REQUEST FOR CEO ENDORSEMENT/APPROVAL

PROJECT TYPE: **Full-sized Project**
GEF EARTH FUND

Submission Date: March: 12/05/2009

PART I: PROJECT INFORMATION

GEFSEC PROJECT ID:
GEF AGENCY PROJECT ID:
COUNTRY(IES): Global
PLATFORM TITLE: Global Market Transformation for Efficient Lighting
GEF AGENCY(IES): UNEP
OTHER EXECUTING PARTNER(S):
GEF FOCAL AREA(S): Climate Change
GEF-4 STRATEGIC PROGRAM(S): SP1 Building EE
NAME OF PARENT PROGRAM/UMBRELLA PROJECT: THE GEF EARTH FUND

Expected Calendar	
Milestones	**Dates**
Council Approval	June 2009
GEF Agency Approval	September 2009
Implementation Start	October 2009
Mid-term Review (if planned)	November 2011
Implementation Completion	September 2013

A. **PLATFORM FRAMEWORK** (Expand table as necessary)

Project Objective: To speed up the transformation of the market for environmentally sustainable efficient lighting technologies in the emerging markets of developing countries.

Project Components	**Indicate whether Investment, TA or STA****	**Expected Outcomes**	**Expected Outputs**	**GEF Financing***		**Co-financing***		**Total ($)**
				($)	%	($)	%	
1. Global Platform	TA	1. Effective initiation and coordination of global policy dialogue for the phase-out of inefficient lighting and the removal of policy and market barriers to the widespread adoption of energy-efficient lighting products worldwide.	1.1 A stakeholder forum for policy dialogue is established and fully operational 1.2 Stakeholders agree upon a roadmap for global market transformation and coordinated phase out of inefficient lighting 1.3 A communication plan set up and implemented to strengthening coordination mechanism in energy efficient lighting market transformation	800,000	35	1,500,000	65	2,300,000
2. Implementation of a Center of Excellence	STA	2. International efforts at policy and technical level successfully coordinated and improved EEL products quality through harmonized standards and certification of energy-efficient lighting products.	2.1 A Centre of Excellence capable of coordinating Project's policy and technical activities established 2.2 A network of expertise and institutions for quality improvement and certification is identified, supported and strengthened 2.3 Guidelines for harmonisation of quality and performance-based	3,000,000	43	4,000,000	57	7,000,000

			standards developed and adopted 2.4 Capacity for harmonisation of quality and performance-based standards built in partner organisations and GEF programme countries 2.5 Guidelines for quality certification and labelling schemes are formulated for energy-efficient lighting products 2.6 A best practice catalogue elaborated and made available to relevant stakeholders					
3. Support for Country Programs	TA	. The specific EEL arket transformation rgets of the first articipating countries eached by the end of e project, conducive the overall, global arket transformation oals of the project	3.1 Policy *toolkit* accessible to countries online and support provided to country programmes for capacity building 3.2 Technical assistance provided to new countries to develop their programmes 3.3 Public Information and Awareness Campaign Plan Implemented 3.4 An institutional arrangement with the Project is set up for CFL disposal	600,000	7	8,000,000	93	8,600,000
4. Project management				500,000	25	1,500,000	75	2,000,000
5. Monitoring and Evaluation				100,000	100	0	0	100,000
Total Project Costs				5,000,000		15,000,000		20,000,00

* List the $ by project components. The percentage is the share of GEF and Co-financing respectively to the total amount for the component.
** TA = Technical Assistance; STA = Scientific & technical analysis.

B. FINANCING PLAN SUMMARY FOR THE PLATFORM ($)

	*Project Preparation**	*Project*	*Agency Fee*[1]	*Total at CEO Endorsement*	*For the record: Total at PIF*
GEF	200,000[2]	5,000,000	468,000	5,668,000	5,668,000
Co-financing	200,000	15,000,000		15,200,000	15,200,000
Total	400,000	20,000,000	468,000	20,868,000	20,868,000

* Please include the previously approved PDFs and PPG, if any. Indicate the amount already approved as footnote here and if the GEF funding is from GEF-3. Provide the status of implementation and use of fund for the project preparation grant in Annex D.

C. SOURCES OF CONFIRMED Cofinancing**,** including co-financing for project preparation for both the PDFs and PPG. (expand the table line items as necessary)

Name of co-financier (source)	*Classification*	*Type*	*Amount ($)*	*%**
UNEP	Executive Agency	In-kind	68,000	0.5
ADEME (France)	Government	Cash	132,000	1
OSRAM	Private sector	In-kind	6,000,000	39.5
Phillips	Private sector	In-kind	6,000,000	39.5
Others[3], incl. Private sector, NGOs, etc.	Private sector	In-kind (to be raised from private sector during project implementa-tion)	3,000,000	19.5
Total Co-financing			15,200,000	100

* Percentage of each co-financier's contribution at CEO endorsement to total co-financing.

Preliminary discussions have been undertaken with a number of partners potentially interested in financing the investment components of the project. The eventual additional (incremental) financing need of the global project is included into the project document.

Indicative co-financing amounts from private sector partners total to US$15 million. Discussions with potential stakeholders, and especially the private western industry evidenced a strong willingness to support the Project. This support will be directed towards the various activities, particularly activities in Component 3, as described in the present project document and the rough estimation of US$15 million co-financing over the project expected lifetime is deemed reasonable by the private manufacturers, given that their involvement through providing in many countries large volumes of CFLs for free, should in itself largely exceed this amount.

D. GEF RESOURCES REQUESTED BY FOCAL AREA(S), AGENCY(IES) OR COUNTRY(IES)

GEF Agency	*Focal Area*	*Country Name/ Global*	*(in $)*			
			Project Preparation	*Project*	*Agency Fee*	*Total*
UNEP	Climate Change	Global	200,000	5,000,000	468,000	5,668,000
Total GEF Resources			200,000	5,000,000	468,000	5,668,000

* No need to provide information for this table if it is a single focal area, single country and single GEF Agency project.

[1] Including a 9% Implementing Agency fee for UNEP (over project preparation and project) but excluding IFC/World Bank's Trustee fee of 3% and any project management fee.
[2] An approved PPG for $200,000 under GEF 4 has already been spent from the Climate Change Global and Regional Exclusion fund.
[3] The IFC Earth Fund Platform will ensure on a project level a minimum leverage of GEF funds of 1:3 (GEF:other sources) within the IFC Earth portfolio.

E. PROJECT MANAGEMENT BUDGET/COST

Cost Items	*Total Estimated person weeks*	*GEF ($)*	*Other sources ($)*	*Project total ($)*
Global Project Coordinator	30	90,000	0	90,000
Project Assistant	170	260,000	0	260,000
*Office facilities, equipment, vehicles and communications***		50,000	0	50,000
Travels		100,000	0	100,000
Total		500,000	0	500,000

* Provide detailed information regarding the consultants in Annex C.
** Provide detailed information and justification for these line items.

F. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

Component	*Estimated person weeks*	*GEF($)*	*Other sources ($)*	*Project total ($)*
*Local consultants**	660	330,000	0	330,000
*International consultants**	120	350,000	0	350,000
Total	780	680,000	0	680,000

* Provide detailed information regarding the consultants in Annex C.

G. DESCRIBE THE BUDGETED M&E PLAN:

The platform (project) will follow all standard UNEP/GEF procedures for monitoring and reporting. This includes a mid-term evaluation and an end of project evaluation. The UNEP/DTIE Project Management Unit will closely monitor the indicators for outputs and outcomes against the Logical Framework (see Annex B) to establish global and local benefits, financial and environmental, accrued from the project.

The M&E plan will be reviewed by the Project Steering Committee (PSC) at the outset of project operations and presented in the Inception Workshop. This plan will confirm the monitoring and verification activities and responsibilities to be undertaken during the project. It will serve as a baseline from which to measure project impacts and will establish efficiencies in the execution of the project.

The following sections outline the principle components of the Monitoring and Evaluation Plan, as they relate to the M&E activities of the overall project. The M&E Plan will be presented and finalized for the Project's Inception Report following a collective fine-tuning of indicators, means of verification, and the full definition of project staff M&E responsibilities.

Monitoring and Reporting Events

Project Inception Phase

The Project Inception Workshop will be conducted with the participation of all potentially interested stakeholders as they have been identified in the relevant sections as well as other GEF Implementing agencies and the GEF Secretariat. It will take place in UNEP/DTIE premises in Paris.

The purpose and objective of the Inception Workshop (IW) will be to: (i) introduce the key actors to each other; (ii) detail the roles, support services and complementary responsibilities of each entity; (iii) provide a detailed overview of the GEF reporting and monitoring and evaluation requirements, with particular emphasis on the Annual Project Implementation Reviews (PIRs) and related documentation as well as mid-term and final evaluations. Equally, the IW will provide an opportunity to inform the participating entities on the project's financial management issues.

This workshop will also set the opportunity to fine-tune the definition and exact content of the various activities as presented in the project's logical framework matrix (logframe). This will include reviewing the logframe (indicators, means of verification, assumptions), imparting additional detail as needed, and on the basis of this exercise finalize the first Annual Work Plans (AWP) with precise and measurable performance indicators, and in a manner consistent with the expected outcomes for the global project.

The Inception Report for the overall project, by building on the outcome of the Inception Workshop, will be prepared by the UNEP-DTIE Project Management Team.

Periodic Progress Reports

A detailed schedule of project review meetings for the overall project will be developed by the Project Management Team (PMT), in consultation with project implementation partners and stakeholder representatives, and this schedule will be incorporated into the Project Inception Report. The schedule should include: (i) tentative time frames for the Project Steering Committee meetings, (or other relevant advisory and/or coordination mechanisms) and (ii) project related Monitoring and Evaluation activities.

The implementation progress will be reported to the IA, PSC and GEF, as applicable, by the Quarterly Progress Reports (QPRs) and through annual Project Implementation Reviews (PIRs). The PIRs typically need to be prepared in July-August each year - the first one from 12 months of starting the project. The PMT will be responsible for preparing the overall PIR for the global project by drawing from the components specific progress reports - the schedule and requirements of which have been elaborated in the M&E sections of each component.

The performance and impact indicators along with their corresponding means of verification presented in the project's logical frame matrix provide the basis for PIR reporting and associated assessment of the progress of the project towards the set targets. The performance indicators of the components are specified in the logframe and they provide a basis for monitoring the progress of each specific component activities, which in turn will provide a basis for a consolidated progress report of the program as a whole. These reporting requirements will be complemented by annual or bi-annual project review meetings of the PSC. Additional PSC meeting can be organized at on-need basis. The management should also inform the PSC immediately of any delays or difficulties faced during implementation so that appropriate support or corrective measures can be adopted in a timely and remedial fashion.

Terminal Report

During the last three months of the project, the PMT will prepare the Project Terminal Report for the project as a whole, by drawing from the component specific terminal reports. This comprehensive report will summarize all activities, achievements and outputs of the project, lessons learnt, objectives met, or not achieved structures and systems implemented, etc. and will be the definitive statement of the project's activities during its lifetime. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the Project's activities.

Independent Evaluations

Mid-term assessment will be conducted based on the M&E indicators to inform midcourse progress as per the logical frame and advise on any needed modifications to maximize the impact during the remaining implementation process. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The details of organization, terms of reference and timing of the project's overall mid-term evaluation will be decided in consultation with the PSC and the managers of the individual project components.

An independent Final Evaluation will take place before the preparation of the terminal report and will focus on the same issues as the mid-term evaluation. The final evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations for follow-up activities. The Terms of Reference for this evaluation will be prepared by the UNEP Monitoring and Evaluation Office in Nairobi, in consultation with UNEP/DTIE.

Information and Knowledge Sharing

The lessons to be learned from the project will be disseminated through a wide range of media to a number of targets to ensure that maximum benefit can be gained. The progress and results of these activities will be regularly available through hard copy and the project website to be managed by the Centre of Excellence. A publication addressing the best practices and lessons learned will also be produced, making sure that any experience gained can be shared across the lighting industry.

In addition, the project will participate, as relevant and appropriate, in UNEP-sponsored networks, organized for senior personnel working on projects that share common characteristics. Finally, the project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation through lessons learned and where the project can make a contribution.

PART II: PROJECT JUSTIFICATION

1. Describe the project rationale and the expected measurable global environmental benefits:

PROJECT SUMMARY

The world is moving fast towards energy-efficient lighting, this was the consensus reached by policy makers, industry representatives, scientists and other stakeholders at an international conference held in Shanghai in May 2008. The phase-out of inefficient lighting is considered as one of the most important short-term initiative nations can take in combating climate change created by GHG emissions. According to the IPCC's[4] Fourth Assessment Report released in 2007, global GHG emissions reduction needs to peak no later than 2015 in order to keep the projected global temperature rise under 2°C.

The Global Environment Facility (GEF) has been seeking an approach to assist developing countries in achieving significant measurable change in their energy patterns and securing a low-carbon energy future. To this end, the GEF launched the Global Market Transformation for Efficient Lighting project (the Project) on November 2007.The Project aims at accelerating global market transformation towards environmentally sustainable, energy-efficient lighting technologies as well as to develop a strategy to phase-out obsolete and in particular incandescent bulbs, thereby reducing global greenhouse gas emission from the lighting sector and with the co-benefit of reducing mercury release from coal combustion in cases where the primary energy is used to produce electricity. The low-energy light bulbs and other efficient lighting systems could have a dramatic impact on global warming and cut energy bills, if disseminated worldwide. In this context, the project will build on the encouraging market development rates already achieved in some countries and will seek to further reinforce and expand the market in other countries. Cognizant of the mercury content in CFLs, the project will likewise seek to find feasible energy efficient alternatives to CFLs, in addition to addressing the current need to find environmentally sound recycling and disposal of CFL waste.

The main purpose of Global Market Transformation for Efficient Lighting is to transform the market of efficient lighting in developing countries through the achievement of three inter-related objectives:(i) to promote high performance, energy efficient lighting technologies; (ii) to phase out inefficient, incandescent lights; and (iii) to substitute traditional fuel-based lighting with modern, efficient alternatives with consideration for mercury free alternatives. This initiative will serve as a platform to build synergy among global stakeholders, share knowledge and information, create policy and regulatory framework, address technical and quality issues, assist public and private entities for the establishment of efficient partnerships and support country programs.

The Project will build upon the existing related activities supported by the GEF. This global approach will serve as an **umbrella program** under which further national projects in various countries will be undertaken. Therefore, the Project will include three main components: (i) the creation of a Global Platform for lighting actors, (ii) the establishment of a Centre of Excellence to deal with political as well as technical (performance, quality standards, certification, etc) aspects and (iii) the provision of support for the implementation of efficient lighting programs in countries at national or regional level.

Given the global nature of the efficient lighting market, a concerted, global approach to addressing the challenges faced by the international community is appropriate and necessary. The strategies to harmonize product requirements, increase the level of consumer awareness, ensure the development of ad hoc production capacities of efficient lighting products at the required level of quality for the various segments of the lighting industry are part of the Project, which will be implemented by UNEP in a close coordination and partnership with the private sector, mainly the lighting industry, in developing and emerging countries.

[4] The Intergovernmental Panel on *Climate Change* is a scientific body tasked to evaluate the risk of climate change caused by human activity

SITUATION ANALYSIS

The worldwide lighting panorama is quickly changing. A recent report by US Global Industry Analysts Inc, estimates that by 2010, the industrial, commercial, residential and public lighting market will exceed USD 94 billion. Of all the aforementioned sectors, those of construction (both residential and commercial) and industrial development activities will witness the steadiest growth.

Since lighting represents a very energy-consuming service, this might, in the first stance, bring more concern than rejoicing to anyone worried about climate change. In fact, a significant growth in lighting would normally mean more energy consumption from renewable or non-renewable sources. The good news, however, is that according to that same report, "high quality and product innovation" as well as "technologically advanced and long-lasting, energy-saving products" (non-incandescent fixtures, HID lighting, electronic ballast, led fixtures) will remain central aspects of competitive strategies for global majors. In fact, all these new technologies are expected to play a central role in lighting the future.

The demand for efficient lighting is likely to be fuelled massively by China, as a rise in living standards and an increase in real estate activity (new construction activity) will act in synergy to bulge the demand for energy-saving devices. Where new construction activity is more modest, the maximization of energy efficiency in existing building is likely to contribute to the demand for new lighting equipment.

Thus, in sum, it appears that market forces are tilting towards energy efficient lighting. While determining if this trend is a consequence of policy innovation (standards, labels, building codes) in developed countries or not is out of the scope of the present work, it is safe to posit that energy efficiency has globally grown in importance and that this renewed concern cannot be ruled out as a cause of the present market structure in lighting.

In 2003, the provision of artificial light was estimated to result in the consumption of approximately 650 Mtoe of primary energy, which represented 8.9% of total global primary energy consumption. As a result, globally, lighting-related CO2 emissions are estimated at 1,900 Mt CO2, equivalent to approximately 8% of world emissions, or 14% of Annex-I countries emissions[5]. Therefore, from a climate policy perspective, reducing the energy consumption for lighting by raising the efficiency of lighting systems can be an important means to abate CO2. The higher the efficiency, the lower the energy required to deliver a given amount of light, and – depending on the carbon intensity of the electricity generation fuel mix – the lower the greenhouse gas emissions.

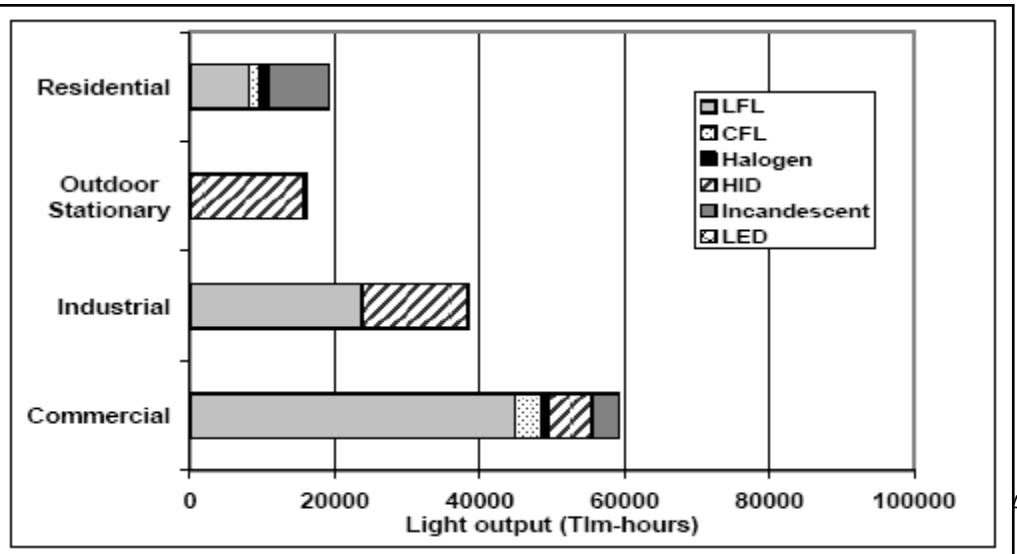
Power input may be reduced by lowering general illumination levels, adopting selective lighting standards, and replacing inefficient sources by high-performance lighting products. One of the most effective means of decreasing power input is to choose energy-efficient technologies. The efficacies of common lamps are described in units of lumens per watt (lm/W); typical values include incandescent 11 to 22, mercury vapor 18 to 65, fluorescent 40 to 80, metal halide 75 to 100 and high pressure sodium 85 to 130. Efficacy alone, however, does not determine the best and most economic lamp choice. For example, High Intensity Discharge (HID) lamps can require a "warm-up" period of several minutes before they reach full light output, and this may be a disadvantage if frequent switching is required.

Low lighting efficiency in the residential sector and, to a lesser extent, in the commercial sector cannot be attributed to a single factor. In addition, circumstances vary from country to country. Yet from a technology perspective, the penetration of incandescent lamps, which are characterized by very low-efficiency levels compared to other lighting technologies, is an important explanation factor of the low energy efficiency levels achieved in the buildings and residential sector As can be seen in Figure 1, incandescent lamps account for close to half of the residential sector's light production and a little above 5% of the commercial sector's light production. In contrast, incandescent lamps account for only a negligible share of the light production in the industrial sector and for outdoor stationary lighting. Substituting conventional incandescent light bulbs with more efficient alternatives, therefore, can constitute an important means to improve these sectors' lighting efficiency.

[5] Figures are from a 2006 IEA publication: *Light's Labour's Lost*

The Compact Fluorescent Lamps (CFL) with integrated ballast was developed as an alternative to the incandescent light bulb specifically for this purpose. On average, CFLs consume 1/4th of the energy used by incandescent light bulbs to provide the same level of light. About 25% of energy consumed by CFLs is converted to visible light compared with just 5% for a conventional incandescent lamp. CFLs also have much longer lifetimes with rated life spans of 6,000 to 12,000[6] hours compared to 1,000 hours on average for incandescent lamps.

Globally, incandescent lamps are estimated to have accounted for 970 TWh of the final electricity consumption in 2005 and resulted in about 560 Mt of CO2 emissions. About 61% of this demand was in the residential sector with most of the remaining demand in commercial and public buildings. If the current trends continue, incandescent lamps could use up to 1610 TWh of final electricity by 2030. In a hypothetical case where all these lamps were to be replaced by CFLs, it would save roughly 800 TWh and reduce the emissions by 470 MtCO2 in 2010, rising to 1200 TWh and 700 MtCO2 in 2030. A market shift from inefficient incandescent lamps to energy-efficient alternatives would cut the world's electricity demand for lighting by 18%.



A, 2006)

Note: LFL = Linear Fluorescent Lamps; HID = High-Intensity Discharge Lamps; LED = Light-Emitting Diodes. Source: IEA (2006).

Conventional incandescent lighting and efficient lighting solutions: basic characteristics

Incandescent light bulbs

Incandescent lamps are bulbs containing a wire filament that is heated and emits light. Up to 95% of the energy emitted by incandescent lamps is heat, and hence the light efficiency of incandescent lamps is inherently low. These bulbs may have different types of finishes to modify the brightness of the filament, internal reflecting substances on the bulb to control the direction of the light, halogen gases, and special tungsten filaments. The latter is used because it has a relatively high melting point and a relatively low rate of evaporation at high temperatures. It is surrounded by a gas (usually argon) to reduce the tungsten evaporation rate and this raises the temperature the filament can operate at and hence the light output. However, the gas also conducts heat away from the element, which lowers the overall efficiency.[7]

The first practical incandescent lamp was developed in 1878 and design improvements continued to be made up to 1936 at which time efficacy levels have increased by approximately a factor of 10. No further developments

[6] An average of 10,000 hours is used by notorious organization like ENERGY STAR and IEA.
[7] http://ec.europa.eu/energy/atlas/html/lightdintro.html

occurred until the halogen lamp, which is also based on the process of incandescence to produce light, was developed in 1958. The most common type of argon-filled incandescent lamp is known as a general service lamp.

