Execution: Independent auditing firm  Support: Project Manager MOI financial officer PMU	Annually (as at 31 December)	GEF: USD 20,000
Publication of Lessons Learnt and other project publications	Lessons learned and other project documents are published for the benefit of on-going and future projects	Execution: PMU  Support: MOI	Annually, part of half-yearly progress reports and Final Report	GEF: Part of the Project management  Co-fin: USD 10,000
<b>TOTAL M&amp;E COST</b>			<b>GEF: USD 90,000</b> <b>Co-fin: USD 59,000</b>	

## **ANNEX H: PROJECT IMPLEMENTATION ARRANGEMENTS**

### **Project management and supervision**

This project is funded by the GEF and co-financed by the Ministry of Industry (MOI), UN Environment, International manufacturers of lighting products and appliances (Electrolux), Global Efficient Lighting Centre (GELC), the International Institute for Energy Conservation (IIEC), the International Copper Association (ICA), Daikin and the Small & Medium Industrial Development Bank (SMIDB).

The United Nations Environment Programme (UN Environment) is acting as the GEF Implementing Agency and will be responsible for the following:

- Ensure timely disbursement/sub-allotment to executing agency, based on agreed legal document and in accordance with UN Environment and GEF fiduciary standards;
- Follow-up with Executing Agency for progress, equipment, financial and audit reports;
- Provide consistent and regular oversight on project execution and conduct project supervisory missions as per Supervision Plans and in doing so ensures that all UN Environment and GEF criteria, rules and regulations are adhered to by project partners;
- Technically assess and oversee quality of project outputs, products and deliverables – including formal publications;
- Provide non-objection to main TORs and subcontracts issued by the project, including selection of Project Manager or equivalent;
- Attend and facilitate inception workshops, field visits where relevant, and steering committee meetings;
- Assess project risks, and monitor and enforce a risk management plan;
- Regularly monitor project progress and performance and rates progress towards meeting project objectives, project execution progress, quality of project monitoring and evaluation, and risk;
- Monitor reporting by project executing partners and provides prompt feedback on the contents of the report;
- Promptly inform management of any significant risks or project problems and take action and follow up on decisions made;
- Apply adaptive management principles to the supervision of the project;
- Review of reporting, checking for consistency between execution activities and expenditures, ensuring that it respects GEF rules;
- Clearance of cash requests, and authorization of disbursements once reporting found to be complete;
- Approve budget revision, certify fund availability and transfer funds;
- Ensure that GEF and UN Environment quality standards are applied consistently to all projects, including branding and safeguards;
- Certify project operational completion;
- Link the project partners to any events organised by GEF and UN Environment to disseminate information on project results and lessons;
- Manage relations with GEF.

The Energy Efficiency & Conservation Division (EECD) under Ministry of Industry (MOI) will be the lead Executing Agency. EECD will be accountable to other key project partners, MOI & UN Environment, and will ensure for the following:

- Ensure technical execution according to the execution plan laid out in the project document;
- Ensure technical quality of products, outputs and deliverables;
- Ensure compilation and submission of progress, financial and audit reporting to IA;

- Submission of budget revisions to IA for approval;
- Addressing and rectifying any issues or inconsistencies raised by the IA;
- Bringing issues raised by or associated with clients to the IA for resolution;
- Facilitating Steering Committees and other oversight bodies of the project;
- Day to day oversight of project execution;
- Submit all technical reports and completion reports to IA (realized outputs, inventories, verification of co-finance, terminal reporting, etc.)
- Proper achievement of the objectives of the Project;
- Monitoring and evaluation of the project outputs and outcomes;
- Effective use of both international and national resources allocated to it;
- Timely availability of financing to support project execution;
- Proper coordination among all project stakeholders; in particular national parties;
- Timely submission of all project reports, including work plans and financial reports

The project implementation arrangements comprise the following:

- National Project Director (NPD)
- Project Steering Committee (PSC)
- Project Implementation Unit (PMU)
- Technical Working Group (TWG)
- Technical Committee (TC)

### **National Project Director (NPD)**

The National Project Director will be with a high-ranking official assigned by the MOI. He/She will assume responsibility for the project on behalf of the national government to direct the project strategy and the implementation.

### **Project Steering Committee (PSC)**

The PSC is the highest decision-making authority of this project. The main roles of the PSC include:

- Guide and oversee the technical progress and performance of the Project; and
- Enhance and optimize the contributions of various partner organizations through coordination of all activities and inputs.

The PSC meetings will be formally called by the National Project Director (as Chairperson of the PSC) at least once a year to discuss the project performance and provide future guidance. Extraordinary meetings will be held if deemed necessary by one of the PSC members.

The PSC is likely to include high level representatives from: MOI, Government of Myanmar, EECD, Department of Trade (Ministry of Commerce- MOC), UN Environment's Task Manager, MONREC, Department of Social Welfare Central Bank of Myanmar and City Development council. Other stakeholders (e.g. industry representatives, NGOs) can be invited to attend meetings as appropriate.

### **Project Management Unit (PMU)**

The PMU will be formally headed by the National Project Director (in-kind contribution of EECD/MOI) and further consist of:

- Project Manager (PM)
- A Technical Committee (TC) who will provide advice and guidance in selected project areas



- Professional and support staff (project assistant)
- Short-term International and national consultants (funded by GEF) to support implementation of project activities

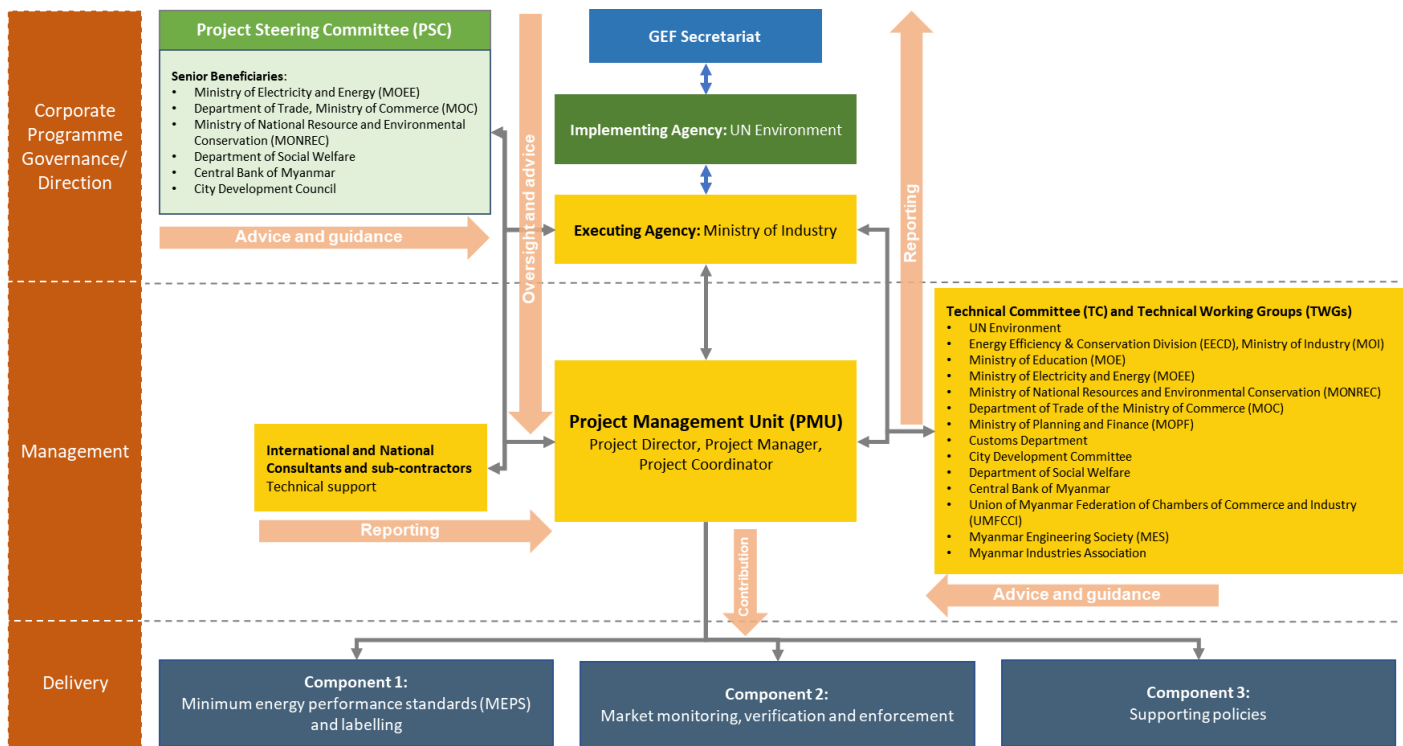
The PMU will be physically housed at EECD or at other premises recommended by MOI. The Project Manager (PM) will be responsible for the day-to-day project operations, financial accounts, periodic reporting to UN Environment and the PSC and for allocation of the GEF grant according to the quarterly and annual work plans and budgets in coordination with UN Environment and MOI. The PM will also act as secretary of the PSC. The PM will prepare progress reports, PIRs, expenditure reports, consolidated co-finance reports, and the project Final Report at the end of the project.

### **Technical Committee (TC)**

The TC will establish to facilitate relevant technical discussions during the project implementation. TC will support PMU to establish a Technical Working Group (TWG).

### **Technical Working Group (TWG)**

To interact with stakeholders at the institutional level, it is foreseen that a Technical Working Group (TWG) will be formed multiple groups for work on a specific technical matter as needed, such as technical issues related to testing of lighting and appliances, establishment of performance metrics, and implementation of MVE activities. TWG's members are invited representatives from international project partners, relevant government agencies/authorities, power distribution utilities, private sector (manufacturer, importers/distributors, retailers, designers and contractors) as well as consumer organizations, universities/institutes and NGOs. The TWG will meet regularly during project implementation.



## Project Implementation Organisation

## ANNEX I - PROJECT WORKPLAN AND DELIVERABLES

Outputs		Activities		Deliverables	Project Year 1												Project Year 2												Project Year 3												Project Year 4												Responsibility																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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Component 1: Minimum energy performance standards (MEPS) and labelling																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
1.1	Assessment of market baseline for lighting products and air-conditioners completed and other target appliances prioritized based on saving estimates	1.1.1	Assessment of market baseline through implementation of a nationwide household appliance saturation survey	- Inception report - Brief report on survey design, methodology, questionnaire and other survey tools - Nationwide household appliance saturation survey report - Assessment report on market baseline data																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																</

Outputs		Activities		Deliverables	Project Year 1												Project Year 2												Project Year 3												Project Year 4												Responsibility																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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Component 2: Market monitoring, verification, and enforcement (MVE)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
2.1	Legislative and institutional framework developed for effective market monitoring, verification and enforcement (MVE)	2.1.1	Establishment of an interim MVE system based on the existing legislative and institutional frameworks	- Agreements among government agencies to set up and operationalize the interim MVE system - Product registry database																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														

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Component 3: Awareness raising and Demonstration projects																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
3.1	Public awareness raising through multi-media communication and mass media campaigns implemented	3.1.1	Design and development of a communication strategy	- Design report on communication strategy summarizing list of target audiences, key messages for each target audience and gender sensitive communication messages																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											

## **ANNEX J-1 - TRACKING TOOL FOR GEF-6 CCM PROJECTS**

This annex is provided in a separate excel file.

