



GLOBAL ENVIRONMENT FACILITY  
INVESTING IN OUR PLANET

**Naoko Ishii**  
CEO and Chairperson

June 13, 2016

Dear Council Member:

UNEP as the Implementing Agency for the project entitled: ***Bolivia: Delivering the Transition to Energy Efficient Lighting***, has submitted the attached proposed project document for CEO endorsement prior to final approval of the project document in accordance with UNEP procedures.

The Secretariat has reviewed the project document. It is consistent with the proposal approved by Council in April 2013 and the proposed project remains consistent with the Instrument and GEF policies and procedures. The attached explanation prepared by UNEP satisfactorily details how Council's comments and those of the STAP have been addressed. I am, therefore, endorsing the project document.

We have today posted the proposed project document on the GEF website at [www.TheGEF.org](http://www.TheGEF.org). If you do not have access to the Web, you may request the local field office of UNDP or the World Bank to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,

  
Naoko Ishii  
Chief Executive Officer and Chairperson

Attachment: GEFSEC Project Review Document  
Copy to: Country Operational Focal Point, GEF Agencies, STAP, Trustee



# REQUEST FOR CEO ENDORSEMENT

PROJECT TYPE: FULL-SIZED PROJECT

TYPE OF TRUST FUND: GEF TRUST FUND

For more information about GEF, visit [TheGEF.org](http://TheGEF.org)

## PART I: PROJECT INFORMATION

Project Title: Delivering the transition to energy efficient lighting			
Country(ies):	Bolivia	GEF Project ID: <sup>1</sup>	5299
GEF Agency(ies):	UNEP	GEF Agency Project ID:	00944
Other Executing Partner(s):	Ministry of Hydrocarbons and Energy and Ministry of Environment and Water	Submission Date:	May 24, 2016
GEF Focal Area (s):	Climate Change	Project Duration (Months)	36
Name of Parent Program (if applicable):		Project Agency Fee (\$):	290,639
<ul style="list-style-type: none"> <li>➤ For SFM/REDD+ <input type="checkbox"/></li> <li>➤ For SGP <input type="checkbox"/></li> <li>➤ For PPP <input type="checkbox"/></li> </ul>			

### A. FOCAL AREA STRATEGY FRAMEWORK<sup>2</sup>

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Grant Amount (USD)	Co-financing (USD)
CCM-1 Promote the demonstration, deployment, and transfer of innovative low-carbon technologies	<ul style="list-style-type: none"> <li>• Technology successfully demonstrated, deployed and transferred</li> </ul>	<ul style="list-style-type: none"> <li>• Innovative low-carbon technologies demonstrated and deployed on the ground</li> </ul>	GEFTF	1,856,080	5,967,575
CCM-2 Promote market transformation for energy efficiency in industry and the building sector	<ul style="list-style-type: none"> <li>• Appropriate policy, legal and regulatory frameworks adopted and enforced.</li> </ul>	<ul style="list-style-type: none"> <li>• Energy efficiency policy and regulations in place</li> <li>• Energy savings achieved</li> </ul>	GEFTF	1,157,619	3,500,000
CHEM-3 Pilot sound chemicals management and mercury reduction	<ul style="list-style-type: none"> <li>• Country capacity built in effectively manage mercury in priority sectors</li> </ul>	<ul style="list-style-type: none"> <li>• Countries receiving GEF support for mercury management and reduction on a pilot basis</li> </ul>	GEFTF	45,662	4,000,000
<b>Total project costs</b>				<b>3,059,361</b>	<b>13,467,575</b>

<sup>1</sup>Project ID number will be assigned by GEFSEC.

<sup>2</sup> Refer to the [Focal Area Results Framework and LDCF/SCCF Framework](#) when completing Table A.

## B. PROJECT FRAMEWORK

**Project Objective:** Accelerate the transition to energy efficient lighting technologies in Bolivia

<b>Project Component</b>	<b>Grant Type</b>	<b>Expected Outcomes</b>	<b>Expected Outputs</b>	<b>Trust Fund</b>	<b>Grant Amount (\$)</b>	<b>Confirmed Co-financing (\$)</b>
1. National policy and regulation development to promote the rapid transition to efficient lighting.	TA	1.1. National efficient lighting strategy employing the integrated policy approach to phasing out inefficient incandescent lamps endorsed.	1.1.1 Comprehensive policies developed to ensure a successful transition to an efficient lighting market to support Bolivia in its efforts, and, standards and labeling activities harmonized regionally to achieve maximum lighting market transformation. 1.1.2 National legislation to establish and enforce minimum energy performance standards (MEPS) for lamps developed. 1.1.3. Monitoring, verification and enforcement (MVE) frameworks created to ensure compliance. 1.1.4 Enabling regulatory environment and legal frameworks in place, to ensure environmentally sound life-cycle management of lamps. 1.1.5 Public communications and awareness raising activities designed to increase public acceptance of high efficiency products, with an understanding of economic and environmental benefits.	GEFTF	274,510	1,000,000
2. Creation of monitoring, verification and enforcement (MVE) capacities to ensure effective transition to efficient lighting.	TA	2.1 Capacities to Monitor, Verify and Enforce energy efficient lighting products are created in Bolivia.	2.1.1 Legal and administrative processes of monitoring, verification and enforcement to improve compliance with national or regional standards developed. 2.1.2 Technical training and support to government authorities and customs administrations delivered. 2.1.3 Technical training and support to national laboratories to verify compliance with standards and promote regional cooperation provided.	GEFTF	868,752	1,000,000
3. Ensuring environmentally sound management for a sustainable transition to efficient lighting.	TA	3.1 Government of Bolivia is able to enact a national plan to collect, recycle and/or responsibly dispose of spent lighting products that	3.1.1 National framework and strategy for environmentally sound management of lighting products developed. 3.1.2 Training to governmental authorities, retailers and collection services provided.	GEFTF	945,780	4,500,000

		may contain valuable and/or hazardous materials.	3.1.3 Awareness raising and communication campaigns to promote collection and recycling of spent lamps carried out. 3.1.4 Waste management systems for spent lamps, including the design of a collection and recycling service organization (CRSO), and international coordination for the environmentally sound export/import of lamp waste developed.			
4. Lighting innovation: accelerating the use of Solid State Lighting (including light emitting diodes (LEDs)) and controls.	TA	4.1 Consensus reached by consumers and decision makers in government and private sector on the increased use of solid state lighting and lighting controls in the domestic, commercial/industrial and outdoor lighting applications.	4.1.1 National efficient lighting strategy with more stringent MEPS, taking into account advanced lighting technologies and systems, further developed. 4.1.2 Supporting policies delivered to increase user acceptance and demand for high efficiency products and systems. 4.1.3. MVE scheme to ensure high quality products that will deliver the expected energy saving and GHG emission reduction benefits developed.	GEF	315,319	2,000,000
	TA / INV	4.2 Municipal governments made aware of the benefits of advanced lighting systems through demonstration programs of locally appropriate street lighting LEDs and controls.	4.2.1 Demonstration program for locally appropriate LEDs and lighting controls for Bolivia's selected stakeholder groups ( <i>i.e.</i> public lighting consumers) designed and delivered. 4.2.2 LED and controls systems procured and installed through the demonstration program. 4.2.3 Gender mainstreaming in Outputs 4.2.1 and 4.2.2 conducted	GEFTF	505,000	4,786,661
Subtotal					2,909,361	<b>13,286,661</b>
Project Management Cost (PMC) <sup>3</sup>				(select)	150,000	180,914
<b>Total project costs</b>						<b>3,059,361</b>
						<b>13,467,575</b>

**C. SOURCES OF CONFIRMED COFINANCING FOR THE PROJECT BY SOURCE AND BY NAME (\$)**

Please include letters confirming co-financing for the project with this form

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<sup>3</sup>PMC should be charged proportionately to focal areas based on focal area project grant amount in Table D below.

Sources of Co-financing	Name of Co-financier (source)	Type of Co-financing	Co-financing Amount (\$)
National Government	Ministry of Hydrocarbons and Energy	In-kind	7,390,000
National Government	Ministry of Environment and Water	In-kind	4,000,000
Public Sector	Municipality of La Paz	In-kind	197,575
Private sector	Philips	In-kind	1,500,000
Private sector	National Lighting Test Center, China	In-kind	300,000
International Agency	UNEP	In-kind	80,000
Total Co-financing			13,467,575

**D. TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY**

GEF Agency	Type of Trust Fund	Focal Area	Country Name/ Global	(in \$)		
				Grant Amount (a)	Agency Fee (b) <sup>2</sup>	Total c=a+b
UNEP	GEF TF	Climate Change	Bolivia	3,013,699	286,301	3,300,000
UNEP	GEF TF	Chemicals and Waste	Bolivia	45,662	4,338	50,000
<b>Total Grant Resources</b>				3,059,361	290,639	3,350,000

<sup>1</sup> In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table. PMC amount from Table B should be included proportionately to the focal area amount in this table.

<sup>2</sup> Indicate fees related to this project.

**E. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:**

Component	Grant Amount (\$)	Co-financing (\$)	Project Total (\$)
International Consultants	118,224	0	118,224
National/Local Consultants	442,000	838,000	1,280,000

Note:

More details are given in Annex E.

**F. DOES THE PROJECT INCLUDE A “NON-GRANT” INSTRUMENT?**

N/A

## PART II: PROJECT JUSTIFICATION

### A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN OF THE ORIGINAL PIF<sup>4</sup>

The project design is in line with the original PIF although some changes have been introduced in the order of presentation and wording of outcomes and outputs as shown and explained in the table below. This was decided guided by new data and information collected during the project design (PPG) phase with inputs and suggestions provided by public authorities and stakeholders.

	Approved PIF framework	Project framework	Explanation of changes
<b>Component</b>	<b>1.National policy and regulation development to promote the rapid transition to efficient lighting</b>		
<b>Outcome</b>	1.1 National Efficient Lighting Strategy employing integrated policy approach to phasing out inefficient incandescent lamps	1.1. National efficient lighting strategy employing the integrated policy approach to phasing out inefficient incandescent lamps endorsed.	<i>It was made clear that strategy should be endorsed.</i>
<b>Outputs</b>	1.1.1 Comprehensive policies implemented to ensure a successful transition to efficient lighting market including financial mechanisms to support Bolivia in its efforts, and, standards and labeling activities harmonized regionally to achieve maximum lighting market transformation 1.1.2 National legislation to establish and enforce minimum energy performance standards (MEPS) for lamps 1.1.3. Monitoring, verification and enforcement (MVE) frameworks created to ensure compliance 1.1.4 Enabling regulatory environment and legal frameworks to ensure environmentally sound life-cycle management of lamps 1.1.5 Public communications and awareness raising activities designed and implemented to increase public acceptance of high efficiency products, with an understanding of economic and environmental benefits	1.1.1 Comprehensive policies to ensure a successful transition to an efficient lighting market to support Bolivia in its efforts, and, standards and labeling activities harmonized regionally to achieve maximum lighting market transformation developed. 1.1.2 National legislation to establish and enforce minimum energy performance standards (MEPS) for lamps developed. 1.1.3. Monitoring, verification and enforcement (MVE) frameworks created to ensure compliance. 1.1.4 Enabling regulatory environment and legal frameworks in place, to ensure environmentally sound life-cycle management of lamps. 1.1.5 Public communications and awareness raising activities designed to increase public acceptance of high efficiency products, with an understanding of economic and environmental benefits.	<i>All outputs were slightly rephrased to adapt the wording to the output level (except from 1.1.3 which remains the same)</i>
<b>Component</b>	<b>2. Creation of monitoring, verification and enforcement (MVE) capacities to ensure effective transition to efficient lighting.</b>		
<b>Outcome</b>	2.1 Implementation of a well-functioning MVE system including the creation of testing capacities in Bolivia or in the region	2.1 Capacities to Monitor, Verify and Enforce energy efficient lighting products are created in Bolivia.	<i>The outcome is focused now on capacity building.</i>
<b>Outputs</b>	2.1.1 Implementation of legal and administrative processes to improve compliance with national or regional standards 2.1.2 Technical training and support to government authorities and customs administrations 2.1.3 Creation or strengthening of national and regional laboratories to verify compliance with standards	2.1.1 Legal and administrative processes of monitoring, verification and enforcement to improve compliance with national or regional standards developed. 2.1.2 Technical training and support to government authorities and customs administrations delivered. 2.1.3 Technical training and support to national laboratories to verify compliance with standards and promote regional cooperation provided.	<i>2.1.1 and 2.2.2 outputs were slightly rephrased to adapt the wording to the output level 2.1.3 was modified to avoid confusion and to be more aligned with the project scope (the project do not include the creation of a laboratory).</i>
<b>Component</b>	<b>3. Ensuring environmentally sound management for a sustainable transition to efficient lighting.</b>		
<b>Outcome</b>	3.1 Implementation of a national system to collect, recycle or responsibly dispose of spent lighting products that may contain valuable and/or hazardous materials	3.1 Government of Bolivia is able to enact a national plan to collect, recycle and/or responsibly dispose of spent lighting products that may contain valuable and/or hazardous materials.	<i>The outcome is focused on a national plan enacted and not the implementation of the system itself.</i>
<b>Outputs</b>	3.1.1 Development of a national framework and strategy for environmentally sound management of lighting products 3.1.2 Provide training to governmental authorities, retailers and collection services	3.1.1 National framework and strategy for environmentally sound management of lighting products developed. 3.1.2 Training to governmental authorities, retailers and collection services provided.	<i>All outputs were slightly rephrased either to adapt the wording to an output level or to have a consistent wording style.</i>

<sup>4</sup> For questions A.1 –A.7 in Part II, if there are no changes since PIF and if not specifically requested in the review sheet at PIF stage, then no need to respond, please enter “NA” after the respective question.

	3.1.3 Awareness raising and communication campaigns to promote collection and recycling of spent lamps 3.1.4 Implementation of waste management systems for spent lamps, including facilities and international coordination for the environmentally sound export/import of lamp waste	3.1.3 Awareness raising and communication campaigns to promote collection and recycling of spent lamps carried out. 3.1.4 Waste management systems for spent lamps, including the design of a collection and recycling service organization (CRSO), and international coordination for the environmentally sound export/import of lamp waste developed.	
<b>Component</b>	<b>4. Lighting innovation: accelerating the use of Solid State Lighting (including light emitting diodes (LEDs)) and controls.</b>		
<b>Outcome</b>	4.1 Agree to increase use of solid state lighting and controls in the domestic, commercial/industrial and outdoor lighting applications	4.1 Consensus reached by consumers and decision makers in government and private sector on the increased use of solid state lighting and lighting controls in the domestic, commercial/industrial and outdoor lighting applications.	<i>The actors of the consensus were specified.</i>
<b>Outputs</b>	4.1.1 Enhance National Efficient Lighting Strategy with more stringent MEPS, taking into account advanced lighting technologies and systems. 4.1.2 Supporting policies to increase user acceptance and demand for high efficiency products and systems. 4.1.3. MVE scheme to ensure high quality products that will deliver the expected energy and GHG emission benefits.	4.1.1 National efficient lighting strategy with more stringent MEPS, taking into account advanced lighting technologies and systems, further developed. 4.1.2 Supporting policies delivered to increase user acceptance and demand for high efficiency products and systems. 4.1.3. MVE scheme to ensure high quality products that will deliver the expected energy saving and GHG emission reduction benefits developed.	<i>All outputs were slightly rephrased either to adapt the wording to the output level or to have a consistent wording style.</i>
<b>Outcome</b>	4.2 Show sustainable benefits of advanced lighting systems.	4.2. Municipal governments made aware of the benefits of advanced lighting systems through demonstration programs of locally appropriate street lighting LEDs and controls.	<i>The initial outcome was considered too vague, the new wording specifies to whom, how and in which sectors the benefits will be demonstrated.</i>
<b>Outputs</b>	4.2.1 Support the design and evaluation of a demonstration program for locally-appropriate LEDs and lighting controls for Bolivia's selected stakeholder groups (i.e. low income residents).	4.2.1 Demonstration program for locally appropriate LEDs and lighting controls for Bolivia's selected stakeholder groups (i.e. public lighting consumers) designed and delivered.	<i>After consultation with the Government of Bolivia during the preparation phase, it was decided to replace street lighting lamps as project pilots in a selection of municipalities.</i>
	4.2.2 Procure and install LED and controls systems demonstrations.	4.2.2 LED and controls systems procured and installed through the demonstration program. 4.2.3 Gender mainstreaming in Outputs 4.2.1 and 4.2.2 conducted	<i>Output was slightly rephrased to be clearer. Output included following new UNEP guidelines on gender</i>

At this stage, secured co-financing amounts to USD 13,467,575.

Despite the important work done looking for additional sources of co-financing, it was not possible to find additional partners able to commit financially to the project at this stage. Several municipalities were approached and some showed interest in the project. However, the legal framework limits the possibility of financial commitment of local authorities for the project period. The law in Bolivia requests municipalities to decide their budgets on a yearly basis (from one year to another), that is why the commitment from Municipality of La Paz signed in 2015, shows its commitment only for the year of 2016. Nevertheless, the project will work with municipalities during implementation to identify relevant lighting and waste management programs that can be considered as leverage and linked to the technical assistance of the project. La Paz municipality has committed to USD 197,575, which is the major difference with the indicative co-finance at the PIF stage. This is due partly because municipalities can only commit to a budget for the following year. Municipalities engaged in the project will either provide or update their commitments annually for the coming year.

At this stage, private sector has committed to USD 1,800,000 in-kind contribution and UNEP to USD 80,000.

In addition, the Ministry of Hydrocarbons and Energy has identified related undertaken projects and has committed to an in-kind contribution of USD 7,390,000. In the same way, the Ministry of Environment and Water has proven its interest on tackling solid waste management and has significantly increase its co-finance to 4 million USD in-kind.

The table below clearly explains the differences from the indicative co-finance at PIF stage.