The number of times they are turned on does not affect the life span of the bulb, but at an average of just 1,000 hours, their lifetime is significantly shorter than other alternatives. Incandescent lamps create comfortable lighting in terms of color, are easy to dim, operate over a wide range of temperatures and, above all, are inexpensive and readily available in many types of retail outlets.

Their chromaticity characteristics give near perfect color rendering but they are only able to produce a warmer light. The most common incandescent lamps distribute light diffusely in all directions from a pear shaped bulb. They can be housed inside reflectors to provide narrower or shaped light distribution when required. Incandescent lamps are also commonly available in a large variety of decorative forms such as candle and flame shapes.

Their low price, warm color and longstanding familiarity have led incandescent lamps to be the most commonly purchased lamps globally. They are heavily used in residential lighting applications in most countries. They however suffer from very poor efficiency. In fact, although the efficiency of incandescent lamps has been improved since their first development, they still have the lowest lighting output efficacies of any modern electric lamp type, ranging from 6-18 lumens per watt.[8]

The Halogen lamps are also technically incandescent lamps. Various types of Halogen can be found on the market. The earlier ones were rather inefficient while the latest generations can provide good quality light with reduced energy consumption. The widely available halogens are 30% more efficient than a normal incandescent lamp while some newer products can provide even higher savings. The use of 50W dychroic spot type lamps has increased dramatically in recent past and while 25W bulbs exist, they are difficult to come by even in markets of developed countries.

Compact fluorescent lamps

Compact fluorescent lamps (CFLs) were first commercialized in early 1980s and are offered in two types: with the ballast integrated into the lamp, or without the ballast integrated. The former are intended as direct substitutes for incandescent lamps and are designed to fit into existing incandescent lamp fixtures, while the latter are orientated more at commercial building retrofits and new-build as alternatives to incandescent lighting installations. CFLs usually consist of 2, 4 or 6 small fluorescent tubes that are mounted in a base attached to a ballast for ballast-integrated models, or are plug-in tubes for the non-integrated variety.

Ballast-integrated lamps have either a screw-in base or bayonet cap like standard incandescent lamps. More recent models are available in a variety of screw-in diameters and fit into a much larger range of sockets than the earlier generations. The light output of integrated CFLs is designed to match the output of equivalent incandescent lamps, but since their efficiency is from 4 to 5 times higher, their wattage ratings are proportionately lower. CFL efficiency ranges between 35 and 80 lumens per watt.

For a given amount of produced light, compact fluorescent lamps consume from 20% to 25% of the energy used by incandescent light bulbs. About 25% of the energy consumed by CFLs is converted to visible light as compared to only 5% for a GLS incandescent lamp. This relatively high efficiency means that many CFLs are cool enough to touch when they are on and therefore safer. Another important benefit is that they have much longer life cycles as compared to incandescent lamps, with rated life spans of 6,000 to 12,000 hours.

Currently, CFLs contain quantities of mercury ranging from 1 to 50 milligrams of mercury per bulb. However, overall estimates show a net reduction in mercury releases from the use of CFLs over traditional incandescent lamps. This is estimated at 1.1 mg to 4.1 mg release reduction per bulb. It should be noted however that these figures are not necessarily meaningful since they do not take into account the important increase of CFLs lifetime

[8] http://ec.europa.eu/energy/atlas/html/lightdintro.html

which lead also to a reduction of the net volume of mercury likely to be released. A clear definition of this concept will be part of the work program as described in the second section of the present document.

Higher mercury prices and mercury content limits set by the EU Restriction of Hazardous Substances (RoHS) Directive have reportedly motivated manufacturers to reduce mercury content in recent years.

The next section will first describe the state of CFL and incandescent lamp markets followed by an overview of the main barriers which have, and continue to hamper CFL technology diffusion.

Overview of CFL and Incandescent Lamp Markets

Statistics on global lamp sales are hard to come by. The IEA (Light's Labour's Lost, 2006) has therefore recently reviewed a large number of sources to produce an estimate of lamp sales by country. As expected, *incandescent lamps* are by far the most commonly sold lamps in the world. They dominate retail lamp sales oriented towards the residential sector in most countries. It is estimated that roughly 13.2 billion units were sold in 2003 representing over 72% of the global lamp market by volume that year. The United States and China are the largest markets for incandescent lamps, with sales in excess of 2.5 billion lamps in each country. Sales in the rest of Asia and Former Soviet Union countries are estimated at 3.2 billion units and in Europe at about 1.8 billion.

In contrast, CFL sales in 2003 were estimated at 1.1 billion units, representing approximately 6% of the global lighting market by volume. Looking back at sales since their introduction in the early 1980s is, however, indicative of future sales trajectories. Figure 2 shows the estimated global sales figures by region between 1990 and 2004. CFL sales have slowly increased over much of the 1990s and rose sharply starting in 1999. Europe was the largest market for CFLs until 2001, but thereafter China became the largest market. CFL sales in 2003 in China were estimated at 355 million units, representing over 30% of the global market.

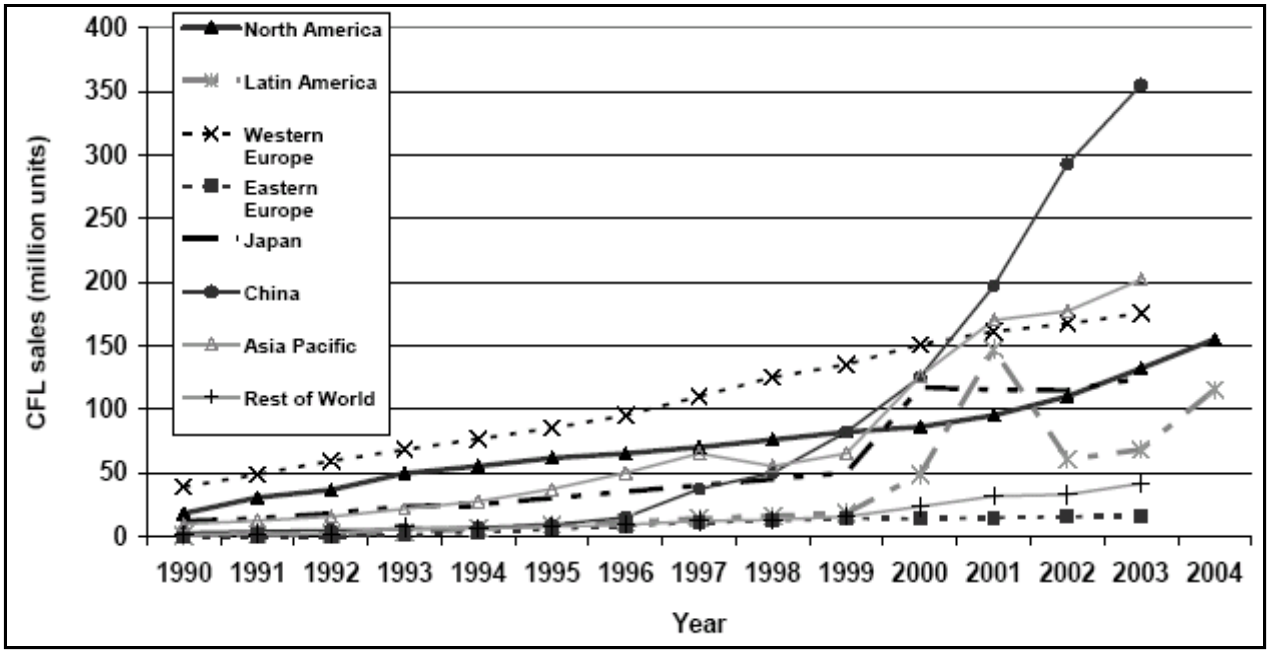


Figure 2: Estimated global CFL sales by region, 1990-2004 (Source: IEA, 2006[9])

The market share by volume of CFLs varies greatly from country to country. In the United States, CFLs accounted for close to 3% of the sales of medium screw-based lamps in 2004 while in Europe, CFL sales represented 10% of the incandescent lamp sales. In Japan, sales slightly exceed those of conventional incandescent lamps. This, however, is mostly a reflection of low incandescent lamp sales since the Japanese household lighting market is

[9] Lefebvre, Nicolas *et al.*, *Barriers to Technology Diffusion: The Case of Compact Fluorescent Lamps*, IEA, 2006

dominated by linear fluorescent lamps. This holds true in some other Asian countries such as the Philippines where linear fluorescent lamps also play an important role in household lighting. Many other developing countries also have high CFL penetration rates. In China for example, it is estimated that CFL sales reached close to 14% of the incandescent lamp sales in 2002.[10]

In recent years, the global production of CFLs increased by 25% to 3 billion units, and more than 80% of these lamps were produced in China. The current exact production could well be over 3 billion, according to the observed trends. Production capacity is not a problem but a lack of consumer acceptance might be if governments don't educate consumers about the benefits of CFLs. Switching from energy-inefficient incandescent light bulbs to CFLs not only reduces GHG and pollutant emissions but also reduces the cost of electricity.

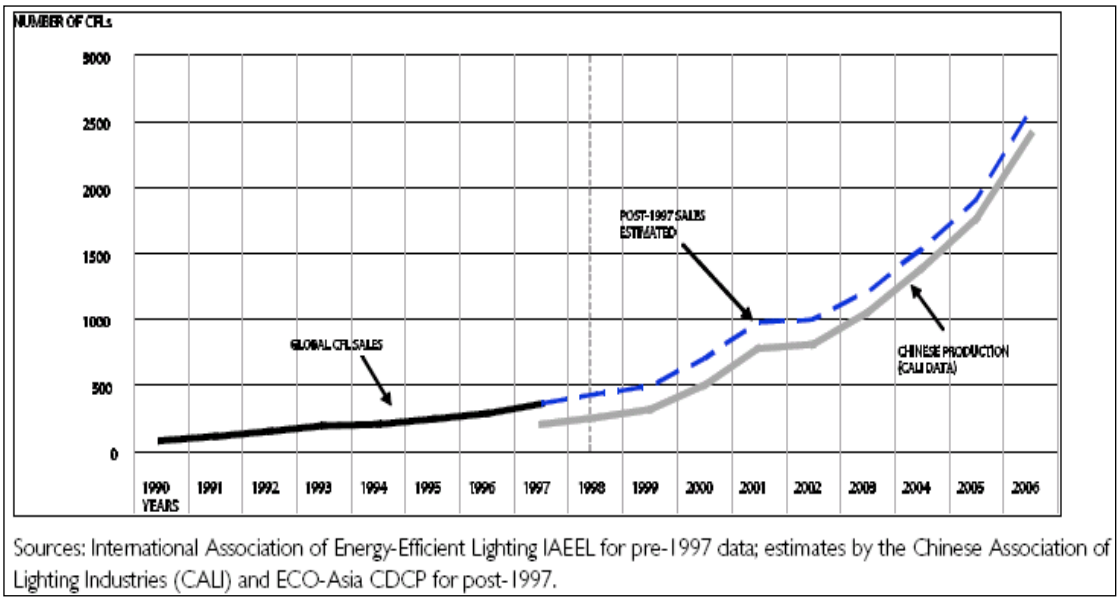


Figure 3: Estimated global CFLs sales by region and Chinese production

The market share of CFLs, as presented in Figure 2, demonstrates that CFL growth rates can be quite impressive, but also that relatively few countries have benefited from this technology so far. This means that there are still significant opportunities for promoting efficient lighting worldwide. The replacement of incandescent lamps by CFLs therefore seems to offer a win-win situation with benefits from both a climatic perspective and on an economic perspective. To the extent to which the adoption of CFLs reduces system load and/or the consumption of primary fuels exposed to international market risks, it can also be regarded as a means of fostering energy security.

Recently, several countries have announced their intention to phase out incandescent lighting and have engaged in legal and technical activities towards this objective. Ireland, Australia, Argentina, and the Philippines are phasing out incandescent bulbs beginning in 2010. The USA[11] introduced new legislation to gradually phase out the least efficient lamps by 2013, while the European Union is starting the process in 2009.

International lighting industry representatives have also announced their support of such a market transformation and have called for coordinated efforts among countries. Some developing countries have also made efforts to promote the adoption of CFLs and to phase-out incandescent lamps.

[10] *Ibidem*

[11] Many large companies, and now finally the federal government in the U.S., have begun installing large amounts of CFLs as short-term energy efficiency initiatives on the way to larger carbon reduction programs

The following are some crucial facts about the state of the CFL market. They are taken from various sources, but primarily from 2006 IEA publication "*Light's Labour's Lost*":

- As the first service offered by electric utilities, lighting ranks among the end-uses dominating global power demand.
- Worldwide, grid-based lighting consumes 19% of total global electricity production, and is associated with 1.9 billion tons of CO2 emissions per year.
- Globally, 70% of total market sales are for incandescent lamps.
- With current economic and energy-efficiency trends, it is projected that global demand for artificial light will be 80% higher by 2030 and still unevenly distributed. If this comes to pass and the rate of improvement of lighting technologies does not increase, global lighting electricity demand will reach 4 250 TWh: almost twice the output of all modern nuclear power plants.
- Without further energy-efficiency policy measures, lighting-related annual CO2 emissions will rise to almost 3 gigatons by 2030.
- The IEA estimates that were end-users to install only efficient lamps, ballasts and controls that will save them money over the life cycle of the lighting service, global lighting electricity demand in 2030 would be just 2 618 TWh.
- This is almost unchanged from 2005 and would actually be lower between 2010 and 2030 (see the LLCC from 2008 scenario in Figure 4).

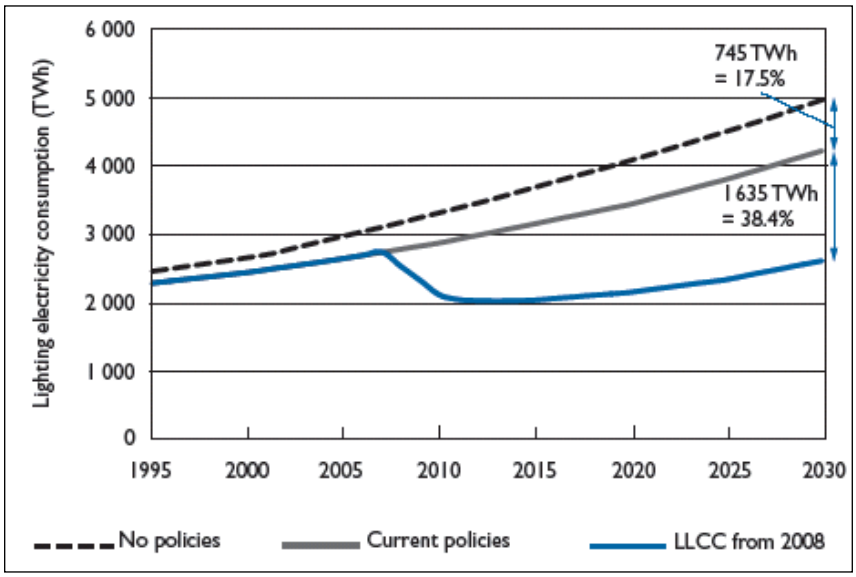


Figure 4: Global lighting electricity consumption in 1995–2030 under different scenarios[12]

Barriers have nevertheless hampered the broad diffusion of CFLs. In the scope of their energy efficiency policies, many governments are devising measures to overcome key barriers to the broad diffusion of CFLs as substitutes to incandescent lamps. Section 2.1.6 below reviews a number of barriers that impede the promotion of energy-efficient lighting.

Innovation

[12] These scenarios are explained in Chapter 6 of the IEA publication "Light's Labour's Lost". The Current Policies scenario is the lighting component of the Reference Scenario in the IEA's *2004 World Energy Outlook* (OECD/IEA, 2004)

The lighting market is evolving quite rapidly. For this reason, CFL are even not anymore considered as "innovative", but as a well-established alternative to incandescent lamps. The following section aims at exposing some avant-garde lighting products or, at least, new applications to old technologies.

Light Emitting Diodes (LED): The most promising innovation in non-domestic lighting is the development of solid state lighting (SSL). This technology is *expected* to achieve efficiencies at least ten times higher than incandescent lamps and up to twice as high than fluorescent lamps.

LED lamps, aside from non-mercury containing have other advantages such as: long life, warm light color similar to incandescent lamps, low heat generation, and the ability to work with dimming switches in certain lamps. LED lamps are energy-efficient and have the potential to be more efficient than CFLs for some applications. They do not emit ultraviolet or infrared light.

A US Department of Energy's (DoE) publication "LED; the Basics" shows that the number of LED products on the market continues to grow. Most popular products include portable desk/task lights, under-cabinet lights, recessed downlights, retail display lights, and outdoor fixtures for street, parking lot, path, and other area lighting.

While some products are manifestly highly reliable, some others are not. This is so for the following reasons:

- LED technology evolves very quickly. New generations of LED devices become available approximately every 4 to 6 months.
- Lighting fixture manufacturers have to climb up a learning curve in applying LEDs. Being sensitive to thermal and electrical conditions, LEDs must be carefully integrated into existing systems.
- Important differences in LED technology compared to other light sources have created a gap in the industry standards and test procedures that underpin all product comparisons and ratings. New standards, test procedures are under development and Energy Star criteria for SSL intended for general illumination were published in 2007 (http://www.netl.doe.gov/ssl/energy_star.html).

Other Technologies: Other efficient lighting technologies which may develop in future, some of which could rival fluorescent lamps in replacing inefficient lamps, are:

- Pin-base CFLs (would require specific fixtures)
- Ceramic metal halide lamps
- Optical fiber technology
- Tungsten photonic lattice lamps
- Halogen infrared lamps
- Organic light-emitting diodes (OLED)
- Phosphorescent organic light-emitting diodes (PHOLED)
- Cold cathode compact fluorescent lamps
- Sulphur plasma lamps.

Issues related to mercury disposal

Mercury is a hazardous substance currently included in fluorescent lamps. The average mercury content in a CFL is about 3 milligrams – roughly the amount it would take to cover the tip of a ball-point pen. By comparison, older thermometers contain 500 milligrams of mercury – the equivalent of more than 100 CFLs. A common wristwatch battery contains five times more mercury than a CFL. Although there is currently no substance that can replace the

efficiency properties of mercury to produce light in fluorescent lamps, manufacturers have reduced the amount of mercury used in lamps. Some manufacturers have voluntarily reduced the mercury content in CFLs by about 80% in the past decade, to as little as 2 mg per bulb. Research is ongoing to achieve further reductions and, ultimately, to develop a mercury-free fluorescent lamp. The chart below compares the mercury content in a CFL to other household items.

The EU Restriction of Hazardous Substances Directive 2002/95/EC (RoHS) limits the amount of mercury allowable to a maximum of 5 mg/lamp. However, there is no agreed test procedure to test the amount of mercury in lamps. This is being reviewed under the CFLi. If there is a large switch from incandescent lamps to CFLs in a global low efficacy phase out, there will be significant additional mercury in the waste stream at the end of life of these lamps. Note however, that there is mercury released by the generation of electricity, so the balance of mercury release is not always in disfavor of CFLs. Many countries, especially with coal-fueled electricity generation are examining the relative weightings of this aspect.

Table 2: comparison of the mercury content in a CFL to other household items

PRODUCT	**Amount of Mercury**	**Number of Equivalent CFLs**
Compact fluorescent lamp	5 milligrams	1
Watch battery	25 milligrams	5
Dental amalgams	500 milligrams	100
Home thermometer	500 milligrams – 2 grams	100 – 400
Float switches in sump pumps	2 grams	400
Tilt thermostat	3 grams	600
Electrical tilt switches and relays	3.5 grams	700

It is important to note that the mercury content of linear fluorescent tubes, widely used in industry worldwide and representing a fair share of lighting for the residential sector in developing countries as well, is higher than in CFLs. Furthermore, due to lack of knowledge, disposal of these long tubes often entails breaking them up, representing an immediate danger for the end consumer. In fact addressing mercury issues for CFL will in turn have positive effects on disposal of linear tubes as well.

The presence of mercury in CFLs can be harmful to human health and the environment. UNEP Governing Council, in decision 24/3 IV, has set priorities for work on mercury, including the reduction of mercury supply, the reduction of mercury use and eventual storage of excess mercury. Given the goal of the UNEP Global Mercury Partnership to reduce, and where feasible eliminate anthropogenic releases of mercury, the Project will include as an objective reducing the demand of mercury for lighting and lamps (Activity 3.4).

Common barriers to energy efficient lighting technologies diffusion

The main barriers hampering the natural uptake of energy-efficient lighting technologies, particularly CFLs, can be classified into ***four groups***: i) cost and technological properties, ii) organization of the lighting market, iii) behavioral or consumer preferences, and iv) health risk (for example, mercury content). Each type of barrier is discussed below.

***Box 2: Barriers* to energy efficient lighting technologies diffusion**

Although strong market development has been evidenced in some GEF program countries, notably in China, in many others, CFL is hardly utilized despite the most cost-effective conditions. If efficient lighting is so economical, why does the market not deliver it automatically? The explanation can be found in a number of barriers that limit deployment of cost-effective lighting technologies. End-users and market actors are often unaware of the savings potentials and lighting-quality advantages and without information are inclined to use the technologies that they have always used. Some efficient lighting has higher initial costs and thus users are less likely to invest in it unless they are aware of the future savings. Most lighting is not installed and directly paid for by the end-user, thus different cost incentives exist for installers and users. Furthermore, most public and private organisations manage their equipment and operations budget separately and thereby create an incentive to minimise equipment costs at the possible consequence of higher operating costs. These and similar obstacles all slow the rate at which markets learn about and adopt cost-effective choices. (IEA 2006, Light's Labour's Lost).