## ANNEX J-2: ESTIMATES OF DIRECT AND INDIRECT GREENHOUSE GAS EMISSION REDUCTION

### Step 1: Enter Basic Project Information

#### Project Information

##### Project Information

Project Title	Leapfrogging Myanmar's market to highefficiency lighting and appliances	
GEF ID Number	9436	
Country	Myanmar	
Region	EAP	
GEF Agency	UN Environment	
Date of Submission of GHG Accounting		
Contact Name		
First Year of Project	2018	
Year of Project Close	2021	
GEF Grant Amount (\$)	\$2,223,578	
Co-financing Amount (\$)	\$3,300,000	

##### General Parameters

	Default	User-Specified
Length of Analysis Period (Years After Project Close)	20	10
First Post-project Year		2022
Last Post-project Year		2031
Maximum Technology / Measure Lifetime (Years)	20	10

##### Notes


##### Fuels and Emission Factors

	Default	User-Specified
Grid Electricity T&D Loss Rate (%)	10%	27%
Grid Electricity Emissions (tCO2/MWh)	N/A	0.2623
Fuel: Click here to select from list	0.0000	0.0000
Fuel: Click here to select from list	0.0000	0.0000
Fuel: Click here to select from list	0.0000	0.0000

##### Notes

Reference: <a href="http://data.worldbank.org/indicator/EG.ELC.LOSS.ZS">http://data.worldbank.org/indicator/EG.ELC.LOSS.ZS</a>
Reference: <a href="http://www.acp-cd4cdm.org/media/363090/emissions-reduction">http://www.acp-cd4cdm.org/media/363090/emissions-reduction</a>

### Step 2: List Activity Components and Select Quantification Module

Activity Component	Sector/Subsector	Logframe Output	Module/Intervention Type
S&L program for lighting - LEDs to replace ILs	Residential	1.3, 2.1, 2.2, 2.3	Standards and Labeling
S&L program for lighting - LEDs to replace CFLs	Residential	1.3, 2.1, 2.2, 2.3	Standards and Labeling
S&L program for lighting - LED Tubes to replace TFLs	Residential & Commercial	1.3, 2.1, 2.2, 2.3	Standards and Labeling
S&L program for RACs - high efficiency RACs	Residential & Commercial	1.3, 2.1, 2.2, 2.3	Standards and Labeling
Demonstration projects - LED Lighting & EE ACs in MOI Buildings	Public Sector	1.3, 2.1, 3.2, 3.3	Demonstration & Diffusion
Demonstration projects - LED Lighting & EE ACs in Yangon General Hospitals	Public Sector	1.3, 2.1, 3.2, 3.3	Demonstration & Diffusion
Demonstration project- LED lighting & EE AC in commercial building	Commercial Sector	1.3, 2.1, 3.2, 3.3	Demonstration & Diffusion

## Overall Results

### All Components

	Cumulative			Annual			
	Total	2018-2021	2022-2031	2018	2021	2025	2035
Direct Electricity Savings (MWh)	411,137	100,261	310,876	0	66,100	41,669	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	1,480,092	360,940	1,119,152	0	237,961	150,010	0
Direct GHG Emission Savings (tCO2)	136,958	33,399	103,559	0	22,019	13,881	0
Direct Post-project GHG Emission Savings (tCO2)	447,389		447,389			40,278	76,914
Indirect Bottom-up Emission Savings (tCO2)	11,926		11,926				
Indirect Top-down Emission Savings (tCO2)	491,238		491,238				

### Standards & Labeling Components

	Cumulative			Annual			
	Total	2018-2021	2022-2031	2018	2021	2025	2035
Direct Electricity Savings (MWh)	405,627	99,049	306,578	0	65,604	41,173	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	1,460,256	356,577	1,103,679	0	236,175	148,224	0
Direct GHG Emission Savings (tCO2)	135,123	32,995	102,127	0	21,854	13,716	0
Direct Post-project GHG Emission Savings (tCO2)	447,389		447,389			40,278	76,914
Indirect Bottom-up Emission Savings (tCO2)							

### Building Codes Components

	Cumulative			Annual			
	Total	2018-2021	2022-2031	2018	2021	2025	2035
Direct Electricity Savings (MWh)	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	0	0	0	0	0	0	0
Direct GHG Emission Savings (tCO2)	0	0	0	0	0	0	0
Direct Post-project GHG Emission Savings (tCO2)	0		0			0	0
Indirect Bottom-up Emission Savings (tCO2)							



### Demonstration & Diffusion Components

	Cumulative			Annual			
	<i>Total</i>	<i>2018-2021</i>	<i>2022-2031</i>	<i>2018</i>	<i>2021</i>	<i>2025</i>	<i>2035</i>
Direct Electricity Savings (MWh)	5,510	1,212	4,298	0	496	496	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	19,836	4,363	15,473	0	1,786	1,786	0
Direct GHG Emission Savings (tCO2)	<b>1,835</b>	404	1,432	0	165	165	0
Direct Post-project GHG Emission Savings (tCO2)							
Indirect Bottom-up Emission Savings (tCO2)	<b>11,926</b>		11,926				

### Financial Components

	Cumulative			Annual			
	<i>Total</i>	<i>2018-2021</i>	<i>2022-2031</i>	<i>2018</i>	<i>2021</i>	<i>2025</i>	<i>2035</i>
Direct Electricity Savings (MWh)	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	0	0	0	0	0	0	0
Direct GHG Emission Savings (tCO2)	<b>0</b>	0	0	0	0	0	0
Direct Post-project GHG Emission Savings (tCO2)	<b>0</b>		0				
Indirect Bottom-up Emission Savings (tCO2)	<b>0</b>		0				

## Step 3: Model Activity Components

### Standards and Labeling Module

#### Project Information

Project Title	Leapfrogging Myanmar's market to highefficiency lighting and appliances
Country	Myanmar
Contact Name	
First Year of Project	2018
Last Year of Project	2021

#### Results: Standards and Labeling Activity Components

	Cumulative			Annual			
	Total	2018-2021	2022-2031	2018	2021	2025	2035
Direct Electricity Savings (MWh)	405,627	99,049	306,578	0	65,604	41,173	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	1,460,256	356,577	1,103,679	0	236,175	148,224	0
Direct GHG Emission Savings (tCO2)	135,123	32,995	102,127	0	21,854	13,716	0
Direct Post-project GHG Emission Savings (tCO2)	447,389		447,389			40,278	76,914
Indirect Bottom-up Emission Savings (tCO2)							

#### Component 1: S&L program for lighting - LEDs to replace ILs -- General Inputs

##### Technology Specifications

	Default	User-Specified
Target Technology	CFL	LED Lighting
Fuel Used	Electricity	Electricity
Displaced Technology	Incandescent	Incandescent
Useful Technology Lifetime (years)	5	5
Power Consumption: LED Lighting (W)	15	11
Power Consumption: Incandescent (W)	60	60

##### Notes


##### Annual Energy Consumption

User may enter either daily or annual energy information

	Default	User-Specified
Daily Usage (hr/day)	3.5	3.5
Days Used Each Year (days/yr)	350	365
Annual Energy Consumption: LED Lighting (kWh/yr)	18	14
Annual Energy Consumption: Incandescent (kWh/yr)	74	77
Percentage Energy Savings		82%

##### Notes


##### Market Assumptions

	Default	User-Specified
Annual Sales in Year 2018		1,770,000
Annual Sales Growth Rate		5%

##### Notes

Estimated light points based on 2.3 million annual sales in 2018 divided by 1.3 (1000 hrs/(3.5*365))
Assumed as demand for new installation and replacements in Myanmar is predicted to increase dramatically from 19 million lamps in 2014 to 43.4 million lamps in 2030 based on industry interviews and PAMA model

##### Baseline Assumptions

	Default	User-Specified
Market Share of LED Lighting in Year 2018		0%
Baseline Annual Increase in LED Lighting Market Share	5%	0%
Annual reduction in energy consumption: LED Lighting	0%	0%
Annual reduction in energy consumption: Incandescent	1%	0%

##### Notes

No LED share in IL segment
LED cannot penetrate without the project
No reduction of IL energy consumption as the technology is mature.

##### Standard/Labeling Program Effectiveness

	Default	User-Specified
Year Standard in Force		2020
GEF6 CEO Endorsement Approval Template - August		20%

##### Notes

Estimated - the 1st S&L program for screw-base LED lamps will be implemented after Year 2 as a voluntary program
S&L to be voluntary at the beginning. Due to this it is anticipated that about 30-50% of lighting products may be compliant with the program.

## Component 1: S&L program for lighting - LEDs to replace ILs -- Annual Inputs and Calculations

		2018	2019	2020	2021	2022	2023	2024
<b>MARKET</b>	Annual Sales (Units)	1,770,000	1,858,500	1,951,425	2,048,996	2,151,446	2,259,018	2,371,969
<b>PROGRAMME</b>	Annual Sales (Incandescent)	1,770,000	1,858,500	1,561,140	1,639,197	1,721,157	1,807,215	1,897,575
	Annual Sales (LED Lighting)	0	0	390,285	409,799	430,289	451,803	474,394
	1st yr Consumption: Incandescent (MWh)	135,671	142,454	119,661	125,644	131,927	138,523	145,449
	1st yr Consumption: LED Lighting (MWh)	0	0	5,484	5,759	6,047	6,349	6,666
	Total Number of Units (Incandescent)	1,770,000	3,628,500	5,189,640	6,828,837	8,549,994	8,587,209	8,626,284
	Total Number of Units (LED Lighting)	0	0	390,285	800,084	1,230,373	1,682,177	2,156,571
	Direct Annual Consumption Electricity (MWh)	135,671	278,125	403,270	534,674	534,674	399,003	256,549
	Direct Post-project Annual Consumption Electricity (MWh)	0	0	0	0	137,973	282,845	434,961
	Direct Annual GHG Emissions (tCO2)	45,195	92,649	134,338	178,111	178,111	132,916	85,462
	Direct Post-project Annual GHG Emissions (tCO2)	0	0	0	0	45,962	94,222	144,895
<b>BASELINE</b>	Annual Sales (Incandescent)	1,770,000	1,858,500	1,951,425	2,048,996	2,151,446	2,259,018	2,371,969
	Annual Sales (LED Lighting)	0	0	0	0	0	0	0
	1st yr Consumption: Incandescent (MWh)	135,671	142,454	149,577	157,056	164,908	173,154	181,811
	1st yr Consumption: LED Lighting (MWh)	0	0	0	0	0	0	0
	Total Number of Units (Incandescent)	1,770,000	3,628,500	5,579,925	7,628,921	9,780,367	10,269,385	10,782,854
	Total Number of Units (LED Lighting)	0	0	0	0	0	0	0
	Direct Annual Consumption Electricity (MWh)	135,671	278,125	427,701	584,757	584,757	449,086	306,632
	Direct Post-project Annual Consumption Electricity (MWh)	0	0	0	0	164,908	338,062	519,873
	Direct Annual GHG Emissions (tCO2)	45,195	92,649	142,476	194,795	194,795	149,600	102,146
	Direct Post-project Annual GHG Emissions (tCO2)	0	0	0	0	54,934	112,616	173,181
<b>SAVINGS</b>	Direct Annual Consumption Electricity (MWh)	0	0	24,431	50,083	50,083	50,083	50,083
	Direct Post-project Annual Consumption Electricity (MWh)	0	0	0	0	26,935	55,217	84,913
	Direct Annual GHG Emissions (tCO2)	0	0	8,138	16,684	16,684	16,684	16,684
	Direct Post-project Annual GHG Emissions (tCO2)	0	0	0	0	8,973	18,394	28,286

<b>TOTALS</b>	Direct Energy Avoided 2018-2021 (MWh)	74,514	Direct GHG Avoided 2018-2021 (tCO2)	24,822
	Direct Energy Avoided 2022-2031 (MWh)	175,902	Direct GHG Avoided 2022-2031 (tCO2)	58,597
	Direct Post-project Energy Avoided 2022-2031 (MWh)	1,295,507	Direct Post-project GHG Avoided 2022-2031 (tCO2)	431,561

## Component 2: S&L program for lighting - LEDs to replace CFLs -- General Inputs

### Technology Specifications

	Default	User-Specified
Target Technology	LED Lighting	LED Lighting
Fuel Used	Electricity	Electricity
Displaced Technology	Improved CFL	Improved CFL
Useful Technology Lifetime (years)	10	10
Power Consumption: LED Lighting (W)	14	11
Power Consumption: Improved CFL (W)	15	15

### Notes


### Annual Energy Consumption

User may enter either daily or annual energy information

	Default	User-Specified
Daily Usage (hr/day)	8.0	3.5
Days Used Each Year (days/yr)	200	365
Annual Energy Consumption: LED Lighting (kWh/yr)	22	14
Annual Energy Consumption: Improved CFL (kWh/yr)	24	19
Percentage Energy Savings		27%

### Notes

Residential applications

### Market Assumptions

	Default	User-Specified
Annual Sales in Year 2018		10,000,000
Annual Sales Growth Rate		5%

### Notes

Estimated lighting points for CFLs and LEDs
Assumed

### Baseline Assumptions

	Default	User-Specified
Market Share of LED Lighting in Year 2018		14%
Baseline Annual Increase in LED Lighting Market Share	5%	5%
Annual reduction in energy consumption: LED Lighting	0%	0%
Annual reduction in energy consumption: Improved CFL	1%	0%

### Notes

assumed
No reduction of CFLs energy consumption as R&D shifted to LEDs

### Standard/Labeling Program Effectiveness

	Default	User-Specified
Year Standard in Force		2020
Percent New Sales Compliant with Standard		40%

### Notes

Estimated - the 1st S&L program for screw-base LED lamps will be implemented after Year 2 as a voluntary program
S&L to be voluntary at the beginning. Due to this it is anticipated that about 30-50% of lighting products may be compliant with the program.