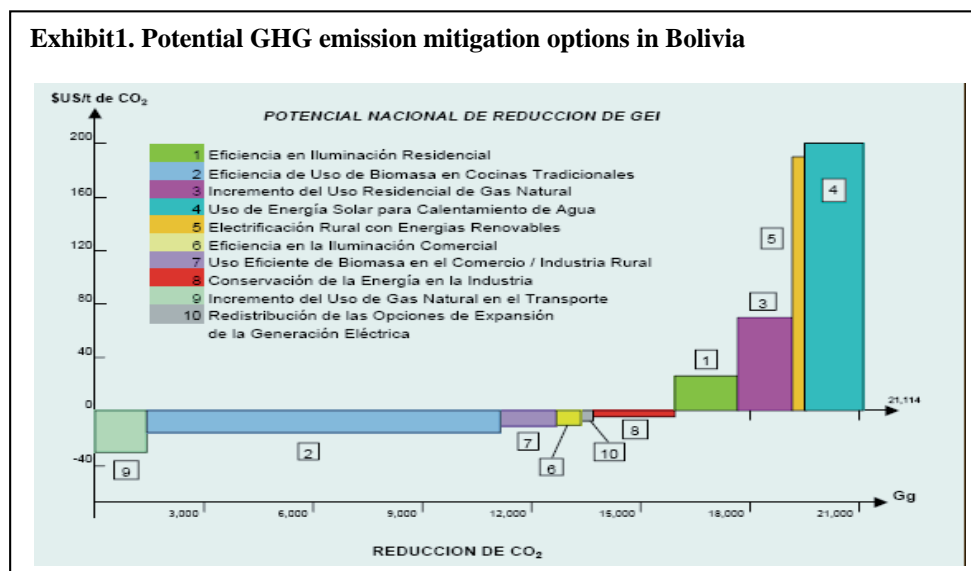
Source of co-finance	Indicative co-finance at PIF stage	Secured co-finance during preparation phase	Explanation of changes
Ministry of Hydrocarbon and Energy	3,975,000	7,390,000	<i>The National Government of Bolivia has identified additional activities in energy efficiency programs that contribute directly to components 3 and 4.</i>
Ministry of Environment and Water	2,900,000	4,000,000	
Municipality of La Paz	2,900,000	197,575	<i>Municipality of La Paz as all local authorities in Bolivia cannot commit to more than one year budget, this amount has been voted in 2015 to be invested during 2016.</i>
Osram	1,000,000	-	<i>OSRAM was very interested in the project during the PIF phase. However, a few years later, the context has changed and they are currently reducing significantly their presence in the region.</i>
Philips Lighting	1,000,000	1,500,000	<i>Philips has increased its support to the project.</i>
National Lighting Test Center, China (NLTC)	200,000	300,000	<i>GELC has identified additional sources to support the MVE system.</i>
UNEP	100,000	80,000	<i>One of the sources of co-finance identified was a fund from the Australian government, this fund is no longer available.</i>

**A.1 National strategies and plans** or reports and assessments under relevant conventions, if applicable, i.e. NAPA NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, Biennial Update Reports, etc.

Bolivia ratified the United Nations (UN) Framework Convention on Climate Change in 1994 and the Kyoto Protocol in 1999. The **Second National Communication** (submitted in 2009) lists a range of climate change mitigation options in section 5.1, identifying residential lighting as an important cost-effective mitigation option, as indicated in Exhibit 1.



**Exhibit1. Potential GHG emission mitigation options in Bolivia**



As non-annex I party to the United Nations Framework Convention on Climate Change (UNFCCC), the national communication of Bolivia to the UNFCCC clearly identifies energy efficiency as a critical path to reduce CO<sub>2</sub> emissions. The project is in line with Bolivia's national priorities and will contribute directly to its sustainable development. According to the provisions of Supreme Decree 29894 of February 7, 2009 in its Article 61, the Vice Ministry of Energy Development (VMDE), within the Ministry of Hydrocarbons and Energy, among other duties, shall: propose comprehensive planning of the energy sector in the medium and long terms; coordinate with deputy ministers and institutions sector activities related to energy policy and the environment; develop and evaluate the country's energy policy to ensure the efficient use of Bolivia's energy resources; and coordinate with the respective deputy ministers the proposal of energy efficiency policies.

Bolivia's Supreme Decree 29466 of March 5, 2008 established the National Energy Efficiency Program (NEEP), which establishes the following lines of action: (i) implement energy efficiency criteria for supply and demand of electricity and for monitoring and control of national energy efficiency; (ii) incorporate international mechanisms for energy efficiency; (iii) develop a policy and regulatory framework for the National Energy Efficiency Program; (iv) implement a system of certification of energy efficiency; (v) develop tools and economic incentives, tax and financial efficiency; and (vi) develop sector programs for energy efficiency in the residential sector, the public sector, industry, energy transformation and technological innovation.

With regard to identified national development priorities, Bolivia's UNDAF (UN Development Assistance Framework), 2013-2017 mentions in its Result #4 as output 4.3.1 "National capacities improved for the adaptation and mitigation of climate change" with "public investment in climate change adaptation and mitigation" as an indicator.

Regarding international conventions addressing hazardous components and waste issues, Bolivia signed the **Minamata Convention on Mercury** on October 10, 2013. Moreover, Bolivia is also party to the Basel convention on the control of transboundary movements of hazardous wastes and their disposal, which it ratified on November 15, 1996, and entered into force in 1997.

## **A.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities**

The project is in consistency with the GEF-5 Climate Change Focal Area Objective 1 (CCM-1) that deals with the promotion, demonstration, deployment, and transfer of innovative low-carbon technologies. In particular, the project aims to promote new high efficiency lighting (such as LEDs) and controls (Component 4). Lighting is a major electricity-consuming appliance in all buildings and sectors, so the project is also consistent with GEF climate change focal area objective 2 (CCM-2). Additionally, the project contributes to its Chemicals Strategy Objective on sound

chemicals management and mercury reduction (CHEM-3), by addressing the problem caused by spent lamp inappropriate disposal and mercury recovery from CFLs and other mercury-containing lighting products (Component 3).

For projects funded from LDCF/SCCF: the LDCF/SCCF eligibility criteria and priorities:

N/A

For projects funded from NPIF, relevant eligibility criteria and priorities of the Fund:

N/A

### **A.3. The GEF Agency's comparative advantage:**

The GEF Council document GEF/C.31/5 mentions 'climate change' as an area in which UNEP has a comparative advantage. The document mentions that UNEP's work builds on its expertise in assessment, standard setting, methodology development, and demonstration. Much of UNEP's work takes on a market sectoral approach responding to environmental drivers.

UNEP provides three types of services: (a) in-depth assessment and analysis of opportunities for reducing greenhouse gas emissions through new technologies, as well as the promotion of global norms and standards for these technologies; (b) activities, training and application of financial innovative mechanisms that promote private sector investment and help expand markets for low-carbon technologies, goods, and services; and (c) training and other institutional support that promotes policy development and planning processes consistent with evolving global norms. UNEP staff in its Regional Office for Latin America and the Caribbean (ROLAC), which is based in Panama City, will also be involved in supporting the project. The project is in line with UNEP Medium-Term Strategy (MTS) and Program of Work (PoW), as approved by the UNEP Governing Council, as well as with UNEP's climate change strategy, which is structured around four themes – mitigation, adaptation, science, and communication - and UNEP-DTIE<sup>5</sup> is currently engaged in a number of projects and programs designed to promote energy efficiency and renewable energy technologies. UNEP will support the project with in-kind co-financing of USD 80,000.

#### *The UNEP-GEF en.lighten initiative*

UNEP implements the en.lighten initiative, funded by the GEF. The UNEP-GEF en.lighten initiative was established in 2009 to accelerate the global market transformation to environmentally sustainable, energy efficient lighting technologies, as well as to develop strategies to phase-out inefficient incandescent lamps to reduce CO<sub>2</sub> emissions and the release of mercury from fossil fuel combustion.

The initiative established a Center of Excellence with a global network of lighting specialists, governments, lighting manufacturers and civil society organizations to assist countries in accelerating market transformation to environmentally sustainable, efficient lighting. The en.lighten initiative developed a consensual methodology - the Integrated Policy Approach - and best practice guidance, published online as "The Efficient Lighting Toolkit". A number of technical publications and policy guidebooks, as well as online tools such as its global policy map, country lighting assessments, efficient lighting savings forecasting model are also made available to support Bolivia.

As of February 2015, sixty-six countries from Africa, Asia, Europe, Latin America, the Caribbean and the Middle East have joined the en.lighten Global Efficient Lighting Partnership Programme. These countries have committed to putting in place regulations and policies to phase-out inefficient incandescent lamps by the end of 2016.

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<sup>5</sup> Division of Technology, Industry, and Economics.

### **The en.lighten initiative's Integrated Policy Approach**

The task forces of international experts convened by the en.lighten initiative concluded that using an integrated policy approach would ensure that all pertinent policy aspects related to energy efficient lighting are considered when countries develop their phase-out strategies. The outcome of this public-private consultation process includes four elements:

- Minimum energy performance standards (MEPS) to increase the average energy efficiency of individual product classes
- Supporting policies and other mechanisms (fiscal policies, labeling and consumer information) to ensure that MEPS can be implemented successfully and permanently
- Monitoring, verification and enforcement (MVE) to protect the market from products that fail to perform as declared or required and increase compliance with established MEPS
- Environmentally sound management of lighting products to minimize the environmental impacts that occur during each phase of a lamp's life, including end of life

Countries determine how these elements fit within their national context. An integrated approach involves all relevant authorities and stakeholders. This includes Ministries of Energy and Environment, energy efficiency agencies, private sector organizations (lamp manufacturers, retailers, distributors and others in the supply chain) and civil society groups. Establishing an integrated National efficient lighting strategy ensures long-term, substantial energy and financial savings and environmental benefits such as reductions of greenhouse gas (GHG) emissions.

#### **A.4. The baseline project and the problem that it seeks to address:**

##### **1) Energy and energy efficiency**

Bolivia is a net importer of oil. In 2012, Bolivia's total oil production was 57,000 barrels per day (bbl/d), while consumption was around 62,000 bbl/d. The country has two oil refineries with a total crude oil distillation capacity of around 41,000 bbl/d. Bolivia is the third-largest natural gas producer in mainland South America. Dry natural gas production in Bolivia was 558 billion cubic feet (bcf) in 2011. Hydrocarbons, primarily natural gas, are an important element of Bolivia's economy and account for 30 percent of total public sector revenue and natural gas exports account for around 50 percent of total export revenue in 2011-2012 (IMF data, 2012).

Total installed capacity in 2012 was 1.88 GW, of which 73.7% was thermal production, primarily natural gas, and 26.3% hydroelectric (the contribution of other renewables is almost negligible)<sup>6</sup>. Total electricity production in the same year amounted to 7,661 GWh with consumption at 6,614 GWh. The electrification rate stood at 82.3% in 2012, but the figure masks major disparities for urban and rural populations; 95.5% of urban cities dwellers have access to electricity, compared to 57.18% of those in rural areas.

The **Electricity Law** 1994/1604 mandated the privatization of the electricity system and the unbundling of generation, transmission and distribution activities, which had all been in the hands of ENDE (*Empresa Nacional de Electricidad*) the vertically integrated public utility, whose assets were privatized in the 1990s. Currently, there are eight electricity generation companies in the interconnected system. The three largest companies alone represent 70% of the total generation. The national electricity company, ENDE, was essentially re-founded in 2008 after its assets had been privatized in the 1990s. In May 2010, the government expropriated four electricity firms that accounted for more than

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<sup>6</sup> Source: *Anuario Estadístico 2012, Autoridad de Fiscalización y Control Social de Electricidad*

half of the electricity market after failed contract renegotiations: Corani, Guaracachi, Valle Hermoso and ELFEC. The nationalizations returned the firms' assets to the recently reconstituted ENDE, controlling about 80% of grid-fed generation.

The *Comité Nacional de Despacho de Carga* (CNDC, National Committee for Load Dispatch) is responsible for operating the SIN. The largest company serving the SIN is the *Compañía Boliviana de Energía Eléctrica* (COBEE), which serves the region surrounding La Paz. The other two are *Empresa Eléctrica Guarachi* (EGSA) and *Empresa Eléctrica Corani* (CORANI). Currently, there are two transmission companies in the SIN, *Transportadora de Electricidad* (TDE), and ISA Bolivia, which runs 53% of the transmission network in Bolivia. Six existing distribution companies enjoy a geographic monopoly in their concession areas. The largest company is Electropaz, followed by *Empresa de Luz y Fuerza Eléctrica Cochabamba* (ELFEC) and the Rural Electrification Cooperative (CRE), which operates in the Department of Santa Cruz<sup>7</sup>. After being nationalized in 2012, Electropaz was renamed DELAPAZ.

Electricity tariffs in Bolivia are far lower than average tariffs in Latin America. For example, the average residential tariff in the area served by DELAPAZ in December 2012 was about cUSD/kWh 7.96, while the average tariff for commerce was cUSD/kWh 11.54, and for industry was cUSD/kWh 5.66. In 2006, the “dignity tariff” was introduced, a scheme under which poorer customers got a 25% cut in their electricity bills, paid for by the companies.

With respect to the residential sector, the National Energy Efficiency Program was launched with a campaign on free replacement of incandescent bulbs with compact fluorescent ones. The first phase of this program, from mid-2008 to mid-2009, consisted of the distribution of around 6.6 million CFLs (18 W) to 1.30 million Bolivian households. According to CNDC information, energy consumption decreased, especially in the (upper) high block (which accounts from 19:00h to 23:00h), enabling energy savings of 0.44 GWh/day and 72 MW of peak demand<sup>8</sup>. Since this distribution campaign had positive effects in energy savings but did not change the market, it was followed by a second phase (2011-12) in which about 10 million lamps were distributed. However, according to regional lighting experts, these distribution campaigns did not lead to a total transformation of the market nor a behavior change, and a significant percentage of consumers are still selecting their lighting products based on the initial purchasing cost and not the operational cost. An evaluation is needed to measure what the impact of the large-scale replacement program was on the mix of incandescent–CFLs on the annual sales and stock of installed lamps.

In parallel, awareness campaigns for the rational use of electricity have taken place, such as: "Move your electricity consumption off-peak" and "If you turn the light off, you won't pay for it." While these activities are focused on promoting energy conservation, they also represent the first awareness raising activities about energy use among Bolivian citizens.

## **2) Limited energy labeling and standards, and monitoring, verification, and enforcement mechanisms in Bolivia for lighting products**

The National Energy Efficiency Program lamp replacement campaign's positive results in terms of energy savings are significant and boosted the distribution of new efficient lamps in the lighting market. Regarding sustainability of lamp replacement on the longer run, standards or regulations such as mandatory consumer labels for CFLs were not previously established, which impedes consumers from distinguishing quality CFLs from substandard products. Consumers therefore received CFL lamps, but did not know which ones were the most efficient lamp models available on the market and what each type of lamp offers in terms of attributes and performance, and cost and lifetime.

Apart from such replacement programs, one of the latest efforts in Bolivia focuses on strengthening the legal framework to phase out the import of incandescent lamps through customs policies by increasing import taxes on incandescent

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<sup>7</sup> Most of the department of Beni, all Pando and Tarija, and the eastern region of Santa Cruz are not integrated in the SIN. As a result, there are vertically integrated operators that provide the service. The most important operators are SETAR (Tarija), and CRE (Santa Cruz area).

<sup>8</sup> <http://www.hidrocarburosbolivia.com/bolivia-mainmenu-117/energia/61325-economizaron-72-mw-con-los-focos-ahorradores.html>

lamps and lowering customs taxes on efficient lamps. However, prices for incandescent lamps are still lower than good quality CFL lamps, and in a country with economic difficulties such as Bolivia, the initial cost is a key factor of decision. Therefore, additional supporting policies based on a national efficient lighting strategy as proposed by this project are essential to complement current efforts.

Regarding labeling, the following documents have been approved as standards by the national standardization body, the *Instituto Boliviano de Normalización y Calidad (IBNORCA)*<sup>9</sup>:

- NB 87001:2006: Energy efficiency – Incandescent bulbs – Specifications and labeling.
- NB 87002:2013: Energy efficiency – Circular and tubular compact fluorescent bulbs – Specifications and labeling.

The efficiency label specified in such standards allows for lamp efficiency reporting with test parameters and values. The above mentioned standards give Bolivia the basis for developing and establishing the minimum energy performance standard (MEPS), which are regulatory tools that increase the average energy performance of particular classes of products and contribute to eliminate less efficient products on the market by defining minimum levels of energy performance that a product of a particular class should comply with to be placed in the market. However, the above standards are not mandatory and monitoring, verification and enforcement (MVE) mechanisms for implementing such standards are yet to be established. In the absence of qualified institutions in Bolivia that carry out product testing, Phocos América Latina, a photovoltaic panels manufacturer has ventured into LED lighting technology and has installed a laboratory to test the luminous efficiency of its products. This is an isolated effort that shows the need to work in an integrated manner. Major municipal governments have their own mechanisms to test the lamps acquired for street lighting.

### **3) Weak technical capacities of institutions involved in policy development**

- Limited institutional capacity:

One of the main constraints that both the Ministry of Hydrocarbons and Energy and the Ministry of Environment and Water of Bolivia have is their limited institutional capacity in terms of staff, knowledge and financial resources, to formulate an efficient lighting strategy and to define policies for the prevention and control of toxic solid waste management, respectively. In this sense, the project, in all its components, will provide specialized technical assistance and training throughout its implementation, thereof strengthening the capacities of human resources and institutions involved. As a result, Bolivia will have a National efficient lighting strategy and comprehensive policies designed to ensure a successful and sustainable transition to efficient lighting.