Cost and technological barriers to the diffusion of energy efficient lighting products

Historically, the main barrier hampering the deployment of energy-efficient lighting products has been their high initial cost. When first launched in the early 1980s, CFLs were 20 to 30 times more expensive to produce than their incandescent equivalents. CFL costs have since steadily declined through deployment and increased competition and now retail for as little as four times the price of an incandescent lamp. Table 1 shows the life cycle cost to an end-user of both incandescent lamps and CFLs. The cost assumptions adopted in this exercise are conservative. In reality, costs (and in particular those of CFLs) vary depending on where the lamp is produced. It shows that, even when considering an initial cost that is 20 times higher than that of an incandescent lamp, when energy costs are taken into consideration, CFLs cost less than a third of the cost of incandescent lamps.

Table 1: The economics of CFLs compared to incandescent lamps over a 10 year period

	Incandescent Lamp	**Compact Fluorescent Lamp (CFL)**
Initial cost of bulb (USD)	0,50	10
Light output (lm)	900	900
Lamp power (W)	75	15
Efficacy (lm/W)	12	60
Lifespan of bulb (h)	1 000	10 000
Calculation over a 10 000 h operating period, assuming an electricity tariff of USD 0.1/kWh		
Electricity consumption (kWh)	750	150
Cost of electricity (USD)	75	15
Cost of lamps (USD)	5	10
Total cost of lamps and electricity (USD)	80	25
Total savings for CFL (USD)		**55**

Source: IEA (2006)

This simple analysis does not take into account the impact of displaced heat. As noted in the introduction, about 25% of the energy consumed by CFLs is converted to visible light compared to only 5% for a conventional incandescent lamp. This means that 75% of the input energy is output heat in the case of CFLs compared to 95% in the case of incandescent lamps. In some circumstances and, particularly in cold climates, the introduction of CFLs to replace incandescent lamps may therefore lead to a greater heat demand with associated costs. In warmer climates however, CFLs may displace the demand for air conditioning thus reducing cooling costs. The financial impact is therefore highly dependent on the climate.

Globally, significantly more electricity networks experience summer peaking in response to air conditioning demands than networks experiencing winter peaking due to space heating demands where non-electric commercial fuels usually dominate. Thus, overall, the high correlation between air conditioning and the peak in electricity demand in the summer will most likely give greater global weight to the additional benefits of lowering the air conditioning demand as opposed to an increase in space heating energy needs.

As shown above, whereas, on a life-cycle basis, CFLs are far more economical than incandescent lamps[13], the higher initial cost remains an important barrier to the broad diffusion of CFLs. Incandescent bulbs are the dominant technology in most countries to a large extent because they are so inexpensive. On the one hand, higher income consumers often regard incandescent lamps as disposable. In this case therefore, the higher initial cost/lower life cycle cost characteristic of CFLs is a market barrier because of incomplete or inaccurate consumer awareness about competing technologies and because of their limited confidence in new technologies. These issues are addressed in the subsections below. On the other hand, for the poorer sections of a community, the capital cost of CFLs can be a substantial barrier even if they save money in the long run. Many will always opt for the cheapest option if there is a price differentiation. In this case, the higher initial cost of CFLs is a purely financial barrier.

In parallel to high costs, early CFLs, while compact when compared with tubular fluorescent lamps, were still more bulky than the incandescent lamps they were designed to displace. With most residential light fittings having been designed over many decades to fit the highly standardized dimensions of incandescent bulbs, the additional length and bulk of CFLs acted as a significant disincentive for residential buyers. CFLs have also had a number of quality and suitability issues to address. The first CFLs had limited color ranges and tended to only be available in the higher cooler-light values. CFLs using magnetic ballasts were also prone to delayed starts and long warm-up times and could suffer from flickering.

Market-driven improvements, accompanied by various market transformation efforts have to a large extent addressed these technical issues. The size of CFLs has been significantly reduced. There are now also a far greater range of sizes and shapes available on the market. Current generations are available in the same warm colors provided by incandescent lamps. In addition, the introduction of higher quality lamps using electronic ballasts has overcome much of the delayed-start and flickering problems.

Barriers related to the organization of the lighting market

As in any market, the availability of accurate and complete information is a necessary element to ensure the effective allocation of resources. Energy-efficient lighting systems cover a wide range of technologies and it is difficult for consumers, and even distributors and installers, to learn about all their attributes, including quality. The comparatively high running costs of incandescent bulbs are, for example, often poorly understood. Most consumers receive electricity bills infrequently and have no way of understanding which part of the bill is accounted for by lighting. Information is also often not readily available at the point of sale, making it all the more complicated for consumers to make informed choices. Lack of information hampers the decision-making process and often leads consumers to prefer known technologies.

Another important characteristic of the lighting market is that generally, those making the decisions about lighting equipment are not the ones who pay directly for the system's energy use and hence lack an incentive to minimize operating costs. This is referred to as the "split incentive" barrier.

Indeed, when a developer or landlord is constructing or retrofitting a building they may have every incentive to lower their initial costs, including by installing less efficient lighting systems. The tenant or purchaser of the building then has to pay for the operating and maintenance costs associated with the chosen system. In the case of

[13] Even in this example where rather high CFL costs are assumed, a CFL that displaces an incandescent lamp represents an investment with an internal rate of return of over 180%

CFLs, they can be used as substitutes to most types of incandescent bulbs. So a tenant or purchaser can often easily choose to replace an incandescent bulb with a CFL if that is the system installed. Yet CFLs cannot replace all incandescent lamp types. In some cases the tenant or purchaser is therefore bound to the less efficient technology. In addition, in many commercial buildings, tenants hire a management company to take care of the building including its lighting systems. Depending on the maintenance contract, the managing company may have little incentive to replace the incandescent lamps with CFLs.

Finally, there are barriers pertaining to the very purchase of lighting equipment. Light bulbs and lamps suitable for residential applications are readily available in a wide range of retail outlets, ranging from grocery stores, corner stores, large department stores and specialty lighting stores, to appliance or building-supply stores. However, the EU's Atlas project[14] estimates that 40% of all general lighting sources are purchased from supermarkets. CFLs are beginning to be displayed more prominently in retail outlets, including supermarkets, although still much less so than incandescent bulbs. Movable lamps are typically an important component of the total lighting use in the residential sector. For this reason, unlike in the commercial and industrial building sector, building energy codes rarely prescribe maximum lighting energy requirements for residential housing[15]. Decisions about lighting are therefore made without regulatory guidance on energy efficiency.

Barriers related to the behavioral and consumer preferences

Most users are time-constrained and have to balance the benefits of optimizing their decision making about lighting efficiency with many other competing demands on their schedule. Given the need to prioritize, many will choose to invest their efforts in other directions and live the consequences of poorly informed decisions about lighting. Consumers are also sceptical about predictions of the benefits of *any* new technology, and this holds equally true for energy-efficient lighting. Many consumers are concerned that CFLs lack performance and reliability. In addition, some early models were substandard and bad reports quickly traveled from consumer to consumer.

Many manufacturers also promoted CFLs on the basis of their extensive lifespan. Therefore, consumer expected *every* lamp to meet the lifetime statement regardless of the brand or price while bulbs' lifespan are based on an *average* lifetime. Following probabilities, and due to lack of quality control in some instances, some CFL failed early, thereby disappointing some consumers. This situation can be worst in developing countries, since markets are sometimes flooded with low quality CFL, increasing the rate of early failure and consequently, consumer's distrust of the technology. Like much energy efficiency technology, consumers who have had a bad experience tend to avoid CFLs altogether even though many of the early problems have now been reduced significantly.

Consumers often look for guarantees or assurances that the products they buy will achieve the promised results, especially when they have paid a high initial cost compared to prices for other, less efficient products. In addition, consumers normally opt to avoid changing habits or actions, especially when conditions such as energy prices are stable. Even given rapid economic changes as has been evident in transition countries in Central and Eastern Europe, there is often a reluctance to move from known practice, even if purchasing energy-efficient lighting makes financial sense.

Some consumers rightly expect a CFL to render the same service as an incandescent lamps. The truth is that in many cases, the slow start up, has had a negative effect on CFLs., the immediate impression being of poor light quality.

The energy demand for lighting in the residential sector is also affected by occupancy patterns and lifestyle factors. In living rooms, people generally like to be able to dim the lights. Similarly, people often appreciate mood lighting, in which case warm colour tints (yellow, orange hues) are often preferred. The CFLs most commonly sold on the commercial market were generally not dimmable and tended to give off a blue/white colour. Modern

14 www.europa.eu.int/comm/energy_transport/atlas

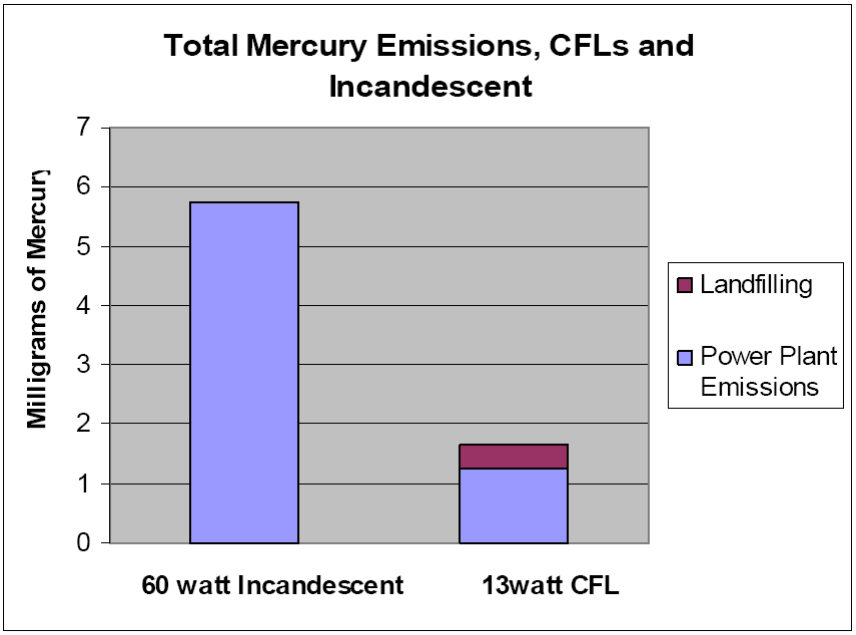
15 The UK is the only IEA country to prescribe maximum lighting energy requirements in the residential sector. California also imposes requirements.

CFLs are now increasingly dimmable and available in a broad range of colour temperatures yet, as mentioned above, it may be that consumers have been "turned off" by earlier models.

In addition, a significant trend in many OECD countries, consistent with the wider trend towards investment in home decorating, is to install spotlighting systems (to highlight architectural features or artwork). These systems may lead to a greater number of lamps per home and also to a preference for less efficient lighting types (such as low-voltage halogens for spot-lighting and dimmable high-voltage halogens or incandescent lamps for mood lighting).

Barriers related to health risk issues (mercury components)

There is a widespread concern that the mercury content of various CFL might be transforming a environment-friendly initiative into a risk for health and the environment. The mercury content of one CFL can range from 0-50 milligrams (depending upon when and where the lamp was manufactured) with current technology it is believed that the average mercury content is of about 5 milligrams per bulb. However, reports clearly state that the amount of electricity used by a single incandescent lamp produces, at the source (power plant), much more mercury than the destruction of CFLs does. The following figure illustrates the matter:



Global mercury demand related to CFL production is estimated at 3-4 % of the current overall global demand and is projected to remain at that level in the coming ten years (with increased production of CFLs with lessening content of mercury). Research is ongoing to achieve further reductions and ultimately, to develop mercury free CFLs.

The UNEP Governing Council, in decision 24/3 IV sets priorities for work on mercury, including the reduction of mercury supply, the reduction of mercury use and eventual storage of excess mercury. Given the goal of the UNEP Global Mercury Partnership to reduce, and where feasible eliminate anthropogenic releases of mercury, the focus of the UNEP Chemicals mercury program is on reducing the demand of mercury for all uses, including lighting and lamps.

Any significant CFL-promotion effort must take into account the environmental risks pertaining to the disposal of CFLs. The third component of this project will address this issue by supporting governments in the establishment of a national strategy of CFL disposal as well as by supporting the enunciation of national risk communication plans.

Conclusion on the situation analysis

In summary, energy-efficient lighting products are economic, commercially viable and available technologies, which due to the different market barriers, however, have not reached the market penetration rate that it could reach on simply economic grounds. Policy makers in many countries have long understood these difficulties and have been implementing measures directly aimed at the surpassing of these barriers since the 1970s. Moreover, these measures have resulted in impressive returns. In cumulative terms the policies implemented since 1990 saved almost 8% (2 960 TWh) of cumulative lighting electricity consumption to 2005 and 1 670 Mt of CO2 emissions; they are also forecasted to save another 14 500 TWh and 8 500 Mt of CO2 (17% of the total) from 2006 to 2030 without being strengthened. In addition they have been remarkably cost-effective in avoiding net costs of USD 253 billion by 2005 and are on course to save USD 1.5 trillion by 2030.

Governments have a key role to play in accelerating the adoption of energy-efficient lighting.They can set standards to prohibit the sale of the least efficient lighting technologies where high-efficiency, good-quality and cost-effective alternatives exist.They can institute regulations applying to the energy performance and quality of lighting systems installed in major applications: commercial buildings, new residential construction, outdoor lighting, industrial lighting and vehicle lighting. They can help develop innovative financing and fiscal schemes to overcome first-cost barriers and provide information and training to lighting specifiers, designers and installers. They can educate the public at large about the benefits of efficient lighting.They can ensure that the energy costs and performance of lighting are visible in the market by labelling the energy performance of equipment and certifying the performance of entire light-using systems such as buildings and outdoor lighting.They can encourage better building design with more effective use of daylight through education, training and incentives.They can lead by example through pioneering efficient-lighting technologies and practices in their own buildings and by setting appropriately ambitious targets. And they can establish programmes and provide support to bring more sustainable, affordable and high-quality lighting to the world's light-poor.

All these measures will bring results but need careful design and targeting. They also need to be ambitious, broadly based and effectively implemented to realise their potential. Many governments have found that comprehensive and broad-ranging programmes with a clearly defined mandate and adequate resources enable the most effective response. While some leading countries have undertaken lighting energy efficiency measures, the global potential is untapped. Furthermore, as some of the more broad-based programmes are novelties, there are only scarce reports of their effectiveness. Given the strong synergy between lighting industries, private sector actors and public agencies towards a more energy efficient lighting future (as illustrated by recent commitments by the EU and Australia, among others), there is arguably no counter-indication to further promotion and implementation of lighting policies and measures.

Incandescent lamps have been used since the 19th century and still have an energy-to-light conversion efficiency of 5%, which is five times lower than that of equivalent good-quality compact fluorescent lamps (CFLs). A replacement of inefficient incandescent lamps by CFLs would alone cut world lighting electricity demand by 18%, without any depreciation of lighting quality. In the service sector, the use of high-efficiency ballasts, slimmer fluorescent tubes with efficient phosphors and highquality luminaires produces savings that are just as impressive.

For street lighting as well as for office and industrial lighting there are great savings to be gathered from discontinuing the use of inefficient mercury vapour lamps and low-efficiency ballasts in favour of higher-efficiency alternatives. The waste of light can also be readily reduced by the use of time-scheduled switching, occupancy sensors and daylight-responsive dimming technologies, all of which are mature and fully proven techniques with high savings returns.

GEF's global lighting initiative expects to take significant actions on global level to transform the market of efficient lighting with three inter-related objectives: (i) to promote high performance, energy efficient lighting technologies; (ii) to phase out inefficient, incandescent lights; and (iii) to substitute traditional fuel-based lighting with modern, efficient alternatives, including the promotion of energy efficient mercury free alternatives. The project consists of three elements, including (i) a global program (this proposal); (ii) country and regional projects;

and (iii) public-private partnerships. This initiative will draw upon past GEF-funded projects in the domain and will be coordinated with other global, regional and national initiatives related to the promotion and market transformation towards efficient lighting.

This global program will serve as a platform to build synergy among global stakeholders, share knowledge and information, create policy and regulatory frameworks, address technical and quality issues, assist public-private partnerships and support country programs. Even in countries with established energy efficiency goals and policies, national taxation, industrial policies and regulatory practices often pose barriers for accelerated penetration of energy efficient lighting.

Governments and other stakeholders have expressed concern about mercury use in CFLs, hence the issue of finding non-mercury alternatives to CFLs will be addressed. The project through its Centre of Excellence will promote the development, by putting emphasis on the setting of quality and performance standards, of feasible and energy efficient alternatives to CFLs and will set standards on maximum mercury content. Consideration shall be given to setting up lamp recycling infrastructure and final disposal past CFL life.

Advocacy for regulatory reforms may be pursued by project partners including industry associations where appropriate, and in concert with the Centre of Excellence working with the Project (described in 2.2). The Centre of Excellence will provide technical assistance to support: (i) energy efficiency and product quality standards harmonisation for lighting products and other related devices i.e. controls ; (ii) reduced import tariffs on energy efficient lighting products; and (iii) developed regulation encouraging appropriate demand-side management activities by electric utilities or other parties.

Utility-based energy efficiency lighting programmes may require an adequate regulatory framework to recover the costs of these lamps through normal utility collection mechanism. The Project will also seek to transfer new or established methodologies for monitoring and verification of the electricity and cost savings associated with energy efficient lighting retrofits. Such methodologies exist at international level and are key in promoting viable commercial financing arrangements for private energy service companies (ESCOs).

PROJECT GOAL AND OBJECTIVE

The goal of the project is to speed up the transformation of the market for environmentally sustainable efficient lighting technologies in the emerging markets of developing countries. The program aims to accelerate the phase-out of incandescent bulbs by removing the market barriers to energy-efficient lighting, promote development of mercury free technologies and thereby reducing global greenhouse gas emissions as well as mercury releases. The objective is to create locally or regionally an institutional/legal/financial/technical environment that is in favor of energy-efficient lighting through the promotion of high-performance and environmentally sustainable new technologies such as mercury free CFLs and the phase-out of inefficient, incandescent lamps. The project will (i) work in close partnership with highly qualified experts specialized in energy efficiency and lighting, (ii) provide a global “open space” for exchange and communication in between all the stakeholders and (iii) provide support to the implementation of adapted country programs, expanding in this way the market transformation mechanisms in a large majority of developing countries.

The GEF implementing agency for the project is the United Nations Environment Program (UNEP). In a complementary way, UNEP and other GEF agencies will develop specific efficient lighting projects at regional and national level under the guidance of the present global approach, in close partnership with the private lighting industry from OECD, emerging and developing countries, building upon the existing related activities supported not only by the GEF but also by other financing agencies. The project will therefore serve as an “umbrella” under which further national projects in various countries will be undertaken. A first series of national and regional projects is already under development and new projects are being developed currently in China, the Russian Federation, Ukraine, Vietnam, Peru, the Caribbean region, and West Africa.

By building on experiences and lessons learned from various international initiatives and an initial market assessment of the targeted countries that have expressed interest in participating in the project, the concrete objective of the Project is to support countries in the development of a local energy efficient lighting industry and business, both in the countries directly benefiting from the project during its implementation or as an outcome for other countries after project completion.

UNDP, in collaboration with the Chinese Government, is presently submitting a GEF Project Proposal concerning the phase –out of incandescent lamps and energy saving lamps promotion (PILESLAMPS Project). Since the two projects will be implemented in parallel, strong synergies could be developed between the global initiative and the project in China. Specifically, the Global Project could provide the following support to PILESLAMPS:

- Contribution to the preparation of the Chinese phase-out roadmap
- Provision of information regarding international best practices and benchmarking
- Contribution to the preparation of a national communication plan
- Contribution to the preparation of improved standards, and enforcement and compliance schemes
- Contribution to the preparation of training for testing and certification bodies
- Contribution to the preparation and implementation of the mercury disposal strategy.

Furthermore, the PILESLAMPS Project will provide invaluable information to the Global Initiative regarding a concrete implementation experience. Since PILESLAMP will end one year before this Project, its actual results should be readily available for analysis. The most relevant outputs of PILESLAMPS for this Project are:

- Risks analysis resulting from phase-out
- Results from the conversion pilot projects
- Improvement of national standards
- Improvement of capacity in testing laboratories
- Results from the improved control of hazardous substances at production and disposal levels
- Results from the large scale promotion projects
- Results from the implementation of voluntary agreements with manufacturers
- Results from the promotion and awareness campaigns
- Identification of financing initiatives

The Global Project will seek to achieve this concrete objective by:

- **supporting** the establishment of an enabling international policy framework that would allow the sustainable development of a global energy-efficient lighting market, including regulations, financial and/or fiscal incentives and/or voluntary or mandatory quality control, certification and labeling schemes;
- **enhancing** the awareness of decision-makers and market actors on the benefit of energy efficient lighting products for meeting the energy climate change challenges and on the benefits of mercury free alternatives ;
- **increasing** consumer access to information through technical support provided to GEF or non-GEF energy efficient lighting projects implemented at the country-level;
- **building** the capacity of the energy efficient lighting supply chain, including training and certification of local manufacturers and traders; and
- **facilitating** global information exchange and networking to learn about the experiences, results, lessons learned and best practices in other countries or initiatives.

PROJECT OUTCOMES

The project is designed to remove the following set of barriers:

- **Policy:** The design of successful policy to transform markets at the lowest possible cost requires time, expertise and commitment of Governments and public agencies. Such crucial resources are sometimes lacking in several countries, making any attempt to transform markets risky. To be efficient, the policy also has to harness the willingness of the private actors to carry on the required improvement. Thus, in contexts where policy dialogue is unusual, broad-based market transformation policies and measures are at risk of being rejected by the private sector.
- **Finance:** There are two layers of financial barriers. First of all, there are considerable financial barriers on the supply side of the lighting market. Suppliers in developing countries, in order to develop the capacity to manufacture, import or distribute highly-efficient lighting products instead of regular lighting products, have to mobilize often scarce capital to finance improvements. The opportunity cost of this capital may be prohibitively high. On the demand side, as previously mentioned, the principal barrier is the higher initial cost of energy efficient products for consumers.
- **Business Skills:** A successful transformation of the local market requires technical abilities to assess and understand products quality and characteristic. It also commands in-depth analysis of the market to be reached with these improvements as to be able to send correct price signals. In some regions, the needed critical business skills can be lacking.
- **Information:** Lack of information or imperfect knowledge on the part of consumers, vendors, manufacturers and policy makers may hamper the introduction of energy efficient lighting measures in situations where they make technical and economic sense. Consumers are frequently unaware of practices and technologies available. Developers, architects, and facilities managers often have misconceptions about new or unfamiliar technologies.
- **Technology:** Several opportunities to produce and to conserve energy depend on new technologies that might not be available in some countries or regions. Many new and efficient lighting technologies incorporate electronic components which rely on good quality power to operate. Voltage fluctuations and frequent power failures will shorten the equipment's designed lifetime. Since R&D has not been overly concerned with such developing countries-specific problems, much is left to be done in order to make modern lighting solutions applicable to developing countries' contexts.