## Component 2: S&L program for lighting - LEDs to replace CFLs -- Annual Inputs and Calculations

		2018	2019	2020	2021	2022	2023	2024
<b>MARKET</b>	Annual Sales (Units)	10,000,000	10,500,000	11,025,000	11,576,250	12,155,063	12,762,816	13,400,956
<b>PROGRAMME</b>	Annual Sales (Improved CFL)	8,600,000	8,505,000	6,615,000	6,945,750	7,293,038	7,657,689	7,504,536
	Annual Sales (LED Lighting)	1,400,000	1,995,000	4,410,000	4,630,500	4,862,025	5,105,126	5,896,421
	1st yr Consumption: Improved CFL (MWh)	164,798	162,977	126,760	133,098	139,753	146,740	143,806
	1st yr Consumption: LED Lighting (MWh)	19,674	28,035	61,972	65,070	68,324	71,740	82,859
	Total Number of Units (Improved CFL)	8,600,000	17,105,000	23,720,000	30,665,750	37,958,788	45,616,477	53,121,012
	Total Number of Units (LED Lighting)	1,400,000	3,395,000	7,805,000	12,435,500	17,297,525	22,402,651	28,299,072
	Direct Annual Consumption Electricity (MWh)	184,471	375,483	564,214	762,382	762,382	762,382	762,382
	Direct Post-project Annual Consumption Electricity (MWh)	0	0	0	0	208,076	426,557	653,222
	Direct Annual GHG Emissions (tCO2)	61,451	125,081	187,952	253,966	253,966	253,966	253,966
	Direct Post-project Annual GHG Emissions (tCO2)	0	0	0	0	69,315	142,095	217,602
<b>BASELINE</b>	Annual Sales (Improved CFL)	8,600,000	8,505,000	8,379,000	8,219,138	8,022,341	7,785,318	7,504,536
	Annual Sales (LED Lighting)	1,400,000	1,995,000	2,646,000	3,357,113	4,132,721	4,977,498	5,896,421
	1st yr Consumption: Improved CFL (MWh)	164,798	162,977	160,563	157,499	153,728	149,186	143,806
	1st yr Consumption: LED Lighting (MWh)	19,674	28,035	37,183	47,176	58,075	69,946	82,859
	Total Number of Units (Improved CFL)	8,600,000	17,105,000	25,484,000	33,703,138	41,725,479	49,510,796	57,015,332
	Total Number of Units (LED Lighting)	1,400,000	3,395,000	6,041,000	9,398,113	13,530,834	18,508,332	24,404,753
	Direct Annual Consumption Electricity (MWh)	184,471	375,483	573,228	777,903	777,903	777,903	777,903
	Direct Post-project Annual Consumption Electricity (MWh)	0	0	0	0	211,803	430,936	657,601
	Direct Annual GHG Emissions (tCO2)	61,451	125,081	190,954	259,136	259,136	259,136	259,136
	Direct Post-project Annual GHG Emissions (tCO2)	0	0	0	0	70,556	143,554	219,061
<b>SAVINGS</b>	Direct Annual Consumption Electricity (MWh)	0	0	9,014	15,521	15,521	15,521	15,521
	Direct Post-project Annual Consumption Electricity (MWh)	0	0	0	0	3,727	4,379	4,379
	Direct Annual GHG Emissions (tCO2)	0	0	3,003	5,170	5,170	5,170	5,170
	Direct Post-project Annual GHG Emissions (tCO2)	0	0	0	0	1,241	1,459	1,459

<b>TOTALS</b>	Direct Energy Avoided 2018-2021 (MWh)	24,535	Direct GHG Avoided 2018-2021 (tCO2)	8,173
	Direct Energy Avoided 2022-2031 (MWh)	130,675	Direct GHG Avoided 2022-2031 (tCO2)	43,531
	Direct Post-project Energy Avoided 2022-2031 (MWh)	43,137	Direct Post-project GHG Avoided 2022-2031 (tCO2)	14,370

### Component 3: S&L program for lighting - LED Tubes to replace TFLs -- General Inputs

#### Technology Specifications

	Default	User-Specified
Target Technology	LED Lighting	LED Lighting
Fuel Used	Electricity	Electricity
Displaced Technology	Improved CFL	T-8 Fluor. Lamp
Useful Technology Lifetime (years)	5	10
Power Consumption: LED Lighting (W)	14	20
Power Consumption: T-8 Fluor. Lamp (W)	15	38

#### Notes

LED Tubes
Based on on-site measurements in Yangon, Myanmar

#### Annual Energy Consumption

User may enter either daily or annual energy information

	Default	User-Specified
Daily Usage (hr/day)	8.0	8.0
Days Used Each Year (days/yr)	200	244
Annual Energy Consumption: LED Lighting (kWh/yr)	22	39
Annual Energy Consumption: T-8 Fluor. Lamp (kWh/yr)	24	74
Percentage Energy Savings		47%

#### Notes

Based on number of actual weekdays in 2017 and official holidays in Myanmar ( <a href="http://www.mofa.gov.mm/?page_id=47">http://www.mofa.gov.mm/?page_id=47</a> )

#### Market Assumptions

	Default	User-Specified
Annual Sales in Year 2018		6,700,000
Annual Sales Growth Rate		5%

#### Notes


#### Baseline Assumptions

	Default	User-Specified
Market Share of LED Lighting in Year 2018		5%
Baseline Annual Increase in LED Lighting Market Share	5%	5%
Annual reduction in energy consumption: LED Lighting	0%	0%
Annual reduction in energy consumption: Improved CFL	1%	0%

#### Notes

Estimation
No reduction of TFLs energy consumption as R&D shifted to LEDs

#### Standard/Labeling Program Effectiveness

	Default	User-Specified
Year Standard in Force		2021
Percent New Sales Compliant with Standard		20%

#### Notes

Estimated - the 2nd S&L program for LED tubes will be implemented after Year 3 as a voluntary program
S&L to be voluntary at the beginning. Due to this it is anticipated that about 30-50% of lighting products may be compliant with the program.

### Component 3: S&L program for lighting - LED Tubes to replace TFLs -- Annual Inputs and Calculations

		2018	2019	2020	2021	2022	2023	2024
<b>MARKET</b>	Annual Sales (Units)	6,700,000	7,035,000	7,386,750	7,756,088	8,143,892	8,551,086	8,978,641
<b>PROGRAMME</b>	Annual Sales (T-8 Fluor. Lamp)	6,365,000	6,331,500	6,278,738	6,204,870	6,107,919	5,985,761	5,836,117
	Annual Sales (LED Lighting)	335,000	703,500	1,108,013	1,551,218	2,035,973	2,565,326	3,142,524
	1st yr Consumption: T-8 Fluor. Lamp (MWh)	472,130	469,645	465,732	460,252	453,061	444,000	432,900
	1st yr Consumption: LED Lighting (MWh)	13,078	27,465	43,257	60,560	79,484	100,150	122,684
	Total Number of Units (T-8 Fluor. Lamp)	6,365,000	12,696,500	18,975,238	25,180,108	31,288,026	37,273,787	43,109,903
	Total Number of Units (LED Lighting)	335,000	1,038,500	2,146,513	3,697,730	5,733,703	8,299,029	11,441,553
	Direct Annual Consumption Electricity (MWh)	485,209	982,319	1,491,307	2,012,119	2,012,119	2,012,119	2,012,119
	Direct Post-project Annual Consumption Electricity (MWh)	0	0	0	0	532,545	1,076,695	1,632,279
	Direct Annual GHG Emissions (tCO2)	161,633	327,231	496,786	670,279	670,279	670,279	670,279
	Direct Post-project Annual GHG Emissions (tCO2)	0	0	0	0	177,402	358,670	543,747
<b>BASELINE</b>	Annual Sales (T-8 Fluor. Lamp)	6,365,000	6,331,500	6,278,738	6,204,870	6,107,919	5,985,761	5,836,117
	Annual Sales (LED Lighting)	335,000	703,500	1,108,013	1,551,218	2,035,973	2,565,326	3,142,524
	1st yr Consumption: T-8 Fluor. Lamp (MWh)	472,130	469,645	465,732	460,252	453,061	444,000	432,900
	1st yr Consumption: LED Lighting (MWh)	13,078	27,465	43,257	60,560	79,484	100,150	122,684
	Total Number of Units (T-8 Fluor. Lamp)	6,365,000	12,696,500	18,975,238	25,180,108	31,288,026	37,273,787	43,109,903
	Total Number of Units (LED Lighting)	335,000	1,038,500	2,146,513	3,697,730	5,733,703	8,299,029	11,441,553
	Direct Annual Consumption Electricity (MWh)	485,209	982,319	1,491,307	2,012,119	2,012,119	2,012,119	2,012,119
	Direct Post-project Annual Consumption Electricity (MWh)	0	0	0	0	532,545	1,076,695	1,632,279
	Direct Annual GHG Emissions (tCO2)	161,633	327,231	496,786	670,279	670,279	670,279	670,279
	Direct Post-project Annual GHG Emissions (tCO2)	0	0	0	0	177,402	358,670	543,747
<b>SAVINGS</b>	Direct Annual Consumption Electricity (MWh)	0	0	0	0	0	0	0
	Direct Post-project Annual Consumption Electricity (MWh)	0	0	0	0	0	0	0
	Direct Annual GHG Emissions (tCO2)	0	0	0	0	0	0	0
	Direct Post-project Annual GHG Emissions (tCO2)	0	0	0	0	0	0	0

<b>TOTALS</b>	Direct Energy Avoided 2018-2021 (MWh)	0	Direct GHG Avoided 2018-2021 (tCO2)	0
	Direct Energy Avoided 2022-2031 (MWh)	0	Direct GHG Avoided 2022-2031 (tCO2)	0
	Direct Post-project Energy Avoided 2022-2031 (MWh)	0	Direct Post-project GHG Avoided 2022-2031 (tCO2)	0

#### Component 4: S&L program for RACs - high efficiency RACs -- General Inputs

##### Technology Specifications

	Default	User-Specified
Target Technology	Home Air Conditioner	Inverter-Type RAC
Fuel Used	Electricity	Electricity
Displaced Technology	Existing Home Air Conditioner	Existing Home Air Conditioner
Useful Technology Lifetime (years)	5	10
Power Consumption: Inverter-Type RAC (W)	1,395	1,149
Power Consumption: Existing Home Air Conditioner (W)	1,641	1,641

##### Notes

Inverter-Type RACs are estimated to save 30%-40% of energy consumption.