- Weak legislative capacity:

Although there were advances in terms of some specifications and labeling for fluorescent lamps, it is necessary to incorporate relevant standards and technical specifications to be abided by for different types of efficient lamps, and especially for LEDs. This will help introduce this technology in the public lighting procurement budget that is yearly approved by the autonomous municipal governments. All components of the project aim at providing technical assistance and specialized training to the institutions involved, in particular the Ministry of Hydrocarbons and Energy, municipal governments, customs offices, the national standardization body (IBNORCA) and the national metrology institute (IBMETRO)<sup>10</sup>, in order to ensure the implementation of the National efficient lighting strategy and the policies that support its success.

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<sup>9</sup> The *Instituto Boliviano de Normalización y Calidad (IBNORCA)* is a non-profit organization and the national body for standardization. IBNORCA is a correspondent member of ISO, a member of IEC, a member of the Panamerican Standards Commission (COPANT) and of the Mercosur Committee for Standardization (CMN). It also participates in the activities of the Andean Committee for Standardization (CAN) of the Andean Group.

<sup>10</sup> IBMETRO (*Instituto Boliviano de Metrología*) is the national institute for measurements and testing.

Both **IBNORCA** and **IBMETRO** are currently working on establishing quality standards and technical regulations. These institutions will be playing a critical role when the minimum energy performance standards (MEPS) and monitoring, verification and enforcement (MVE) mechanisms are defined, not just because they are the competent authorities for the development of national standards and regulations, but also because they will take part in project implementation.

- Weak monitoring and verification capacity:

**As there are no test laboratories** legally established to carry out energy performance tests for household appliances, lamps and industrial equipment, test laboratories' participation in the program allowed by the municipal governments and public universities will be relevant. The program will offer technical training and advice in order to build national capacities in monitoring and verification.

Although the *Autoridad de Fiscalización y Control Social de Electricidad* (AE) does not have a specific role in terms of energy efficiency, its mandate to monitor the quality of electricity services could be relevant when MEPS are being defined and during their implementation.

#### **4) Weak environmental management of spent lamps**

According to the State Constitution, the Environmental Law establishes that the Ministry of Environment and Water has to define the policies and general regulations for the prevention and control of solid waste management. The Environmental Law, whose objective is to protect and conserve the environment, also establishes that the autonomous municipal governments have responsibility for planning the organization and implementation at the various stages of solid waste management; setting rates of urban cleaning to ensure sustainability of the service, and developing specific regulations for the handling of hazardous waste.

The Supreme Decree 24176 of December 8, 1995 regulates activities that operate with hazardous substances, establishing procedures for handling, control and risk reduction. According to this decree, the Ministry of Environment and Water must define policies for the proper use and handling of hazardous substances in the context of environmental protection strategies; issue technical standards for the handling of hazardous substances in coordination with the competent prefectural and sectorial organizations; and establish standard tests for the determination of hazardous substances with the competent bodies.

Under this legal framework, there is specific regulation for the management of solid waste such as paper, plastic bottles, glasses, used batteries and solid waste from health facilities, and therefore there are private and public companies involved in the management, collection, recycling and disposal of such solid waste. However, no such regulation was designed for used fluorescent lamps or for LEDs.

According to officials responsible for the environmental management of solid waste at the municipal government of La Paz, there is concern about the lack of regulation and control systems for used fluorescents bulbs, but the main constraint is the lack of knowledge to develop such regulation. Nonetheless, there are currently some legislative efforts in Bolivia towards the development of regulations for lamp waste management. The Ministry of Environment and Water is planning on working with the national standardization body, IBNORCA, in this matter. It would also like to develop a legislation on waste management including the extended producer responsibility for electrical and electronic equipment waste. In addition, in the framework of a triangular cooperation between Germany, Costa Rica and Bolivia, the Ministry of Environment and Water contemplates developing a national strategy for electrical and electronic equipment waste management (including luminaires).

During the initial phase of the project, the current legislative and institutional frameworks will be thoroughly assessed in order to further identify the needs and gaps to be addressed to enhance the environmental management of spent lamps.

## 5) Limited public awareness of the financial benefits of energy efficient lighting

In order to disseminate information about the objectives of the project “Delivering the transition to energy efficient lighting in Bolivia”, meetings and workshops with the following organizations were held:

- The Federation for Municipal Associations of Bolivia (FAM - Bolivia), which is the top organization of the municipal association movement representing all autonomous municipalities of the country through the nine departmental municipal associations of the country.
- Municipalities Association of the Santa Cruz Department – AMDECRUZ<sup>11</sup>
- Municipalities Association of the La Paz Department – AMDEPAZ<sup>12</sup>
- The Operating Unit of Public Lighting of the Autonomous Municipal Government of Santa Cruz de la Sierra, La Paz, El Alto, Viacha, Sacaba, Warnes, La Guardia, Yacuiba, Villamontes and Tarija.

Although municipal governments expressed their understanding of the potential savings that can be achieved with LED lights, they expressed their lack of knowledge of technical and economic issues.

They have an urgent need for specialized support in terms of training and technical assistance to resolve questions related to technical aspects of LED technology but also related to the regulatory and institutional framework required for its operation, management, monitoring, and control.

To have technical institutions and foundations supporting the transition to efficient lighting, municipalities considered essential to design and implement demonstration projects in coordination with electricity distributors, retailers and manufacturers of LED luminaires.

## 6) Inefficient lamps are still significantly present in the market

One approach to assess the current lighting situation in Bolivia is to analyze the sales in the market by type of technology. Since Bolivia does not have local production of lamps, it is assumed that sales in the market are equal to lighting products imports. The estimation in the table below is based on data extracted from the UN Comtrade Database until 2015 and regional estimations from the en.lighten team. The amount of sold lamps has been projected to 2016 using the same 2.8% annual growth rate and keeping the technology mix the same as 2015.

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<sup>11</sup>AMDECRUZ associates 55 of the 56 municipalities of Santa Cruz (see Annex 2) for a list of such municipalities).

<sup>12</sup>AMDEPAZ associates all 87 municipalities of the Department of La Paz (see Annex 3 for a list of such municipalities)

	Imports 2015 (source: en.lighten 2016, based on comtrade data until 2015)			Imports Linear Projection 2016	Baseline market share by technology
	Total	Residential	Other		
Incandescent Lamps	22,172,000	15,664,000	6,508,000	22,793,000	68.8%
Tungsten Halogen	1,632,000	653,000	979,000	1,678,000	5.1%
Compact Fluorescent Lamps (CFL)	5,120,000	1,536,000	3,584,000	5,263,000	15.9%
Light Emitting Diode (LED)	662,000	320,000	342,000	681,000	2.1%
High Intensity Discharge	236,000	14,000	222,000	242,000	0.7%
Efficient High Intensity Discharge	56,000	1,000	55,000	58,000	0.2%
Linear Fluorescent	1,967,000	450,000	1,517,000	2,021,000	6.1%
Efficient Linear Fluorescent	403,000	24,000	379,000	414,000	1.2%
<b>TOTAL</b>	<b>32,248,000</b>	<b>18,662,000</b>	<b>13,586,000</b>	<b>33,150,000</b>	<b>100%</b>

The STAP/GEF energy efficiency tool has been used to estimate the impacts of the project based on these last market sales figures (results are presented in Annex D and the Excel tool itself is also submitted with this document). For this projection, it is considered that the project will start in 2016 and will finish in 2018, but the adoption of the first MEPS for phasing out inefficient lighting products and thus the visible impacts of the project will start in 2021. In order to be conservative, it is considered that the MEPS for LEDs will be only adopted by 2025. Finally, the period of influence of the project is 10 years after the completion. In order to have conservative estimations, for the GEF scenario projections, it is considered a level of compliance with adopted standards of only 80%. This explains that there is not a complete phase out of incandescents. The following table shows the extract of the market projections for the key years to be considered.

	2016		2021				2025				2028			
	Current situation		BAU		GEF scenario		BAU		GEF scenario		BAU		GEF scenario	
	Imports (thousands of lamps)	Share	Imports (thousands of lamps)	Share	Imports (thousands of lamps)	Share	Imports (thousands of lamps)	Share	Imports (thousands of lamps)	Share	Imports (thousands of lamps)	Share	Imports (thousands of lamps)	Share
Incandescent Lamps	22,793	68.8%	14,610	38.4%	8,552	22.5%	5,990	14.1%	3,613	8.5%	3,201	6.9%	727	1.6%
Tungsten Halogen	1,678	5.1%	1,656	4.4%	1,656	4.4%	1,607	3.8%	605	1.4%	1,549	3.4%	657	1.4%
Compact Fluorescent Lamps (CFL)	5,263	15.9%	17,416	45.8%	23,473	61.7%	29,611	69.7%	29,062	68.4%	35,341	76.5%	34,770	75.3%
Light Emitting Diode (LED)	681	2.1%	1,237	3.3%	1,237	3.3%	1,788	4.2%	5,717	13.5%	2,274	4.9%	6,210	13.5%
High Intensity Discharge	242	0.7%	175	0.5%	69	0.2%	103	0.2%	77	0.2%	36	0.1%	36	0.1%
Efficient High Intensity Discharge	58	0.2%	170	0.4%	276	0.7%	282	0.7%	308	0.7%	382	0.8%	382	0.8%
Linear Fluorescent	2,021	6.1%	1,482	3.9%	559	1.5%	905	2.1%	624	1.5%	373	0.8%	373	0.8%
Efficient Linear Fluorescent	414	1.2%	1,314	3.5%	2,236	5.9%	2,217	5.2%	2,498	5.9%	3,019	6.5%	3,019	6.5%
<b>TOTAL</b>	<b>33,150</b>	<b>100%</b>	<b>38,058</b>	<b>100%</b>	<b>38,058</b>	<b>100%</b>	<b>42,503</b>	<b>100%</b>	<b>42,503</b>	<b>100%</b>	<b>46,174</b>	<b>100%</b>	<b>46,174</b>	<b>100%</b>

## 7) Gender situation of Government of Bolivia

The first gender-mainstreaming plan to be drawn up and implemented in Bolivia was the 2001-2003 National Gender Equity Plan, backed by Supreme Decree 26350, which combined sectoral commitments in order to attain joint objectives. Agreement was reached with civil society on a Minimum Gender Platform and, based on a civil society initiative, a mechanism was established and promoted by the State for monitoring and evaluating compliance with government policies on gender issues.

According to UN Women 2014 report, Bolivia was the second country in the world to achieve parity in parliamentary political representation with 53% women in lower house 2014 legislative election.

### A.5. Incremental /Additional cost reasoning:

Describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:

#### 1) Barriers to widespread use of efficient lighting in Bolivia



The programs of massive replacement of incandescent lamps by CFLs during 2008-2012 contributed to energy savings and peak load demand reduction. However, without a proper system to measure its results, it is hard to actually quantitatively estimate the savings. Further, these programs did not address the barriers and gaps the lighting market has that hamper a sustainable transition to efficient lighting. The market in itself has not changed, and the spent CFLs that had been distributed are being replaced by incandescent lamps. The following table describes the barriers and the outputs expected from GEF support.

Description of gap or barrier	Outputs expected from GEF support (incremental reasoning)
<i>Regulatory and institutional</i>	
<p>There are no MEPS for lighting, and existing labels are voluntary. There is no clear strategy or action plan on how to achieve the transition to more efficient lighting (including LEDs) and phase-out incandescent lamps.</p> <p>Lack of technical knowledge on cost, benefits and environmental aspects of lighting products among decision-makers in government, private sector and NGOs.</p> <p>Lack of reliable and consistent market data (including statistics on low-quality lamps), which hampers policy making (target setting; formulation of categories for energy labels).</p> <p>The institutions to be involved in MVE need to be substantially strengthened in order to have effective implementation of a mandatory standards &amp; labeling (S&amp;L) system.</p>	<p>1.1.1 Comprehensive policies developed to ensure a successful transition to an efficient lighting market to support Bolivia in its efforts, and, standards and labeling activities harmonized regionally to achieve maximum lighting market transformation.</p> <p>1.1.2 National legislation to establish and enforce minimum energy performance standards (MEPS) for lamps developed.</p> <p>1.1.3. Monitoring, verification and enforcement (MVE) frameworks created to ensure compliance.</p> <p>1.1.4 Enabling regulatory environment and legal frameworks in place, to ensure environmentally sound life-cycle management of lamps.</p> <p>2.1.1 Legal and administrative processes of monitoring, verification and enforcement to improve compliance with national or regional standards developed.</p> <p>2.1.2 Technical training and support to government authorities and customs administrations delivered.</p> <p>3.1.1 National framework and strategy for environmentally sound management of lighting products developed.</p> <p>4.1.1 National efficient lighting strategy with more stringent MEPS, taking into account advanced lighting technologies and systems, further developed.</p>
<i>Technical</i>	
<p>Testing labs and certification bodies are not involved in lighting testing due to perceived small market. Lamp suppliers face insufficient testing capacity.</p> <p>The country does not have control mechanisms or regulations regarding sustainable management of lamp residues, in particular mercury. The extended producer responsibility principle for waste management is not applied in the country.</p> <p>Bolivia does not have a collection and recycling system in place and there are no incentives for companies to process and manage lamp waste, including mercury.</p>	<p>2.1.3 Technical training and support to national laboratories to verify compliance with standards and promote regional cooperation provided.</p> <p>3.1.2 Training to governmental authorities, retailers and collection services provided.</p> <p>3.1.4 Waste management systems for spent lamps, including the design of a collection and recycling service organization (CRSO), and international coordination for the environmentally sound export/import of lamp waste developed.</p> <p>4.1.3. MVE scheme to ensure high quality products that will deliver the expected energy saving and GHG emission reduction benefits developed.</p>
<i>Market and awareness</i>	
<p>Consumers have been offered CFLs for free, but for future investment decisions in which they have to pay the initial investment (especially among lower-income households), they have to be fully aware of the (initial and lifecycle) cost and other benefits</p>	<p>1.1.5 Public communications and awareness raising activities designed to increase public acceptance of high efficiency products, with an understanding of economic and environmental benefits.</p>

<p>of CFLs.</p> <p>Residential consumers are not fully aware of the benefits of LED lamps over its lifetime and shun such technologies due to the high initial price of LEDs vs CFLs vs incandescent lamps (17:5:1) and/or perceived different lamp characteristics (start-up time, color, temperature, etc.). In addition, there is still a need to educate consumers as to how to read and interpret the information provided on the energy label, especially when introduced to new technologies (such as LEDs). Consumers should be made aware about low-quality products (e.g. CFLs with much shorter lifetimes than the 8,000 hours often claimed) and how to make a proper choice.</p>	<p>3.1.3 Awareness raising and communication campaigns to promote collection and recycling of spent lamps carried out.</p> <p>4.1.2 Supporting policies delivered to increase user acceptance and demand for high efficiency products and systems.</p> <p>4.2.1 Demonstration program for locally appropriate LEDs and lighting controls for Bolivia’s selected stakeholder groups (i.e. public lighting consumers) designed and delivered.</p> <p>4.2.2 LED and controls systems procured and installed through the demonstration program.</p> <p>4.2.3 Gender mainstreaming in Outputs 4.2.1 and 4.2.2 conducted</p>
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## 2) Project scope and activities

### Project goal

The overall objective of the project is to accelerate the transition to energy efficient lighting technologies in Bolivia through the development of a national efficient lighting policy and practical innovative interventions that ensure success of the transition, thereby reducing electricity demand and consumption and the related GHG emissions.

### Component 1. National policy and regulation development to promote the rapid transition to efficient lighting

Outcome: National efficient lighting strategy employing the integrated policy approach to phasing out inefficient incandescent lamps endorsed.