The project strategy to address these issues suggests the following outcomes:

- *Consensual decisions and a roadmap for global lighting market transformation all over the world agreed* upon, with subsequent decisions to orient action in a wide range of arrays including pace for phasing out obsolete technologies and introduction of new ones, quality requirements, support to national and regional initiatives, development of financing incentives and financial mechanisms including the use of CDM methodologies and the use of carbon finance instruments (linked to Component 1 described below);
- An *International Centre of Excellence* in charge of strategies, policies, knowledge management, best practices diffusion, quality harmonization, etc., established and operational (linked to Component 2 described below);
- A set of *guidelines for harmonisation efforts* to be undertaken on global quality and performance-based standards for energy-efficient lighting products designated and made operational (linked to Component 2);
- *Identification of gaps and guidelines to promote International testing and certification* procedures (technical, performance and quality standards) for those products emerging in the lighting market (linked to Component 2);
- *A clear and comprehensive toolkit* based on national experiences, to phase out at national level, with key factors for success and identified risks (Component 2 and Component 3 described below);
- *Capacity built in GEF programme countries* both at policy and at quality enhancement level (component 3);
- National and regional *market transformation strategies* for lighting products implemented (linked to Component 3);

- *Knowledge and information sharing* tools for enhancing awareness of key stakeholders at national/regional levels adopted (linked to Component 3);
- Chemicals mercury impact reduction plan is adopted (linked to Component 3).

PROJECT COMPONENTS

The global project has three main interrelated components outlined below:

1) Creation of a Global Platform composed of a high level forum to identify major efficient lighting topics in order to improve coherence among the main stakeholders and delineate coordinated orientations on ways forward regarding global market evolution, which secretariat will be assured by the Centre of Excellence described hereafter;
2) Implementation of a Centre of Excellence for efficient lighting policies promotion and for quality improvement and certification for energy efficient lighting products;
3) Support to National and Regional Energy-Efficient Lighting Market Transformation Programs.

COMPONENT 1: CREATION OF A GLOBAL PLATFORM

This component includes the creation of an institutional and policy corpus, under the form of a wide-based stakeholder forum consisting of members from national governments, professional associations, utilities, private manufacturers, international organizations, consumers associations and other concerned members. This body will concentrate decision makers' view and create consensus for global lighting market transformation all over the world.

As a consequence of this consensus, an international roadmap reflecting national and regional phasing-out plans will be developed, with subsequent decisions to guiding action in a wide range of arrays including pace for phasing out obsolete technologies and introduction of new ones, quality requirements, support to national and regional initiatives, development of financing incentives and financial mechanisms, particularly carbon finance.

Simultaneously, on the supply side, the market traditionally dominated by three major western firms (GE, OSRAM and Phillips), is also benefiting from this technology shift with the most notable increase of the role of the Chinese industry and, to a lesser extent, that of the Indian industry. The strive in terms of sales is clearly on CFLs but other technologies are drawing more and more attention, and national stakeholders are increasingly investing into R&D programs.

The global platform is therefore expected to develop a dialogue between the different categories of stakeholder, to create synergies amongst the various initiatives at international, national and regional levels, to collect and render accessible to all potentially involved stakeholders accurate and up to date information, to facilitate a general consensus to push the market towards more efficiency and higher quality products, and finally to support national strategies and policy decisions reflecting this international consensus.. Another key task of this global platform will be to analyse, synthesise and advertise national experiences highlighting key factors for success, major risks and identifying best practises when phasing out obsolete lighting technologies and introducing new ones, such as mercury free technologies.

Outcome 1**:** *Consensual decisions and a roadmap for global lighting market transformation all over the world agreed* upon

Output 1.1: A stakeholder forum for policy dialogue is established and fully operational

Activity 1.1.: Create and operate a stakeholder forum for implementing a policy dialogue to support sustainable energy-efficient lighting market transformation.

The first activity will focus on the creation of a stakeholder forum under the form of a Multi-Stakeholder Commission, called the Global Alliance for Efficient Lighting (GAFEL). This forum will be created with the view of discussing the main issues and providing guidance to decision makers as regards the most appropriate ways to ensure the steady phasing out of obsolete lighting technologies and their replacement by new and more efficient ones, depending on the various segments of the lighting market and on the financial and technical constraints to be taken into account for these various new technologies.

Its main goal can be expressed in terms of global coordination with a focus on advancing consensus on a variety of subjects including pace of phasing out, , targets for quality requirements of products, including lessening mercury content and eventual phase-out, environment management and finance. It will be set up to promote dialogue among the world stakeholders and to provide a common view under the form of stakeholders agreements, which will impact public and private sectors decision processes in view of accelerating the phase-out of inefficient lighting products and support market transformation in favour of high quality energy-efficient lighting technologies. The key stakeholders to be involved are international organizations, government agencies, manufacturers, testing laboratories, lighting associations, utilities, large manufacturers, retailers and consumer associations.

GAFEL's mission can be summarized as follows:

- ***Demonstrate*** the benefits of Efficient Lighting and position it as climate friendly technology for a low carbon world.
- ***Create*** the environment to develop and sustain Efficient Lighting markets.
- ***Identify*** and stimulate innovation, including mercury free alternatives.
- ***Promote*** compliance with health, safety and environment standards and good business practices.
- ***Facilitate*** and drive communication among all stakeholders.

GAFEL will be a forum for identifying new initiatives and proposing to the Project Steering Committee (PSC) topics of interest, so that project activities can best respond to evolving needs of a transforming market. It will identify, upon suggestions from the Centre of Excellence (see Component 2) study needs and will subsequently create working groups that will address these specific issues. The objective is to cover a wide range of aspects related to global market transformation for efficient lighting, update analyses and use the results to tailor the program to local needs (in phase with country programs).

Thematic working groups will be created within the GAFEL to provide policy and technical guidelines as a background for the work of the Center of Excellence, particularly regarding the elaboration of specific tools and the support to new countries. The working groups will be moderated and technically driven by GAFEL members, while the Centre of Excellence will provide secretariat support and implement the recommendations and guidance coming out of the working groups. They will distinctively deal with the different issues raised by the Project findings and will be coordinated by the Centre of Excellence, under the supervision of the PSC. The main topics of interest for the constitution of the working groups are:

- Standardization, quality, testing and labelling
- Enforcement and verification
- International cooperation, capacity building and training

- Research and development
- Market data and analysis
- Policy, regulation and financial incentives
- Global communication strategy

The missions of the working groups will be:

- to identify best suitable ways to demonstrate the benefits of efficient lighting and position it as climate friendly technology for a low carbon world;
- within their own subject matters, to review and analyze current situation, follow up and analyze the trends, identify issues and provide recommendations – constantly updated to guide activities of the project partners;
- identify the tools needed by countries willing to develop initiatives at local or regional level and propose path for development of related toolkits.

The success of the global platform, or rather its level of impact, depends of 3 key main factors:

(i) the level, quality, commitment and variety of members composing the GAFEL;
(ii) the ability of this body to reach decisions which result from a vision and provide forward looking orientations;
(iii) the visibility of this work, guaranteed through the dedication of each and every member of the GAFEL and through specific communication activities to widely advertise decisions taken by the forum.

Output 1.2: Stakeholders agree upon a roadmap for global market transformation and coordinated phase out of inefficient lighting

Activity 1.2.: Carry out a policy dialogue leading to the elaboration of a global roadmap

This activity aims at supporting multi-stakeholder discussions, based on sound, comprehensive and up to date information, allowing partners to reach consensus for action, translated into orientations and general guidelines, which, while non-binding, will find their validity from the legitimacy of the participants in the various working groups established within the forum. Allowing these orientations to be made public will be both a key indicator and a key factor for success.

As previously mentioned, various countries, both in the developed and developing worlds, have already taken steps to phase out inefficient lamps.

A number of multilateral and bilateral initiatives are currently active on many aspects related to the transformation of the lighting market, either from the standard and quality standpoint such as ELI and the USAID Asian project, or from the regulatory standpoint, such as inclusion into building codes of specifications for lighting output per type of building use.

Decision processes in various spheres including private companies, national governments, standardisation bodies, international organisations, etc, will be impacted by the result of the discussions conducted under the Global Platform approach.

The activities to be undertaken will raise the awareness of key international decision and policy makers on the benefits of energy-efficient lighting and facilitate the policy dialogue at the global level on the possible institutional, regulatory, technical and financial measures to accelerate the global efficient lighting market growth as well as the phase out of inefficient lighting products. The main tasks will include prioritizing best-practice applications from the field and diffusing them to members and the general public, as well as providing guidance for the development of coordinated, national and regional implementation plans. This will result in the steady setting up of a coherent, enabling environment, at the global level, to allow the Project reaching its ultimate goal.

GAFEL will also identify key topics to be examined by the PSC in order to direct the project work plan taking into account ongoing development in the lighting market.

The policy measures to be promoted should include the following:

- setting up of a process for policy dialogue with the aim of producing consensual decisions at a global level
- endorsement of the objective of across-the-board best practice in lighting
- identification of major topics on which the project, through the Centre of Excellence (see Component 2), will produce guidelines. The topics shall include: for example energy-performance requirements such as output per watt, life time, start up and flickers, mercury content, quality of batteries for portable devices such as LED, but also moving towards providing clear product information to consumers i.e. lumen/watt instead of watt today, etc.
- identification of gaps in information, diffusion and recommendation of actions on any topic of relevance including best practices, suitable role of utilities, direct and in-direct financial and fiscal incentives for end-users.

As a result, a global agenda and work plan for coordinating phase out of inefficient lighting will be finalized and agreed on by the international community.

Output 1.3: A communication plan set up and implemented to strengthening coordination mechanism in energy efficient lighting market transformation

Activities under this output will focus on overcoming the information barrier, particularly the lack of awareness among decision-makers. This output is complementary to output 3.1 specifically aimed at national institutions.

Activity 1.3.: Produce a detailed communication plan and mobilize communication channels

Work under this activity will assess the need for communication and provide recommendations to secure a maximum impact of GAFEL decisions in existing negotiations and decision processes at global and regional level.

This activity is designed for the widespread dissemination of GAFEL decisions and lessons learned from through policy dialogue and advocacy. From the initial stage of the project onwards, funding will be utilized to disseminate information and consensual decisions through existing media such as technical brochures or other means, on all efficient lighting related topics, whether technical or political and regulatory, or linked to buildings construction issues and architecture. UNEP department for communication will also be called upon to use UNEP core media to disseminate project information and relevant decisions.

When feasible mercury free alternatives to CFLs would become available, the communication plan should include information and promotion to such alternatives which are equally energy efficient.

A detailed communication plan will thus be prepared by a specific working group within GAFEL, while the tools themselves will be designed by the Center of Excellence. The plan will include the following aspects:
- Identification of the targets to be reached by the planned communication activities
- Identification of the contents of the information to be disseminate
- Identification of communication tools
- Identification of communication channels at international, national and regional levels
- Detailed evaluation of the communication activities and improvement of tools

Specific achievements for this activity will be:

(i) A website developed under component 3.1, serving as a knowledge base operating and used as a tool to monitor project visibility as well as to enlarge the influence circle of the project and increase the number of partners
(ii) A series of articles in newspapers for the large public and technical media support in various languages
(iii) A Project newsletter reflecting the orientations chosen by the GAFEL Working Groups and the decisions reached within the forum
(iv) Exchange of information with related projects initiated by international institutions
(v) A database of projects, initiatives and actors active in the lighting sector, both in the countries where the Project will be implemented and in the targeted new countries
(vi) Participation in international events
(vii) Targeted information and awareness-raising campaigns (to government agencies, professionals, end-users)

This communication plan will constitute the basis for the elaboration of national communication plans (see activities 3.2 and 3.3).

COMPONENT 2: IMPLEMENTATION OF A CENTRE OF EXCELLENCE

Transforming a global market such as the lighting market entails serious challenges in terms of quality and credibility, balance between efficacy and potential environmental impacts, competition amongst suppliers, as well as in production and supply capacity issues. This specific **component,** focused on quality and performance issues, will strive to address these aspects in an equitable and professional way, while building on and working with a network of already existing organisations and institutions at international and regional and national levels.

Working as a secretariat and executive body for the GAFEL, a Centre of Excellence (COE) will be established, grouping highly qualified experts in energy efficiency policy making, lighting quality improvement and standardization issues. The COE will directly address the technical aspects of the project by reviewing current and ongoing experiences in the field with respect to efficient lighting technologies development. Based on the guidance and recommendations of the GAFEL, the COE will also conduct studies, analysis, tests, etc. through the network of technical organisations associated, available both in the developed and developing countries. The objective is twofold: (i) clearly identify the detailed content of guidelines allowing to reach consensus on energy efficiency norms, working conditions and life-cycle, environmental safeguards and performance standards for efficient lighting products and any other relevant technology resulting in improved efficiency of lighting system; and (ii) provide needed support to the supply chain to effectively secure the use of efficient products and the phasing out of obsolete technologies on the international markets.

The following are the expected **outputs** associated to the above-mentioned Component:

- A Centre of Excellence capable of coordinating the Project's policy and selected technical activities
- A network of expertise and institutions for quality improvement and certification identified, supported and strengthened
- Gaps in existing testing and performance standards identified an steps to fill these gaps taken as new technologies are introduced
- Guidelines for harmonisation of quality and performance-based standards developed and adopted
- Capacity for harmonisation of quality and performance-based standards built in partner organisations and GEF programme countries
- Guidelines for quality certification and labelling schemes formulated for energy-efficient lighting products
- A toolkit developed and made available to relevant partners

Outcome 2: An International Centre of Excellence in charge of strategies, policies, knowledge management, best practices diffusion, quality harmonization, etc., established and operational

Output 2.1: A Centre of Excellence capable of coordinating Project's policy and technical activities established

Activity 2.1.: Establishment of an International Centre of Excellence in charge of strategies, knowledge management, best practices diffusion, harmonization, etc.

To address its mission effectively, the Centre of Excellence will need to reach a "critical mass" of high level experts and technology developers and will require a well-managed structure. It will have to efficiently and rapidly mobilize the expertise of specialists to elaborate working and strategy papers to be discussed by the GAFEL assembly. Furthermore, it will act as secretariat to the GAFEL Working Groups, providing background analyses and documents, preparing minutes of meetings and implementing the activities decided by the forum as well as by the Working Groups. It should be viewed as a resource center by the GAFEL members, as well as by the national and international organizations to be involved in the Project.

In addition the Centre of Excellence needs to present the indisputable characteristics of neutrality and professionalism. From this depends the credibility and hence the success of the initiative. At the same time, but at project completion, a sound cooperation will be established amongst stakeholders allowing the transfer of financial support entirely outside the GEF.

Based on the above characteristics as well as on a wide consultation during preparation, the COE will be housed by UNEP-DTIE in Paris and will work under the supervision of the Project Steering Committee and the guidance of the GAFEL. Its core team will be staffed with high level internationally recognized experts, paid on the project budget, or seconded by firms and institutions from all over the world on lighting issues. The Centre will be directed by the Project Steering Committee (PSC), in charge of developing and implementing the recommendations of the GAFEL. It will carry tasks on its own but will also, for a large part, subcontract tasks to other individuals and institutions, testing centres or laboratories as required.

The Centre of Excellence will be dealing with three main areas of interest: product quality and environmental safety, policy and implementation tools, and new technologies. A core team will act as secretariat to GAFEL and the PSC. Communication specialists will implement the communication strategies at the global and regional/national levels.

Additionally, the COE will be in charge of monitoring the lighting market and undertaking studies to inform about the impact of the Project in term of energy and greenhouse gas (GHG) emission reduction on a global level. Monitoring and evaluation efforts are designed to assess both the direct impacts of the purchases of energy efficient lighting products such as CFLs, and the wider "market transformation" impacts of the program on GHG emissions at a global level. Evaluation activities are also required to allow continual fine-tuning of the Project.

As a summary, the following breakdown provides a non exhaustive overview of the proposed goals and activities to be undertaken by the Centre of Excellence:

a. Understanding and Promoting Energy-Efficient Lighting Technologies Worldwide

- Gather, analyse and provide ongoing knowledge base of efficient lighting policy initiatives around the world;
- Develop methodological tools to analyse national and regional experiences, identify and present best practices, highlight risks and mitigation strategies;
- Gather, analyse and provide ongoing knowledge base on standards, health and safety (e.g. mercury) issues, promotional plans, etc;

- Mandate studies and keep a comprehensive knowledge base on market evolutions including volumes, prices, and technologies.

b. Building Stakeholders' Capacity

- Build capacity of keys stakeholders involved (international organizations; government agencies, manufacturers, testing laboratories, large retailers and consumer associations) in efficient lighting diffusion through the development of adapted information materiel, including training kits and training sessions;
- Organize technical support for the development and implementation of policies at the international, national and local (including work programmes) level.

c. Developing Networks

- Develop a wide network of key collaborative organizations with political peers, partnerships with Government agencies, and strong relationships with lighting business organizations at international and local level;
- Develop network with technical bodies such as testing centres, certification institutions, standards set up and labelling organizations, consumer associations and laboratories in all regions, prepare mapping of capacities, organize capacity building where required.

d. Providing Access to Knowledge

- Develop the global communication strategy and elaborate the tools identified by the GAFEL Working Group on communication;
- Prepare models of national or regional communication plans on the basis of the global strategy and the tools developed during the Project implementation. This material will be the base for subcomponent 3.1 focussed on communication;
- Provide public access to a highly developed pool of knowledge as it evolves in policy measures for market transformation through contributions to the strategy papers and the web;
- Gather, analyse and provide ongoing knowledge base of efficient lighting products availability and application;
- Gather, analyse and provide ongoing knowledge base of production capacities, technical capabilities, available capacity, costs and pricing, etc. of production in countries where primary production of efficient lighting products takes place.

The table below summarizes a priority set of actions to be engaged by the COE under the guidance of the GAFEL, with the indication of the required stakeholder involvement level:

Table 2: Summary of priority actions to improve energy-efficient lighting product quality

Action	Stakeholder Involvement
1) Recognize that sub-standard efficient lighting products are a common problem.	High-level policy makers must recognize that while efficient lighting represent a viable and cost effective tool for climate change mitigation, the prevalence of low-quality products in the market represents a significant barrier to the achievement of the phasing out of inefficient products.
2) Develop regional agreement on a common test procedure. There is an urgent need for a regional uniform process to test and assure the quality of efficient lighting products.	Nearly all countries producing CFL use the IEC test procedures as their international reference standard. Some importing countries might wish to recognize test centres following IEC procedures. Mutual recognition agreement should be promoted.
3) Develop common performance quality standards for regions involved. Quality standards are needed to keep low quality products out of the market.	Guidelines for further harmonization will be based on expert knowledge of a network of organizations recognized internationally. The consensual decisions from GAFEL widely advertised, will secure maximum impact towards harmonisation.
4) Better inform consumers and dispose of a reliable base for incentive	ELI, Energy Star, the EU scheme each offer specific information. While information uptake depends on local conditions, the expert input for selection of the best possible label and to also make this label operational will be a key asset of the project.
5) Develop an incentives framework	Voluntary approaches to product efficiency are limited, and research shows that over the long-term it is important to have mandatory testing and labelling of all products in the market and develop minimum energy performance standards. Efficient lighting products should be addressed as other appliances, with a program in place to test products, provide labelling (including mercury content) in the market to assist consumers buy high-efficiency models and choose those with low mercury content, and lead eventually to the adoption of minimum energy performance requirements. In the meantime, utilities and governments have a strong role to play in securing swift and quality orientated uptake and labelling scheme can provide sound basis for action.
6) Seek funding for testing and compliance.	Government agencies require funding and technical assistance in setting up testing and compliance procedures. This includes funding for personnel to develop and operate compliance schemes, as well as funding for product testing. A number of countries have expressed an interest in establishing national accredited laboratories.
7) Seek technical assistance in improving efficient lighting manufacture.	A number of governments have expressed the need for technical assistance for local manufacturers to help improve the quality of CFLs manufactured locally.
8) Provide exchange of information and of technical expertise.	A number of countries need technical assistance in setting up the infrastructure (testing facility, development of standards, training of laboratory personnel, etc.) to certify the performance of CFLs, as well as in recycling CFLs and dealing with end-of-life issues, including mercury content and safe lamp disposal.
9) Provide updated information on technology evolution	Markets in developing countries are too often lagging behind in benefiting from new technologies. The project will fill the information gap while project partners will be in an ideal position to also address the commercial gap.

<u>Output 2.2</u>: A network of expertise and institutions for quality improvement and certification is identified, supported and strengthened

<u>Activity 2.2.: Creation of a network of experts and institutions to effectively promote global quality and performance-based energy-efficient lighting products</u>

CFLs are one of the main technologies targeted by the present project. Although nearly all CFLs sold in the world are produced in China, India, Indonesia, and Vietnam, these countries each have established different test procedures, specification levels, and minimum energy performance standards (MEPS). Most countries have at least a test protocol in place, but there is no harmonization of either test procedures or minimum energy performance requirements. And many countries have only limited means for testing efficient lighting product quality. Indeed, a lack of testing laboratories, as well as related resources (personnel and operating budgets), result in a lack of available test data, and this makes it difficult for policymakers and regulators to certify and track product quality in the market.

While CFL production is highly localized in just a few countries, the CFL market is international and dispersed. Consequently, to comply with the proliferation of different CFL standards (and test protocols), multiple testing and certification steps are necessary. This can increase compliance costs. Faced with the common weak market surveillance and compliance regime, some suppliers may choose not to certify their products at all. In addition, the cost of complying with testing and certification requirements (usually in the range of a few percent of production costs) can rise to as high as 5 percent. Given the global nature of the efficient lighting market, a concerted, global as well as regional approach to addressing these market transformation challenges is appropriate and necessary.

The strategies to harmonize product requirements, increase the level of consumer awareness, and achieve efficient lighting quality assurance are not new, and a number of them have been successfully implemented elsewhere. However, in regions such as Asia or Latin America, the market size, geographic and economic settings, and the number and levels of government agencies involved can present significant challenges to a regional harmonization effort.