##### Annual Energy Consumption

User may enter either daily or annual energy information

	Default	User-Specified
Daily Usage (hr/day)	8.0	7.0
Days Used Each Year (days/yr)	180	244
Annual Energy Consumption: Inverter-Type RAC (kWh/yr)	2,008	1,962
Annual Energy Consumption: Existing Home Air Conditioner (kWh/yr)	2,363	2,802
Percentage Energy Savings		30%

##### Notes

In calculation sheet duty cycle is not accounted. Due to this operation hour of 7.5 is estimated, which is equivalent to operation of AC with duty cycle of about 85%
Based on number of actual weekdays in 2017 and official holidays in Myanmar ( <a href="http://www.mofa.gov.mm/?page_id=47">http://www.mofa.gov.mm/?page_id=47</a> )

##### Market Assumptions

	Default	User-Specified
Annual Sales in Year 2018		16,470
Annual Sales Growth Rate		5%

##### Notes

Estimated based on actual annual sales growth rate from 2009 to 2013
Estimation

##### Baseline Assumptions

	Default	User-Specified
Market Share of Inverter-Type RAC in Year 2018		10%
Baseline Annual Increase in Inverter-Type RAC Market Share	5%	3%
Annual reduction in energy consumption: Inverter-Type RAC	0%	0%
Annual reduction in energy consumption: Existing Home Air Conditioner	1%	1%

##### Notes

Estimation

##### Standard/Labeling Program Effectiveness

	Default	User-Specified
Year Standard in Force		2022
Percent New Sales Compliant with Standard		25%

##### Notes

Estimated - the 3rd S&L program for inverter-type RACs will be implemented after EOP as a voluntary program
S&L to be voluntary at the beginning. Due to this it is anticipated that about 30-50% of lighting products may be compliant with the program.



#### Component 4: S&L program for RACs - high efficiency RACs -- Annual Inputs and Calculations

		2018	2019	2020	2021	2022	2023	2024
<b>MARKET</b>	Annual Sales (Units)	16,470	17,294	18,158	19,066	20,019	21,020	22,071
<b>PROGRAMME</b>	Annual Sales (Existing Home Air Conditioner)	14,823	15,045	15,253	15,444	15,015	15,765	15,891
	Annual Sales (Inverter-Type RAC)	1,647	2,248	2,905	3,623	5,005	5,255	6,180
	1st yr Consumption: Existing Home Air Conditioner (MWh)	41,537	41,738	41,891	41,990	40,416	42,012	41,925
	1st yr Consumption: Inverter-Type RAC (MWh)	3,232	4,412	5,702	7,109	9,822	10,313	12,128
	Total Number of Units (Existing Home Air Conditioner)	14,823	29,868	45,121	60,565	75,579	91,345	107,236
	Total Number of Units (Inverter-Type RAC)	1,647	3,895	6,800	10,423	15,428	20,683	26,863
	Direct Annual Consumption Electricity (MWh)	44,769	90,919	138,512	187,611	187,611	187,611	187,611
	Direct Post-project Annual Consumption Electricity (MWh)	0	0	0	0	50,238	102,563	156,616
	Direct Annual GHG Emissions (tCO2)	14,914	30,287	46,141	62,497	62,497	62,497	62,497
	Direct Post-project Annual GHG Emissions (tCO2)	0	0	0	0	16,735	34,166	52,172
<b>BASELINE</b>	Annual Sales (Existing Home Air Conditioner)	14,823	15,045	15,253	15,444	15,615	15,765	15,891
	Annual Sales (Inverter-Type RAC)	1,647	2,248	2,905	3,623	4,404	5,255	6,180
	1st yr Consumption: Existing Home Air Conditioner (MWh)	41,537	41,738	41,891	41,990	42,032	42,012	41,925
	1st yr Consumption: Inverter-Type RAC (MWh)	3,232	4,412	5,702	7,109	8,643	10,313	12,128
	Total Number of Units (Existing Home Air Conditioner)	14,823	29,868	45,121	60,565	76,180	91,945	107,837
	Total Number of Units (Inverter-Type RAC)	1,647	3,895	6,800	10,423	14,827	20,082	26,262
	Direct Annual Consumption Electricity (MWh)	44,769	90,919	138,512	187,611	187,611	187,611	187,611
	Direct Post-project Annual Consumption Electricity (MWh)	0	0	0	0	50,676	103,001	157,054
	Direct Annual GHG Emissions (tCO2)	14,914	30,287	46,141	62,497	62,497	62,497	62,497
	Direct Post-project Annual GHG Emissions (tCO2)	0	0	0	0	16,881	34,312	52,318
<b>SAVINGS</b>	Direct Annual Consumption Electricity (MWh)	0	0	0	0	0	0	0
	Direct Post-project Annual Consumption Electricity (MWh)	0	0	0	0	438	438	438
	Direct Annual GHG Emissions (tCO2)	0	0	0	0	0	0	0
	Direct Post-project Annual GHG Emissions (tCO2)	0	0	0	0	146	146	146

<b>TOTALS</b>	Direct Energy Avoided 2018-2021 (MWh)	0	Direct GHG Avoided 2018-2021 (tCO2)	0
	Direct Energy Avoided 2022-2031 (MWh)	0	Direct GHG Avoided 2022-2031 (tCO2)	0
	Direct Post-project Energy Avoided 2022-2031 (MWh)	4,380	Direct Post-project GHG Avoided 2022-2031 (tCO2)	1,459

## Results: Demonstration/Diffusion Activity Components

	Cumulative			Annual			
	Total	2018-2021	2022-2031	2018	2021	2025	2035
Direct Electricity Savings (MWh)	5,510	1,212	4,298	0	496	496	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	19,836	4,363	15,473	0	1,786	1,786	0
Direct GHG Emission Savings (tCO2)	1,835	404	1,432	0	165	165	0
Direct Post-project GHG Emission Savings (tCO2)							
Indirect Bottom-up Emission Savings (tCO2)	11,926		11,926				

## Component 1: Demonstration projects - LED Lighting & EE ACs in MOI Buildings -- General Inputs

Component Specifications	Default	User-Specified	Per Unit	Notes
Annual Electricity Savings (MWh)		110.00	MOI building demo	Installation of 550 LED lamps and 150 energy efficient ACs
---				in MOI building, Nay Pyi Taw
---				Estimated investment = US\$130,000;
---				Estimated annual savings = 110,000 kWh
Useful Lifetime of Investment	5	10		

Baseline Assumptions	Default	User-Specified	Notes
Percent of Activities Implemented in the Baseline	10%	0%	

Indirect Bottom-up Estimate	Default	User-Specified	Notes
Number of MOI building demos Implemented During Project Period		1	
Number of Replications Post-project as Spillover		10	
Total		10	

**Component 1: Demonstration projects - LED Lighting & EE ACs in MOI Buildings -- Annual Inputs and Calculations**

		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
PROGRAMME	MOI building demo(s) in Year	0	1	0	0										
BASELINE	MOI building demo(s) in Year	0	0	0	0										
NET	Cumulative MOI building demo(s) in Place	0	1	1	1	1	1	1	1	1	1	1	0	0	0
DIRECT SAVINGS	Annual Electricity Savings (MWh)	0	110	110	110	110	110	110	110	110	110	110	0	0	0
	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	Direct Energy Avoided 2018-2021 (GJ)	1,188													
	Direct Energy Avoided 2022-2031 (GJ)	2,772													
	Direct Post-project Energy Avoided 2022-2031 (GJ)	0													
	Direct GHG Avoided 2018-2021 (tCO2)					110									
	Direct GHG Avoided 2022-2031 (tCO2)					257									
	Direct Post-project GHG Avoided 2022-2031 (tCO2)					0									
INDIRECT BOTTOM-UP SAVINGS	2022-2031	3,664	tCO2												

**Component 2: Demonstration projects - LED Lighting & EE ACs in Yangon General Hospitals -- General Inputs**
**Component Specifications**

	Default	User-Specified	Per Unit	Notes
Annual Electricity Savings (MWh)		166.00	Hospital demo	Installation of 1,000 LED lamps and 40 energy efficient ACs in Yangon general hospital, Yangon
---				Estimated investment = US\$80,000;
---				Estimated annual savings = 166,000 kWh
---				
Useful Lifetime of Investment	15	10		

**Baseline Assumptions**

	Default	User-Specified	Notes
Percent of Activities Implemented in the Baseline	10%	0%	

**Indirect Bottom-up Estimate**

	Default	User-Specified	Notes
Number of Hospital demos Implemented During Project Period		1	
Number of Replications Post-project as Spillover		5	
Total		5	

**Component 2: Demonstration projects - LED Lighting & EE ACs in Yangon General Hospitals -- Annual Inputs and Calculations**

		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
PROGRAMME	Hospital demo(s) in Year	0	0	1	0										
BASELINE	Hospital demo(s) in Year	0	0	0	0										
NET	Cumulative Hospital demo(s) in Place	0	0	1	1	1	1	1	1	1	1	1	1	0	0
DIRECT SAVINGS	Annual Electricity Savings (MWh)	0	0	166	166	166	166	166	166	166	166	166	166	0	0
	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	Direct Energy Avoided 2018-2021 (GJ)	1,195													
	Direct Energy Avoided 2022-2031 (GJ)	4,781													
	Direct Post-project Energy Avoided 2022-2031 (GJ)	0													
	Direct GHG Avoided 2018-2021 (tCO2)					111									
	Direct GHG Avoided 2022-2031 (tCO2)					442									
	Direct Post-project GHG Avoided 2022-2031 (tCO2)					0									
INDIRECT BOTTOM-UP SAVINGS	2022-2031	2,765	tCO2												

### Component 3: Demonstration project- LED lighting & EE AC in commercial building -- General Inputs

Component Specifications	Default	User-Specified	Per Unit	Notes
Annual Electricity Savings (MWh)		110.00	Commercial building demo	Installation of 550 LED lamps and 150 energy efficient Acs
---				in commercial building
---				Estimated investment = US\$200,000;
---				Estimated annual savings = 110,000 kWh
Useful Lifetime of Investment	15	15		

Baseline Assumptions	Default	User-Specified	Notes
Percent of Activities Implemented in the Baseline	10%	10%	

Indirect Bottom-up Estimate	Default	User-Specified	Notes
Number of Commercial building demos Implemented During Project Period		2	
Number of Replications Post-project as Spillover		5	
Total		10	

### Component 3: Demonstration project- LED lighting & EE AC in commercial building -- Annual Inputs and Calculations

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
PROGRAMME Commercial building demo(s) in Year		1	1											
BASELINE Commercial building demo(s) in Year	0	0	0	0										
NET Cumulative Commercial building demo(s) in Place	0	1	2	2	2	2	2	2	2	2	2	2	2	2
DIRECT SAVINGS Annual Electricity Savings (MWh)	0	110	220	220	220	220	220	220	220	220	220	220	220	220
---	0	0	0	0	0	0	0	0	0	0	0	0	0	0
---	0	0	0	0	0	0	0	0	0	0	0	0	0	0
---	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTALS	Direct Energy Avoided 2018-2021 (GJ)	1,980	Direct GHG Avoided 2018-2021 (tCO2)	183
	Direct Energy Avoided 2022-2031 (GJ)	7,920	Direct GHG Avoided 2022-2031 (tCO2)	733
	Direct Post-project Energy Avoided 2022-2031 (GJ)	0	Direct Post-project GHG Avoided 2022-2031 (tCO2)	0

INDIRECT BOTTOM-UP SAVINGS	2022-2031	5,496	tCO2
----------------------------	-----------	-------	------

## Step 4: Calculate Indirect Top-Down Impacts

	User-Specified
Total Market Potential (tCO2)	818,730
Causality factor	60%
Indirect Top-Down Emission Reductions (tCO2)	491,238

### Notes

Source: MMR U4E Country Assessments Saving Report 2016 (cumulative savings 2020-2030)

Myanmar has in place an EE&C policy and a S&L roadmap as well as an agency responsible for EE&C implementation (EECD). However implementation of EE&C to date has been slow due to limited technical and financial resources. Considering this, the Level 3 causality factor of 60% (The GEF contribution is substantial but modest) is recommended.

## ANNEX K: OFP ENDORSEMENT LETTER

The Republic of the Union of Myanmar  
Ministry of Environmental Conservation and Forestry  
Environmental Conservation Department  
Office (53), Nay Pyi Taw, Myanmar

Dated: 17<sup>th</sup> August 2015

To:  
Brennan Vandyke  
United Nations Environment Programme  
United Nations Avenue,  
Gigiri PO Box 30552, 00100  
Nairobi, Kenya

Subject: Endorsement for Leapfrogging the national market to high efficiency lighting and appliances (Child Project)

In my capacity as GEF Operational Focal Point for Myanmar, I confirm that the above program proposal (a) is in accordance with my government's national priorities and our commitment to the relevant global environmental conventions; and (b) was discussed with relevant stakeholders, including the global environmental convention focal points.