Output	Activities
<p>1.1.1 Comprehensive policies developed to ensure a successful transition to an efficient lighting market, to support Bolivia in its efforts, and, standards and labeling activities harmonized regionally to achieve maximum lighting market transformation.</p>	<p><i>Step 1 - Planning and Preparation</i></p> <ul style="list-style-type: none"> <li>i. Appointment of a national focal point and coordinating committee</li> <li>ii. Definition of strategy’s scope and fundamentals</li> <li>iii. Establishment of national thematic working groups</li> </ul> <p><i>Step 2 - Stocktaking and Assessment</i></p> <ul style="list-style-type: none"> <li>iv. Taking stock of the current energy and electricity use for lighting as well as the shares of lighting technologies in the country</li> <li>v. Identifying the existing legal, policy and institutional frameworks</li> <li>vi. Identifying opportunities for harmonization of existing/planned standards in neighboring countries and principle trading partners</li> <li>vii. Assessing the gaps and opportunities</li> <li>viii. General gender analysis and action plan</li> </ul> <p><i>Step 3 - Strategy Development</i></p> <ul style="list-style-type: none"> <li>ix. Launch of an effective and inclusive process</li> <li>x. Definition of national objectives and priority actions</li> <li>xi. Drafting of the national efficient lighting strategy document</li> </ul> <p><i>Step 4 - Finalization and Adoption</i></p> <ul style="list-style-type: none"> <li>xii. Technical validation of the draft efficient lighting strategy</li> <li>xiii. Obtaining high level political endorsement and commitment</li> </ul>
<p>1.1.2 National legislation to establish and enforce minimum energy performance standards (MEPS) for lamps developed.</p>	<ul style="list-style-type: none"> <li>i. Formation and design of the activity plan of the Work Group 1 on lighting minimum energy performance standards.</li> <li>ii. Development and adoption of new technical standards for lighting products based on international best practices and guideline limits for national standards.</li> </ul>

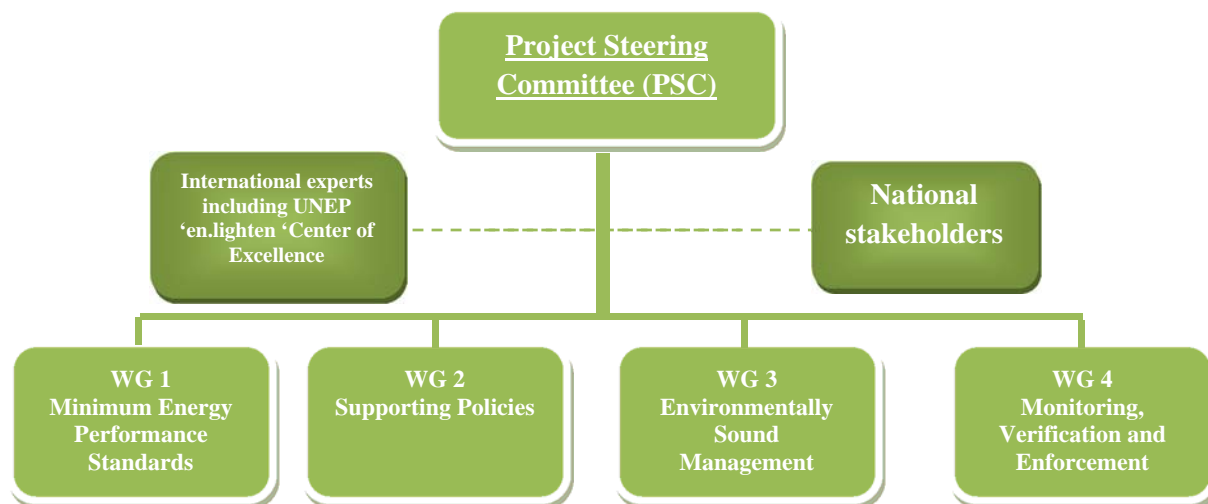
	<p>iii. Establishment of the enforcement mechanism and required capacities to facilitate compliance of lighting products with adopted technical standards.</p> <p>iv. Analysis of customs offices implications and facilitation of connections with Bolivian entities involved in the definition of customs rules, certification, and inspection of lighting products.</p>
1.1.3. Monitoring, verification and enforcement (MVE) frameworks created to ensure compliance.	<p>i. Creation of the regulatory framework that will ensure the monitoring, verification, and enforcement of the MEPS and labels that Bolivia will develop.</p> <p>ii. Training on monitoring, verification and enforcement practices that guarantee the compliance of MEPS and labels, and the phase-out of inefficient lamps.</p> <p>iii. Harmonize product certification processes with the rest of Latin American countries, and especially with international best practices.</p>
1.1.4 Enabling regulatory environment and legal frameworks in place, to ensure environmentally sound life-cycle management of lamps.	<p>i. Set standards for maximum levels of mercury in accordance with global best practices.</p> <p>ii. Develop a legal framework for the environmentally sound management of lighting products at end of life.</p>
1.1.5 Public communications and awareness raising activities designed to increase public acceptance of high efficiency products, with an understanding of economic and environmental benefits.	<p>i. Creation of a locally appropriate communication, information and awareness raising campaign.</p>

Under the UNEP guidelines, a number of preparatory activities have to be planned in order to ensure the successful development of the national efficient lighting strategy for Bolivia mentioned in Output 1.1.1 **“Comprehensive policies developed to ensure a successful transition to an efficient lighting market to support Bolivia in its efforts, and, standards and labeling activities harmonized regionally to achieve maximum lighting market transformation.”**. The first of these activities is the establishment of a sustainable organizational mechanism with responsibility and accountability.

A national coordination committee, as part of the planning and preparation activities, has to define the scope of the national efficient lighting strategy and its fundamentals, initially in an internal workshop. Then the national coordination committee will organize an inception workshop with the participation of international experts in lighting technologies, MEPS, MVE and lighting waste management programs. At the inception workshop, the Ministry of Hydrocarbons and Energy (MHE) will present the national status report on the efficient lighting situation in Bolivia that was prepared. Presentations will also be made by national public and private actors on the country's progress towards efficient lighting.

With inputs from the internal and inception workshops, priority activities for the development of the national efficient lighting strategy will be defined in a clear timeline for its completion and adoption. Based on UNEP en.lighten experience with pilot regions and countries, the development of a national efficient lighting strategy from planning and preparation to finalization usually takes 9 to 15 months.

As part of planning and preparation activities, thematic working groups, following the elements of the integrated policy approach, will be constituted. The working groups will include representatives based on their specific priorities and areas of expertise.



The project's core group determines the composition of the working groups and the way to formalize appointment of members of working groups. The involvement of the selected experts in the working groups shall be voluntary and with no remuneration. The following table presents an initial list of potential participants in each working group.

Minimum Energy Performance Standards	<u>Necessary:</u> Ministry of Hydrocarbons and Energy (VMDE, VMEEA), Ministry of Environment and Water, Ministry of Productive Development and Plural Economy, <i>Autoridad de Fiscalización y Control Social de Electricidad</i> , Municipalities, IBNORCA, IBMETRO. <u>Optional:</u> Private Sector
Supporting Policies and Mechanisms	<u>Necessary:</u> Ministry of Hydrocarbons and Energy (VMDE, VMEEA), utilities, Ministry of Economics and Finance, rural electrification agencies. <u>Optional:</u> International cooperation, national banks, lighting manufactures, UNEP
Environmentally Sound Management	<u>Necessary:</u> Ministry of Hydrocarbons and Energy (VMDE), Ministry of Environment and Water, municipalities, waste management agencies. <u>Optional:</u> Lighting manufacturers, Ministry of Health, international cooperation.
Monitoring, Verification and Enforcement	<u>Necessary:</u> Ministry of Hydrocarbons and Energy (VMDE) testing laboratories (universities and municipalities), customs, Ministry of Productive Development and Plural Economy (MPDPE), rural electrification agencies. <u>Optional:</u> Consumer protection agency, lighting manufacturers, Global Efficient Lighting Center

As a result of the second step for Output 1.1.1., relating to the stocktaking and assessment, a national efficient lighting status report will be prepared to provide a general overview of the Bolivian lighting situation, including past and current efforts, activities and stakeholders related to energy efficient lighting. Different lighting aspects will be described thoroughly, such as the current energy consumption, GHG emissions, amount of inefficient and efficient lamps in place on the national market, and projections on future consumption and emissions.

As part of the initial assessment activities, a legal, policy and institutional frameworks analysis will be developed, as well as an evaluation of the past efficient lighting programs. Additionally, the main obstacles and key problems that need to be addressed in order to achieve a successful transition towards efficient lighting will be identified. These can include education, capacity, governance, legal issues and more. Finally, a gender assessment on the current situation in Bolivia will be conducted and a Gender Action Plan (developed) to mainstream gender in the activities of this GEF project as well as in the design of the National Energy Efficiency Strategy.

Collaboration and support expected from UNEP enlighten and/or other international development agencies to assist Bolivia in the transition process will be specified. In addition, potential regional or bilateral cooperation opportunities and public-private partnership initiatives will be identified.

The third step is the development of the national efficient lighting strategy itself; the national coordination committee should formulate the strategy on the basis of the current national efficient lighting situation and the conclusions of a multi-stakeholder national consultative workshop. To ensure that the process is effective and inclusive, the main elements of the efficient lighting strategy will be defined in a transparent manner, based on consultations with a broad range of national stakeholders. Participants will include all the key representatives from relevant national institutions and organizations such as ministries, utilities, private sector companies, nongovernmental organizations, potential donors, financiers and other stakeholders as appropriate, international and/or regional lighting experts and representatives of the sponsoring institutions. Participants will review results of the national efficient lighting status report and proposed work plan for the national efficient lighting strategy development process.

Based on the Bolivian priorities and the work plan agreed upon at the inception workshop, the main components of the national efficient lighting strategy will be defined.

The draft national efficient lighting strategy prepared by the working groups and national coordinator will be circulated for comments and inputs to stakeholders ahead of a final consultation workshop aiming at achieving a consensus for its adoption.

A finalization workshop will be organized with national stakeholders for the national coordinating committee to present the components of the draft national efficient lighting strategy.

Participants will include representatives of organizations and commissions, ministers or vice ministers (hydrocarbons and energy, environment and water, economy and finance, or others); funders (such as development banks); private sector; civil society representatives; media; and any project sponsors.

The final step in strategy development is the high level political endorsement, which should be obtained after the public consultation process is complete. A high level meeting should be organized in order to get a formal commitment to implement the strategy, including promulgating necessary legislation or establishing the legal framework.

Regarding Output 1.1.2. **“National legislation to establish and enforce minimum energy performance standards (MEPS) for lamps developed.”** all the activities will be oriented towards the design or establishment of national mandatory lighting MEPS, based on global best practice, accepted international standards and national conditions.

As mentioned in point A.4.2, there are two standards approved by IBNORCA, regarding energy efficiency for incandescent bulbs and circular, tubular and compact fluorescents bulbs, which are a basis for establishing the MEPS. However, as the application of those standards is voluntary, it is necessary to establish the appropriate mandatory norm in order to enforce its use.

As mentioned above, the following activities are required to deliver Output 1.1.2. :

- i. Formation and design of the activity plan of the Work Group 1 on lighting minimum energy performance standards.
- ii. Development and adoption of new technical standards for lighting products based on international best practices and guideline limits for national standards.
- iii. Establishment of the enforcement mechanism and required capacities to facilitate compliance of lighting products with adopted technical standards.
- iv. Analysis of customs offices implications and facilitation of connections with Bolivian entities involved in the definition of customs rules, certification, and inspection of lighting products.

The Ministry of Hydrocarbons and Energy, the Ministry of Productive Development and Plural Economy (MPDPE), the Authority of Audit and Social Control of Electricity (*Autoridad de Fiscalización y Control Social de Electricidad* (AE)), municipal governments and utilities will be in charge of the development process of energy efficiency labeling and the establishment of MEPS for efficient lighting.

This will include regulatory and institutional provisions for mandatory certification of lighting products, and improvement of methodological and technological base of national testing laboratories for verification of product conformity. No new testing facility will be created. The project will focus on strengthening existing national/regional laboratories' capacities (including equipment provision).

It is recommended that the *Autoridad de Fiscalización y Control Social de Electricidad* (AE), as regulator and supervisor of the quality of electricity service, be responsible of verification of compliance with MEPS. The function would be assigned by the appropriate legal framework.

Regarding Output 1.1.3. **“Monitoring, verification and enforcement (MVE) frameworks created to ensure compliance.”** the following activities have to be undertaken:

- i. Creation of the regulatory framework that will ensure the monitoring, verification, and enforcement of the MEPS and labels that Bolivia will develop.
- ii. Training on monitoring, verification and enforcement practices that guarantee the compliance of MEPS and labels, and the phase-out of inefficient lamps.
- iii. Harmonize product certification processes with the rest of Latin American countries, and especially with international best practices. This will reduce test times by reducing waiting times faced by providers when certification is required.

Regarding Output 1.1.4. **“Enabling regulatory environment and legal frameworks in place, to ensure environmentally sound life-cycle management of lamps.”** the activities will include:

- i. Setting standards for maximum levels of mercury in accordance with global best practices.
- ii. Developing a legal framework for the environmentally sound management of lighting products at end of life.

In order to meet the need to regulate the handling of toxic solid waste from fluorescent lamps, the program will develop a legal framework for the environmentally sound management of lighting products that is within the framework of existing environmental legislation. Additionally, as Bolivia ratified the Minamata Convention on Mercury, the country will have to design and implement a regulation to control the maximum levels of mercury in lamps that are imported into the country.

Finally, regarding Output 1.1.5. **“Public communications and awareness raising activities designed to increase public acceptance of high efficiency products, with an understanding of economic and environmental benefits.”** the activities will be focused on the design of planned public communications to disseminate the advantages of high efficiency lighting technology.

Component 2. Creation of monitoring, verification and enforcement (MVE) capacities to ensure effective transition to efficient lighting

Outcome: Capacities to Monitor, Verify and Enforce energy efficient lighting products are created in Bolivia

Outputs	Activities
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2.1.1. Legal and administrative processes of monitoring, verification and enforcement to improve compliance with national or regional standards developed.	<ul style="list-style-type: none"> <li>i. Participation in international technical meetings, lighting fairs and/or visit to lighting test laboratories.</li> <li>ii. Assessment and proposal on strengthening MVE for (mandatory) standards and labeling and analysis of capacity building needs.</li> </ul>
2.1.2 Technical training and support to government authorities and customs administrations delivered.	<ul style="list-style-type: none"> <li>i. Technical training sessions on MVE practices and operations to government authorities and customs administrations.</li> </ul>
2.1.3 Technical training and support to national laboratories to verify compliance with standards and promote regional cooperation provided.	<ul style="list-style-type: none"> <li>i. Analysis of capacity of laboratories and strengthening needs, proposing alternatives to control, verify and enforce MEPS and labels in the national market, including alternatives of regional collaboration.</li> <li>ii. Technical assistance support to selected laboratories: harmonization of testing methods and training of technical staff.</li> </ul>

In addition to the policy level MVE component of the strategy treated under Output 1.1.3, Outcome 2.1 will deeply strengthen the operational elements that will guarantee compliance with lighting MEPS. These MEPS will be developed during the project and should become mandatory a couple of years after the end of the project. The success of a transition strategy depends on a well-functioning system of monitoring, control, and testing facilities to ensure enforcement and full compliance with MEPS. Without an effective monitoring, verification and enforcement (MVE) system, poor quality products would still be found on the market and in the end would disappoint users, leading to complaints about the transition to efficient lighting. Activities of an effective MVE system include: the continuous assessment of product efficiency verification processes, the validation of declarations of conformity, and the enforcement of actions against suppliers or retailers of non-compliant products. Any MVE scheme developed will comply with Bolivia's legal system.

Existing lighting test facilities will be assessed to identify the gaps that need to be addressed. A proposal will be made to strengthen laboratory technical and operational capacities. This includes advice and training, via the enlighten expert network, for laboratories that intend to become qualified and accredited in order to test and evaluate the performance of lamps and lighting control products, as well as targeted technical assistance to one or more testing laboratories.

To enhance the MVE capacity in Bolivia, enlighten will facilitate sharing of information and skills between neighboring or similar countries. The project will encourage regional cooperation and harmonization to strengthen MVE schemes and to discourage entry of poor-performance products.

The main actors include institutions in charge of planning; customs operations; the Ministry of Hydrocarbons and Energy; the Ministry of Planning; and the Ministry of Environment and Water.

Component 3: Ensuring environmentally sound management for a sustainable transition to efficient lighting

Outcome: Government of Bolivia is able to enact a national plan to collect, recycle and/or responsibly dispose of spent lighting products that may contain valuable and/or hazardous materials.

Outputs	Activities
3.1.1. National framework and strategy for environmentally sound management of lighting products developed.	<ul style="list-style-type: none"> <li>i. Analysis of issues, options and proposals for environmentally sound management of lighting products in Bolivia (including mercury recovery of fluorescent lamps).</li> <li>ii. Design of an operational framework and development of corresponding legislation and strategy to establish a collection scheme, recycling facilities and/or sound disposal systems, as appropriate, that ensures the sustainable end of life treatment of spent lamps.</li> </ul>

3.1.2 Training to governmental authorities, retailers and collection services provided.	i. Training on environmentally sound management of lighting residues (topics include: national framework, extended producer responsibility, municipal and private operation of collection and recycling services) provided to governmental authorities, retailers and collection services. ii. Develop a technical guidebook providing additional guidelines to the implementation of a collection and recycling scheme for all stakeholders involved.
3.1.3. Awareness raising and communication campaigns to promote collection and recycling of spent lamps carried out.	i. Design and application of collection and recycling gender-sensitive communication campaign.
3.1.4. Waste management systems for spent lamps, including the design of a collection and recycling service organization (CRSO), and international coordination for the environmentally sound export/import of lamp waste developed.	i. Technical assistance support for the design of a collection and recycling services organization (CRSO) for lighting products.

Concerns over the mercury content of CFLs with regard to health and the environment are an obstacle to the use of mercury-added lamps. To overcome this barrier and to address public concerns, en.lighten’s global task force experts recommend that: the doses of mercury in lamps be reduced to the maximum allowable content in line with the Minamata Convention on Mercury; and, countries adopt environmentally sound management systems to ensure that mercury and electronic waste is not released into the environment. This advice is consistent with global agreements such as the Basel Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal, and the Minamata Convention on Mercury.

This component will design a collection and recycling service organization (CRSO) with a collection scheme, recycling and/or sound disposal systems, as appropriate, to ensure the sustainable end of life treatment of spent lamps. Actions will conform to the national legal waste management framework for efficient lighting products developed under Output 3.1.1, which will include the development of legislation regulating the collection and recycling service organization operations, as relevant. Moreover, the overall system will be adapted to the specificities of Bolivia to ensure effectiveness. Under the coordination of the Ministry of Environment and Water, and under the supervision of the Project Steering Committee, the collection and recycling service organization scheme, once developed, will be piloted in selected municipalities, according to criteria to be defined by the Project Steering Committee, such as municipalities’ political motivation and willingness to take part in the pilot phase, already ongoing initiatives taking place in this field, and the level of maturity and involvement of national private sector companies that are active in collection and recycling in Bolivia. The project and its private sector partners will also coordinate activities among countries within the region and with other organizations to ensure conformance with the Basel and Minamata Conventions. Technical assistance will be sought from the BRS regional center in LAC and the Secretariat of the Minamata Convention and the UNEP-IETC center during the detailed design, terms of reference and implementation of these activities, to also provide best practice and support in the disposal of used lamps containing hazardous materials.

The project will also provide training to government authorities, retailers, and collection services on specific topics that will prepare the ground for the CRSO design. Participants in such trainings will learn about the extended producer responsibility concept and its application, about key components of a national plan for establishing environmentally sound management systems for spent lighting products, and key concepts for operating a CRSO. Thereafter, Bolivia will develop its own national plan for establishing environmentally sound management systems for spent lighting products, which will set the ground for designing the CRSO. Further, a guidebook will be developed to provide each stakeholder involved in the setting up of a CRSO with guidelines on their role in the collection and recycling system, as well as the technical aspects to be considered when operating a CRSO. These trainings and technical assistance will also be provided to on-going projects in Bolivia that target municipal or national development and/or implementation of integrated solid waste management strategies.

Component 4: Lighting innovation: accelerating the use of efficient lighting, in particular light emitting diodes (LEDs) and controls



Outcomes: Consensus reached by consumers and decision makers in government and private sector on the increased use of solid state lighting and lighting controls in the domestic, commercial/industrial. Municipal governments made aware of the benefits of advanced lighting systems through demonstration programs of locally appropriate street lighting LEDs and controls.