To overcome these barriers, the COE will establish a network of testing centres to agree at an expert level on best possible harmonised criteria and to provide support to suppliers. Other experts and institutions will be invited to participate in the network's activities, on the basis of suggestions from the GAFEL's members. Initially a strong focus will be given to CFLs but this can evolve as other technologies emerge. This network for Quality and Environment issues will respond to demands formulated precisely by the COE and will be in charge of the development of international testing capacity. Its mission includes the following tasks:

- Promote best practices for testing laboratory management systems;
- Set up technical working group on testing methodologies;
- Train technicians for testing and quality assurance/quality control skills;
- Assistance with equipment selection and purchase;
- Produce technical papers and recommendations regarding harmonization of testing procedure;
- Ensure regular on-site capacity building;
- Update lighting system guidelines into relevant international regulation;
- Develop a scheme on testing procedures with lighting manufacturers and distributors;
- Establish monitoring procedures to verify the way testing methodologies are implemented;
- Establish consumer information and awareness programmes;

- Monitor quality in market shares for various technologies.

<u>Output 2.3:</u> Guidelines for the harmonisation of quality and performance-based standards developed and adopted

<u>Activity 2.3.: Harmonization of international quality and performance-based standards and procedures for energy-efficient lighting products</u>

Many of the harmonization programs feature the compact fluorescent lamp (CFL) as a mainstay in delivering energy conservation in the residential as well as in non-residential sectors. As mentioned, low-quality CFLs, lack of harmonized labels and standards and lack of consumer confidence act as impediments to a greater adoption of CFLs by end-users. Since CFLs are being promoted as a direct replacement for incandescent lamps, they must be reliable enough as to avoid a generalized mistrust of CFLs. As of today, the market is still filled with "shoddy" CFL products, mainly exported by countries where standards and minimum performance requirements are insufficient or simply lacking.[16]

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The findings from recent studies[17] conducted in Asia on a regional basis suggest that the total market share of low-quality CFLs produced in the region averages close to 50 percent of the market. This means that Asian consumers have a 50-50 chance of selecting a poor-quality product. This situation also applies in Latin America while in Africa, the proportion of low quality lamps is most probably higher. In addition, due to the fact that there is no commonly used quality guideline in the world today, manufacturers lack a sufficient incentive to produce high quality CFLs, and consumers gravitate toward cheaper, lower-quality products. Currently, there are a total of 41 different national standards and labelling schemes for CFLs in place or under consideration worldwide. For manufacturers who export to more than one country, compliance with all of these different CFL programs and schemes can increase product costs and may negate pricing efficiency gains from volume production.
The increased adoption of high-quality, energy-efficient products can provide the world, particularly the developing countries, with an important opportunity for mitigating climate change threat, while also enhancing international collaboration on common clean energy challenges. The high-level political commitments worldwide to phase out incandescent lamps, without adequate planning for production and quality issues, (including plans for decreasing mercury content and eventual phase out, as well as the promotion of mercury free alternatives), have the makings of a large-scale policy failure.

The IEA and other agencies recommend that governments and private sector lighting suppliers work together to develop and implement a viable, regional quality control scheme over the next 5 years in order to avoid the risk of losing consumer confidence due to the proliferation of poor-standard lighting products. Such a recommendation has effectively been partially integrated: a number of regional and international initiatives are now addressing efficient lighting diffusion. The challenge is now for governments and suppliers to seize the initiative by working together to develop a common, harmonized approach to the problem of efficient lighting products quality. The proposed guidelines for the harmonization of quality and performance-based standards will be compiled on the basis of existing norms and inputs from national and international experts consulted by the COE, in close consultation with experts already working on the matter through initiatives such as the (coming) EU CFL standards and the Asia CFL Quality Charter. They will be largely disseminated through the standardisation and certification institutes participating in the Network implemented by the Project (Activity 2.2).

While CFLs is the obvious response to date, LEDs are rapidly being developed and might take a fair share of the market in a few years time. The market demand for LEDs could be increased by the growing demand for non-mercury alternatives. There is also a need to implement a more harmonized process to edict adapted norms and standards for this new product. The market penetration of new technologies actually constitute a real opportunity for developing and implementing more harmonized quality standards.

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16 ECO-Asia Report, *Confidence in Quality*, p.2

17 USAID / ASIA Confidence in Quality: Harmonization of CFLs to help Asia Address Climate Change, Oct. 2007

Output 2.4: Capacity for harmonisation of quality and performance-based standards built in partner organisations and GEF programme countries

Activity 2.4.: Train key institutions involved in international quality and performance-based standards:

Given the high complexity of existing norms and standards, and the high number of institutions involved, staff in national institutions and staff in private manufacturers do not have a clear understanding or an up to date knowledge of achievable performances.

Training for technical staff regarding standard harmonisation issues is key for Project success. To this end, workshops, study tours and other capacity building activities will be undertaken under the supervision of the COE. Under this activity, training of public and private sector representatives will be completed to allow market players understanding and effectively addressing the quality improvement challenges.

Training will be tailored to target groups in various institutions such as ministries, customs, normative institutions, testing laboratories and local manufacturers and retailers. The aim is to inform on existing context, and inform on convergence paths so that all countries can plays a coherent role in existing international and regional institutions and can influence national regulations as well.

Output 2.5: Guidelines for quality certification and labelling schemes are formulated for energy-efficient lighting products

Activity 2.5.: Development of tools for testing and certification of lighting products and training of national bureaus of standards and testing laboratories:

Quality improvement of lighting products can also be achieved through testing and certification. There is a strong need to ensure market sustainability with high quality products and to maintain consumer confidence. To this end, the Project will collaborate with other energy-efficient lighting initiatives worldwide to develop and disseminate mechanisms for certification and testing. Depending on national circumstances, these certification schemes can also serve a sound base for financial and or fiscal incentives.

The planned activity will result in the Centre of Excellence having a clear strategy to support capacity building activities that will benefit testing laboratories and national bureau of standards. A series of workshop, study tours and educational activities will be performed for key staff from the relevant organisations.

Output 2.6: A best-practice catalogue elaborated and made available to relevant stakeholders

Activity 2.6.: Elaboration of a best-practice catalogue related to energy- efficient lighting promotion

The key objective of this activity is to help GEF programme countries accessing information on successful policies and operational programs for the design and implementation of successful market transformation programmes for energy efficient lighting technologies. To this end, the COE will undertake a review of existing initiatives and programs that present the best options in this field.

In particular, lessons learnt from the Chinese PILESLAMP project will be carefully reviewed to integrate their experience in terms of policy and institutional support (Component 3 of the PILESLAMP project).

The World Bank has recently launched an ESMAP activity aiming at developing a comprehensive toolkit to "help scale up the replication of programs based on large-scale energy efficient lighting programs". This instrument will include key operational components, such as technical, economic and financial analyses, program design, market tools, procurement issues, awareness activities, etc. The work performed by the COE in compiling and analysing best-practice policies and programs could provide valuable information for the World Bank team to develop their models. Furthermore, its activities in terms of harmonization of standards and certification could also contribute to design such a toolkit. The draft versions of the World Bank toolkit could be tested by the members of this Project Network and discussed by the GAFEL for concrete inputs.

COMPONENT 3: SUPPORT TO NATIONAL AND REGIONAL PROGRAMS

While components 1 and 2 previously described provide the knowledge base and the dynamics for evolution, this component is focussed on information, dissemination and support to countries either experiencing phase out of inefficient lighting or about to take the decision to do so and seeking information and advice.

The primary objective of this component will be the provision of linkages and support to national governments, regional bodies and other stakeholders to implement programs encouraging efficient lighting and the phase-out of incandescent lamps. In addition to information dissemination, this component will consist of technical assistance to government in the design of policy and incentives to encourage efficient lighting (including fiscal and/or financial incentives) as well as support in transposing harmonized international performance and quality standards into selected, host countries/ regions.

This component will focus on overcoming the technical and policy barriers to national/regional efficient lighting market development. It is designed to supporting the activities needed at the national/regional level to adopt a phase out strategy, and to implement such strategy in a satisfactory manner, taking advantage of technology innovation while securing the best quality service with a minimum environmental impact. It will consist in the follow-up of several parallel country programs. The latest information indicates that a total of 41 countries world-wide have decided to implement a phase out strategy. Amongst them are a majority of OECD countries and the main objective of the present Project is to make a number of developing countries follow this path.

National projects supported by the GEF and implemented by UNDP, the World Bank and UNEP will be associated to the Project. Their experience will be collected and shared, they will have access to the whole knowledge base of the present initiative, will be invited to participate to relevant fora and meetings and will on a request basis, benefit from technical support from the Project.

The Component 3 outcome is that the basic conditions for the development of an energy-efficient lighting market on both national and regional level are established, conducive to the overall, global market transformation goals of the project.

The expected outputs are the following:

- Capacities of relevant national/regional entities are enhanced for quality control and quality assurance
- Energy-efficient lighting products quality improvement documentation that is tailored to countries needs is developed and made available
- Support for design and implementation of specific and adapted financial mechanisms for market transformation is provided to national and regional programs
- Large-scale market transformation is initiated through the commitment of many countries (at the national and/or regional levels) to engage in ad hoc programs
- A tool-kit for communication and awareness raising is developed
- Communication plans for awareness raising are implemented at the national level
- Institutional arrangement within the Project is set up for defining a CFL disposal strategy

Outcome 3*: Capacity built in GEF programme countries* both at policy and at quality enhancement levels

Output3.1: **Policy *toolkit* accessible to countries online and support provided to country programmes for capacity building**

Activity 3.1.: Launch and operation of a Project website

The tools developed under Component 2 activities will serve to reinforce the capacities of key actors, particularly policy makers and state and non-state institutions involved in quality improvement of energy efficient lighting products. In particular needs expressed by the GAFEL will be incorporated at the design stage so that the website developed can respond in a flexible manner to a wide range of needs. The core data will be surrounded by a user friendly framework so as to render the use of the system available through the web, including for programming purposes.

The COE will develop a website and make available the material to countries online. The general concepts, guidelines and procedures discussed and developed, under the GAFEL advice and guidance by the COE, will be made available to the national or regional initiatives during the implementation phase, in order to ensure full consistency between the Project and the local initiatives.

This capacity building activity aims to successfully support national/regional market transformation program with the value added services to be provided by the COE.

The expected result is the development and adoption of national and regional market transformation strategies to support the implementation of national/regional energy-efficient lighting programs.

Output 3.2: **Technical assistance provided to new countries to develop their programmes**

Activity 3.2.: Engage new countries in the development and implementation of energy-efficient lighting programmes

A specific assistance will be provided by the Project for new countries or emerging markets to scaling up the Project approaches and models. This will be done through a provision of expertise to develop Project Identification Form (PIFs) and Project Preparation Grants (PPGs) for countries with market studies completed.

GAFEL members will propose a list of new countries to be invited to the forum and to benefit from the technical assistance to be provided by the Center of Excellence and external experts. Criteria for selection will include various aspects such as existing policy commitments, potential for CO2 emission reduction, replication potential, etc. Target countries will be selected in Asia, Africa, Latin America as well as Central Europe.

Output 3.3: **National Public Information and Awareness Campaign Plans Implemented**

Activity 3.3.: Assist Countries to adopt and implement a strategic communication plan

This activity will focus on the effective initiation and coordination of the country specific support needs and improved access of national experts to state-of-the-art information, technical backstopping, training and sharing of international experiences and lessons learnt. The COE, on the basis of the strategy adopted by the ad hoc GAFEL Working Group, will support national teams in developing national communication plans and implementing communication tools through various means (website, articles, workshops, training sessions, expert missions, etc) to enhance knowledge acquisition and awareness raising. The expected result is an increased awareness of the benefits of the Project both globally and at regional/national level and an increased interest from countries in benefiting from the support of the global initiative.

Output 3.4: **An institutional arrangement with the Project is set up for CFL disposal**

Activity 3.4.: Provide support to develop a CFL disposal strategy with national authorities as well as a chemical risk communication plan.

As mentioned in the situation analysis, the mercury content of CFLs is of key importance. Careless handling and disposal of CFLs can lead to several detrimental effects on ecosystems and on human life. Thus, it is of absolute importance that a disposal strategy be established in all markets where a phasing-out of incandescent light bulbs is promoted. This strategy is considered as extremely important by bulbs manufacturers, whose participation in the Project is strongly connected to the development of a specific strategy regarding environmental issues. They are already engaged in in-depth discussions about developing, implementing and optimising sustainable collection and recycling schemes for end-of-life (mercury containing) lamps. They are presently seeking to sign local Framework Agreements between producers in selected countries (e.g. in South America, Asia and South Africa), on the basis of a risk-assessment and cost analysis adapted to local conditions, and will develop country specific projects related to their extended producer responsibility.

It is expected that by the end of the project, the following elements will be included in a strategic plan to support GEF programme countries in adopting a CFL disposal strategy: LFL disposal will be incorporated to the extent possible.

- Review of legislation and related regulations in the participating countries;
- Review of tax systems and potential alternatives in participating countries to fund disposal schemes;
- Discussions with stakeholders, including manufacturers, retailers, local and national authorities and NGOs, to find environmentally- and cost-acceptable conditions for lamps disposal and define share of responsibilities;
- Preparation of terms of reference for a study to develop and promote feasible alternatives;
- Elaboration of recommendations for the setting and adaptation of standards of mercury content in CFLs;
- Collaboration with manufacturers to potentially decrease and eventually phase out mercury content; minimize mercury release in the production process of CFLs;
- Preparation of technical guidelines for environmentally sound disposal of mercury containing CFLs, including compliance issues;
- Assistance in the dissemination of CFL alternatives, recycling and disposal schemes.

Since the mercury content of CFLs can act as a barrier to the phasing-out of incandescent bulbs, a risk communication plan, aimed at market actors and governments, should be included in communication and awareness raising strategy. This plan would have, as a goal, to inform governments and market actors (potentially end-users) on the health and safety risks inherent to the disposal/usage of CFLs in a clear, rational and moderate fashion. The communication plan aims at providing objective, scientific and pragmatic information on (i) the magnitude of CFL contribution to mercury pollution and (ii) the most appropriate risk reduction strategies.

This activity will be implemented by the Project experts, in close collaboration with UNEP Chemicals Mercury Program, whose aim is to reduce and eventually eliminate anthropogenic mercury, thereby protecting human health and the environment from the risk of mercury.

Country Ownership

Country eligibility

This project is in essence, a global one and is supported by the GEF-4 funding. According to the "*Instrument for the Establishment of the Restructured Global Environment Facility* (March 2008)", GEF shall operate, on the basis of collaboration and partnership among the Implementing Agencies, as a mechanism for international cooperation for the purpose of providing new and additional grant and concessional funding to meet the agreed incremental costs of measures to achieve agreed global environmental benefits in selected focal areas (including climate change) as well as concerning chemicals management as they relate to the focal areas.

The expected participating countries qualify for GEF financing on the following criteria:

- they have ratified the United Nations Framework Convention on Climate Change (China has ratified the UNFCCC 05/01/93, Russian Federation 28/12/94); and
- they are net-receivers of aid from the World Bank and UN Organizations.

Country Drivenness

As indicated under section "Project Indicators, Risks and Assumptions", the focus will be on countries, where the basic conditions and political will for successful market intervention seem to exist, where active and committed local stakeholders have been identified to act as "local champions" for promoting the project goals and which countries or regions pose a significant market potential for energy-efficient lighting and the phase out of inefficient lamps in a global context and/or can provide useful experiences and lessons learnt for other countries or regions.

It has been already mentioned that several countries are already engaged in national efficient lighting programs. Other countries will be included during the global project implementation on the request of their respective governments and based on planned activities under "component 3", as well as funds availability. Once a request is received, a country assessment will be carried out. Based on the country assessment and associated consultation process, the global project management team, together with the local stakeholders, will elaborate the country specific support needs to effectively support the local energy efficient lighting market growth.

Sustainability

The project is addressing the sustainability aspects by taking into account in its design and implementation the international experiences, best practices and results achieved so far, many of which are relatively well documented and reflected also in the situation analysis section. It is obvious that in order to facilitate sustainable market transformation, there is a need for both demand and supply side measures, which together can increase the global market demand for energy efficient lighting technologies, while simultaneously ensuring the supply of reliable, customer friendly technology, thereby building the long term confidence and customer satisfaction.

As highlighted by experiences from some countries with more mature markets, where there is still relatively little actual experience with energy efficient lighting technologies and little support data upon which Governments can make their decisions, the program sustainability will be enhanced through phase-out policy, product quality improvement and consumer awareness campaign.

In fact, in the long term, sustainability will depend on a broad base of cost effective, trouble free customer experience with the technology. Such experience can be supported by internationally recognized and understood product standards, certification and labelling. Furthermore training of designers, sales persons as well as consumer awareness campaigns are expected to be considered as the core national level activities supported by the project that will reinforce the project sustainability.

The proposed project will also support the implementation of a monitoring network to measure the impact of the gradual process of the diffusion of energy efficient lighting products and the phase-out of incandescent lamps through various projects. The monitoring network will be equipped with methodologies/survey instruments for market assessment and evaluation of potential impacts of the energy efficient lighting programs worldwide. The technical capacity of the network of institutions involved in monitoring induced impacts of energy efficient lighting market transformation in general, and the phase-out of incandescent lamps in particular, will be strengthened to enable better long-term planning for further adaptation of policy and interventions.

Institutional sustainability is achieved through the participation of project partners in staffing of the COE. Initially located at UNEP, it is expected that this structure will outlive the project and will continue to deal with issues relating to the lighting market as this innovative approach of phasing out is applied to a wider range of technologies.

Replicability

The replication of lessons learned is an integral component of the project design as the expected energy savings from the use of energy efficient products - and the corresponding GHG emissions reduction - somehow rely on the replication of the various GEF umbrella project activities. The global project will be used to develop an operational toolkit - comprising policy and technical measures - to disseminate expertise and know-how regarding Energy Efficient Lighting Program design and implementation. Project outcomes will provide substantive lessons regarding energy efficient lighting market transformation in various economic conditions and technology environment.

The activities that will be carried out under the global project are meant to create an enabling framework that would facilitate the widespread utilization of energy-efficient lighting products and gradual phase-out of incandescent bulbs. With such enabling environment, the development of national and regional initiatives based on energy efficient lighting products are expected to be carried out on behalf this umbrella project, offering the opportunity to achieve the project overarching goals. In particular, the various national/regional energy efficient lighting programs that will be supported are meant to showcase feasible design and application of energy efficient lighting systems, enforcement of policies, and implementation of energy efficient lighting quality improvement and certification and energy efficient lighting projects financing.

The project's replication strategy is based on the following features of the project design:

- Technical assistance activities aiming to lay the necessary foundation of a supportive legal and regulatory framework, institutional structures and national capacities to initiate, develop and manage sustainable promotion of EE lighting market at the national levels.
- Global networking, management and dissemination of international experiences, success stories and best practices through UNEP, other UN agencies and other network partnerships.
- Adoption of internationally recognized product standards, (including decreased mercury content), labelling testing and quality control schemes.
- Supporting the financial structuring for and introduction of new financing and service models for enhancing the energy efficient lighting technologies market.
- Close monitoring and evaluation of the project implementation and results, thereby providing lesson learned for future action; and
- Ongoing public awareness raising efforts and effective dissemination of the Project results.

The effective replication of project activities will require a combination of policy related changes as well as effective dissemination of the project results and lessons learned, thereby providing applicable examples for the replication of best practice. Sometimes results on the practical side are needed, before the necessary changes at the policy level can be effectively promoted and implemented. For this reason, the global project will work closely with GEF national program activities in the first group of countries: China, Russia, Vietnam, etc.

The project will facilitate continuing contacts and co-operation between the different stakeholder groups at the national and international level by organizing seminars, workshops and other public events, thereby bringing the project proponents, the policy makers and the potential investors as well as other donors together. UNEP/DTIE, in co-operation with the project partners, is envisaged to continue to manage and disseminate the information, experiences and lessons learnt also after the closure of the project as well as to extend the replication of similar activities beyond the countries that are directly supported by the proposed GEF umbrella project. Leveraging additional financial resources through partnerships and networking with the lighting industry will, therefore, be one of the key tasks and targets of the Executing Agency through its project management unit.

The Global Platform will ensure that broader replication is supported and to this end dissemination of the results through a knowledge management network will be a very important activity.

Replication will also encompass other technologies. As climate change related risks become reality, the phasing out approach would most probably been taken up for electric motors, all appliances, and stand by as per IEA recommendations.

B. Describe the consistency of the project with national priorities/plans:

This project is global in essence. However, its success will depend on the commitment of the participating countries to carry out market transformation at national level. Experience from implementing GEF-funded lighting projects has been extremely positive. Furthermore, a number of key developing countries have express support for the GEF global initiative and willingness to participate with the GEF to phase out the production and use of incandescent lighting at national level. Some of them have already started instituting programs to that end, including China, India, Vietnam, the Philippines, Thailand, South Africa, Egypt, Tunisia, Ghana, Colombia and Caribbean countries. Improving lighting efficiency is consistent with the national priorities of these countries, and will directly contribute to their sustainable development.

C. Describe the consistency of the project with gef strategies and strategic programs:

A global market transformation to phase out incandescent lighting is in line with, and in support of, the renewed GEF vision: strategy, innovation, equity, accessibility and focus. The global program proposed here also relies on a strong public-private partnership. The global lighting initiative is consistent with the GEF Climate Change Strategy and the Strategic Program of Promoting Energy Efficiency in Buildings, as lighting is a major, omnipresent electricity-consuming equipment in all buildings.

The global lighting initiative takes a programmatic approach, and will involve major GEF program countries and stakeholders, including policy makers, the industry and consumers. The GEF experience as a network and partnership instrument to cope with global climate change issues is likely to be expanded from the envisaged market transformation, focused on a global phase-out of incandescent lighting, both in production and use. The GEF initiative will contribute to the G8+5 initiative on energy efficiency, and could become one of its most visible and pragmatic component. Under the leadership of the GEF, phasing-out incandescent lighting could also be embraced by the UNFCC COP/MOPs. Within UNFCC, the CDM Executive Board could facilitate specific transformation of some national lighting markets, using the recently approved CDM framework.

D. Outline the Coordination with other related initiatives:

The following paragraphs highlight a range of international initiatives aimed at transformation of lighting markets. The means available to transform lighting market are diverse and can be suitable to any context given proper market studies.