I am pleased to endorse the preparation of the above Program proposal which will be led by the United Nations Environment Programme (UNEP). If approved, the proposal will be prepared and implemented by the Ministry of Industry.

The total financing<sup>1</sup> being requested for the child projects under this Program supported by Myanmar, is US\$ 2,500,000 inclusive of GEF financing for the child projects, PPG that will finance the preparation of individual child projects under the Program, and Agency fees for project cycle management services associated with the projects under the Program. The fund requested for Myanmar is detailed in the table below including the GEF Agency that will implement the project(s).

Source of Funds	GEF Agency	Focal Area	Amount (in US\$)			
			Project Preparation	Project	Fee	Total
GEPTF	UNEP	CCM	70,000	2,223,578	206,422	2,500,000
Total GEF Resources			70,000	2,223,578	206,422	2,500,000

I consent to the utilization of Myanmar's allocations in GEF-6 as defined in the System for Transparent Allocation of Resources (STAR).

Sincerely,



*Handwritten signature of Mr. Hla Maung Thein*  
14.8.2015

Mr. Hla Maung Thein  
GEF Operational Focal Point/  
Deputy Director General  
Environmental Conservation Department  
Ministry of Environmental Conservation and Forestry

Copy to (delete as necessary): Convention Focal Point for UNFCCC

<sup>1</sup> "Total financing" refers to funding from the GEPTF, LDCF, and/or SDCF.

GEF Operational Focal Point Endorsement Template, December 2014



Ministry of Industry  
Directorate of Industrial Collaboration (DIC)

Letter No. 1501(1)/SaMaYa(2)/2017-18/449(009)

Date: ၁၁ . December, 2017

Ms. Kelly West  
GEF Executive Coordinator  
United Nations Environment Programme  
Nairobi-Kenya

Subject: Co-financing letter for GEF 6 "Leapfrogging Myanmar's market to high efficient lighting and appliances" Project

Dear Ms. Kelly West,

This letter is to confirm our commitment to participate in the implementation of the UN Environment and the Ministry of Industry, Myanmar - GEF 6 supported "Leapfrogging Myanmar's market to high efficient lighting and appliances" Project.

Ministry of Industry would like to affirm its contribution for the implementation of the project through an in-kind contribution which is equivalent to estimated value of US\$ 1,700,000. This in-kind contribution will include staffs' time, resources for implementation of the project components, public awareness campaigns and necessary meeting purposes.

The Ministry welcomes to implement such the important project for Myanmar as a country counterpart and looking forward to having cooperation with UN Environment and GEF.

Sincerely Yours,

Ko Ko Tin (Mr.)  
Director General  
Directorate of Industrial Collaboration  
Ministry of Industry

Address : Building No. 30, Zayahtami Rd,  
Nay Pyi Taw.

Telephone : 95 67 405324  
95 67 405334  
Fax : 95 67 405052



Dear Ms. Kelly West,

GEF Executive Coordinator

UN Environment

Nairobi - Kenya

Date 14 December, 2017

Subject: Co- financing of Department of Research and Innovation – DRI for GEF Project “Leapfrogging Myanmar’s market to high efficiency lighting and appliances”

Dear Ms. Kelly West,

This letter is to confirm our commitment to participate in the implementation of the UN Environment and Ministry of Industry – GEF 6 supported “Leapfrogging Myanmar’s market to high efficient lighting and appliances” Project.

We are pleased to confirm our in-kind contribution with an estimated value US \$ 500,000 comprising staff time and utilization of our facilities to support implementation of the following project activities.

- Implementation of training programs of standards development under Component 1;
- Design and development of MEPS and labeling programs under Component 1;

The Ministry of Education welcomes this important project in Myanmar and is pleased to be part of it.

Sincerely Yours,

  
(Dr. Zar Ni Aung)

Signature

For and on behalf of :

Win Khaing Moe  
Director General  
Department of Research and Innovation  
Ministry of Education  
Tel: +95-1-664930  
Fax: +95-1-668033  
Email: [winkmoe@gmail.com](mailto:winkmoe@gmail.com), [winkhaingmoe@moe-st.gov.mm](mailto:winkhaingmoe@moe-st.gov.mm)  
Address: No 6, Kabaaye Pagoda Road, Yankin Township,  
Yangon, Myanmar

Dr. Zar Ni Aung

Director

National Standards and Quality Department  
Department of Research and Innovation



Subject: Co-financing for GEF Project "Leapfrogging Myanmar's market to high efficiency lighting and appliances"

Dear Ms. Kelly West,

Daikin Malaysia Sdn. Bhd. (Myanmar Branch) is pleased to participate as a co-financier, in the implementation of the UN Environment and Ministry of Industry – Global Environmental Facility supported "Leapfrogging Myanmar's market to high efficiency lighting and appliances" project.

We will contribute to promoting energy efficient lighting and appliances in Myanmar by co-financing this project with an estimated budget value of US\$385,000 over the four years project period, and will support the implementation of the project through the following activities:

- Product and technical knowledge transfer of energy efficient air-conditioning system
- Technology transfer of inverter and variable refrigerant flow system
- Communication and public awareness campaign of energy efficient air-conditioning system
- Consultation assistance of energy efficient air conditioning system

We are looking forward to work together in the "Leapfrogging Myanmar's market to high efficiency lighting and appliances" project.

Thank you.

Yours Sincerely,

Mr. Lim Cheng Liang  
Chief Representative  
Daikin Malaysia Sdn. Bhd., (Myanmar Branch)

Lim Cheng Liang

**DAIKIN MALAYSIA SDN. BHD. (MYANMAR BRANCH)**

(Co. Reg. No 112531-W)

# 151, Yawgi Kyaung Street, 11 Ward, Hlaing Township, Yangon, Myanmar.

Off Tel: + 95 1 519 661 / 662

Cool Line: + 95 9 25345 2534 (Sales & Service)

Web: [www.daikin.com.my](http://www.daikin.com.my)





Economy Division



Date: 11 October 2017

**Subject: UN Environment/U4E Co-financing for GEF project "Leapfrogging Myanmar's market to high efficiency lighting and appliances"**

Dear Kelly,

I have the pleasure of writing to you to confirm the support of UN Environment to the UNEP-GEF project "Leapfrogging Myanmar's market to high efficiency lighting and appliances". The UN Environment's United for Efficiency initiative will support the project with tools, guidebooks and training through the global GEF project (full name: Global project to leapfrog markets to energy efficient lighting, appliances and equipment) and ASEAN SHINE – Lighting Regional project.

The UN Environment affirms its desire to support the implementation of this project through an in-kind contribution with an estimated value of US\$ 90,000. The contribution will comprise staff time from the UN Environment Energy and Climate Branch, including:

- US\$ 20,000 of staff time from the Head of the Energy Unit (P-4) in order to coordinate perspective partners and provide strategic advice to the project.
- US\$ 20,000 of staff time from the Asia Pacific Climate Change Coordinator (P-4) to support collaboration with ongoing UN Environment initiatives and projects in the region.
- US\$ 50,000 of in-kind resources (guides, training packages, etc.) and training from the Kigali Cooling Efficiency Program & UN Environment project on energy-efficient and climate friendly cooling products.

The UN Environment welcomes this important project in Myanmar and is pleased to be part of it.

Yours sincerely,

  
 Mark Radka  
 Chief, Energy and Climate Branch *arc*

Ms. Kelly West  
 GEF Executive Coordinator  
 UN Environment  
 Nairobi - Kenya

United Nations Avenue, Gigiri  
 P O Box 30552-00100 Nairobi, Kenya  
 Tel +33 (0)1 44 37 14 50 | [unep.drie@unep.org](mailto:unep.drie@unep.org)  
[www.unep.org](http://www.unep.org)

New York, 30 November 2017

Dear Ms. Kelly West,

**Subject: International Copper Association, co-financing towards the project “Leapfrogging Myanmar’s market to high efficiency lighting and appliances”**

Dear Ms. Kelly West,

I have the pleasure of writing to you to confirm the intention of the International Copper Association (ICA) to continue to support the Efficient Appliances and Equipment Partnership Programme led by the United Nations Environment Programme – United for Efficiency (U4E).

For many years, the International Copper Association has been supporting national, regional, and global projects to advance energy efficiency, including a joint UN Environment – ICA project in Southeast Asia to promote the regional harmonization of policies for energy-efficient products. Energy efficiency is a priority for us, as it aligns with our business objectives and we see the U4E as an attractive opportunity to advance the use of energy-efficient products.

ICA is already providing co-financing to the current Global Environment Facility-U4E project (“Establishing the Foundations of a Partnership to Accelerate the Global Market Transformation for Efficient Appliances and Equipment”). Over the last two years, with ICA’s support, U4E has developed 150 country assessments and a series of guides to support policymakers in the transition towards energy-efficient products. ICA has provided in-kind co-financing that included drafting policy guides, reviewing technical documents, and participating in both technical and governance meetings. ICA has also supported the initiative by leading U4E’s global action campaign, which included participation in numerous outreach events and developing communication tools, including the development of the U4E website ([www.united4efficiency.org](http://www.united4efficiency.org)), and a U4E video.

In line with this commitment, ICA would like to continue the support to U4E under the future GEF-U4E project (“**Leapfrogging Myanmar’s market to high efficiency lighting and appliances**”). The total anticipated commitment of ICA over the 3 years of the project is 300,000 US Dollars.

Under this partnership, ICA will support the following project activities:

- Development of training packages and tools to support the transition to energy-efficiency

- products;
- Training for country and officials to develop and implement projects and policies to advance energy-efficient products;
- Development and implementation of minimum energy performance standards through reports, events, etc.);
- Outreach efforts.

The contribution of ICA will take different forms, such as:

- Providing ICA's staff time and travel costs to assist U4E in carrying out national training for country officials;
- Providing staff's time for the development and review of training packages, tools, and draft projects / policies;
- Providing ICA's existing publications, tools, training packages and templates;
- Providing staff time for communication and outreach campaigns on energy-efficient products, including managing the U4E website;

ICA strongly supports this important initiative of the GEF and UN Environment and is pleased to be part of it. We look forward to continue working with UN Environment and its partners to accelerate the transition to efficient appliances and equipment, and making it a success.

Yours sincerely,



Steven L. Kukoda  
Executive Director  
International Copper Association

Ms. Kelly West  
GEF Executive Coordinator  
UN Environment  
Nairobi - Kenya

Beijing, 7 August 2017

**Subject: GELC, co-financing towards the project "Leapfrogging Myanmar's market to high efficiency lighting and appliances"**

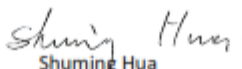
Dear Ms. Kelly West,

The Global Efficient Lighting Centre (GELC) is pleased to participate, as a co-financier, in the Global Environment Facility and UN Environment's project for "Leapfrogging Myanmar's market to high efficiency lighting and appliances". GELC is the UN Environment Collaborating centre for Efficient Lighting and shares the same objective of promoting the rapid development of energy efficient lighting technologies in developing countries and emerging economies. GELC assists in the development of national and international standards, performs research into new testing technologies and equipment, offers technical services and training, testing of energy efficient products and provides assistance to other countries regarding policy consultation and development.

I hereby confirm a co-finance contribution to this project of USD 150,000 over 3 years. This contribution is subject to project progress, economic developments and overall project delivery.

The GELC's in-kind contribution will mainly focus on support through the delivery of tools, remote assistance and activities to strengthen monitoring, verification and enforcement (MVE) capacities to ensure an effective transition to efficient lighting in Myanmar.

Yours sincerely,



Shuming Hua  
General Director

Global Efficient Lighting Centre

Ms. Kelly West  
GEF Executive Coordinator  
UN Environment  
Nairobi - Kenya

No. A3, Chaopocun, Dabeyao, Chaoyang District, Beijing 100022, China  
Tel: +86-10-67708989, Fax: +86-10-67761445

12<sup>th</sup> Floor, UBC II Building, Suite 1208,  
591 Sukhumvit Rd. (corner Soi 33),  
Wattana, Bangkok 10110, Thailand

7 December 2017

**Subject: Co-financing letter for the GEF funded project " Leapfrogging Myanmar's market to high efficient lighting and appliances"**

Dear Sir,

This is to confirm the commitment of the International Institute for Energy Conservation (IIEC) to act as one of the co-executing partners for the Government of Myanmar in implementation of the aforementioned project.