Outputs	Activities
4.1.1 National efficient lighting strategy with more stringent MEPS, taking into account advanced lighting technologies and systems, further developed.	<ul style="list-style-type: none"> <li>i. Training and information about LEDs and controls and how they are best applied in each sector (domestic, commercial/industrial and outdoor lighting), drawing upon international best practices, case studies and published evaluations.</li> <li>ii. Development of quality specifications and/or MEPS for LED lamps and lighting controls to protect local markets and consumers from non-compliant products.</li> </ul>
4.1.2 Supporting policies delivered to increase user acceptance and demand for high efficiency products and systems.	<ul style="list-style-type: none"> <li>i. Gender-sensitive communication campaigns focused on LED technology and controls.</li> <li>ii. Development of a study/proposal for lighting labels.</li> <li>iii. Development of a study on supporting policy options that government could use to encourage the use of LEDs and controls.</li> </ul>
4.1.3. MVE scheme to ensure high quality products that will deliver the expected energy saving and GHG emission reduction benefits developed.	<ul style="list-style-type: none"> <li>i. Development of LEDs and controls procurement guide/protocol based on international best practice including technical specifications and product performance evaluation methods.</li> <li>ii. Technical advice and training via the en.lighten expert network for laboratories that intend to be qualified to test and evaluate the performance of LED lamps and lighting control products.</li> <li>iii. Training for customs officers on MVE system and activities focusing on LED and controls.</li> </ul>
4.2.1 Demonstration program for locally appropriate LEDs and lighting controls for Bolivia's selected stakeholder groups (i.e. public lighting consumers) designed and delivered.	<ul style="list-style-type: none"> <li>i. Designing demonstrations and evaluations of LEDs and lighting controls, including case studies of financial models for offsetting the higher initial first cost of high efficiency products (such as bulk procurement discounts, leasing schemes, micro-financing, energy service company financing, and low-cost loans for pre-qualified products and installation services).</li> <li>ii. Provide technical guidance on procurement specifications for LED lamps under the project demonstrations</li> </ul>
4.2.2 LED and controls systems procured and installed through the demonstration program.	<ul style="list-style-type: none"> <li>i. Implementation of pilot projects and project demonstrations in selected locations.</li> </ul>
4.2.3 Gender mainstreaming in Outputs 4.2.1 and 4.2.2 conducted	<ul style="list-style-type: none"> <li>i. Gender assessment &amp; formulation of Gender Action Plan for outputs 4.2.1 and 4.2.2.</li> </ul>

Solid-state lighting and controls, if used throughout Bolivia, could significantly reduce electricity consumption and related GHG emissions. Energy consumption (watt-hours) for lighting can be reduced by deploying technologies that require lower input power (watts); and, by reducing unnecessary use (hours) through automatic controls or changes in user behavior.

The Ministry of Hydrocarbons and Energy has invited several municipal governments to participate actively in this project. In addition, large off-grid projects currently undertaken by the Ministry aiming to improve access to clean energy in remote areas have been identified as a source of co-finance. Therefore, some of these areas where renewable energy will be installed will also be selected to participate in this GEF project demonstration LED, since for off-grid

lighting it is essential to use the most efficient technologies available and suitable procurement specifications for the ambient conditions. The project will advise the government while doing the procurement specifications for these initiatives to have provisions for the collection of any waste lamps.

Bolivia has three very distinct geographical zones – the Andean region, the Sub-Andean region and the Llanos region – so the project will aim to select at least one demonstration project for each zone. Technical guidance on procurement specifications for LED lamps will be adapted for each specific geographical zone.

With the participation of the invited municipalities, coordinators of the on-going projects, interested suppliers, universities and electricity distribution companies, as well as the national standardization body, IBNORCA and the national metrology institute, IBMETRO, the project manager will organize a workshop for the detailed planning of the demonstration project.

Based on the outcomes of the workshop and the technical specifications required that were defined, the project manager will invite suppliers of LED luminaires and controls to submit a financial and technical proposal for the completion of the demonstration project.

It is important to mention that the project will support demonstration of technology with long-term replication potential, large-scale energy savings, and market transformation with LEDs and controls, given appropriate technical justification and co-financing. The selection process will also favor diversity in the overall project portfolio. Application of these criteria will ensure that the project will achieve maximum results that can be tracked during and after the project period, in terms of avoided emissions, as well as a market-transformation impact that is as wide as possible.

The project manager will make recommendations on the final selection of demonstration projects, subject to consensus approval of the project steering committee.

Evaluation will begin immediately upon selection of the demonstration projects, with the establishment of baseline energy consumption levels via calculations and metering, and its results will be presented in a final workshop.

The activities planned for this component include:

- Training and information about LEDs and controls and how they are best applied in each sector (domestic, commercial/industrial and outdoor lighting) as well as for each geographical zone, drawing upon international best practices, case studies and published evaluations.
- Demonstrations and evaluations of LEDs and lighting controls, including case studies of financial models for offsetting the higher initial first cost of high efficiency products (such as bulk procurement discounts, leasing schemes, micro-financing, energy service company financing, and low-cost loans for pre-qualified products and installation services).
- Best practice technical advice for LED and lighting controls procurement, such as specification development and product performance evaluation methods; and development of LEDs and controls procurement guide/protocols.
- Development of quality specifications and MEPS for LED lamps and lighting controls to protect local markets and consumers from inferior products at lower price points.
- Technical advice and training via the en.lighten expert network for laboratories that intend to be qualified to test and evaluate the performance of LED lamps and lighting control products.
- If requested by industry or economic development authorities, technical consultations will be arranged by en.lighten for manufacturers or assemblers of lighting products, so that they can learn about and potentially produce LED lamps and controls.

Gender will be carefully considered under this component, and a specific gender action plan for the pilot LED projects will be formulated.

The gender-sensitive communication campaigns focused on LED technology and controls should be designed in coordination with the disposal campaigns in Component 3 and present a consolidated message on the uptake and safe disposal of lamps. The coordination of public and private institutions is a priority for the implementation of such energy efficiency projects. These institutions include:

- a) Ministry of Hydrocarbons and Energy (*Ministerio de Hidrocarburos y Energía - MHE*)
- b) Ministry of Environment and Water (*Ministerio de Medio Ambiente y Agua – MMAyA*)
- c) National Institute of Statistics (*Instituto Nacional de Estadísticas - INE*)
- d) Municipality governments; utility companies

### **3) Incremental cost reasoning**

The project will address the above-mentioned barriers and help Bolivia achieve the objectives of its energy efficiency strategy by strengthening the capacity of the Government of Bolivia, raising awareness among consumers and interest of lighting industry key players in efficient lighting technologies. The project will speed up the transfer of low-carbon, high efficiency technologies for the lighting sector, which will be translated into comprehensive national policy and regulatory frameworks and create the necessary conditions for technology transfer benefiting Bolivia.

GEF support is sought to mobilize international experience and expertise, for example for studies and analyses on labeling and MEPS and harmonization with standards and labeling systems of other countries in the region; to establish a framework for environmentally sound handling of lamp product waste (including mercury) and practical definition and implementation of a collection, recycling and waste disposal system; to strengthen testing laboratories in the certification process and harmonization of protocols with countries in the region.

The project takes a barrier removal approach, since the life cycle costs of CFLs are less expensive than incandescent lamps. The project will introduce and enforce MEPS to sustain a market change brought about by the CFL campaign, on which this project builds. LED technologies are more costly than CFL's or incandescent lamps, so the project will focus on co-financing and demonstration to raise awareness of this technology in the country, and begin to prepare consumers for the technology as prices come down to an affordable level.

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

The use of solid-state lighting and controls is innovative in an economy where initial costs often lead to the selection of inefficient, short-term installations. By demonstrating and documenting the long-term economic and environmental benefits of advanced technology, the business case for sustainable solutions can be examined and adopted by key players in Bolivia, such as municipal governments and other providers of public services who are accountable for sound financial management of resources. Peer-to-peer communication and stakeholder evaluation of demonstrations of LED street lighting, for example, helps aggregate demand and create templates for technical specifications that can be used to purchase hardware and installations services at lower cost, and to secure maintenance contracts and warranties that deliver longer-term savings.

The proposed project supports GEF climate change focal area objective CCM-1 that deals with the promotion, demonstration, deployment, and transfer of **innovative low-carbon technologies**, particularly high efficiency LED and

usage-controlling lighting technologies. Although the initial cost of a typical LED lamp is still much higher than CFLs, let alone incandescent lamps, the prices are globally dropping.

On **sustainability**, a number of risks may affect the likelihood of continuation of the project’s benefits after the project ends. These are listed in the next section A.6 and possible risk mitigation measures have been considered. However, the integrated policy approach provided by the en.lighten initiative used in the design of the project for Bolivia ensures the sustainability of the project objectives, and of outcomes oriented towards savings in electricity consumption, and consequently reductions in GHG emissions.

The project will build strong partnerships with private sector companies, technical organizations and international agencies and initiatives encouraging lighting innovation.

Regarding **scaling up**, the implementation of the system of labeling and standards (MEPS) together with the capacity building efforts and information and awareness raising campaigns will lead to a larger stock of high-performing lighting products with a much higher market share of LEDs eventually.

### **A.6 Risks:**

*Including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and measures that address these risks:*

The project is subject to risks that can be anticipated. Adequate risk management and mitigation strategies ensuring successful project implementation may be developed and implemented. The potential risks are:

<b>Risk description</b>	<b>Mitigation measure</b>	<b>Level of risk</b>
Policies might be recommended but not implemented; weak government support, which leads to inadequate and ineffective enforcement or policies and regulations.	Staff changes at the national-level and in local policy-making bodies, especially after elections, may hinder the implementation and cause delays. However, in the past decade, energy efficiency has been on the political agenda, as evidenced by the National Energy Efficiency Program and is likely to remain so.  The Project Steering Committee and the various seminars and events will act as discussion forums for the various entities involved in efficient lighting and will allow participants to identify needs and demands through continuous dialogue.  Strengthening staff capacity of Ministries and other organizations involved in standards and labeling formulation and implementation of the MVE system is an integral part of the project.	Medium
Low commitment of local laboratories to strengthen their capacity for testing of lighting products.	The project will undertake the assessment of the current situation for testing and certification of lighting products; will provide further training support and enhancement for testing of lighting products; and facilitate linkages and information exchange with similar testing and certification bodies in the region.	Low
Delayed implementation of activities that are baselines for specific incremental activities of the proposed project.	The activities will be constantly monitored and implemented according to a realistic schedule that will be fine-tuned by the responsible agencies according to real-time progress.	Medium
Low-level participation from the private sector actors including lighting technology manufacturers and distributors.	Private sector key players have been engaged in the project’s design stage and some have even expressed commitment by means of a co-financing letter (e.g. Philips, NLTC).  Private stakeholders of the national lighting sector will continue to be involved	Low

	in activities supported by the project to ensure their views are taken into account in the formulation of the national efficient lighting strategy with regard to the development of a market for CFLs and LEDs as well as the phasing out of incandescent lamps.	
The designed and executed energy efficiency in lighting and waste management communication campaigns are not effective in terms of educating and raising awareness of consumers with regard to the benefits of using LEDs, CFLs and efficient tubular fluorescent lamps (TLs).	<p>The replacement programs of the National Energy Efficiency Program have been accompanied by educational campaigns. These experiences and lessons learned will be taken into account when continuing the information and awareness raising campaigning that also stress the costs and benefits and the importance of taking lifecycle costing into account vs. initial cost of lighting technology. Market surveys will shed light on consumers' attitudes and preferences (distinguishing men and women behaviours) so that they are also taken into account when campaigns are developed.</p> <p>The gender-sensitive communication campaigns of both components 2 and component 3 should be designed to support the uptake and the safe disposal of lamps (cross-reference to each other, similar communication supports).</p> <p>In general, consumer education will continue as a collaborative effort, involving state entities, manufacturers, retailers, electricity companies, consumer associations and NGOs.</p>	Low
The additional cost related to waste management activities is a barrier to implement them.	Activities under component 3 will identify the best CRSO design to collect the discarded lamps and look for a regional partner to do the recycling.	Medium
For lamps containing hazardous substances the transportation to off-grid communities presents environmental and health risks	<p>The lamps directly distributed by the project will be LED lamps and under government-led initiatives. LED lamps do not contain mercury which limits the negative impacts in case of an accident during transportation. The project will advise the government while doing the procurement specifications for these initiatives to have provisions for the collection of any waste lamps.</p> <p>The communication campaign related to waste management will clearly state all the risks related to the lamps management.</p>	Low

#### **A.7. Coordination with other relevant GEF financed initiatives:**

The project provides a valuable resource for and is in line with other GEF initiatives linked to energy efficient lighting. This project builds on the UNEP-GEF en.lighten Global Partnership initiative, which has been established as a GEF *de facto* global authority on lighting energy efficiency policies. The en.lighten initiative offers a Center of Excellence with a repository of knowledge and best practice experiences to promote efficient lighting solutions. Up to date, 66 countries have joined the en.lighten initiative. UNEP coordinates all of its GEF-funded lighting projects using en.lighten's integrated policy approach.

### **B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE**

#### **B.1. Stakeholders and project management:**

<b>Stakeholder</b>	<b>Role</b>
Government and national	Policy makers, officials and technical staff within government ministries will play a crucial role in the implementation of the proposed project. In practice, the Ministry of

standards-setting bodies	Hydrocarbons and Energy is responsible for policy and regulatory actions promoting energy efficiency. The Ministry of Environment and Water will also play a key role because climate change mitigation activities as well as mercury control competencies rely on this body. Other ministries such as the Ministry of Economy and Finance, and the Ministry of Health will also play a key role through their participation in project oversight and implementation of market control activities. The national standards-setting body (IBNORCA) will play a key role in the proposed project implementation as well.
Energy providers	Energy utilities have an incentive in the longer term to encourage efficiency to lower capital costs for infrastructure (deferred investment in capacity expansion). Utilities can provide key inputs to the project as they often have the best information regarding consumer demand patterns.
Testing laboratories and technical institutions	Test procedures represent the technical foundation for MEPS. Testing laboratories would actively take part in the process of standards and quality control.
Lighting manufacturers, importers, distributors and retailers	Lighting manufacturers, importers, trade associations, distributors and retailers are directly affected by energy efficiency regulations. They have valuable information about production costs and market structures. MEPS necessarily impose some burdens on manufacturers and importers, but these can be acceptable as long as they affect all companies equally and also introduce new business opportunities. Domestic and international firms will play a crucial role by providing their input. Equipment retailers will participate in the proposed project implementation by characterizing the market and consumer response to lighting product efficiency and pricing.
Environmental advocates and consumer groups	Non-governmental organizations that advocate for responsible energy policies will contribute with their perspectives during the development of lighting MEPS. They will provide a balancing perspective to manufacturers with regard to the stringency of MEPS and MVE schemes. Inputs from civil society consumer groups can ensure that regulations do not require overly expensive or less functional lighting products.
International organizations, national banks and financial institutions	International organizations and institutions will be critical to ensure support, capacity building and technical assistance in the implementation of national activities.

## Project administration arrangements

A focal point will be designated, with the appropriate authority to act as a champion for the integrated national efficient lighting development process, from project conception to completion. The focal point will be responsible for ensuring the overall project coordination, coordinating stakeholders' contribution and meeting the agreed timelines. The Vice-Ministry of Energy Development, through the National Director of Planning and Energy Integration will be the focal point.

The focal point will engage support from key interested stakeholders to form a small core group, the national coordinating committee. The composition and shape of this group will include relevant national institutions, supporting experts and UNEP. The national coordinating committee will meet regularly throughout project implementation and contribute to strategic decisions on national priorities, activities, timelines and budgets.

The project is funded by the Global Environment Facility (GEF) with the United Nations Environment Programme (UNEP) acting as the GEF Implementing Agency. UNEP as the GEF Implementing Agency will be responsible for

the supervision of project execution to ensure consistency with GEF and UNEP policies and procedures, and will be responsible for overall project reporting. UNEP will formally participate in meetings and final evaluations, clearance of half yearly and annual reports, technical review of project outputs, and additional technical assistance for the execution of the project as may be requested. The Ministry of Hydrocarbons and Energy, as the local executing agency, will be accountable to the Government and UNEP-GEF for ensuring:

- (i) Proper achievement of the objectives of the project;
- (ii) Monitoring and evaluation of the project outputs and outcomes;
- (iii) Effective use of both international and national resources allocated to it;
- (iv) Timely availability of financing to support project implementation;
- (v) Proper coordination among all project stakeholders; in particular national parties; and
- (vi) Timely submission of all project reports, including work plans and financial reports.

The project implementation arrangements comprise of the following, whose functions are detailed in Annex H.

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

## **B.2 Socio-economic benefits**

*Describe the socio-economic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCF/SCCF):*

At the national level, the program will foster energy efficiency stemming from efficient lighting use. This will reduce Bolivia's greenhouse gas emissions and the use of fossil energy carriers. Given the current high costs of electricity generation, the use of efficient technologies is expected to improve the cost-effectiveness of the electricity sector. The access to cheaper electricity will improve social and economic development and improve quality of life, including basic services such as medical assistance and education.

The overall benefits of the project can be detailed as follows:

### *Economic*

The proposed project aims to provide socio-economic benefits at the national and local level. The transition to efficient lighting significantly impacts the ability to maximize use of existing electrical power generation and reduce peak power demand without having to build new and expensive generation and distribution facilities. In a time of global recession, avoiding the construction of new power plants is financially significant to any developing economy, while the reduced annual electric energy consumption will reduce the fuel bill for the electricity sector.

In addition, since the Government financially supported efficient lighting, the economic benefits from efficient lighting technologies will eventually strengthen Bolivia's fiscal position. These benefits however, will only materialize in the context of additional policy and institutional measures, which are addressed under the present project. At the national level, the direct beneficiaries of the project are therefore the Plurinational State of Bolivia and the nation as a whole.