Standards and labels

Compact Fluorescent Lamp Harmonization: Governments worldwide have called for increased international co-operation on policy to encourage more environmentally sustainable, energy efficient products. As the marketplace for goods and services becomes increasingly global, so is the need to ensure co-operation in the development of policy roadmaps, labels and standards. The most fundamental activity pertaining to harmonization is the International Compact Fluorescent Lamp (CFL) Harmonization Initiative launched at RightLight6 in Shanghai (May 2005). It is aimed at increasing the availability of higher quality, energy efficient compact fluorescent lamps around the world through cooperation on testing and standard setting. More precisely, the Initiative revised the IEC test procedure, conducted round robin testing on five continents using the reviewed test, initiated a dialogue on setting performance tiers and drafted a framework for compliance[18].

Regionally, the GEF is supporting the "Barrier Removal to the Cost Effective Development and Implementation of Energy Efficiency Standards and Labelling Project" (BRSEL) in Asia with a budget of USD 8 Million. This project focuses on regional Energy Efficiency Standards and Labelling program cooperation and harmonization with provision for general information, tools and training to all interested developing countries in the region. CFLs and electronic ballast are among the targeted products.

In Latin America two GEF supported initiatives have been under preparation for a number of years and due to institutional difficulties, one has not seen the day. The remaining initiative, for the Andean region, is making slow progress. COPANT is acting to reach greater harmonization but the inherent dynamics of the region are difficult barriers to overcome. This is true in particular for white appliances. Due to the organization of the lighting market on one hand and the steps taken to transform national lighting markets by most of the Latin American countries, the global initiative, focusing only on lighting, has greater assets for swift success.

In Asia, there have been considerable steps taken towards a greater harmonization of CFL products. The Asia CFL Quality Charter is among the most significant initiatives of the kind and any global CFL harmonization initiative should try to build on this experience and work in synergy with it. The Charter aims at avoiding potentially disastrous policy failures: in fact, while governments are committed to the phasing-out of incandescent light bulbs, they generally fail to recognize that the available alternatives (CFLs) sometimes are of very low quality and could ruin consumer confidence in CFLs. With over 41 standards and labels worldwide, each with different requirements, avoiding the mentioned policy failures requires harmonization of these standards, labels and minimum performance requirements.

Eco-design of Energy Using Products (EuP): The Framework Directive for the Eco-design of Energy Using Products (EuP) provides a framework for establishing minimum eco-design requirements for energy using products. It is intended to help deliver European Union (EU) objectives to reduce greenhouse gas emissions, to reduce the adverse environmental impacts of products, and to ensure free-trade in energy-using products. A series of products are being evaluated through Preparatory Studies. These studies are intended to provide the Commission and the product Consultation Forum with the evidence available to allow them to assess whether a product should be considered for an implementing measure. Current studies are related to work on domestic lighting, office lighting and street lighting products. Future preparatory studies are expected to include industrial lighting. Residential lighting will be included, and it is likely that there will be an implementing measure for residential lighting. This could include the mandatory phase out of low efficacy lamps.

Multi-Country Efficient Lighting Initiative (ELI): Advances in lighting technology have created a variety of new products which promise significant economic and environmental benefits from large increases in energy efficiency compared to conventional lighting products. In many developing countries, these new, efficient lighting products still face significant barriers to wide-spread acceptance. During the period 2000 through 2003, the International Finance Corporation (IFC) established a multi-country Efficient Lighting Initiative (ELI) using US$15 million of GEF funds to support private sector activities and promote market expansion for energy

[18] More information is available at the following address: http://www.apec-esis.org/www/cfl/

efficient lighting in a selected set of GEF-eligible countries, namely, Argentina, Czech Republic, Hungary, Latvia, Peru, Philippines and South Africa.

The ELI was built upon lessons learned in the IFC/GEF Poland Efficient Lighting Project (PELP) and other efficient lighting projects to significantly accelerate the penetration of energy efficient lighting technologies. A key program objective was to mobilize additional private sector resources. The original ELI program has five components: (i) efficient product financial incentives; (ii) public education programs; (iii) transaction support; (iv) market aggregation; and (v) electric utility programs.

In 2005, the China Standard Certification Center (CSC) was commissioned by the IFC, with funding to develop and expand the ELI certification and branding system globally. The new, expanded ELI Program is an extension of assistance from a team of international experts from the original ELI seven countries, and will continue to work in cooperation with government agencies, international organizations, manufacturers, testing laboratories, lighting associations, large retailers and other agencies, etc. to accelerate the widespread adoption of energy-efficient lighting products and thereby reduce greenhouse gas emissions.

The ELI Quality Certification Institute is seeking strategic partnerships worldwide, and is working to establish ELI as a global service network. In 2008, ELI has focused on the developing countries of Asia/Asia Pacific, Latin America and Africa and also seeks opportunities to harmonize its test methods and performance specifications with other voluntary labelling programs internationally.

Energy Star: Energy Star is a United States government's Environmental Protection Agency (EPA) program to promote energy efficient consumer products. It began as a voluntary labelling program designed to identify and promote energy efficient products, and computer products were the first to be labelled, though it has since expanded to major appliances, office equipment, lighting, home electronics, and more. The label can also be found on some new homes and commercial and industrial buildings.

The international Energy Star symbol is a simple way for consumers to identify products that are among the most energy-efficient on the market. Only manufacturers and retailers whose products meet the Energy Star criteria can label their products with this symbol. Choosing an Energy Star-labelled product over a conventional model could save hundreds of dollars in energy costs.

Energy Star has been instrumental in the more widespread use of LED traffic lights and the wider adoption of efficient fluorescent lighting (CFLs). The energy saved through the adoption of Energy Star qualified residential and commercial lighting products, reported in their 2006 Annual Report, was 13 billion kWh. Energy Star has now been adopted by several countries around the world, including the European Union, Canada, Australia and New Zealand[19]. Lighting, however, is not covered by this label in the EU.

Energy Saving Trust's Specification: Under the UK Energy Saving Trust's (EST) Energy Saving Recommended (ESR)[20] scheme only products that meet strict criteria on energy efficiency and independently tested by an independent accredited testing body can carry the logo. Along with their energy consumption, the criteria for light bulbs cover how long they should last, start-up time, quality of light, packaging information and safety. The criteria are reviewed on a regular basis and the standards are constantly being raised to make sure that energy-saving bulbs keep on improving in terms of efficiency and performance. The specifications for ESR accreditation for CFLs are high and similar to the Energy Star level. A recent review of this label increased the expected lifespan of light bulbs significantly.

Eco labelling: Eco labelling schemes are growing in popularity. Since there are a huge variety of these, they are presented in the table below with basic information. These "eco label" schemes incorporate environmental performance and impact criteria for lighting products.

[19] http://oee.nrcan.gc.ca/energystar/english/consumers/index.cfm / http://www.energystar.gov.au/ http://www.eeca.govt.nz/

[20] http://www.energysavingtrust.org.uk/energy_saving_products/about_energy_saving_recommended_products

Best practice initiatives: Standards and labels are a powerful tool to enhance overall energy efficiency of devices and products. In fact, securing a certification for products (in the case of labels) has increasingly been regarded as a commercial strategy by both manufacturers and retailers. However, labels and standards can require frequent updates as the market evolves. For instance, Energy Star ratings are periodically reviewed as to limit the number of devices and products in the upper end of the efficiency spectrum.

Some best practice initiatives palliate to that need in being a *dynamic* recognition system for the most performing products. This is the case of the Top Ten initiative in Europe. As can be deduced from the name of the initiative, the Top Ten classification lists the top ten energy efficient devices and products in each category. The classification is thus inherently competitive as new products can automatically be included in the Top Ten ranking, pushing out the lower-end energy efficient devices. This scheme provides incentives to any manufacturer to carry on continuous improvement of its products.

Global Phase Out of Low Energy Efficient Lamps

As mentioned above, the Eco-design of Energy Using Products (EuP) of the European Union includes a phasing out scheme. As of October 2008, the European Commission suggests a staged approach from 2009 to 2013, now supported by the lighting industry.

OECD countries: Since early 2007 almost all Organization for Economic Co-operation and Development (OECD) governments have begun developing policies aimed at phasing-out low efficacy lighting. The intention is to encourage the usage of higher efficiency lamps and most notably Compact Fluorescent Lamps (CFLs).

The result is a strong probability that the majority of incandescent lamps will be prohibited from sale within the OECD countries in the 2008 to 2016 timeframe. Globally, OECD economies account for approximately 50% of global incandescent lamp sales of between 12 and 13 billion lamps per annum. Regulatory, fiscal and voluntary measures to phase-out incandescent lamps are in place or under development in Australia, Canada, the EU (including separate national initiatives in Belgium, Ireland, the Netherlands, Portugal and the UK), Switzerland and the USA.

Latin America: Cuba and Venezuela have implemented regulatory measures to phase-out incandescent lamps within their borders. Brazil is already using as many CFLs as incandescent lamps and has benefited from substantial sustained electricity savings as a result. More recently Ecuador has decided to phase out incandescent lamps at the end of 2008 and Colombia as well. Bolivia has decided to distribute such a high level of CFLs that every family will be given one for free.

Asia: Indonesia, Vietnam, India, South Africa, Thailand and the Philippines have set up promotional programs for CFL, in substitution of incandescent lamps. China currently consumes roughly 2 billion incandescent lamps and is also the dominant producer of CFLs for the global market, with over 80% of all CFLs manufactured there, including most of those sourced to OECD markets through the major lamp manufacturers. The Chinese government and lighting industry is currently evaluating the pros and cons of an accelerated phase-out of incandescent lamps in China as well as of the probable cumulative impact of the international regulations on the global lamp market and in particular the demand for CFLs.

The unprecedented rapidity of these international policy developments is of such a scale that it could pose a risk for the security of supply of CFLs in the international market. Depending on the timing and ambition of policy settings and the lamp production investment decisions taken in response to these, there is a real risk of shortages of lamps of appropriate quality, which is liable to seriously undermine public confidence in energy efficiency and greenhouse gas abatement efforts in general. In response to this concern, the IEA has launched a study into the global supply of CFLs under various phase-out scenarios. Funded initially by Canada, the UK and the large lamp manufacturers, the study should report its findings in the following months. ITFSP will be taking a keen interest in

the study and its outcome. For an overview of global phase out initiatives, see CLASP's article: "A Global Movement toward Phasing out Energy Inefficient Light Bulbs"[21] .

Box 1: Examples of market transformation initiatives

A) The Philippines Efficient Lighting Market Transformation Project: The project addresses the barriers to widespread utilization of energy efficient lighting systems (EELs) in the Philippines. It will cover energy efficient versions of linear fluorescent lamps (standard vs. the slim tubes), compact fluorescent lamps (CFL), high intensity discharge (HID) lamps, ballasts (low loss electromagnetic and electronic), and luminaries. The Project will accelerate integration of EEL programs to the planned activities of the Department of Energy, enhance private sector's involvement and appreciation of the benefits of EEL and ensure that environmental impacts associated with the use of EELs are mitigated. The project will achieve its objectives by: updating of policies, standards/guidelines; institutional capacity building; consumer education and information dissemination; developing and implementing financing mechanisms; and, mitigating environmental impacts of the project. http://cdmdna.emb.gov.ph/cdm/public/cdm-ph-initiatives.php?main=cdmph&sub=initiatives#B

B) Australian Phase-out of inefficient incandescent light bulbs: The first stage of the phase-out plan will be the introduction of an import restriction on inefficient incandescent light bulbs used for general lighting purposes from November this year, as was announced on 5 June 2008. The savings to the environment and the economy which the initiative will generate are considerable. Across the country, the move to more efficient lighting, such as compact fluorescent lamps (CFLs), is expected to save more than four terawatt hours of electricity, up to four million tons of greenhouse gas emissions (equivalent to one million cars off the road) and more than $400 million per year (saving more than $50 per year per household).

http://www.environment.gov.au/settlements/energyefficiency/lighting.html

Developing new markets for efficient lighting products

Lighting Africa: this program is a World Bank Group initiative aimed at providing up to 250 million people in Sub-Saharan Africa with access to non-fossil fuel based, low cost, safe, and reliable lighting products with associated basic energy services by the year 2030.

The programme basically consists in a competition for the design and delivery of adapted lighting products targeting low income consumers. It is thus aimed at the sustainable development of the energy-efficient lighting products addressing the needs of poorer populations, with limited or no access to an electricity grid.

Energy efficient light bulbs program in India: The Indo-German Energy Program carried out by the German Technical Cooperation Agency (GTZ) and the Indian Bureau of Energy Efficiency (BEE), and funded by the German Federal Ministry for Economic Cooperation and Development (BMZ), is disseminating up to 400 million energy-efficient light bulbs to private households all over the country over five years. This should reduce the electricity demand by a total of about 10,000 MW. However, modern compact fluorescent lamp (CFL) bulbs are ten times more expensive than conventional bulbs. To make the energy-efficient CFLs affordable for all Indian households, the GTZ is assisting the BEE in registering the project under the Clean Development Mechanism (CDM).

By applying to a special CDM category – a "Program of Activities" (PoA) – it becomes possible to 'bundle' the emissions from about 100 small-scale CFL projects under one organizational umbrella. The PoA is particularly relevant for development projects because it allows the bundling of reductions from many small actions. The BEE and GTZ hope to realize a potential CO2 reduction equivalent of 10 million tons annually, which will generate 10

[21] http://www.clasponline.org/clasp.online.whatnew.php?no=517

million certified emissions reductions (CER). Revenues from the CERs will help cover the investment costs of €1.4 million per million CFL bulbs. The GTZ is currently drafting the PoA and designing a rigorous monitoring plan for this complex CDM project; the next step will be to obtain clearance from the CDM board. Interestingly enough this has pushed manufacturers to provide 15000 hours lamps hence pushing duration further than normal. Mexico is preparing a similar program.

New GEF market transformation and phasing-out initiatives: In a decision rendered in July 2008, the GEF has approved two projects related to market transformation and phasing-out of incandescent light bulbs. These two initiatives target the Chinese and Russian markets.

China: Phasing-out Incandescent Lamps and Energy Saving Lamps Promotion (PILESLAMP), in collaboration with UNDP. GEF project grant: USD 14 m.

Russian Federation: Transforming the Market for Efficient Lighting, in collaboration with UNDP. GEF project grant: USD 7.02 m.

In addition to these projects, in November 2008, GEF Council approved efficient lighting projects in **Vietnam** as well as in **West Africa**.

Relationship with other Projects (GEF and non GEF)

The proposed project is structured to maintain links with other ongoing and future projects in the domain via the permanent global platform that will be established. National lighting programs as well as international donor-financed programs (such as the World Bank Efficient Lighting Initiative) will be key points of reference in order to build up their experience and avoid the unnecessary duplication of effort. Special attention will be given to the UNDP implemented China lighting project starting implementation simultaneously due to the weight of China as supplier and consumer in the global lighting market.

Box 4: World Bank Efficient Lighting

Over the past few years, the World Bank has stepped up its efforts to provide support, to developing countries, with designing and implementing energy efficient lighting-based demand-side management (DSM) programs. The implementation approach builds upon the experience and best practices of IFC and the Bank led work in late 1990s, largely with GEF support, in developing large scale energy-efficient lighting programs in Thailand, Mexico, Poland, Philippines etc. that led to the establishment of the Efficient Lighting Initiative-ELI. (www.efficientlighting.net). The primary objective and impact of the CFL-based DSM programs has been to address power shortages through peak load reduction, though such programs also have other developmental benefits. Their application can helps mitigate the impacts of tariff increases to end users, as higher tariffs are offset by energy and bill savings. These programs can allow electric utilities to improve the reliability of supply in a more cost effective manner than supply-side improvements alone, since the cost of energy saved through CFLs is estimated to be only 1/20th of cost of adding new generation capacity (such as diesel based power supply). They can also be used to reduce utility losses where for social reasons tariffs may be unable to sufficiently recover supply costs. In addition, deployment of CFLs in place of conventional ICs, results in reduction of air pollutants and global greenhouse gases (GHGs) associated with grid energy generation. The latter provides the opportunity to mainstream Clean Development Mechanism (CDM) into CFL projects and obtain carbon credits.4 In addition to CDM, some CFL programs have benefited from GEF program support even in recent years (e.g., Russia, China programs endorsed by GEF in 2008).

(Source: ESMAP Energy-Efficient Lighting Operational Toolkit - Terms of Reference, Sep. 2008)

E. **Describe** the incremental reasoning **of the project:**

The economic benefits as well as the global environmental benefits of phasing out inefficient lighting are well recognized, and several OECD countries have already announced their intention and a timeframe for phase-out. However, a global, coordinated effort to transform the efficient lighting market is still absent. The GEF global lighting initiative is intended to fill this void. The GEF will build upon its existing efforts and experience in supporting lighting programs in various countries, and will use its convening power to launch a global initiative so as to bring the major global players and stakeholders together to accelerate the market transformation and the phase-out.

Incremental Cost Matrix

Outcome 1: Effective initiation and coordination of global policy dialogue for the phase-out of inefficient lighting and the removal of policy and market barriers to the widespread adoption of energy-efficient lighting products worldwide**.**	***Baseline:*** Low level of political commitment and weak coordination of international efforts to phase-out inefficient lighting.	***Alternative*****:** A strategic effort to build global partnerships, to phase-out inefficient lighting, to initiate and support the EEL market transformation across several countries by building on the best practices and lessons learned globally	***GEF Increment:*** *Technical assistance. Estimated GEF costs: USD 800,000* ***Estimated global benefits:*** *Global commitment to phase-out inefficient lighting and promote the widespread adoption of EE lighting, connected to the successful initiation and implementation of activities at the country level.*
Outcome 2: International efforts at policy and technical level successfully coordinated and improved EEL products quality through harmonized standards and certification of energy-efficient lighting products.	***Baseline:*** Less efficient technical backstopping and weak exchange of information and learning between different countries for improving EEL product quality	***Alternative*****:** An international centre of excellence is fully operational to support EEL products quality improvement and harmonization of standards and labels scheme	***GEF Increment:*** *Technical assistance Total GEF costs: USD 3,000,000* ***Estimated global benefits:*** *The quality of EEL products improved conducive to the widespread adoption of EEL by consumers*
Outcome 3: The specific EEL market transformation targets of the first participating countries reached by the end of the project, conducive to the overall, global market transformation goals of the project	***Baseline*****:** The EEL market development is not reaching its full potential in reducing GHG emissions and producing other economic and domestic benefits.	***Alternative***: Reaching the specific targets[22] in the countries participating and facilitating sustainable growth of the EEL market after the project is completed, including: • enabling policy frameworks in place; • enhanced awareness and capacity of the targeted end users and local EEL industry; • access to new financing mechanism; • improved quality control of EEL products and enhanced capacity of the supply side to ensure quality; and • institutionalisation of the support provided	***GEF Increment:*** *Technical assistance USD 600,000* ***Estimated global benefits:*** *Cumulative, direct GHG reduction resulting from the installation of EEL products in participating countries has been estimated in national project document.*

[22] For further details, see the logframes of each country program document.

Total	***Baseline:*** In the absence of the suggested strategic initiative to stimulate the EEL market and to remove the related barriers simultaneously in several countries, the global EEL market development will not reach the level that on the basis of the technical maturity and cost-efficiency of the EEL technologies it should.	Alternative: Reaching the set targets in the participating countries and initiating similar market transformation activities at least in 20 new countries by the end of the project.	***GEF Increment:*** *Technical assistance and financing. Total GEF costs USD 5,000,000.* ***(including PM: 500,000 and M&E: 100,000)*** ***Estimated global benefits:*** *Cumulative, incremental GHG reduction impact including both direct and direct post project impact has been assessed in national project document*

F. Indicate risks, including climate change risks, that might prevent the project objective(s) from being achieved and outline risk management measures:

The key indicators of success of the project are as follows:

- Global energy-efficient lighting market stakeholders reach consensus on major topics and this is translated in widely communicated decisions;
- The technical backstopping needs of the project partner agencies and institutions are met at the adequate level and in the timely manner leading to effective implementation of multi-stakeholder policy dialogue for energy-efficient lighting market transformation and strengthening activities.
- A supportive legal and regulatory framework for quality control and certification of energy-efficient lighting products is adopted at the global level.
- Sustainable market growth and at least 20 additional countries decide to implement a phase out strategy before the end of the project;
- Adoption of harmonized international energy-efficient lighting product standards, labeling and quality control schemes in all participating countries at the agreed level.

Guidelines for sound environmental recycling and disposal of mercury in CFLs

The analysis conducted identified the following risks and mitigation strategies:

Risk	Level of Risk	Mitigating Strategies and Actions
Public Sector Risks		
Weak commitment from governments to implement efficient lighting policies and measures.	**Low**	Carefully manage the first elements of component 1, make sure that the initiative be strong from its very inception, secure the commitment of main players before the actual EEL Stakeholder is launched.
Disbelief in the energy saving potential of efficient lighting.	**Low**	Rely on worldwide studies (IEA, IPCC) to demonstrate clearly the potential energy savings of energy efficiency in lighting.
Fear of mercury-related risks	**Moderate**	Inform governments on the real mercury-related risks of some efficient lighting products and propose risk-reduction/risk-management procedures.

Improper management, by governments, of the mercury-related risks.	**Low likelihood, with high magnitude**	Advocate the explicit inclusion of a recycling/disposal plan provision in the global agreement to phase-out incandescent bulbs and advocate the explicit inclusion of disposal in national strategies.
Private Sector Risks		
Ineffective Global Platform due to conflicting interests and agenda.	**Low**	Market forces heavily tilting towards efficient lighting, flexibility in national implementation strategies should be key: the consensus to reach is that of a commitment to phase out, the means to make operational this transition should not be rigid as to create a risk of breaking consensus.
Unwillingness of end-users to buy energy efficient lighting products due to bad experiences in the past and to high initial costs.	**High**	If, in a given country, end-users reaction is such, recent, reliable and credible information should be provided by public or private actors. For further promotion could include the subsidizing, by governments, of a small amount of efficient lighting products for demonstration purposes.
Highly conservative private sector or declining interest in phasing-out.	**Low**	Even though unlikely because of current market trends, this could be matched (when necessary) by cost-effective financial incentives from governments to encourage private participation in the process.
Structural Risks		
World financial crisis increases risk-aversion from both governments and private actors, resulting in politically difficult phasing-out measures.	**Moderate**	Support to governments to establish communication strategies aimed at informing private actors and end-users on the monetary benefits of lighting energy efficiency.