I am pleased to confirm our in-kind co-financing contribution of USD 10,000. Our contributions would include but not limited to provision of technical assistance including:

- USD 5,000 for measurement and verification (M&V) activities of the pilot demonstration project/s including provision of energy audit equipment.
- USD 5,000 for support the design of marketing material, including printed and digital publications

We look forward to having strong collaborations with Ministry of Industry and other co-executing partners in the successful implementation of this project.

Yours sincerely,



Felix Gooneratne  
CEO

International Institute for Energy conservation

Tel. +66 0 2 662 3460-4  
Email: [iiecbangkok@iiec.org](mailto:iiecbangkok@iiec.org)  
Website: [www.iiec.org](http://www.iiec.org)





**SMALL & MEDIUM INDUSTRIAL DEVELOPMENT BANK LTD.**

No. 298, Between (Anawrahta & Wadan) Street, No. (2) Quarter, Lanmadaw Tsp, Yangon, Myanmar.

Ph: 01- 2302339, 2302340, 2302385, 2302387, 2302390, 2302408

Fax: 01-2302339, 2302340, 2302392, 2302408 E-mail: [contact@smidb.com.mm](mailto:contact@smidb.com.mm)

No. Sa Pha Ba/Loan/2017-18/ 382

Date: 15 December 2017

Ms Kelly West,  
GEF Executive Coordinator,  
United Nations Environment Programme  
Nairobi, Kenya.

**Subject: Small & Medium Industrial Development Bank Co-financing for  
GEF Project “Leapfrogging Myanmar’s market to high efficiency  
lighting and appliances”**

Dear Ms. Kelly West,

This letter is to confirm our commitment to participate in the implementation of the UN Environment and Ministry of Industry – GEF 6 supported “Leapfrogging Myanmar’s market to high efficiency lighting and appliances” project.

We are pleased to confirm our contribution to the design and implementation of financial mechanisms to support energy efficiency investments by households, institutions and small & medium enterprises (SMEs) in Myanmar. Our current loan portfolio of Myanmar Kyats 20,383 M equivalent of US\$ 15.32 M for SME customers, part of which we shall consider as our co-financing, will support implementation of the project activities.

Our contribution is contingent on the final detailed design of the proposed financial mechanisms and scope of implementation.

We are looking forward working together with the “Leapfrogging Myanmar’s market to high efficiency lighting and appliances” project team.

Sincerely Yours,

(Dr Zeyar Nyunt)

Chief Executive Officer



Mrs Brennan Van Dyke  
GEF Executive Coordinator  
Deputy Director, Office for Operations  
UN Environment  
Nairobi - Kenya

December 8, 2017

**Subject: "Leapfrogging Myanmar's market to high efficiency lighting and appliances" – United for Efficiency**

Dear Mrs. Van Dyke,

I have the pleasure of writing to you to confirm the support of AB Electrolux to the Efficient Appliances and Equipment Partnership Programme led by the United Nations Environment Programme. AB Electrolux is a global leader in household and professional appliances, including the development and manufacturing of energy efficient residential refrigerators.

AB Electrolux is already providing co-financing to the current Global Environment Facility-U4E project and in line with this commitment, AB Electrolux would like to support U4E under the future GEF-U4E project **"Leapfrogging Myanmar's market to high efficiency lighting and appliances"** at some time during the three years of the project. AB Electrolux can potentially support the project activities with:

- Supporting the country in the transition to energy-efficient refrigeration products;
- Supporting officials to develop policies to advance energy-efficient refrigeration products;
- Harmonization activities (with regional standards and practices reports, through inter-country information exchange, study tours and events, etc.) for energy-efficient refrigeration products;

The contribution of AB Electrolux can take different forms, such as providing staff expertise and travel to assist U4E activity related to above activity.

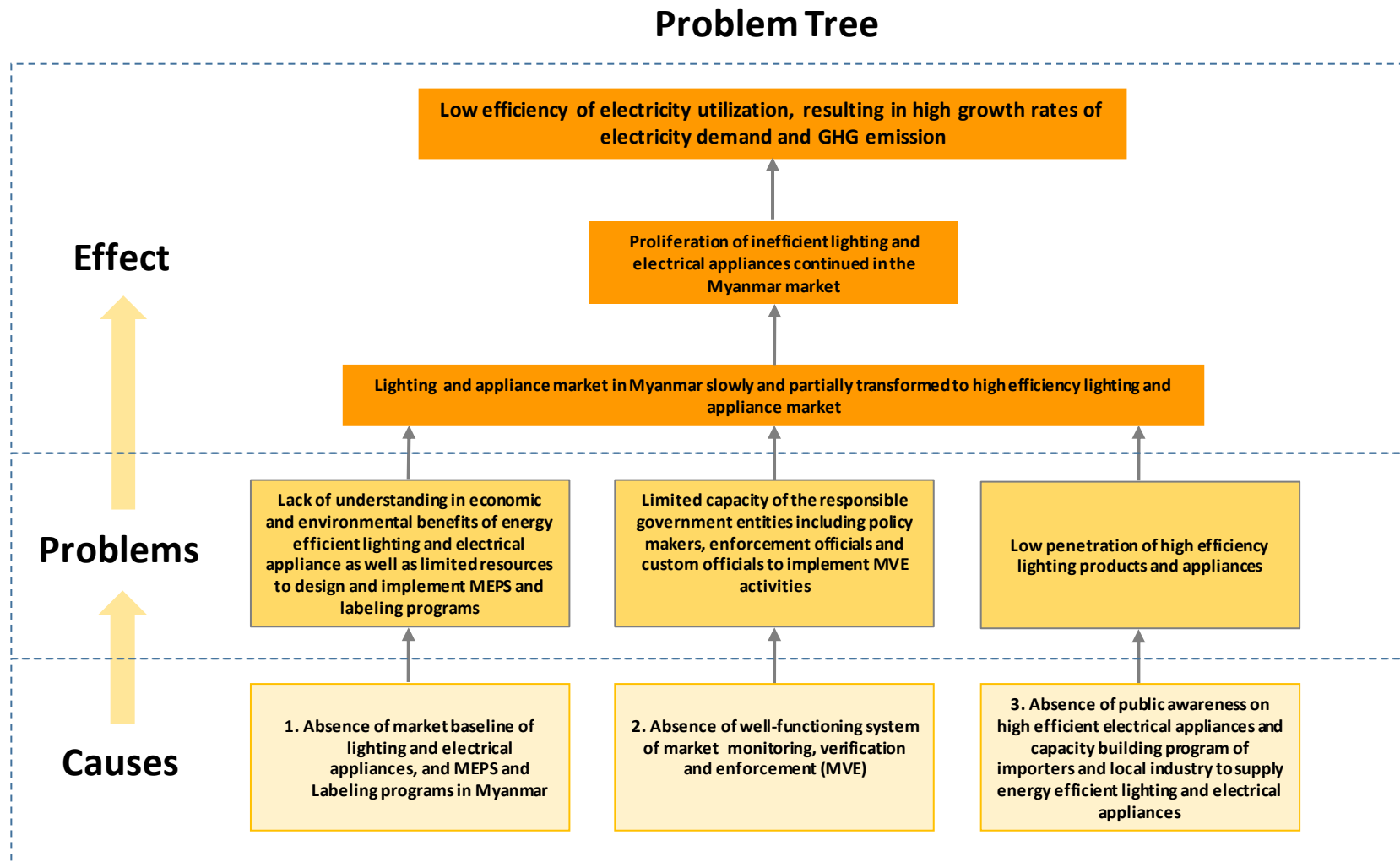
AB Electrolux strongly supports this important initiative of the GEF and UN Environment and is pleased to be part of it. AB Electrolux looks forward to continue working with UN Environment and its partners to accelerate the global transition to efficient refrigeration.

Yours sincerely,

Henrik Sundström  
VP Sustainability Affairs

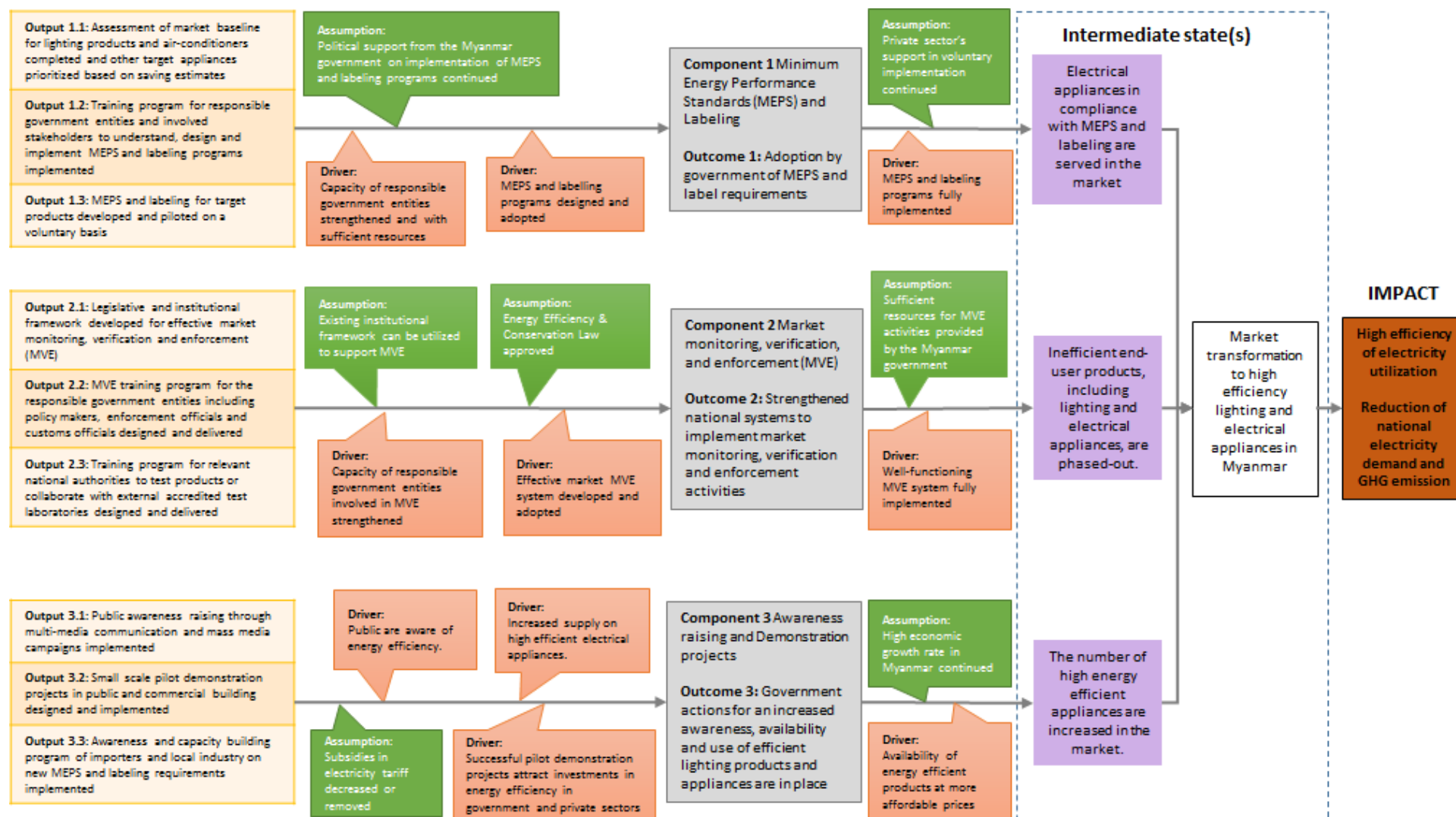
## ANNEX M: PROBLEM TREE AND THEORY OF CHANGE