Cost reductions in lighting in Bolivia's public, commercial and residential sectors will also increase purchase power of the population and strengthen the competitiveness of the national economy.

Furthermore, the following socio-economic benefits are envisaged as a result of the project:

- 1) Energy savings and associated cost reduction for municipalities will account for approximately 40% of energy use for lighting in municipal spending, which makes 1.5% of a city budget.

2) The project will introduce LED-based street lighting, which apart from energy savings can provide for better light quality, improved visibility and perception of street safety, the latter being important social benefits closely associated with the energy efficiency technology deployment promoted by the project.

### *Environmental*

In addition to economic benefits, energy efficient lighting technologies offer a great potential to avoid CO<sub>2</sub> emissions from direct fossil fuel burning for electric power production (see next section B.3) and reduce related local and regional air pollution (NO and SO<sub>2</sub>). In the GEF-supported alternative trajectory of market development of lighting products calculated with the STAP methodology, mercury content of lamps entering Bolivia's territory between 2016 and 2028 will be 711 kg Hg, due to increased CFL penetration. In the baseline scenario, since the main share of lamps will still be inefficient lamps that do not contain mercury, mercury entering the market will be 684 kg Hg. These values are calculated assuming a content of 2.5 mg of mercury as the maximum established by the Minamata Convention. However, it is likely that without the project the content of mercury would be higher due to CFLs not meeting Minamata standards. Indeed, using the average content of mercury in a CFL of 4mg Hg/lamp, mercury entering Bolivia's market would be 1,074 kg Hg. The collection, recycling and environmentally sound management of spent lamps will further reduce the risk of mercury contamination for all citizens; up to 85-89% of the mercury in recycled lamps can be recovered. Component 3 of this project aims to ensure the safe collection and disposal of all lamps containing mercury. This project will allow the country to have an integrated waste management system that could be replicated for other types of waste.

### *Social benefits and gender*

The project will track gender of participants in stakeholder groups, workshops, task forces, project oversight committees, project staff and staff or consultants retained by the Government of Bolivia. Gender as a topic will be addressed in the project management team and stakeholder meetings, to help identify other areas where gender goals could be established. For example, purchasers of lighting products may have gender-related preferences that could be identified in order to encourage greater participation in market-based promotion and improve consumer information campaigns. The project will take into account the different views and opinions of both men and women in the public information campaign and surveys to measure benchmark and change.

A gender specialist will be included among the consultants to be hired under the project. The gender specialist may consider the following points in conducting gender analysis:

- Assess whether gender information is adequate, identify any gender focused assessments or studies that need to be done
- Ensure that gender dimensions of the project are adequately addressed in the design of the social and environmental assessments
- Broaden knowledge and strengthen commitment of the executing agency to gender issues in energy efficiency projects
- Ensure that female as well as male stakeholders are consulted in the different stated of the project
- Design a gender equality approach that would not add to the burden of work for women, or would it help distribute responsibilities fairly between women and men.

For expected Output 4.2.1 and 4.2.2, the development of the detailed implementation plans for the activities under these expected Outputs, the following may be taken into consideration:

- A gender balanced stakeholder participation to create a two-way flow of information, and facilitate development of community skills to analyze situations and identify solutions
- Both men and women in the target population actively participate in implementation
- Activities are generating the intended benefits for men and women, how the outcomes compare to the targets and what factors account for variation in outcomes
- Review how the risk indicators/critical assumptions about gender interact with the inputs in support or hindrance of project progress



- Determine whether there are any realistic prospects of sustaining the benefit being derived from the project in the long run

### **B.3 Global environmental benefits and cost-effectiveness:**

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

The project is expected to have a **direct GHG emission reductions of 233 tCO<sub>2</sub>** related to the demonstration program directly financed by the project using GEF funding. This program consists of direct procurement and distribution of LED outdoor lamps for street lighting in selected municipalities during the period 2016-2018. Additionally, the project has **direct post-project GHG emissions savings of 3,500 ktCO<sub>2</sub>** related to standards and labels policies that will lead to the transition of the market towards more efficient lighting products (cumulatively over the period 2019-2028). Concerning the indirect impacts, using a bottom-up methodology the GHG emission savings are estimated to 952 tCO<sub>2</sub> and **using a top-down approach the GHG emission savings are estimated at 5,540 ktCO<sub>2</sub>**.

These impacts have been calculated using the GEF Energy Efficiency Tool (2013), the reader is referred to Annex D for details of the impacts per component.

The results are summarized in the table below:

#### **Overall Results**

##### **All Components**

	<b>Cumulative</b>		
	<i>Total</i>	<i>2016-2018</i>	<i>2019-2028</i>
Direct Electricity Savings (MWh)	532	48	484
N/A	0	0	0
N/A	0	0	0
N/A	0	0	0
Direct Total Energy Savings (GJ)	<b>1,917</b>	174	1,743
Direct GHG Emission Savings (tCO <sub>2</sub> )	<b>233</b>	21	212
Direct Post-project GHG Emission Savings (tCO <sub>2</sub> )	<b>3,498,662</b>		3,498,662
Indirect Bottom-up Emission Savings (tCO <sub>2</sub> )	<b>952</b>		952
Indirect Top-down Emission Savings (tCO <sub>2</sub> )	<b>5,540,296</b>		5,540,296

The cost-effectiveness of the project considering only direct impacts (including post-project) is 0.87 USD/tCO<sub>2</sub>.

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

UNEP will be responsible for managing the mid-term review/evaluation and the terminal evaluation. The Project Manager and partners will participate actively in the process.

In-line with UNEP Evaluation Policy and the GEF's Monitoring and Evaluation Policy the project will be subject to a Terminal Evaluation and, additionally, a Mid-Term Review will be commissioned and launched by the Project Manager before the project reaches its mid-point. If project is rated as being at risk, a Mid-Term Evaluation will be conducted by the Evaluation Office.

An independent terminal evaluation (TE) will take place at the end of project implementation. The Evaluation Office (EO) of UNEP will be responsible for the TE and liaise with the UNEP Task Manager throughout the process. The TE will provide an independent assessment of project performance (in terms of relevance, effectiveness and efficiency), and determine the likelihood of impact and sustainability. It will have two primary purposes:

- (i) to provide evidence of results to meet accountability requirements, and
- (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP and executing partners.

While a TE should review use of project funds against budget, it would be the role of a financial audit to assess probity (i.e. correctness, integrity etc.) of expenditure and transactions.

The TE report will be sent to project stakeholders for comments. Formal comments on the report will be shared by the EO in an open and transparent manner. The project performance will be assessed against standard evaluation criteria using a six point rating scheme. The final determination of project ratings will be made by the EO when the report is finalized. The evaluation report will be publically disclosed and will be followed by a recommendation compliance process.


The direct costs of reviews and evaluations will be charged against the project evaluation budget. A summary of M&E activities envisaged is provided in Annex G. When relevant, M&E activities will assess gender mainstreaming. The GEF contribution for M&E activities is USD 67,500.

**PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY**

**A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT(S) ON BEHALF OF THE GOVERNMENT(S):**  
 (Please attach the [Operational Focal Point endorsement letter\(s\)](#) with this form. For SGP, use this [OFP endorsement letter](#)).

NAME	POSITION	MINISTRY	DATE(MM/dd/yyyy)
Juan Pablo Cardozo Arnez	Vice-minister	ENVIRONMENT (MEDIO AMBIENTE, BIODIVERSIDAD, CAMBIO CLIMÁTICO Y GESTIÓN Y DESARROLLO FORESTAL)	09/13/2012

**B. GEF AGENCY CERTIFICATION**

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for CEO endorsement/approval of project.					
Agency Coordinator, Agency Name	Signature	Date (Month, day, year)	Project Contact Person	Telephone	Email Address
Brennan Van Dyke Director, GEF Coordination Office, UNEP		May 24, 2016	Ruth Coutto UNEP/GEF Climate Change Mitigation Task Manager, Energy, Climate, and Technology Branch Division of Technology, Industry and Economics (DTIE)	+33 1 44 37 16 34	Ruth.Coutto@unep.org

## ANNEX A - 1: PROJECT RESULTS FRAMEWORK

Project Objective	Objective level Indicators	Baseline	End of project Target	Means of Verification	Assumptions & Risks	UNEP MTS reference*
To accelerate the transition to energy efficient lighting technologies in Bolivia through the development of a national efficient lighting policy and practical innovative interventions that ensure success of the transition, thereby reducing electricity demand and consumption and the related GHG emissions.	<p>A) The amount of Energy Savings in the lighting sector in Bolivia</p> <p>B) The amount of CO<sub>2</sub>eq emissions avoided in the lighting sector in Bolivia</p> <p>C) Market share of lamps entered in the Bolivian market: IL / Hal / CFL / LED / others at the end of the project but also at each MEPS adoption</p>	<p>A) 0 MWh</p> <p>B) 0 tCO<sub>2</sub>eq</p> <p>C) In 2016: IL: 69%; Hal: 5% CFL: 16%; LED: 2% Others: 8%</p> <p>In 2018: IL: 56.5%; Hal: 5% CFL: 28%; LED: 2.5% Others: 8%</p> <p>In 2021: IL: 38.5%; Hal: 4.5%; CFL: 46%; LED: 3%; Others: 8%</p>	<p>A) Direct: 532 MWh Direct post-project: 7,970 GWh</p> <p>B) Direct: 233 tCO<sub>2</sub>eq Direct post-project: 3,500 ktCO<sub>2</sub>eq</p> <p>C) In 2018:<sup>13</sup> IL: 55.5%; Hal: 4% CFL: 29%; LED: 3.5% Others: 8%</p> <p>In 2021: IL: 22.5%; Hal: 4% CFL: 62%; LED: 3.5% Others: 8%</p> <p>In 2025: IL: 9%; Hal: 1%; CFL: 68.5%; LED: 13.5%; Others: 8%</p>	<ul style="list-style-type: none"> <li>• Energy sales provided by the Authority of Electricity</li> <li>• Official import data and technology vendor statistics; vendor interviews</li> <li>• Project monitoring and evaluation</li> <li>• Market assessment from national statistics and surveys in the context of the standards and labeling program</li> <li>• UN comtrade data</li> <li>• Environmentally Sound Management strategy document published online</li> </ul>	<p>The assumption is that risks as described in Section A.6 of Part II do not have negative impact on the project's progress or can be mitigated:</p> <ul style="list-style-type: none"> <li>• Policies might be recommended but not implemented; weak government support</li> <li>• Low commitment of local laboratories to strengthen their capacity for testing of lighting products;</li> <li>• Delayed implementation of activities that are baseline activities;</li> <li>• Low level participation from the private sector actors including lighting technology manufacturers and distributors;</li> </ul>	<p>Sub program 1: Climate Change Expected Accomplishment (b) – Output 2.b Indicator: (ii) Increased percentage of countries meeting energy efficiency standards in specific sectors, with support from UNEP.</p>

<sup>13</sup> The STAP/GEF model used to create the BAU and the project scenarios for the market transition is based on standards and labels regulations adopted by the government which are assumed to be enforced in two phases, the first MEPS will be adopted by 2021 which is after the completion of the project. Therefore, the STAP model shows the same technology rates for the GEF scenario than for the BAU in 2018 (IL/Hal/CFL/LED/others - 56.5%/5%/28%/2.5%/8%). However, the project aims to boost the efficient lighting market (CFL and LED shares) during the project period through communication campaigns and demonstration programs. Therefore, the target for the market share of these technologies in 2018 is at least 29% for CFL and 3.5% for LED, even if this is not shown in the STAP/GEF model.

	<p>D) National framework to collect, recycle and/or dispose of spent lighting products endorsed by the government</p>	<p>In 2025:  IL: 14%; Hal: 4%; CFL: 70%; LED: 4%; Others: 8%</p> <p>0</p>	<p>1</p>		<ul style="list-style-type: none"> <li>• The designed and executed EE in lighting and waste management communication campaign is not effective.</li> </ul>	
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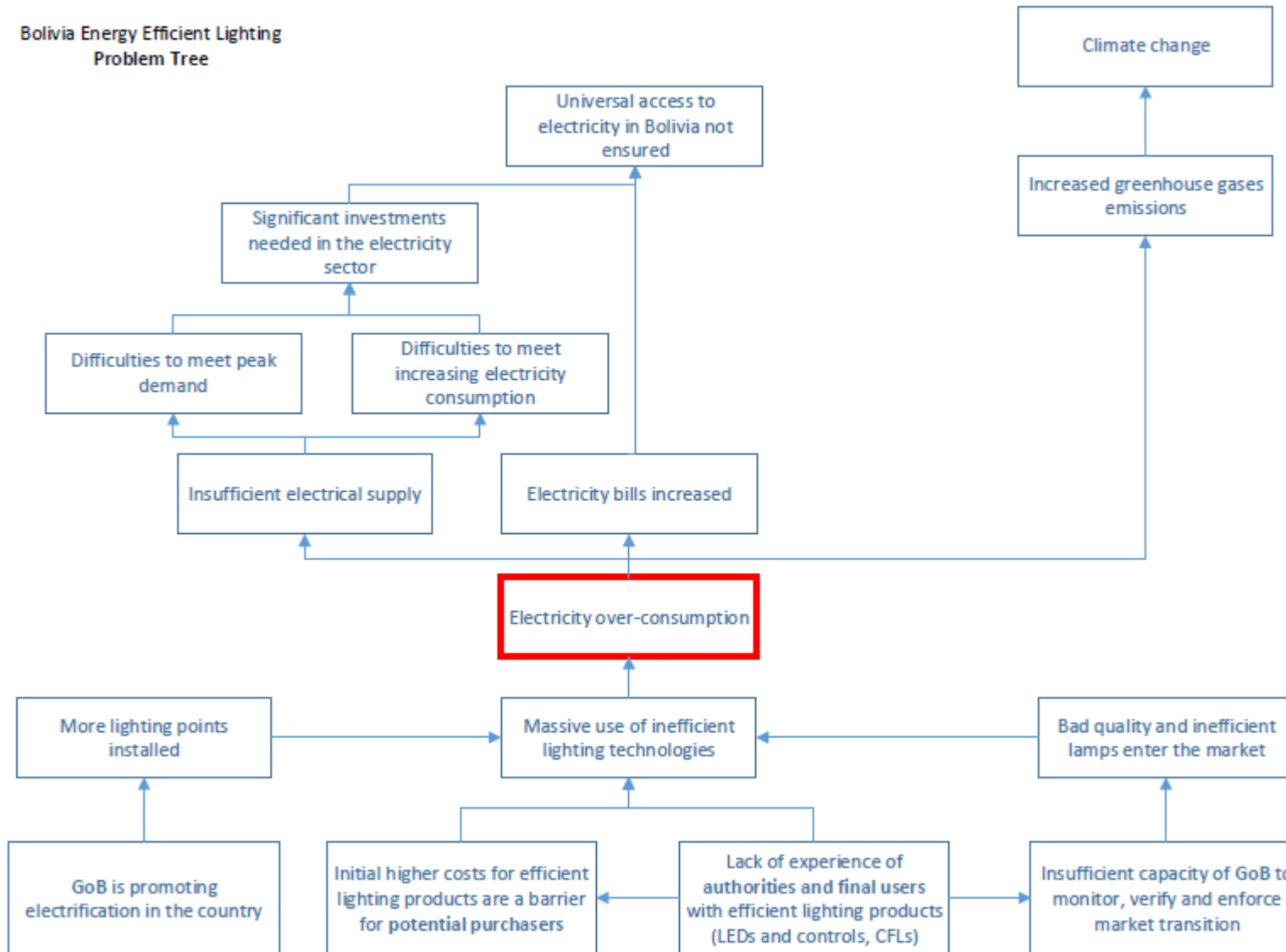
Project Outcome	Outcome Indicators	Baseline	End of project Target	Means of Verification	Assumptions & Risks	MTS Expected Accomplishment
1.1. National efficient lighting strategy employing the integrated policy approach to phasing out inefficient incandescent lamps endorsed.	<p>1) Number of National efficient lighting strategy endorsed by the government</p> <p>2) Standardized and comprehensive MEPS for efficient lighting adopted by the government</p> <p>3) Number of private sector actors participating in the strategy development</p>	<p>0 (No)</p> <p>0</p> <p>0</p>	<p>1 (Yes)</p> <p>1</p> <p>2</p>	<ul style="list-style-type: none"> <li>• Official government publications and news bulletins</li> <li>• Project work plans; monitoring and evaluation reports</li> <li>• Technical reports (on labeling and MEPS; assessment, market studies)</li> <li>• Press coverage and/or internal report on the endorsement of the National efficient lighting strategy.</li> <li>• National efficient lighting strategy published online</li> </ul>	<ul style="list-style-type: none"> <li>• Delayed implementation of baseline activities;</li> <li>• Low level participation from the private sector actors including lighting technology manufacturers and distributors</li> <li>• Lobby boycott changes</li> <li>• Subnational governments belonging to the opposition resist strategy</li> </ul>	Expected Accomplishment (EA) 2: Low emission growth
2.1. Capacities to Monitor, Verify and Enforce energy efficient lighting products are created in Bolivia	<p>4) Number of regulations establishing the MVE system are adopted by the government</p> <p>5) Increase in the number of laboratories certified to assess MEPS and labels for lighting products</p>	<p>0</p> <p>0</p>	<p>1</p> <p>At least 1</p>	<ul style="list-style-type: none"> <li>• Technical reports (on labeling and MEPS; MVE assessment)</li> <li>• Official government publications and news bulletins; project work plans; monitoring and evaluation report</li> </ul>	<ul style="list-style-type: none"> <li>• Low commitment of local laboratories to strengthen their capacity for testing of lighting products</li> <li>• Weak government support, which leads to inadequate enforcement or policies and regulations</li> </ul>	Expected Accomplishment (EA) 2: Low emission growth