The key assumptions in order to successfully promote the energy-efficient lighting market at the global level are that:

- The basic framework conditions for increasing the interest and demand for energy-efficient lighting product exist, as indicated in many market studies and other energy sources;
- The political will to promote the energy-efficient lighting, as indicated in the Project Information Form (PIF) already exists;
- Active and committed international stakeholders can be identified to act as “champions” within the steering committee in promoting the project goals.

G. Explain how cost-effectiveness is reflected in the project design:

If all incandescent lamps were replaced globally by CFLs more than 700 TWh of electricity would be saved per year, which translates to a reduction of 400 Mtons of CO2 per year. For developing countries, up to 300 TWh could be saved per year, or 170 Mtons of CO2 per year. A total market change from inefficient incandescent bulbs to CFLs would reduce world lighting electricity demand by 18%.

The main national and local benefits are expected to be:

- Providing an alternative to the population producing direct costs savings compared to the traditional incandescent lamps (energy-efficient lighting products are most efficient and last up to 10 times longer than incandescent lamps).
- Economic cost savings at the national level and reduced dependency and expenditures on imported fossil fuels.
- The promotion on non-mercury technologies will likewise contribute to cost savings in terms of the eventual disposal costs of mercury-containing CFLs.
- Reduced pressure (and peak load reduction) on the power system, which in many countries is already suffering from a demand that is exceeding the capacity.
- Reduced local pollution produced by conventional energy sources (replacing a single incandescent bulb with a CFL will keep a half-ton of CO2 out of the atmosphere over the life of the bulb. Saving electricity reduces CO2 emissions, sulphur oxide and high-level nuclear waste).
- Enhanced employment opportunities and development of the country's SME sector in the lighting industry, particularly in Asia.
- Enhanced product quality.
- Can be used for scaling up energy efficiency, on a replicable basis.
- Providing financial benefits to the consumers (although initially more expensive, the consumers save money in the long run because energy-efficient lighting products use 1/3 of the electricity consumed by incandescent bulbs and last up to 10 times longer than incandescent. A single 18 watt CFL instead of a 75 watt incandescent bulb will save about 570 kWh over its lifetime. At 10 cents per kWh, this equates to a $55 savings).

PART III: INSTITUTIONAL COORDINATION AND SUPPORT

A. PROJECT IMPLEMENTATION ARRANGEMENT:

Project Implementation Strategy

The project is seeking to accelerate the global commercialization and market transformation of EE lighting technologies by working at global level and providing the support to country programs.

The GEF's experience to date has shown that the barriers being removed generally relate to five market characteristics: policy; finance; business skills; information; and technology. As identified in the second Climate Change Program Study (CCPS2, 2004) as well as in the new draft programming framework for GEF-4, the removal of market barriers relating to these qualities "can form the basis for a market development strategy that is applicable to all of GEF's Operational Programs as well as being replicable, sustainable, and cost-effective".

In general, the country consultations conducted so far have confirmed that the barriers faced by different countries share much in common and that the efforts to overcome these barriers with GEF support would benefit from a global approach, both in terms of promoting knowledge sharing and exchanging the experiences and lessons learnt as well as by being more cost-effective than stand-alone national activities. On the technical assistance side, these cost-savings have been estimated at around 20-30% per country by making available, among others, consolidated technical backstopping, shared help-desk functions, shared experiences and lessons learnt as well as public awareness raising and marketing material, the preparation of which does not need to be started for every country from scratch.

In order to overcome the identified barriers, the project implementation strategy consists in designing the three interrelated project components and developing them through hiring qualified staff able to start and run efficiently the activities.

Project Management and Supervision

UNEP will act as the GEF Implementing Agency for the global initiative (while UNEP and other GEF agencies will be implementing national efficient lighting projects on a case-by-case basis).

The decision body for the project is the Project Steering Committee (PSC) composed of the GEF Secretariat, UNEP, UNDP, the World Bank Group, IEA, and the other project co-financiers. The PSC will work on the basis of an agenda and background documents prepared by the COE. In return the PSC will provide orientation for the programme of work of the COE, in all project areas. The PSC will physically meet at least once a year. One of the key tasks of the PSC will be to ensure coordination and complementarities between the global project and the national and/or regional efficient lighting initiatives, especially, but not exclusively, those supported by the GEF, including the programmes initiated during the last years and implemented by the IFC (the ELI projects). Particular attention will be paid to ensure efficient coordination with UNDP's national lighting projects in China, Russia, and Ukraine as well as national lighting projects implemented by UNEP in Vietnam and West Africa.[23] A Project Management Committee comprising the Head of the COE, concerned UNEP-DTIE staff, and the Task Manager in UNEP's Division for GEF Coordination (UNEP/DGEF), will be responsible for the preparation, approval, and monitoring of the annual project budget and workplan and will meet on a quarterly basis. These documents will be prepared by the Project Manager.

UNEP has made efficient lighting one of its topics for action as translated in numerous public statements and newspaper articles. UNEP is already allocating considerable resources to this particular topic and will continue doing so during project implementation. UNEP-DTIE is also already involved in standards and labelling activities, in particular with the European commission. There is a real opportunity for synergies between a wide range of

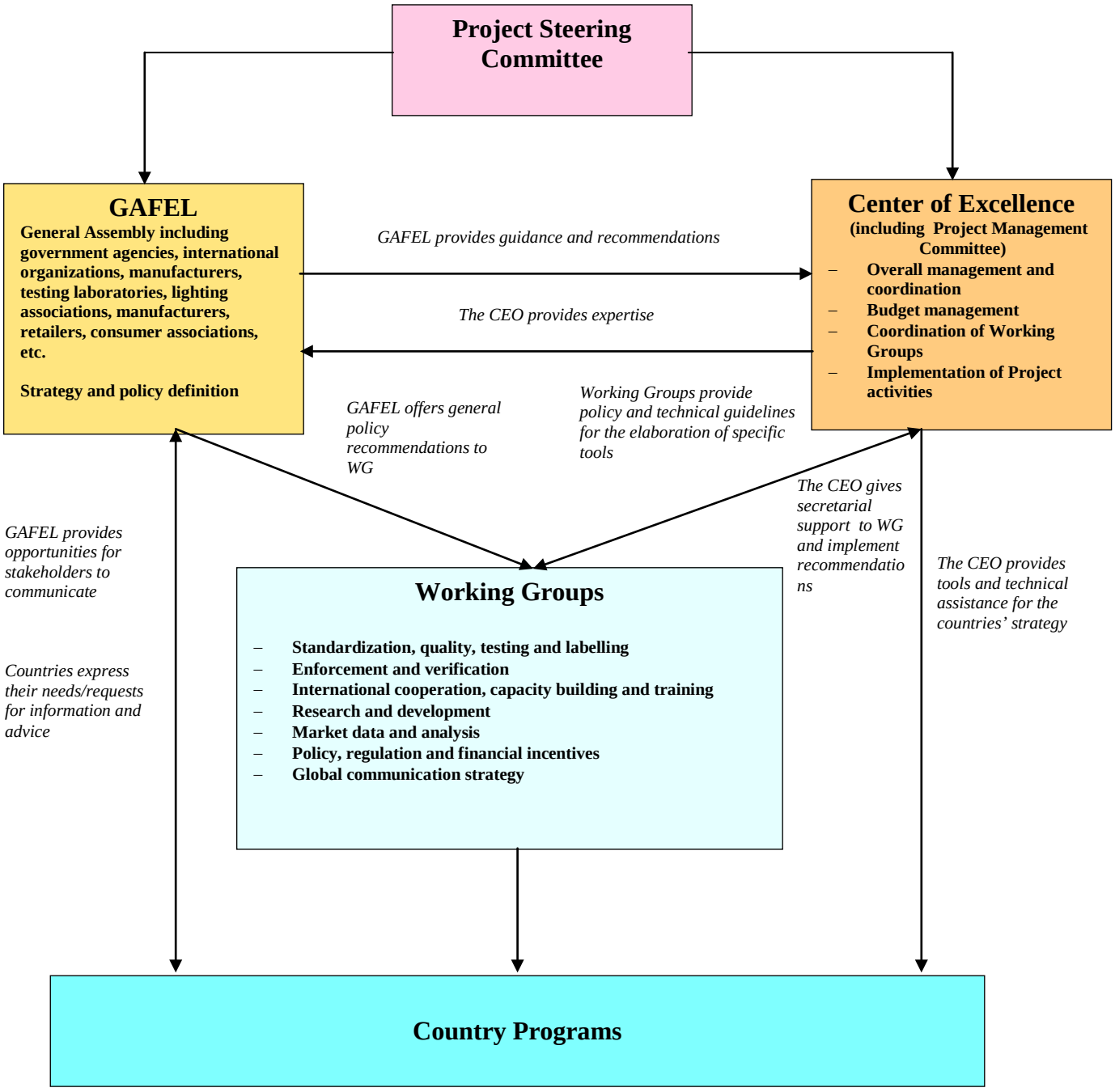
[23] Likewise, the same efforts will be made for efficient coordination with possible additional GEF-supported national lighting projects in Brazil, Peru, or elsewhere.

donor programmes. UNEP has stated its support for the present initiative, which has resulted in considerable co-financing. UNEP-DTIE will be the Executing Agency for this initiative and will establish a dedicated Project Management Team, headed by a Project Manager, for this purpose. The Chemicals Branch of UNEP-DTIE will assist in activities related to mercury reduction and phase-out in CFLs. UNEP-DTIE will host the COE; provide space for GAFEL's working groups and general assembly, and the PSC and meetings, and draw on its network of organisations to enlarge the already well developed network of experts and institutions to secure high quality deliverable and reaching project outcomes.

The Secretariat of the Basel Convention will be consulted on the draft technical guidelines on the environmentally sound management of mercury containing waste with emphasis on recycling and safe disposal of products

The project structure will be designed in such a way as to make sure it will allow to enlarging the scope of project stakeholders and have them integrate the wide range of potential project partners. A project manager and a project assistant will be hired for the duration of the project. The project manager will be responsible for the day-to-day management and administration of all project activities, staff, consultants, disbursements, etc and for ensuring that M&E requirements are met in a timely fashion. The project assistant will be responsible for secretarial tasks. Consultants, will be hired as required by a selection committee, which will include the Implementing Agency, UNEP, and the Project Steering Committee.

The relations between the different project bodies are described in the figure below.



Stakeholder Involvement

The key stakeholders of the project are envisaged to consist of:

- Public authorities of the participating countries;
- Global and local energy-efficient lighting manufacturers and large retailers;
- National, regional and international EEL interest groups such as lighting industry associations;
- Banking Associations, national development banks and local private banks and other financing entities;
- Local power utilities; and
- Consumer associations.

The global platform stakeholders of the project are envisaged to consist of:

- United Nations Environment Programme (UNEP-DTIE, UNEP Global Mercury Partnership, Secretariat of the Basel Convention)
- United Nations Development Programme
- The World Bank Group
- International Energy Agency
- The Renewable Energy & Energy Efficiency Partnership's (REEEP)
- The International Partnership for Energy Efficiency Cooperation
- The Alliance to Save Energy
- The Collaborative Labelling Appliance Standards Programme (CLASP)
- The International and regional harmonization institutes and organisations such as IEC and COPANT
- The bilateral donors involved in lighting and their specific projects such as USAID for Asia and GTZ for India.

All these stakeholders will be involved in further project implementation by using appropriate mechanisms and channels. While direct consultations, specific workshops and associated public awareness raising and training are envisaged to be the main channels for the involvement of institutional stakeholders, the broader consumer surveys and public media are expected to be more applicable for reflecting the views of individual consumers.

A number of relevant international and regional entities, which have been involved in supporting lighting activities in different countries, have been listed by the project team. Close co-operation with these entities will be sought both in terms of exchanging the experiences and lessons learnt as well as at the level of joint activities and possible cost sharing.

In providing technical backstopping for country specific activities and working with international experts, major emphasis will be placed on making sure that the work will be done jointly and in close co-operation with local experts and interest groups, thereby facilitating associated on-the-job training.

Every year, UNEP/DGEF will undertake a desk evaluation, to measure the degree to which the objectives of the project have been achieved. This will be in addition to the standard mid-term and final evaluations of the project per UNEP procedures defined in Section 2 and the Monitoring, Evaluation and Reporting procedures as well as supervision missions conducted by the UNEP Task Manager and/or UNEP Fund Management Officer.

UNEP, as the Implementing Agency, will be responsible for overall project supervision to ensure consistency with GEF policies and procedures and will provide guidance on linkages with related GEF-funded activities. UNEP/DGEF will monitor implementation of the activities undertaken across the UNEP-executed national efficient lighting projects and preppare aggregated progress reports that will be submitted through UNEP to GEF.

UNEP-DTIE, as the Executing Agency, will be responsible for global project management, monitoring, and technical assistance components including financial instruments. This includes administration and supervision of MoUs with other partner executing agencies.

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PART IV: EXPLAIN THE ALIGNMENT OF PROJECT DESIGN WITH THE ORIGINAL PIF:

There are some changes in project design in comparison with the original PIF, namely in terms of indicative calendar, phrasing of components outcomes and outputs, and budget allocation between components. However, the Project structure remains the same. These changes are described below:

1. The indicative calendar has been postponed to fit with the actual submission of the Project, as follows:

- Implementation Start: January 2009, instead of September 2008
- Mid-term Review: December 2010, instead of September 2010
- Implementation Completion: December 2012, instead of September 2012.

2. The terms designating the components, outcomes and outputs have been slightly modified for better visibility and clarity, as described below:

a) Components

PIF	CEO Endorsement
1. Global Platform	1. Global Platform
2. Technical, performance & quality standards and certification	2. Implementation of a Center of Excellence
3. Support Country Programs	3. Support for Country Programs
4. Project Management	4. Project Management
-	5. Monitoring & Evaluation

b) Outcomes and outputs

Component	Expected Outcomes		Expected Outputs	
	PIF	CEO Endorsement	PIF	CEO Endorsement
1. Global Platform	- A legal, institutional technical & policy framework - An international Center for Excellence	Effective initiation and coordination of global policy dialogue for the phase-out of inefficient lighting and the removal of policy and market barriers to the widespread adoption of energy-efficient lighting products worldwide.	- The Global Alliance for Efficient Lighting is established and operational - Lessons learnt from international best practices are documented & made available - A global agenda for coordinated phase out of inefficient lighting - Monitor lighting market & assess energy, GHG reductions	1.1 A stakeholder forum for policy dialogue is established and fully operational 1.2 Stakeholders agree upon a roadmap for global market transformation and coordinated phase out of inefficient lighting 1.3 A communication plan set up and implemented to strengthening coordination mechanism in energy efficient lighting market transformation

2. Implementation of a Center of Excellence	- A Set of harmonized International quality and performance- based standards & procedure - Energy efficiency specification	International efforts at policy and technical level successfully coordinated and improved EEL products quality through harmonized standards and certification of energy-efficient lighting products.	Analysis of the technology issues - Quality, environmental and performance standards are harmonized - an international certification scheme is introduced	2.1 A Centre of Excellence capable of coordinating Project's policy and technical activities established 2.2 A network of expertise and institutions for quality improvement and certification is identified, supported and strengthened 2.3 Guidelines for harmonisation of quality and performance-based standards developed and adopted 2.4 Capacity for harmonisation of quality and performance-based standards built in partner organisations and GEF programme countries 2.5 Guidelines for quality certification and labelling schemes are formulated for energy-efficient lighting products 2.6 A best practice catalogue elaborated and made available to relevant stakeholders
3. Support for Country Programs	- Strategic communication - Tailored international standards to country needs - Elaborate strategies for national and regional market transformation for lighting products	he specific EEL market ansformation targets of the rst participating countries eached by the end of the roject, conducive to the verall, global market ansformation goals of the roject	- Tool box for communication - Coordination and support for design & implementation of specific and adapted financial mechanisms for market transformation - Stimulate large-scale market transformation & implementation	3.1 Policy *toolkit* accessible to countries online and support provided to country programmes for capacity building 3.2 Technical assistance provided to new countries to develop their programmes 3.3 Public Information and Awareness Campaign Plan Implemented 3.4 An institutional arrangement with the Project is set up for CFL disposal

3. The GEF budget allocated to the creation and operation of the GAFEL (Component 1) has been reduced by half, mostly in favor of the reinforcement of the Center of Excellence's activities. In effect, the COE and its appointed experts will perform the task upon the suggestion of the Working Groups and under the guidance of GAFEL. Support to country specific programs has also been slightly reduced to account for the preparation of tools by the COE. Besides, the bulk of co-financing has been shifted from technical activities (Component 2) to the implementation of country programs (Component 3). The total budget, as well as the distribution between GEF and other funding, remains the same.

The table below shows the updated budget by component (excluding PPG):

Project component	PIF Budget		CEO Endorsement		Total	
	GEF financing	Co-financing	GEF financing	Co-financing	PIF Buget	CEO Endors.
1. Global Platform	800,000	1,500,000	800,000	1,500,000	2,300,000	2,300,000
2. Implementation of a Center of Excellence	3,000,000	4,000,000	3,000,000	4,000,000	7,000,000	7,000,000
3. Support for Country Programs	600,000	8,000,000	600,000	8,000,000	8,600,000	8,600,000
4. Project Management	500,000	1,500,000	500,000	1,500,000	2,000,000	2,000,000
5. Monitoring & Evaluation	100,000	0	100,000	0	100,000	100,000
TOTAL	5,000,000	15,000,000	5,000,000	15,000,000	20,000,000	20,000,000

PART V: AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF policies and procedures and meets the GEF criteria for CEO Endorsement.	
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ANNEX A: PROJECT RESULTS FRAMEWORK

Project Strategy	Indicator	Baseline	Target	Sources of Verification	Assumptions
Goal: Acceleration of the global commercialization and market development of energy-efficient lighting technologies in industrial; commercial, and residential sectors as well as in public lighting	Amount of estimated global light production by user sector and lamp type Annual market growth rate of energy-efficient lighting in the Project participating countries. Number of governments adopting a policy to phase out inefficient lighting and start-up of replication of market development activities in their countries.	As per the initial country specific market assessments and baseline analysis	An additional 1 billion EEL products sold per year at the completion of the project compared to the expected baseline development by the end of the project. Sustainable market growth of at least 20 % in average in the participating countries by the end of the project. 20 new governments expressed interest in and start-up of replication of similar activities in other countries.	Project monitoring and evaluation reports.	Available political support from the participating countries as well as the commitment of global lighting industry Competitiveness of EELs technologies with alternative lighting products (such as incandescent and electromagnetic lighting ballasts)
COMPONENT 1: ESTABLISH A GLOBAL PLATFORM **Outcome 1:** Consensual decisions and a roadmap for global lighting market transformation all over the world agreed upon	Number of countries with EEL market transformation and strengthening activities initiated Number of countries participating to a phase out agreement.	No proactive and coordinated effort to support the targeted GEF program activity to accelerate the global phase-out of inefficient lighting and promote the EEL market.	EEL global market transformation and strengthening activities on policy level supported by OECD member states and developing countries as well as global lighting industry initially in 6 countries and expanded later to at least 20 GEF program countries.	Project monitoring and evaluation reports.	Willingness of policy makers and international organizations as well as major lighting industry to coordinate their efforts
Output 1.1: A stakeholder forum for policy dialogue is established and fully operational	The global platform legally established at the end of the first year of Project The policy dialogue for EEL promotion launched	No legal framework for policy dialogue Low level of policy dialogue on EEL	A global platform is established for policy dialogue on EEL A coordinated effort to launch a stakeholder forum on EEL	M&E reports	Available political support from countries
Output 1.2: Stakeholders agreed upon a roadmap for global market transformation and coordinated phase out of inefficient lighting	A consensus for phasing out incandescent reached after one year	No proactive effort to phase out incandescent	A consensus is reached one year after project start to phase out inefficient lighting	M&E reports	See above
Output 1.3: A communication plan set up and implemented to strengthening coordination mechanism in energy efficient lighting market transformation	Communication plan for supporting the phase out and assisting in market transformation efforts for EE lighting	No communication plan for promoting EE lighting and phase out of inefficient lighting	A communication tool-kit developed during the first year and implemented	Project monitoring reports	Resource are timely available to develop a communication tool

Project Strategy	Indicator	Baseline	Target	Sources of Verification	Assumptions
COMPONENT 2: IMPLEMENTATION OF A CENTER OF EXCELLENCE **Outcome 2:** An International Centre of Excellence (COE) in charge of strategies, policies, knowledge management, best practices diffusion, quality harmonization, etc., established and operational	The number of countries with EEL products quality improvement initiated Availability of timely and cost-effective technical backstopping responding to the needs of EEL lighting technology improvement.	No proactive and coordinated effort at international level to support the targeted GEF programme countries to improve EEL product quality.	The global technical assistance needed for EEL products quality improvement met at the adequate level and timely manner leading to effective implementation of country specific EEL market transformation strengthening activities.	Market monitoring studies Country specific program evaluation reports.	Stated demand of selected representative countries for international technical assistance and harmonization of standards and testing procedures
Output 2.1: A Centre of Excellence capable of coordinating Project's policy and technical activities selected and enhanced	The COE in operation	No international body designated for facilitating policy dialogue	Legal entity designated to coordinate activities related to policy dialogue for EEL promotion & phase out of incandescent	M&E reports	Available political support from countries
Output 2.2: A network of technical institutions is established and enhanced for lighting products quality improvement	A network of institutes for EEL quality improvement in operation	No global quality improvement entity in operation	The institutes for EEL quality improvement are operational one year after project starting	Project reports M&E reports	Political and technical support from the participating countries
Output 2.3: Guidelines for harmonisation of quality and performance-based standards developed and adopted	Technical guidelines for EE lighting quality improvement established	No EE lighting global quality improvement material available	The material for EE lighting quality improvement are available during the first year of project implementation	Project reports M&E reports	Technical and political support from international centre of excellence and EE lighting experts
Output 2.4: Capacity for harmonisation of quality and performance-based standards built in partner organisations and GEF programme countries	Number of EEL market staff trained for quality and performance-based standards	No systematic action undertaken at national and global levels to train EEL market actors to participate in market transformation efforts	At least 2 representatives from major stakeholders trained including national and global entities	Project reports M&E reports	Technical and political support from international centre of excellence and EE lighting experts
Output 2.5: Guidelines for quality certification and labelling schemes are formulated for energy-efficient lighting products	Number of EEL market staff trained on testing and certification procedures	No practical certification and labelling schemes adopted at global level	At least 2 representatives from testing laboratories trained	Project reports M&E reports	Technical and political support from international centre of excellence and EE lighting experts
Output 2.6: A best practice catalogue elaborated and made available to relevant stakeholders	Operational toolkit for EE lighting programmes design and implementation developed the 1st year	Limited material available for EE lighting programmes design and implement	Operational capacity building material available for energy-efficient lighting programmes design and implementation	Project reports M&E reports	Technical support from international centre of excellence and EE lighting experts