### Problem Tree





## Theory of Change



## UNEP Environmental, Social and Economic Review Note (ESERN)

### I. Project Overview

Identification	<i>GEF ID 9499</i>
Project Title	<i>Leapfrogging Myanmar's market to high efficient lighting and appliances</i>
Managing Division	<i>UN Environment, Economy Division</i>
Type/Location	<i>National</i>
Region	<i>Asia Pacific</i>
List Countries	<i>Myanmar</i>
Project Description	<p><i>The project's objective is to facilitate a market transformation toward high efficiency lighting and electrical appliances through the integrated policy approach, thereby reducing growth in electrical demand and greenhouse gas (GHG) emissions, while simultaneously increasing energy access. This will be achieved through the 3 following components:</i></p> <ol style="list-style-type: none"> <li><i>1. Minimum energy performance standards (MEPS) and labelling</i></li> <li><i>2. Market Monitoring, Verification and Enforcement</i></li> <li><i>3. Awareness raising and Demonstration projects</i></li> </ol>
Estimated duration of project:	<i>48 months</i>
Estimated cost of the project :	<i>US\$ 2,223,578</i>

## II. Environmental Social and Economic Screening Determination

### A. Summary of the Safeguard Risks Triggered

Safeguard Standard Triggered by the Project	Impact of Risk <sup>27</sup> (1-5)	Probability of Risk (1-5)	Significance of Risk (L, M, H)
SS 1: Biodiversity, natural habitat and Sustainable Management of Living Resources	1	1	L
SS 2: Resource Efficiency, Pollution Prevention and Management of Chemicals and Wastes	2	3	M
SS 3: Safety of Dams	1	1	L
SS 4: Involuntary resettlement	1	1	L
SS 5: Indigenous peoples	1	1	L
SS 6: Labor and working conditions	1	1	L
SS 7: Cultural Heritage	1	1	L
SS 8: Gender equity	2	2	L
SS 9: Economic Sustainability	3	3	M
Additional Safeguard questions for projects seeking GCF-funding (Section IV)			

**B. ESE Screening Decision<sup>28</sup>** (Refer to the UNEP ESES Framework (Chapter 2) and the UNEP's ESES Guidelines.)

Low risk ☐ Moderate risk ☒ High risk ☐ Additional information required ☐

### C. Development of ESE Review Note and Screening Decision:

Prepared by: Name: Paul Kellett Date: 15/12/2017

Safeguard Advisor: Name: Yunae Yi Date: 18/12/2017

Task Manager: Name: Ruth Coutto Date: 20/12/2017

### D. Recommended further action from the Safeguard Advisor:

I agree with the project manager that this is likely to be in the moderate safeguard risk category. Y. The project document already identified some key risks. Compliance with what is described in the project document will avoid/minimize such risks.

<sup>27</sup> Refer to UNEP Environment, Social and Economic Sustainability (ESES): Implementation Guidance Note to assign values to the Impact of Risk and the Probability of Risk to determine the overall significance of Risk (Low, Moderate or High).

<sup>28</sup> **Low risk:** Negative impacts negligible: no further study or impact management required.

**Moderate risk:** Potential negative impacts, but less significant; few if any impacts irreversible; impact amenable to management using standard mitigation measures; limited environmental or social analysis may be required to develop a ESEMP. Straightforward application of good practice may be sufficient without additional study.

**High risk:** Potential for significant negative impacts, possibly irreversible, ESEA including a full impact assessment may be required, followed by an effective safeguard management plan.

Please consult various stakeholders and get feedback on what may be the challenges at the individual (including cultural, financial and information gaps, fitting/replacing the existing layouts), private sector (including the production capacity, distribution network and profitability), and policy levels technical (including production, recycling, regulations, policy inconsistencies across laws, strategies, fiscal and economic approaches).

SS 2: GHG emissions in the country will increase with the projected economic growth. Energy sources and policy advice in the broad national energy and climate change policy framework can provide “do good” opportunity beyond the lighting project.

A functioning and efficient waste management system is often expensive and requires adequate capacity building. Resource efficiency through manufacturing, distribution and consumption, management of waste from the old light bulbs, including mercury, as well as the LED bulbs and lamps and air-conditioning appliances require careful management, monitoring and reporting. Training and support should be provided to those who are in charge of disposing the harmful materials or those who change the lamps and air-conditioning appliances.

SS 9: Financial mechanisms for end users need practical and effective system through pilot testing, feedback and cautious roll out. Rolling out of fiscal and technology support should be based on understanding of the needs, responsibilities and constraints of diverse international private sector and government ministries and consumers, especially the poor, local SMEs and certain population groups (based on region, types of industries involved, urban vs. rural groups and so on).

#### **E: Responses from the Task Manager**

- On stakeholder consultations: as part of the design of the MEPS, it is a standard approach to conduct consultations by the government with manufacturers, distributors, retailers, customs and laboratories, and the implications of different policy options. This will be done as part of Component 1 of the project.
- On waste: an important part of these policy discussions will be the implications related to collection and disposal of used lamps. This is captured in two activities in Component 1 of this project, namely the development of a disposal guideline for discarded and end-of -life lamps and room air-conditioners based on the global best practice and the U4E policy guides and the development of a roadmap for collection with the MoE and other stakeholders on discarded and end-of-life collection of lamps and air conditioners. In addition, the discarded and end-of-life lighting products and ACs generated by the pilot demonstration in Component 3 of the project will be managed in accordance with the safe and environmentally sound disposal guideline developed under Output 1.3 of Component 1. Fluorescent lamp waste will be properly stored for safe disposal and ACs with HCFCs will be degassed and recycled by qualified contractors.
- On financing mechanisms: in Component 3 of the project, there is a pilot demonstration on AC and LED that is targeted at government and municipal buildings. This will help to build the experience consumer response in Myanmar. In addition the Myanmar local bank (Small and Medium Industrial Development Bank) has issued a co-financing letter of up to USD 15 Million. So the project will support the bank to structure and issue loans for efficient air conditioners and light bulbs based on the results of a market survey. Revisions to this dedicated line of credit will be an iterative and inclusive process targeted at the commercial sector, starting during the project with the expectation that the bank will carry-on evolving this line of credit after the life of the project to make it as attractive to its clients as possible.

### III. ESES Principle and Safeguard checklist

(Section III and IV should be retained in UNEP)

Precautionary Approach
The project will take precautionary measures even if some cause and effect relationships are not fully established scientifically and there is risk of causing harm to the people or to the environment.
Human Rights Principle
The project will make an effort to include any potentially affected stakeholders, in particular vulnerable and marginalized groups; from the decision making process that may affect them.
The project will respond to any significant concerns or disputes raised during the stakeholder engagement process.
The project will make an effort to avoid inequitable or discriminatory negative impacts on the quality of and access to resources or basic services, on affected populations, particularly people living in poverty or marginalized or excluded individuals or groups. <sup>29</sup>

Screening checklist	Y/N/ Maybe	Comment
<b>Safeguard Standard 1: Biodiversity, natural habitat and Sustainable Management of Living Resources</b>		
Will the proposed project support directly or indirectly any activities that significantly convert or degrade biodiversity and habitat including modified habitat, natural habitat and critical natural habitat?	N	
Will the proposed project likely convert or degrade habitats that are legally protected?	N	
Will the proposed project likely convert or degrade habitats that are officially proposed for protection? (e.g.; National Park, Nature Conservancy, Indigenous Community Conserved Area, (ICCA); etc.)	N	
Will the proposed project likely convert or degrade habitats that are identified by authoritative sources for their high conservation and biodiversity value?	N	
Will the proposed project likely convert or degrade habitats that are recognized- including by authoritative sources and /or the national and local government entity, as protected and conserved by traditional local communities?	N	
Will the proposed project approach possibly not be legally permitted or inconsistent with any officially recognized management plans for the area?	N	
Will the proposed project activities result in soils deterioration and land degradation?	N	
Will the proposed project interventions cause any changes to the quality or quantity of water in rivers, ponds, lakes or other wetlands?	N	

<sup>29</sup> Prohibited grounds of discrimination include race, ethnicity, gender, age, language, disability, sexual orientation, religion, political or other opinion, national or social or geographical origin, property, birth or other status including as an indigenous person or as a member of a minority. References to “women and men” or similar is understood to include women and men, boys and girls, and other groups discriminated against based on their gender identities, such as transgender people and transsexuals.

Screening checklist	Y/N/ Maybe	Comment
Will the proposed project possibly introduce or utilize any invasive alien species of flora and fauna, whether accidental or intentional?	N	
<b>Safeguard Standard 2: Resource Efficiency, Pollution Prevention and Management of Chemicals and Wastes</b>		
Will the proposed project likely result in the significant release of pollutants to air, water or soil?	Maybe	<p>The Project will accelerate market transformation toward energy efficient LED lighting products and ACs. LED lighting technologies do not contain mercury and the energy efficient ACs promoted by the project are climate-friendly, with low GWP refrigerant.</p> <p>Discarded and end-of-life lighting products and ACs generated by the project will be managed in accordance with the safe and environmentally sound disposal guideline that will be developed under the provisions of Activity 1.3.1, Output 1.3 in Component 1 (<i>“Develop necessary documents, e.g., procedures and guidelines for testing and certification, application forms, disposal guideline for discarded and end-of –life lamps and room air-conditioners based on the global best practice and the UAE policy guides, etc.”</i> and <i>“Develop a roadmap for collection with the MoE and other stakeholders on discarded and end-of – life the collection of lamps and air conditioners”</i>). Fluorescent lamp waste will be properly stored for safe disposal and ACs with HCFCs will be degassed and recycled by qualified contractors.</p>
Will the proposed project likely consume or cause significant consumption of water, energy or other resources through its own footprint or through the boundary of influence of the activity?	N	The project seeks to reduce energy consumption through the promotion of energy efficient lighting products and appliances.
Will the proposed project likely cause significant generation of Green House Gas (GHG) emissions during and/or after the project?	N	Under the project, inefficient with high GWP refrigerant ACs will be replaced by energy efficient and climate-friendly ACs. The existing inefficient with high

Screening checklist	Y/N/ Maybe	Comment
		<p>GWP refrigerant ACs being replaced will be properly decommissioned and degassed by qualified contractors in according with the safe-disposal guideline developed under provisions of Activity 1.3.1, Output 1.3 in Component 1 (<i>“Develop necessary documents, e.g., procedures and guidelines for testing and certification, application forms, disposal guideline for discarded and end-of-life lamps and room air-conditioners based on the global best practice and the U4E policy guides, etc.”</i> and <i>“Develop a roadmap for collection with the MoE and other stakeholders on discarded and end-of-life the collection of lamps and air conditioners”</i>.)</p> <p>The current market size of ACs in Myanmar is small compared with neighboring countries and the market is projected to exponentially grow in coming years. Energy efficient and climate-friendly ACs promoted by the project will help ensuring that future installation of ACs will be less harmful to the environment. In addition, the project will also reduce GHG emissions in comparison with the baseline situation since less electricity will be generated and used through adoption of LED lighting, and energy efficient and climate friendly ACs.</p> <p>Please refer to section A.1.5., Annex J-1 and J-2 of the CEO Endorsement for more details on emission reductions.</p>
Will the proposed project likely generate wastes, including hazardous waste that cannot be reused, recycled or disposed in an environmentally sound and safe manner?	maybe	Generally speaking, the project aims at replacing incandescent lamps, TFLs and CFLs with energy efficient LED lighting

Screening checklist	Y/N/ Maybe	Comment
		<p>technologies, and replace inefficient high GWP ACs with efficient climate-friendly low GWP ACs. These inefficient products will be prevented from being reused and therefore considered as waste. However, the project will develop guidelines for safe disposal of used products through the provisions of Activity 1.3.1 (Output 1.3, Component 1): <i>“Develop necessary documents, e.g., procedures and guidelines for testing and certification, application forms, <b>disposal guideline for discarded and end-of-life lamps and room air-conditioners based on the global best practice and the U4E policy guides, etc.”</b> and <b>“Develop a roadmap for collection with the MoE and other stakeholders on discarded and end-of-life the collection of lamps and air conditioners”</b>).</i></p> <p>Incandescent lamps do not contain mercury but its presence in TFLs and CFLs and the presence of HCFCs in inefficient ACs are considered the main potential environmental threat as a result of the project. Disposal of hazardous lamp waste and AC equipment from the project pilots, containing HCFCs will follow the disposal guideline for discarded and end-of-life lamps and room air-conditioners which will be developed based on the global best practice and the U4E policy guides (Output 1.3 under Component 1). Management of the replaced products will be carried out as part of the pilot demonstration projects under Component 3 (<b>Activity 3.2.3, which provisions state the</b></p>