Project Outcome	Outcome Indicators	Baseline	End of project Target	Means of Verification	Assumptions & Risks	MTS Expected Accomplishment
3.1. Government of Bolivia is able to enact a national plan to collect, recycle and/or responsibly dispose of spent lighting products that may contain valuable and/or hazardous materials.	6) Number of Collection & Recycling System Organization (CRSO) business models designed	0	1	<ul style="list-style-type: none"> <li>• Project monitoring and evaluation reports</li> <li>• Project technical reports (incl. description of waste disposal and management strategy, issues and options)</li> <li>• Proceedings of training events and workshops</li> <li>Regulation documents published online</li> </ul>	<ul style="list-style-type: none"> <li>• Weak local government support for lamp waste recycling</li> <li>• Delayed implementation of baseline activities</li> <li>• The designed and executed waste management communication campaign is not effective</li> </ul>	Expected Accomplishment (EA b and c ) 3: Chemicals and Waste
4.1. Consensus reached by consumers and decision makers in government and private sector on the increased use of solid state lighting and lighting controls in the domestic, commercial/industrial and outdoor lighting applications.	7) The national efficient lighting strategy includes in its objectives the increasing use of solid state lighting and lighting controls	0 (No)	1 (Yes)	<ul style="list-style-type: none"> <li>• Work plan and minutes of the working group on solid state lighting technologies</li> <li>• Project monitoring and evaluation reports</li> <li>• Project technical reports (incl. specifications and/or MEPS for LED lamps and lighting control)</li> <li>• Campaign materials; reports on campaign concept and impacts</li> <li>• Proceedings of training events and workshops</li> </ul>	<ul style="list-style-type: none"> <li>• Ineffective to inadequate and ineffective enforcement or policies and regulations</li> <li>• Delayed implementation of baseline activities</li> <li>• Low level participation from the private sector</li> <li>• Low level participation from the private sector actors including lighting technology manufacturers and distributors;</li> <li>• The designed and executed EE in lighting and waste management communication campaign is not effective</li> </ul>	Expected Accomplishment (EA) 2: Low emission growth
4.2 Municipal governments made aware of the benefits of advanced lighting systems through demonstration programs of locally appropriate street lighting LEDs and controls.	8) Number of municipalities that have procured LEDs  9) Number of male and female beneficiaries of the above-mentioned outcome determined	0  0	3  TBD during the formulation of the Gender Action Plan			

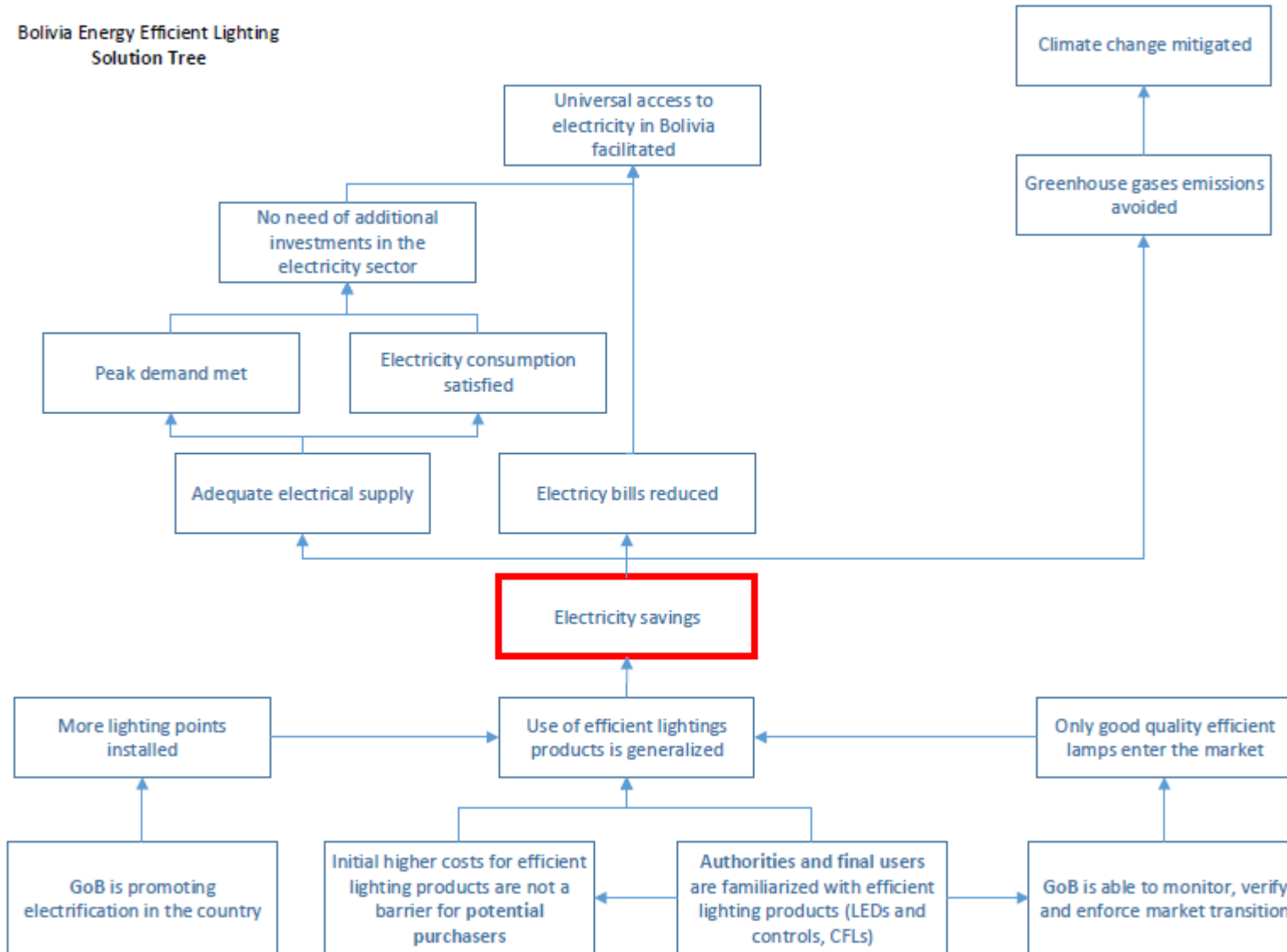
## **ANNEX A - 2: PROJECT THEORY OF CHANGE**



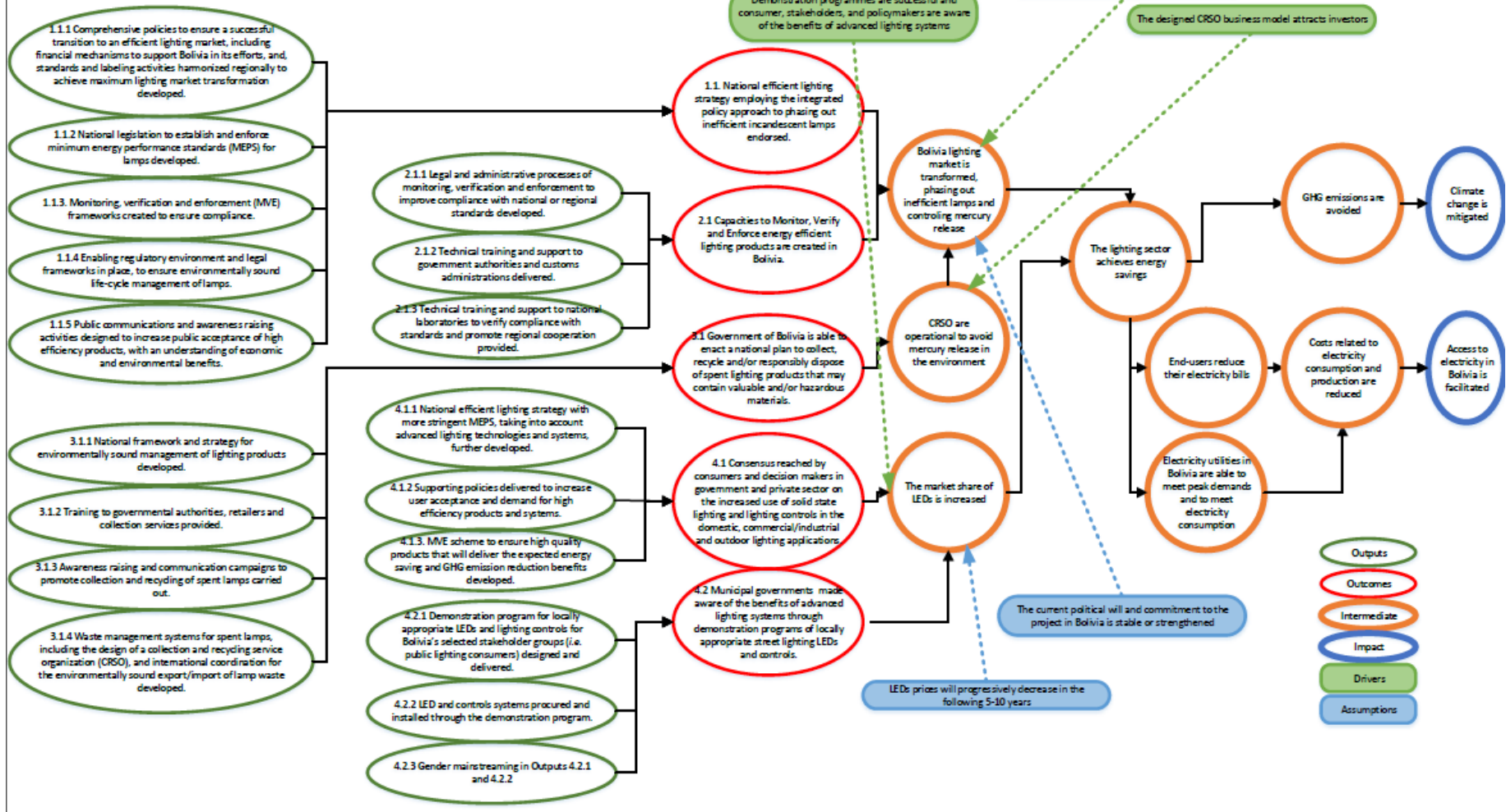
**Bolivia Energy Efficient Lighting Problem Tree**



**Bolivia Energy Efficient Lighting Solution Tree**



# Bolivia Energy Efficient Lighting Theory of Change



## **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).

### **1) Comments from GEF Secretariat at PIF**

#### *Question 17*

- *Comment: DER, February 12, 2013. In order to increase co-financing ratio, agency is requested to pursue additional partners during project design.*

#### *Response:*

After having discussed with many stakeholders in Bolivia with the aim of identifying new sources of co-finance, the politic and economic situation in Bolivia was not favorable to find additional partners able to commit to contribute financially to the project at this stage. During the implementation of the project, new sources of co-finance will be identified, mainly among local authorities.

At this stage, an amount of USD 13,467,575 of co-financing has been confirmed. The Ministry of Hydrocarbons and Energy has committed to USD 7,390,000 of in-kind national contributions, the Ministry of Environment and Water has committed to 4 million USD of in-kind co-financing and La Paz municipality has committed to USD 197,575 in-kind co-financing. These amounts are related to on-going activities related to this project. In addition, there is USD 1,500,000 from Philips, USD 300,000 from National Lighting Test Center and USD 80,000 from UNEP of in-kind contributions. This co-financing will be used mainly for support in the development of the national efficient lighting strategy, through in-kind contributions to the personnel component on MEPS design, environmentally sound management, and communications campaigns; international support in the development of an MVE scheme; contribution to stocktaking activities and market assessment; support in the design of a collection and recycling communication campaign; and support in the development of demonstration programs on LED and controls.

#### *Question 24*

- *Comment 1) Please clarify by CEO endorsement if a facility for MVE will be created, as this may consume more of the resources.*

#### *Response:*

The creation of a new facility for MVE is not part of the scope of the project. This has been clarified in the description of Component 2 in section A.5.2.

Component 2 includes activities focused on strengthening existing national/regional laboratories' capacities (including equipment provision) such as the activity 2.1.3 i. "Analysis of capacity of laboratories and strengthening needs, proposing alternatives to control, verify and enforce MEPS and labels in the national market, including alternatives of regional collaboration" and 2.1.3 ii. "Technical assistance support to selected laboratories: harmonization of testing methods and training of technical staff".

- *Comment 2) Please provide precise description of how the global technical assistance support will be integrated with local technical support and monitored carefully for transparency and accountability, especially as the center may be supporting multiple countries simultaneously.*

#### *Response:*

The en.lighten Center of Excellence, a global network of lighting specialists, governments, lighting manufacturers and civil society organizations, provides assistance to countries in accelerating market transformation to efficient lighting. The en.lighten Integrated Policy Approach recommended by the international experts from environmental groups, international organizations, manufacturers, and governments

is adapted to the context and the situation of each country. Indeed, countries determine how these elements fit within their national context. The development of a national efficient lighting strategy and recommendations following the integrated approach take place through an effective and inclusive consultation process with all relevant authorities and stakeholders. This includes Ministries of Energy and Environment, energy efficiency agencies, private sector organizations (lamp manufacturers, retailers, distributors and others in the supply chain) and civil society groups. To ensure best practice policies recommendations are incorporated within the project, en.lighten experts will participate in key meetings and review documents and review draft standards that are developed within the project.

- *Comment 3) Please consider the use of lighting quality labels, especially for LEDs, modeled after similar approaches in the U.S. and EU (e.g., LED Lighting Facts)*

*Response:*

The Integrated Policy Approach proposed by the en.lighten initiative considers the use of lighting quality labels based on international best practices. The development of LEDs labels are planned as part of Component 4, activity 4.1.2. ii. “Development of a study/proposal for lighting labels”.

- *Comment 4) Please identify the large-scale LED demonstration program, and if possible, sustainable funding strategies.*

*Response:*

The country has decided to carry on the LED demonstration program focused on street lighting in a few municipalities, this demonstration program is further described in section A.5.2, as part of the activities of Outcome 4.2 “Municipal governments made aware of the benefits of advanced lighting systems through demonstration programs of locally appropriate street lighting LEDs and controls.”

This Outcome also considers identifying funding strategies as part of the activity 4.2.1.i. “Designing demonstrations and evaluations of LEDs and lighting controls, including case studies of financial models for offsetting the higher initial first cost of high efficiency products (such as bulk procurement discounts, leasing schemes, micro-financing, energy service company financing, and low-cost loans for pre-qualified products and installation services).”

- *Comment 5) Please pursue additional sources of co-financing.*

*Response:*

As the response to question 17 states, additional co-financing has been identified from national resources, namely from the national budget of ministries involved in project implementation.

## **2) Response to the comments by the STAP scientific and technical screening of the Project Identification Form (PIF)<sup>14</sup>:**

- *The 8 million CFLs made available in 2009 and 9 million in 2012. Would be interesting to know what approximate share of lamps this account for. The costs in terms of \$/t CO2 avoided is also not clear*

*Response:*

Official data on installed stock of lamps in Bolivia is currently not available. The en.lighten initiative has developed a methodology to estimate the impacts of the transition to efficient lighting and has elaborated a

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<sup>14</sup> STAP: Scientific and Technical Advisory Panel

country lighting assessment (CLA) for each country. Based on Bolivia CLA, the total installed stock of lamps in the country in 2011 is estimated to be less than 14 million. Considering this figure, the 8 million CFLs distributed in 2009 would represent more than half of the total installed lamps.

It is also possible to estimate the lamps entering in the market through UN comtrade shipments data. Since Bolivia does not produce lamps, according to the shipments data, the lighting market for the residential sector is estimated to almost 20 million lamps in 2015. The almost 10 million CFLs distributed in 2012 will then account for approximately half of this market.

It would be interesting to see how many CFLs distributed were actually installed and how many are still in use (reportedly many were of low-quality). Indeed, updating market information on annual sales and stock is one of the first activities of the project (activity 1.1.1.iv.).

The cost effectiveness of the GEF project considering direct impacts (including post-project) is 0.87 USD/tCO<sub>2</sub>, please refer to Section B.3 of Part I.

- *The future mix of 85% CFLs, 5% LEDs and 10% incandescent is fine but, given the problems of mercury when disposing of CFLs, a higher share of LEDs could be a good target to aim for. Leap-frogging to 90% LEDs would be innovative but probably impractical. It would be interesting to compare a project proposal budget aiming for higher shares of LEDs and hence avoiding large investments in waste management of spent CFL lamps.*

*Response:*

The alternative scenario calculated using the STAP/GEF model (GEF Energy Efficiency tool v1.0) presents a mix of 68.5% CFLs, 13.5% LEDs, 9% conventional incandescent and 9% of other technologies on the lighting market by 2025 (year when the LEDs standards and labels are assumed to be implemented and enforced). The project aims to boost the LED market during the project period through demonstration programs to obtain a higher LED market share than the one of the BAU scenario, aiming a 3.5% LED share by 2018 instead of the 2.5% projected in the baseline. The project will also pave the way for MEPS for LEDs to be adopted.

However, LEDs prices remain high, which can be restrictive for an important part of the population in Bolivia, therefore the LED MEPS are assumed to be adopted by 2025. The introduction of CFLs and the related development of an environmentally sound waste management system for lamps remain a necessity in order to accelerate the transition to an efficient lighting market. In addition, the CFLs are not the only lamps containing mercury, Linear Fluorescent Lamps (tubular T8 and T12) already present in the market also contain mercury. Therefore, the sound waste management of spent lamps proposed as part of the integrated approach of en.lighten will be a good investment for the country.

- *It's not clear what will be measured/monitored in order to assess the project success (or otherwise). Could it be the number of CFLs/LEDs sold by a certain date? Or the number actually installed?*

*Response:*

At this stage the impacts estimations are based on imports data that do not have the level of detail needed to actually determine the exact share of efficient technologies. Expert estimations of the technology shares based on different sources of data (industry, UN comtrade...) has been used. In order to overcome this barrier and have a better baseline, the market share of efficient technologies (CFL/LED) compared to inefficient technologies (IL/Hal) will be measured through a market study (activity 1.1.1.iv.). At the end of the project an update of the market research could be carried on in order to identify trends in the market and compare the results with the baseline and alternative market trajectories of Annex D and the target indicators mentioned in Annex A and fed into monitoring and evaluation reporting (Annex G).