Project Strategy	Indicator	Baseline	Target	Sources of Verification	Assumptions
COMPONENT 3: SUPPORT TO COUNTRY AND PROGRAMS **Outcome 3**: The specific EEL market transformation targets of the first participating countries reached by the end of the project, conducive to the overall, global market transformation goals of the project	Market characteristics of the participating countries. The total EE lighting products purchased at national level Annual growth rate of the EEL market in participating countries at the end	The basic conditions for accelerated EEL market development in most GEF programme countries still missing. Initial country specific market assessment and baseline analysis	A supportive legal and regulatory framework in the participating countries adopted The level of awareness of the targeted end users raised. The capacity of the key local stakeholders built as per the targets of individual country components.	The monitoring and evaluation reports of the country programs	Available political support from the participating countries and committed private sector "local champions" to promote the EE lighting market.
Output 3.1: Policy toolkit accessible to countries online and support provided to country programmes for capacity building	Status of the EE lighting policy tool-kit to be developed by the umbrella programme	No EE lighting policy tool-kit available to support national programmes	A communication tool-kit developed during the first year and implemented	Monitoring reports M&E reports	Resource are timely available to develop a policy toolkit
Output 3.2: Technical assistance provided to new countries to develop their programs	Number of countries with EEL programs launched	Lack of commitment to support GEF country programs	At least, 14 new countries engaged in EE lighting programs design and implementation	M&E reports Project reports	Country programme partners are available to collaborate with the global Project Resource are timely available
Output 3.3: Public Information and Awareness Campaign Plan Implemented	The use of awareness and training material & feedback from countries	No monitoring data on public information and awareness raising	High level of awareness of the targeted stakeholders including decision makers and consumers	M&E reports Project reports	Resource are timely available
Output 3.4: CFL disposal strategy and action plan adopted	Number of countries to adopt CFL disposal the strategy and action plan	Low percentage of countries with CFL disposal action plan	All participating countries have adopted the strategy and implemented the action plan	Project monitoring reports	Political commitment of the participating countries

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF)

COMMENTS FROM FRANCE It is evident that the use of high performance lightening lamps will lead to a substantial diminution of energy consumption. Public sector has to take the lead as the private sector and individuals have to play their role as well. The international organization can play definitively a key role although the lighting market is controlled by large groups and is driven by market forces and local conditions. CFL represents an investment for a family in poor countries, and the conditions of large diffusion and of affordability are to be studied carefully.	• UNEP is leading a number of initiatives on sustainable production and consumption including lighting. Hence a strong internal expertise has been built over the years. In effect, UNEP together with the GEF Secretariat and UNDP, have been leading an awareness raising effort about the advantages and timeliness of phasing out obsolete technologies and accelerate the introduction of new ones in the lighting market since 2002 and have contributed to numerous international events led by the IEA , the Marrakech Task force, the GEF Assembly, etc. Dialogue has been active with project partners for the last five years. UNEP has also been using its media support network to inform the general public. • Governments and public institutions do play a role in securing that the poorest have access to efficient lighting and can benefit from the economic advantage as well. The downtrend in prices is also expected to continue as market expands, and the project will, through its various components, address the pricing issue, as well as the financial mechanisms and incentives that could be designed to support families purchasing the new technology.
However, it is not clear in the PIF how the project will be implemented, what are the priorities amongst the different activities, what will be the weight of the R&D, what will be the contribution of GEF to that regard?	• At PIF stage all the details of project implementation could not be presented. They are now developed in the present project document. The architecture of the project has been designed to be as simple as possible, while addressing the identified gaps at global level, mainly a global platform for consensus building, a center of excellence for knowledge creation and management and a network of experts for support on very specialized topics linked to production of lamps and technology transfer. The R&D is clearly carried out by private partners and GEF funds will not be strictly dedicated to this. Given rapid evolution however, a technological observation and information focus is necessary to secure up to date information and in the end accelerated diffusion.
The 4 years duration of the project seems to be very short. UNEP and GEF secretariat should precise which internally expertise and the knowledge they have to manage such an innovative project?	• In the course of the past 3 years, a dynamic has seen the light of the day, and decisions to transform the lighting market have been taken in numerous countries or regions, the latest decision being that of the European Union. Hence, in consultation with project partners, and especially the private sector, 4 years is seen adequate for project implementation, considering that after this period, the conditions and networks for consensus will have been built and GEF support will not be needed any longer.

COMMENTS FROM THE UNITED STATES We are not clear why a steering committee including the GEF Secretariat is necessary to implement this project as this might make implementation more difficult. The project document should clarify the rationale and role of this steering committee.	• The team acknowledges the concern of the United States and the Steering Committee of the project has been designed to operate even in the absence of the GEF Secretariat. The GEF Secretariat is a permanent guest to the Project Steering Committee which is the decision body of the project. The PSC as described in the present project document (p.49) will define a work plan and identify priority actions based on the information and proposal of the Center of Excellence. This is to guaranty flexibility in project execution in a rapidly evolving environment.

ANNEX C: CONSULTANTS TO BE HIRED FOR THE PROJECT

Position Titles	*$/ person week*	*Estimated person weeks*	*Tasks to be performed*
For Project Management			
Local			
none			
International			
none			
For Technical Assistance			
Local			
Local standards and certification specialists	500	200	Component 2: contribution to harmonization procedures; adaptation and adoption of new norms and standards
Local trainers	500	110	Component 2: implementation of national training programs
Local policy experts	500	100	Component 3: development of national programs
Local communication experts	500	150	Component 3: preparation and implementation of national communication plans
Local environment experts	500	100	Component 3: contribution to the preparation of national risks communication plans
International			
Policy adviser	3000	50	Component 1: support to the preparation of the global and national roadmaps Component 3: support to the preparation of capacity building tools; provision of TA for the development of national programs
Expert in norms and standards	3000	25	Component 2: preparation of ad-hoc studies and analysis
Expert in certification	3000	25	Component 2: preparation of ad-hoc studies and analysis
Trainers	3000	15	Component 2: drafting of training materials; coordination with national institutions for the organization of local training programs

ANNEX D: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS

A. EXPLAIN IF THE PPG OBJECTIVE HAS BEEN ACHIEVED THROUGH THE PPG ACTIVITIES UNDERTAKEN.

The PPG objective has been achieved; and the full project has been designed according to plan.

B. DESCRIBE IF ANY FINDINGS THAT MIGHT AFFECT THE PROJECT DESIGN OR ANY CONCERNS ON PROJECT IMPLEMENTATION.

No specific difficulty has been noticed during the project preparation that might affect the project implementation.

C. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES AND THEIR IMPLEMENTATION STATUS IN THE TABLE BELOW:

Project Preparation Activities Approved	*Implementation Status*	*GEF Amount ($)*				*Co-financing ($)*
		Amount Approved	*Amount Spent To-date*	*Amount Committed*	*Uncommitted Amount**	
1. Consultation with lighting stakeholders	full completion expected in January 2009	190,000	190,000	190,000	0	140,000
2. Data collection and analysis market trends, energy demand & GHG emission & summary of best practices in energy efficient lighting	completed	100,000	100,000	100,000	0	20,000
3. Detailed planning of activities including communication event at COP 13	completed	70,000	70,000	70,000	0	20,000
4. Finalization of project document	full completion expected in January 2009	40,000	40,000	40,000	0	20,000
Total		**400,000**	**400,000**	**400,000**	0	200,000

* Uncommitted amount should be returned to the GEF Trust Fund. Please indicate expected date of refund transaction to Trustee.

Co-financing includes commitments made by the government of Australia (100,000) as well as by some of the main bulbs manufacturers (Philips, Osram, 100,000).

In addition, the French Energy Conservation Agency has also indicated its intention to support the project through co-financing. This co-financing will be mainly used to fund international consulting activities.

ANNEX E: Project Costs

UNEP Managed GEF Funds Budget Only											
Project No: 4060											
Project Name: Global Market Transformation for Efficient Lighting as part of the GEF Global Lighting Initiative (GLI)											
			EXPENDITURE BY PROJECT COMPONENT/ACTIVITY					**EXPENDITURE BY CALENDAR YEAR**			
			Component 1: Global Platform	**Component 2**: Centre of Excellence	**Component 3**: Support to Country Programs	**Component 4**: Project Management / M&E	**Total**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Total**
UNEP BUDGET LINE/OBJECT OF EXPENDITURE			**US$**	**US$**	**US$**	**US$**	**US$**	US$	US$	US$	US$	US$
10	**PROJECT PERSONNEL COMPONENT**											
	1100	**Project Personnel**										
	1101	Global Project Coordinator	150.000	200.000	120.000	90.000	560.000	140.000	140.000	140.000	140.000	560.000
	1102	*Technical Expert (Policy)*	60.000	360.000	0	0	420.000	105.000	105.000	105.000	105.000	420.000
	1103	*Technical Expert (Standards & Labels)*	0	420.000	0	0	420.000	105.000	105.000	105.000	105.000	420.000
	1104	*Technical Expert (Environmental issues)*	60.000	200.000	80.000	0	340.000	60.000	90.000	90.000	100.000	340.000
	1105	*Technical Expert (Communication)*	100.000	200.000	0	0	300.000	75.000	75.000	75.000	75.000	300.000
	1199	Sub-Total	**370.000**	**1.380.000**	**200.000**	**90.000**	**2.040.000**	485.000	515.000	515.000	525.000	2.040.000
	1200	**Consultants**										
	1201	Component 1 - Global Platform	80.000	0	0	0	80.000	50.000	30.000	0	0	80.000
	1202	Component 2 - Centre of Excellence	0	350.000	0	0	350.000	90.000	90.000	90.000	80.000	350.000
	1203	Component 3 - Support to Country Programs	0	0	250.000	0	250.000	0	50.000	100.000	100.000	250.000
	1299	Sub-Total	**80.000**	**350.000**	**250.000**	**0**	**680.000**	140.000	170.000	190.000	180.000	**680.000**

	1300	**Administrative Support**										
	1301	Programme Assistant	0	0	0	260.000	260.000	65.000	65.000	65.000	65.000	260.000
	1399	Sub-total	0	0	0	**260.000**	**260.000**	65.000	65.000	65.000	65.000	**260.000**
	1600	**Travel on official business (UNEP staff)**										
	1601	Project Staff Travel	0	0	0	100.000	100.000	20.000	30.000	30.000	20.000	100.000
	1699	Sub-Total	0	0	0	**100.000**	**100.000**	20.000	30.000	30.000	20.000	**100.000**
	1999	**Component Total**	**450.000**	**1.730.000**	**450.000**	**450.000**	**3.080.000**	**710.000**	**780.000**	**800.000**	**790.000**	**3.080.000**
20	**SUB-CONTRACT COMPONENT**											
	2100	**Sub-contracts (MoU's/LA's for cooperating and supporting agencies)**										
	2103	Establishment and Management of Website	0	100.000	0	0	100.000	50.000	20.000	20.000	10.000	100.000
	2104	Devel. of commuc. plan and strategies for supporting country programs	100.000	100.000	0	0	200.000	60.000	60.000	40.000	40.000	200.000
	2199	Sub-Total	100.000	200.000	0	0	300.000	110.000	80.000	60.000	50.000	300.000
	2999	**Component Total**	**100.000**	**200.000**	**0**	**0**	**300.000**	**110.000**	**80.000**	**60.000**	**50.000**	**300.000**
30	**TRAINING COMPONENT**											
	3300	**Meetings/conferences**										
	3301	Meetings (Component 1)	250.000	0	0	0	250.000	75.000	75.000	50.000	50.000	250.000
	3302	Workshops (Component 2)	0	150.000	0	0	150.000	25.000	50.000	50.000	25.000	150.000
	3303	Training (Component 2)		250.000	0	0	250.000	0	100.000	100.000	50.000	250.000
	3304	Meetings (Component 3)	0	0	150.000	0	150.000	50.000	50.000	25.000	25.000	150.000
	3399	Sub-Total	250.000	400.000	150.000	0	800.000	150.000	275.000	225.000	150.000	800.000
	3999	**Component Total**	**250.000**	**400.000**	**150.000**	**0**	**800.000**	**150.000**	**275.000**	**225.000**	**150.000**	**800.000**
40	**EQUIPMENT & PREMISES COMPONENT**											
	4300	**Premises (office rent, maintenance of premises, etc)**										
	4301	cofinanced office rent	0	0	0	50.000	50.000	12.500	12.500	12.500	12.500	50.000
	4399	Sub-Total	0	0	0	50.000	50.000	12.500	12.500	12.500	12.500	50.000
	4999	**Component Total**	**0**	**0**	**0**	**50.000**	**50.000**	**12.500**	**12.500**	**12.500**	**12.500**	**50.000**

50	**MISCELLANEOUS COMPONENT**											
	5100	**Operation and maintenance of equip.**										
	5200	**Reporting costs (publications, maps,newsletters, printing, etc)**										
	5201	Technical publications	0	250.000	0	0	250.000	50.000	75.000	75.000	50.000	250.000
	5202	Publications, Newsletters		120.000	0	0	120.000	20.000	35.000	35.000	30.000	120.000
	5203	Information campaigns		300.000	0	0	300.000	0	100.000	100.000	100.000	300.000
	5299	Sub-Total	**0**	670.000	0	0	670.000	70.000	210.000	210.000	180.000	670.000
	5500	**Evaluation (consultants fees/travel) DSA, admin support, etc. internal projects**										
	5501	Monitoring & Evaluation	0	0	0	100.000	100.000	0	50.000	0	50.000	100.000
	5599	Sub-Total	0	0	0	100.000	100.000	0	50.000	0	50.000	100.000
	5999	**Component Total**	**0**	**670.000**	**0**	**100.000**	**770.000**	**70.000**	**260.000**	**210.000**	**230.000**	**770.000**
99	**TOTAL COSTS**		**800.000**	**3.000.000**	**600.000**	**600.000**	**5.000.000**	**1.052.500**	**1.407.500**	**1.307.500**	**1.232.500**	**5.000.000**

ANNEX F: Work Plan and Timetable

Activities	Year 1				Year 2				Year 3				Year 4				Outputs
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1.1 Establishment and operation of a stakeholder forum for policy dialogue																	GAFEL established
1.2 Development of a Roadmap and Cordination of Phase-out																	Phase-out agreement adopted
1.3 Production and implementation of a detailed Communication Plan																	Communication Plan developed and implemented
2.1 Establishment and operation of a Center of Excellence																	Center of Excellence implemented and operational
2.2 Creation and operation of a Network of technical experts and institutions																	Network of partners created and operational
2.3 Harmonization of quality and performance-based standards																	Harmonized Quality and performance-based standards adopted
2.4 Training key insitutions in new standards																	Key insitutions trained in new standards
2.5 Development of tools for testing and certification of lighting products																	Testing and certification tools developed
2.6 Elaboration of a best-practice catalogue																	Best-practice catalogue developed and disseminated
3.1 Launch and operation of project website																	Project website operational
3.2 Engagement of new countries in the development and implementation of national programs																	TA provided to new countries
3.3 Assistance to countries to develop communication plans																	Public information and awareness campaign plans implemented
3.4 Support to develop a CFL disposal strategy																	CFL disposal strategy adopted

ANNEX G: Description of the GAFEL Working Groups

Thematic working groups will be created within the GAFEL to provide policy and technical guidelines as a background for the work of the Center of Excellence, particularly regarding the elaboration of specific tools and the support to new countries. The working groups will be moderated and technically driven by GAFEL members, while the Centre of Excellence will provide secretariat support and implement the recommendations and guidance coming out of the working groups. They will distinctively deal with the different issues raised by the Project findings and will be coordinated by the Centre of Excellence, under the supervision of the PSC.

The missions of the Working groups will be:

- to indicate how to best demonstrate the benefits of efficient lighting and position it as climate friendly technology for a low carbon world
- within their own subject matters, to review and analyze current situation, follow up and analyze the trends, identify issues and do research, provide results and recommendations – constantly updated
- to benefit country and regional programs and identify needed toolkits for countries willing to participate in the program.

The advantages of such Working groups will be that:

- their works can be carried out by an existing ongoing initiative on lighting, specialized in the corresponding topic
- there is a certain independence in between the Working groups, each of them being assigned with a significant amount of work to do; however, at the same time the Secretariat has an overview and ensures that there is no double work and a good coordination, and also that the work undertaken in the Working groups on "standardization" is of use for the Working group on capacity building, etc.

1. Working group on Standardization, quality, testing and labelling

This Working group will promote global quality and performance-based standards for energy-efficient lighting products.

Missions:

- Expert guidance on the following: state of the art worldwide concerning test methods, energy standards, quality standards, national requirements (mandatory and voluntary)
- strategy papers regarding the possible harmonization of testing procedures (could be worldwide), of standards (could be regional), of requirements (could be regional / national)
- When judged necessary, carry out lobbying to reach this harmonization by working with IEC, ISO, etc.
- International testing capacity with testing laboratory management systems establishment and training of technicians for testing and Quality Assurance / Quality Control skills
- Identify the list of products to be covered
- Constantly provide inputs for analyzing efficiency levels / performance test methods / (accredited) test labs / labels / enforcement compliance /etc. to be used.

***Box X:* How the initial SEEEM initiative managed to influence standard definitions**

Initially SEEEM (Standards for Energy Efficiency of Electric Motor Systems) was a Swiss individual initiative which rapidly gained support from UK and Australian governments as well as from several international experts in motor systems. The initiator had applied to the IEC Council and was elected to represent Switzerland. Amongst other country representatives mainly from the industrial sector, he could bring into IEC the SEEEM expertise, which in the meantime had grown into an international network of experts, and could make the standard process evolve in order to take into consideration energy efficiency. SEEEM will now transform into a formal Annex of 4E (implementing agreement under the IEA).

2. Working group on Enforcement and verification

Missions:

To provide Expert guidance for the following:

- implementation, monitoring and evaluation schemes, describing in particular inspecting bodies' role and procedures
- measures to stimulate the application of enforcement and verification schemes such as regulatory framework, budget estimates, training for inspectors, set up of international data bases of products tested
- procedure for enforcement does not split the responsibility between too many actors
- for regions where there is no capacity nor laboratory, schemes to designate one: at a national or regional level, possibly through bidding procedures.

***Box X*. The China Standard Certification Center (CSC) as the administrating body of ELI Quality Certification Institute**

CSC was initially founded locally in 1998 and administered by China National Institute of Standardization. Year after year CSC proved successful and committed to the global sustainable development by undertaking a significant number of local and international researches and studies in collaboration with international organizations such as UNDP, IEA, IFC, CLASP, APEC EE expert group, etc. In 2005 it got involved in ELI, administrating the ELI Quality Certification Institute.
China being the most significant lamp producer worldwide (by far: 80% of the market) the importance of CSC is all the more increased.

3. Working group on International cooperation, capacity building and training

Missions:

- To provide Expert guidance on the following:capacity building and financial support to country with no capacity, even to be represented in regional and international bodies or initiatives
- training to officials mainly about lighting and energy prospects, the need for efficient lighting and standards, the right and significance of voting within IEC
- awareness-raising campaigns on energy challenge and climate change related to lighting issues; enhance the awareness of the key stakeholders on the benefit of energy efficient lighting products; develop training

schemes and adapted tools addressed to politicians, retailers, procurement officers, end-users, certifiers, inspectors, bankers, etc. (powerpoint documents or online informative/training modules, etc.)

- to ensure that the information on the significance of efficient lighting is well disseminated including within the building codes
- lighting manufacturers and distributors needs to be able to produce good quality CFLs, depending on the country
- to assist in equipment selection and purchase.

4. Working group on Research and development

Missions:

To provide Expert guidance on the following:

- R&D activities
- information about new technologies
- lighting systems not only in the residential sector but also in the commercial, public, industrial and outdoor sectors

Box X. **The potential "Lighting" Annex under the IEA Implementing Agreement for the cooperating program 4E on Efficient Electrical End-use Equipment**

Like the already approved Annexes on "Mapping & Benchmarking", "Standby Power", "Set-top Boxes" and "Motor Systems", the potential future "Lighting" Annex would seek to be an interface with existing networks/initiatives establishing synergies and avoiding duplication of ongoing activities. It would operate through an operating agent and the 4E Representative of the leading country of the Annex. The "Lighting" Annex with a potential focus on LEDs is currently under discussion and the decision should be official by the end of the year 2008.

5. Working group on "Market data and analysis"

Missions:

To provide Expert guidance on the following

- to produce the necessary basic analysis for any policy development
- to analyze the markets of lamps and keep the information updated
- to define a typology of countries (or regions) according to their level of awareness/engagement/enhancement in terms of efficient lighting and to their economic/social/cultural/environmental features
- to assess the production capacity of manufacturers from various regions of the World to various standards of quality
- to form sub-groups corresponding to the typology defined, the main criteria mixing economic level, size, legal and institutional energy efficiency framework, existing or non-existing lighting initiatives, existing or non-existing lamp market, existing or non-existing capacity, etc.
- to assess the luminaries market (in many developed countries halogens are embedded into the house design, ruling out the possibility to use CFLs).

6. Working group on Policy: regulation, labelling, financial incentives

Missions:

To provide Expert guidance on the following:

- to review the existing policies and regulatory frameworks
- to review the existing labels (informative and endorsement) different from a country to another, same for the financial incentives and fiscal devices
- to design specific and adapted financial mechanisms for market transformation such as: earmarked taxes (the fee pays for the rebate), utilities programs, etc.
- to develop financial and/or fiscal incentives (for producers, end-users, etc.).

7. Working group on Global Communication Strategy

Missions:

To provide Expert guidance on the following

- to design the global communication strategy, including targets, contents, tools and channels
- to prepare a model for the national or regional communication strategy
- to review the communication activities implemented by the Center of Excellence