Screening checklist	Y/N/ Maybe	Comment
		following: “ <i>Ensure safe-disposal and storage of inefficient products/equipment being replaced by energy efficient models</i> ”) and the project will work with the Ministry of Environment to develop a road map to implement the best practices disposal guidelines.
Will the proposed project use, cause the use of, or manage the use of, storage and disposal of hazardous chemicals, including pesticides?	Y	Please refer to answers above on hazardous waste.
Will the proposed project involve the manufacturing, trade, release and/or use of hazardous materials subject to international action bans or phase-outs, such as DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Convention on Persistent Organic Pollutants or the Montreal Protocol?	N	
Will the proposed project require the procurement of chemical pesticides that is not a component of integrated pest management (IPM) <sup>30</sup> or integrated vector management (IVM) <sup>31</sup> approaches?	N	
Will the proposed project require inclusion of chemical pesticides that are included in IPM or IVM but high in human toxicity?	N	
Will the proposed project have difficulty in abiding to FAO’s International Code of Conduct <sup>32</sup> in terms of handling, storage, application and disposal of pesticides?	N	
Will the proposed project potentially expose the public to hazardous materials and substances and pose potentially serious risk to human health and the environment?	Maybe	Management of the used equipment (mercury, HCFC) will be carried out as part of the pilot demonstration projects under Component 3 (refer to provisions of project activity 3.2.3, which state the following: “ <i>Ensure safe-disposal and storage of inefficient products/equipment being replaced by energy efficient models. This will be carried in accordance with the disposal guideline prepared under Output 1.3</i> ”) and the project will work with the

<sup>30</sup> “Integrated Pest Management (IPM) means the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimize risks to human health and the environment. IPM emphasizes the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms  
<http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/ipm/en/>

<sup>31</sup> “IVM is a rational decision-making process for the optimal use of resources for vector control. The approach seeks to improve the efficacy, cost-effectiveness, ecological soundness and sustainability of disease-vector control. The ultimate goal is to prevent the transmission of vector-borne diseases such as malaria, dengue, Japanese encephalitis, leishmaniasis, schistosomiasis and Chagas disease.” ([http://www.who.int/neglected\\_diseases/vector\\_ecology/ivm\\_concept/en/](http://www.who.int/neglected_diseases/vector_ecology/ivm_concept/en/))

<sup>32</sup> Find more information from [http://www.fao.org/fileadmin/templates/agphome/documents/Pests\\_Pesticides/Code/CODE\\_2014Sep\\_ENG.pdf](http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/CODE_2014Sep_ENG.pdf)

Screening checklist	Y/N/ Maybe	Comment
		Ministry of Environment to develop a road map to implement the best practices disposal guidelines.
<b>Safeguard Standard 3: Safety of Dams</b>		
Will the proposed project involve constructing a new dam(s)?	N	
Will the proposed project involve rehabilitating an existing dam(s)?	N	
Will the proposed project activities involve dam safety operations?	N	
<b>Safeguard Standard 4: Involuntary resettlement</b>		
Will the proposed project likely involve full or partial physical displacement or relocation of people?	N	
Will the proposed project involve involuntary restrictions on land use that deny a community the use of resources to which they have traditional or recognizable use rights?	N	
Will the proposed project likely cause restrictions on access to land or use of resources that are sources of livelihood?	N	
Will the proposed project likely cause or involve temporary/permanent loss of land?	N	
Will the proposed project likely cause or involve economic displacements affecting their crops, businesses, income generation sources and assets?	N	
Will the proposed project likely cause or involve forced eviction?	N	
Will the proposed project likely affect land tenure arrangements, including communal and/or customary/traditional land tenure patterns negatively?	N	
<b>Safeguard Standard 5: Indigenous peoples<sup>33</sup></b>		
Will indigenous peoples be present in the proposed project area or area of influence?	N	
Will the proposed project be located on lands and territories claimed by indigenous peoples?	N	
Will the proposed project likely affect livelihoods of indigenous peoples negatively through affecting the rights, lands and territories claimed by them?	N	
Will the proposed project involve the utilization and/or commercial development of natural resources on lands and territories claimed by indigenous peoples?	N	
Will the project negatively affect the development priorities of indigenous peoples defined by them?	N	
Will the project potentially affect the traditional livelihoods, physical and cultural survival of indigenous peoples?	N	
Will the project potentially affect the Cultural Heritage of indigenous peoples, including through the commercialization or use of their traditional knowledge and practices?	N	
<b>Safeguard Standard 6: Labor and working conditions</b>		
Will the proposed project involve the use of forced labor and child labor?	N	
Will the proposed project cause the increase of local or regional un-employment?	N	
<b>Safeguard Standard 7: Cultural Heritage</b>		
Will the proposed project potentially have negative impact on objects with historical, cultural, artistic, traditional or religious values and archeological sites that are internationally recognized or legally protected?	N	

<sup>33</sup> Refer to the Toolkit for the application of the UNEP Indigenous Peoples Policy Guidance for further information.

Screening checklist	Y/N/ Maybe	Comment
Will the proposed project rely on or profit from tangible cultural heritage (e.g., tourism)?	N	
Will the proposed project involve land clearing or excavation with the possibility of encountering previously undetected tangible cultural heritage?	N	
Will the proposed project involve in land clearing or excavation?	N	
<b>Safeguard Standard 8: Gender equity</b>		
Will the proposed project likely have inequitable negative impacts on gender equality and/or the situation of women and girls?	N	The project will promote gender equality and women's empowerment into its approach and outcomes in multiple ways. Please refer to section A.4 of the CEO endorsement document for more details. The project's Results Framework (Annex A) also includes a gender-related indicator (indicator 6).
Will the proposed project potentially discriminate against women or other groups based on gender, especially regarding participation in the design and implementation or access to opportunities and benefits?	N	Refer to above comment.
Will the proposed project have impacts that could negatively affect women's and men's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services?	N	
<b>Safeguard Standard 9: Economic Sustainability</b>		
Will the proposed project likely bring immediate or short-term net gain to the local communities or countries at the risk of generating long-term economic burden (e.g., agriculture for food vs. biofuel; mangrove vs. commercial shrimp farm in terms of fishing, forest products and protection, etc.)?	N	
Will the proposed project likely bring unequal economic benefits to a limited subset of the target group?	Maybe	Not anticipated.

#### IV. Additional Safeguard Questions for Projects seeking GCF-funding

<b>Community Health, Safety, and Security</b>			
Will there be potential risks and negative impacts to the health and safety of the Affected Communities during the project life-cycle?		N/A	
Will the proposed project involve design, construction, operation and decommissioning of the structural elements such as new buildings or structures?		N/A	
Will the proposed project involve constructing new buildings or structures that will be accessed by public?		N/A	
Will the proposed project possibly cause direct or indirect health-related risks and impacts to the Affected Communities due to the diminution or degradation of natural resources, and ecosystem services?		N/A	
Will the proposed project activities potentially cause community exposure to health issues such as water-born, water-based, water-related, vector-borne diseases, and communicable diseases?		N/A	
In case of an emergency event, will the project team, including partners, have the capacity to respond together with relevant local and national authorities?		N/A	
Will the proposed project need to retain workers to provide security to safeguard its personnel and property?		N/A	
<b>Labor and Supply Chain</b>			
Will UNEP or the implementing/executing partner(s) involve suppliers of goods and services who may have high risk of significant safety issues related to their own workers?		N/A	

## ANNEX O: ACRONYMS AND ABBREVIATIONS

*Incorporate here the list of acronyms or abbreviations related to the project.*

ACs	Air conditioners
ADB	Asian Development Bank
AHEEER	ASEAN Harmonized Electrical and Electronic Equipment Regulatory Regime
ASEAN EE MRA	ASEAN Sectoral Mutual Recognition Arrangement for Electrical and Electronic Equipment
ASEAN SHINE	ASEAN-Standard Harmonization Initiative for Energy Efficiency
ASEAN	Association of Southeast Asian Nations
BAT	Best Available Technology
BAU	Business as usual
Btu	British thermal unit
CCM	Climate change mitigation
CFL	Compact fluorescent lamp
CLASP	Collaborative Labeling and Appliance Standards Program
CNG	Compressed natural gas
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
CSPF	Cooling Seasonal Performance Factor
DICA	Directorate of Investment and Company Administration
EC	Energy Efficiency and Conservation
ECCJ	Energy Conservation Center, Japan
EE&C-SSN	Energy Efficiency and Conservation Sub-Sector
EECD	Energy Efficiency and Conservation Division
EER	Energy efficiency ratio
EIA	Environmental impact assessment
EnMS	Energy management system
EOU	UN Environment Evaluation Office
ESCO	Energy Service Company

ESTs	Environmentally Sound Technologies
FIs	Financial institutions
GEFTF	Global Environment Facility Trust Fund
GELC	Global Efficient lighting Centre
GHG	Greenhouse gas
GWh	Gigawatt hours
GWP	Global warming potential
HCFC	Hydrochlorofluorocarbon
HID	High-intensity discharge
hr	Hour
ICA	International Copper Association
IEC	International Electrotechnical Commission
IEE	Industrial Energy Efficiency
IIEC	International Institute for Energy Conservation
IL	Incandescent lamp
INC	Initial National Communication
INDC	Intended Nationally Determined Contributions
ISO	International Organization for Standardization
IW	Inception Workshop
JICA	Japan International Cooperation Agency
JRAIA	Japan Refrigeration and Air Conditioning Industry Association
ktCO <sub>2</sub>	Kilotons of carbon dioxide
kWh	Kilowatt hour
Lao PDR	Lao People's Democratic Republic
LED	Light-emitting diode
M&E	Monitoring and Evaluation
M&V	Measurement and verification
MDG	Millennium Development Goal
MEAs	Multilateral environmental agreements

MEPS	Minimum energy performance standards
MES	Myanmar Engineering Society
MOC	Ministry of Commerce
MOE	Ministry of Education
MOECAP	Ministry of Environmental Conservation and Forestry
MOEE	Ministry of Electricity and Energy
MOI	Ministry of Industry
MONREC	Ministry of Natural Resources and Environmental Conservation
MPF	Ministry of Planning and Finance
MTE	Mid-Term Evaluation
MTR	Mid-Term management Review
MVE	Monitoring, verification and enforcement
MYA	Myanmar
NEDO	New Energy and Industrial Technology Development Organization
NGOs	Non-governmental organization
NRDC	Natural Resources Defense Council
O&M	Operation and Maintenance
ODP	Ozone depletion potential
PAMA	Policy Analysis Model for ASEAN
PCB	Polychlorinated biphenyls
PIR	Project Implementation Review
PMC	Project management cost
PMU	Project Management Unit
POPs	Persistent Organic Pollutants
PPG	Project preparation grant
PSU	Project Steering Committee
RAC	Room air conditioner
RECP	Resource Efficient and Cleaner Production
S&L	Standards and labeling

SDG	Sustainable Development Goals
SE4ALL	Sustainable Energy for All
SMIDB	Small & Medium Industrial Development Bank (SMIDB)
SPSS	Statistical Package for the Social Sciences
TA	Technical Assistance
TC	Technical Committee
tCO <sub>2</sub>	Tons of carbon dioxide
TE	Terminal Evaluation
TNA	Technology Needs Assessment
TWG	Technical Working Group
TWh	Terawatt hours
U4E	United for Efficiency
UNDAF	United Nations Development Assistance Framework
UMFCCI	Union of Myanmar Federation of Chambers of Commerce and Industry
UN Environment	United Nations Environment Programme
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization



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