In addition, UN comtrade data and en.lighten assessments can be used to monitor the share of lighting technologies. However, at this stage the code of customs classification in Bolivia does not allow to clearly

observe the imports for LEDs. One activity that will be proposed as part of the MVE component is to improve the detail of the imports database, for instance improving the customs classification of lighting products.

It is important to point out that the main impacts of the project will not be observed during the project period. Regarding the direct impacts during the project period, the success of the LEDs installations will be easier to assess by monitoring the number of LEDs procured and installed, the number of municipalities and communities receiving these LEDs and estimating the CO2 emission reductions related to the energy savings.

- *Finally, it is not clear why this is a multi-focal area (MFA) project whereas lighting in Chile (5150) and Yemen (5152) are both listed as Climate change projects. They are all very similar.*

*Response:*

Apart from addressing Climate Change Mitigation Focal Areas CCM-1 and CCM-2, this project also addresses Focal Area CHEM-3 through the development of Component 3 “Ensuring environmentally sound management for a sustainable transition to efficient lighting”. This component on sound management of mercury contained in lamps is the reason why the project was presented as a Multi Focal Area project. However, the amount of funding coming from CHEM-3 is minor: only USD 50,000 and the project is now listed as a Climate Change project. This is the same case as for the lighting projects in Chile (5150) and Yemen (5152).

**ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS<sup>15</sup>**

**A. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES FINANCING STATUS IN THE TABLE BELOW:**

PPG Grant Approved at PIF: <b>Lighting Bolivia</b>				
<i>Project Preparation Activities Implemented</i>	<i>GEF/LDCF/SCCF/NPIF Amount (\$)</i>			
	<i>Budgeted Amount</i>	<i>Amount Spent To Date</i>	<i>Amount Committed</i>	<i>Balance</i>
Consultant: National Efficient Lighting Expert	16,700.00	16,554.00	0.00	146.00
Consultant (Reviewer)	5,250.00	5,250.00	0.00	0.00
Communication	880.00	0.00	0.00	880.00
<b>Total</b>	<b>22,830.00</b>	<b>21,804.00</b>	<b>0.00</b>	<b>1,026.00</b>

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<sup>15</sup>If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities.



## ANNEX D: ESTIMATES OF DIRECT AND INDIRECT GHG EMISSION REDUCTION

The impacts of the projects have been estimated through the STAP/GEF tool.

The main impacts are related to standards and labels and will be visible after the project completion, during the 10 years of period of influence.

The standards and labels are assumed to have a level of compliance of 80% and be adopted in two phases: an initial MEPS by 2021 will mainly impact the market of IL, CFLs, High intensity discharge lamps and Linear fluorescent, then a specific MEPS for LED technology will be adopted by 2025.

The market sales used are based on UN Comtrade imports data of 2015, projected to 2016 with a growth rate of 2.8%. Information regarding the LED market in Bolivia are not available, some assumptions based on expert's assessments (including industry data reviews) have been necessary to estimate the LED shares and growth rate.

Overall Results							
All Components	Cumulative			Annual			
	Total	2016-2018	2019-2028	2016	2018	2026	2036
	Direct Electricity Savings (MWh)	532	48	484	0	48	48
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	1,917	174	1,743	0	174	174	0
Direct GHG Emission Savings (tCO2)	233	21	212	0	21	21	0
Direct Post-project GHG Emission Savings (tCO2)	3,498,662		3,498,662	0	0	611,453	903,451
Indirect Bottom-up Emission Savings (tCO2)	952		952				
Indirect Top-down Emission Savings (tCO2)	5,540,296		5,540,296				

Standards & Labeling Components	Cumulative			Annual			
	Total	2016-2018	2019-2028	2016	2018	2026	2036
	Direct Electricity Savings (MWh)	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	0	0	0	0	0	0	0
Direct GHG Emission Savings (tCO2)	0	0	0	0	0	0	0
Direct Post-project GHG Emission Savings (tCO2)	3,498,662		3,498,662	0	0	611,453	903,451
Indirect Bottom-up Emission Savings (tCO2)							

In addition, direct impacts are related to project procurement and installation of LEDs. For the calculations it is considered that 440 street lighting high pressure sodium lamps will be replaced by LEDs. This is a conservative calculation, since some LEDs in off-grid areas will be replacing lighting points that emit more CO<sub>2</sub> than sodium lamps. The calculations will be updated as the details of the co-financing arrangements are confirmed.

Demonstration & Diffusion Components	Cumulative			Annual			
	Total	2016-2018	2019-2028	2016	2018	2026	2036
	Direct Electricity Savings (MWh)	532	48	484	0	48	48
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	1,917	174	1,742	0	174	174	0
Direct GHG Emission Savings (tCO2)	233	21	211	0	21	21	0
Direct Post-project GHG Emission Savings (tCO2)							
Indirect Bottom-up Emission Savings (tCO2)	952		952				

The following tables show the different steps of the STAP tool calculations. The Excel document is submitted as a complement of this annex.

## Step 1: Enter Basic Project Information

### Project Information

Project Information	
Project Title	Delivering the transition to energy efficient lighting
GEF ID Number	5299
Country	Bolivia
Region	LCR
GEF Agency	944
Date of Submission of GHG Accounting	
Contact Name	Ruth Coutto
First Year of Project	2016
Year of Project Close	2018
GEF Grant Amount (\$)	\$3,059,361
Co-financing Amount (\$)	\$13,467,575

General Parameters	Default	User-Specified	Notes
Length of Analysis Period (Years After Project Close)	20	10	
First Post-project Year		2019	
Last Post-project Year		2028	
Maximum Technology/ Measure Lifetime (Years)	20	25	

Fuels and Emission Factors	Default	User-Specified	Notes
Grid Electricity T&D Loss Rate (%)	10%	8%	
Grid Electricity Emissions (tCO2/MWh)	0.5750	0.4046	source Country Lighting Assessment 'en.lighten'
Fuel: Click here to select from list	0.0000	0.0000	
Fuel: Click here to select from list	0.0000	0.0000	
Fuel: Click here to select from list	0.0000	0.0000	

## Step 2: List Project Components and Select Quantification Module (based on intervention type)

Project Component	Sector/Subsector	Logframe Output	Module/Intervention Type
HPS replaced by LED	Street lighting	4.2.2 LED and controls systems procured and installed through the demonstration programme.	Demonstration & Diffusion
CFL replacing IL	Lighting/all sectors	1.1.2 National legislation to establish and enforce minimum energy performance standards (MEPS) for lamps developed.	Standards and Labeling
LED replacing IL	Lighting/all sectors		Standards and Labeling
LED replacing Hal	Lighting/all sectors		Standards and Labeling
Phase out of inefficient High Intensity Discharge Lamps	Lighting/all sectors		Standards and Labeling
Phase out of inefficient Tubular lamps	Lighting/all sectors		Standards and Labeling
LED replacing CFL	Lighting/all sectors		Standards and Labeling

**Results: Standards and Labeling Project Components**

	Cumulative			Annual			
	Total	2016-2018	2019-2028	2016	2018	2026	2036
Direct Electricity Savings (MWh)	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	0	0	0	0	0	0	0
Direct GHG Emission Savings (tCO2)	0	0	0	0	0	0	0
Direct Post-project GHG Emission Savings (tCO2)	3,498,662		3,498,662	0	0	611,453	903,451
Indirect Bottom-up Emission Savings (tCO2)							

**Component 1: CFL replacing IL -- General Inputs**

**Technology Specifications**

	Default	User-Specified
Target Technology	CFL	CFL
Fuel Used	Electricity	Electricity
Displaced Technology	Incandescent	Incandescent
Useful Technology Lifetime (years)	5	6
Power Consumption: CFL (W)	15	18
Power Consumption: Incandescent (W)	60	80

Notes


**Annual Energy Consumption**

*User may enter either daily or annual energy information*

	Default	User-Specified
Daily Usage (hr/day)	3.5	4.0
Days Used Each Year (days/yr)	350	365
Annual Energy Consumption: CFL (kWh/yr)	18	27
Annual Energy Consumption: Incandescent (kWh/yr)	74	117
Percentage Energy Savings		77%

Notes


**Market Assumptions**

	Default	User-Specified
Annual Sales in Year 2016		24,841,643
Annual Sales Growth Rate		2.8%

Notes

Since in the efficient lighting market we have 89%CFL and 11%LED. In this market we find 89% of the market "IL+CFL".
IEA WEO 2012 growth rate for this region

**Baseline Assumptions**

	Default	User-Specified
Market Share of CFL in Year 2016		19%
Baseline Annual Increase in CFL Market Share	2%	8%
Annual reduction in energy consumption: CFL	0%	0%
Annual reduction in energy consumption: Incandescent	1%	1%

Notes


**Standard/Labeling Program Effectiveness**

	Default	User-Specified
Year Standard in Force		2021
Percent New Sales Compliant with Standard		80%

Notes


<b>TOTALS</b>	Energy Avoided 2016-2018 (MWh)	0	Direct GHG Avoided 2016-2018 (tCO2)	0
	Direct Energy Avoided 2019-2028 (MWh)	0	Direct GHG Avoided 2019-2028 (tCO2)	0
	Direct Post-project Energy Avoided 2019-2028 (MWh)	5,773,682	Direct Post-project GHG Avoided 2019-2028 (tCO2)	2,522,914

**Component 2: LED replacing IL -- General Inputs**

Technology Specifications	Default	User-Specified	Notes
Target Technology	LED Lighting	LED Lighting	
Fuel Used	Electricity	Electricity	
Displaced Technology	Improved CFL	IL	
Useful Technology Lifetime (years)	5	15	
Power Consumption: LED Lighting (W)	14	12	
Power Consumption: IL (W)	15	80	

Annual Energy Consumption	Default	User-Specified	Notes
<i>User may enter either daily or annual energy information</i>			
Daily Usage (hr/day)	8.0	4.0	
Days Used Each Year (days/yr)	200	200	
Annual Energy Consumption: LED Lighting (kWh/yr)	22	10	
Annual Energy Consumption: IL (kWh/yr)	24	64	
Percentage Energy Savings		85%	

Market Assumptions	Default	User-Specified	Notes
Annual Sales in Year 2016		2,611,378	The remaining 11% of total IL. For simplification We assume that in 2016 no IL are replaced by LEDs.
Annual Sales Growth Rate		2.8%	

Baseline Assumptions	Default	User-Specified	Notes
Market Share of LED Lighting in Year 2016		0%	
Baseline Annual Increase in LED Lighting Market Share	2%	1.0%	
Annual reduction in energy consumption: LED Lighting	0%	0%	
Annual reduction in energy consumption: Improved CFL	1%	1%	

Standard/Labeling Program Effectiveness	Default	User-Specified	Notes
Year Standard in Force		2025	
Percent New Sales Compliant with Standard		80%	

<b>TOTALS</b>	Energy Avoided 2016-2018 (MWh)	0	Direct GHG Avoided 2016-2018 (tCO2)	
	Direct Energy Avoided 2019-2028 (MWh)	0	Direct GHG Avoided 2019-2028 (tCO2)	
	Direct Post-project Energy Avoided 2019-2028 (MWh)	1,163,110	Direct Post-project GHG Avoided 2019-2028 (tCO2)	

**Component 3: LED replacing Hal -- General Inputs**

Technology Specifications	Default	User-Specified	Notes
Target Technology	LED Lighting	LED Lighting	
Fuel Used	Electricity	Electricity	
Displaced Technology	Improved CFL	Hal	
Useful Technology Lifetime (years)	5	15	
Power Consumption: LED Lighting (W)	14	12	
Power Consumption: Hal (W)	15	68	

Annual Energy Consumption	Default	User-Specified	Notes
<i>User may enter either daily or annual energy information</i>			
Daily Usage (hr/day)	8.0	4.0	
Days Used Each Year (days/yr)	200	365	
Annual Energy Consumption: LED Lighting (kWh/yr)	22	18	
Annual Energy Consumption: Hal (kWh/yr)	24	99	
Percentage Energy Savings		82%	

Market Assumptions	Default	User-Specified	Notes
Annual Sales in Year 2016		2,359,000	All Halogens and all LEDs. These technologies are the more expensive, so it is more likely to have user from halogens buying LEDs.
Annual Sales Growth Rate		2.8%	

Baseline Assumptions	Default	User-Specified	Notes
Market Share of LED Lighting in Year 2016		29%	
Baseline Annual Increase in LED Lighting Market Share	2%	2.0%	
Annual reduction in energy consumption: LED Lighting	0%	0%	
Annual reduction in energy consumption: Improved CFL	1%	1%	

Standard/Labeling Program Effectiveness	Default	User-Specified	Notes
Year Standard in Force		2025	
Percent New Sales Compliant with Standard		80%	

<b>TOTALS</b>	Energy Avoided 2016-2018 (MWh)	0	Direct GHG Avoided 2016-2018 (tCO2)	0
	Direct Energy Avoided 2019-2028 (MWh)	0	Direct GHG Avoided 2019-2028 (tCO2)	0
	Direct Post-project Energy Avoided 2019-2028 (MWh)	698,913	Direct Post-project GHG Avoided 2019-2028 (tCO2)	305,403

**Component 4: Phase out of inefficient High Intensity Discharge Lamps -- General Inputs**

Technology Specifications	Default	User-Specified	Notes
Target Technology	T-8 Fluor. Lamp	Efficient HID	
Fuel Used	Electricity	Electricity	
Displaced Technology	T-12 Fluor. Lamp	HID	
Useful Technology Lifetime (years)	5	4	
Power Consumption: Efficient HID (W)	28	120	
Power Consumption: HID (W)	40	150	

Annual Energy Consumption	Default	User-Specified	Notes
<i>User may enter either daily or annual energy information</i>			
Daily Usage (hr/day)	5.0	10.0	
Days Used Each Year (days/yr)	350	365	
Annual Energy Consumption: Efficient HID (kWh/yr)	49	438	
Annual Energy Consumption: HID (kWh/yr)	70	548	
Percentage Energy Savings		20%	

Market Assumptions	Default	User-Specified	Notes
Annual Sales in Year 2016		300,000	
Annual Sales Growth Rate		2.8%	

Baseline Assumptions	Default	User-Specified	Notes
Market Share of Efficient HID in Year 2016		19.3%	
Baseline Annual Increase in Efficient HID Market Share	2%	6%	
Annual reduction in energy consumption: Efficient HID	0%	0%	
Annual reduction in energy consumption: T-12 Fluor. Lamp	1%	1%	

Standard/Labeling Program Effectiveness	Default	User-Specified	Notes
Year Standard in Force		2021	
Percent New Sales Compliant with Standard		80%	

<b>TOTALS</b>	Energy Avoided 2016-2018 (MWh)	0	Direct GHG Avoided 2016-2018 (tCO2)	0
	Direct Energy Avoided 2019-2028 (MWh)	0	Direct GHG Avoided 2019-2028 (tCO2)	0
	Direct Post-project Energy Avoided 2019-2028 (MWh)	124,798	Direct Post-project GHG Avoided 2019-2028 (tCO2)	54,533

**Component 5: Phase out of inefficient Tubular Lamps -- General Inputs**

Technology Specifications	Default	User-Specified	Notes
Target Technology	T-8 Fluor. Lamp	T-8 Fluor. Lamp	
Fuel Used	Electricity	Electricity	
Displaced Technology	T-12 Fluor. Lamp	T-12 Fluor. Lamp	
Useful Technology Lifetime (years)	5	6	
Power Consumption: T-8 Fluor. Lamp (W)	28	27	
Power Consumption: T-12 Fluor. Lamp (W)	40	36	

Annual Energy Consumption	Default	User-Specified	Notes
<i>User may enter either daily or annual energy information</i>			
Daily Usage (hr/day)	5.0	5.0	
Days Used Each Year (days/yr)	350	350	
Annual Energy Consumption: T-8 Fluor. Lamp (kWh/yr)	49	47	
Annual Energy Consumption: T-12 Fluor. Lamp (kWh/yr)	70	63	
Percentage Energy Savings		25%	

Market Assumptions	Default	User-Specified	Notes
Annual Sales in Year 2016		2,435,000	
Annual Sales Growth Rate		2.8%	

Baseline Assumptions	Default	User-Specified	Notes
Market Share of T-8 Fluor. Lamp in Year 2016		17%	
Baseline Annual Increase in T-8 Fluor. Lamp Market Share	2%	6%	
Annual reduction in energy consumption: T-8 Fluor. Lamp	0%	0%	
Annual reduction in energy consumption: T-12 Fluor. Lamp	1%	1%	

Standard/Labeling Program Effectiveness	Default	User-Specified	Notes
Year Standard in Force		2021	
Percent New Sales Compliant with Standard		80%	

<b>TOTALS</b>	Energy Avoided 2016-2018 (MWh)	0	Direct GHG Avoided 2016-2018 (tCO2)	0
	Direct Energy Avoided 2019-2028 (MWh)	0	Direct GHG Avoided 2019-2028 (tCO2)	0
	Direct Post-project Energy Avoided 2019-2028 (MWh)	208,101	Direct Post-project GHG Avoided 2019-2028 (tCO2)	90,933

**Component 6: LED replacing CFL -- General Inputs**

**Technology Specifications**

	Default	User-Specified
Target Technology	LED Lighting	LED Lighting
Fuel Used	Electricity	Electricity
Displaced Technology	Improved CFL	Improved CFL
Useful Technology Lifetime (years)	5	15
Power Consumption: LED Lighting (W)	14	12
Power Consumption: Improved CFL (W)	15	18

*Notes*


**Annual Energy Consumption**

*User may enter either daily or annual energy information*

	Default	User-Specified
Daily Usage (hr/day)	8.0	8.0
Days Used Each Year (days/yr)	200	200
Annual Energy Consumption: LED Lighting (kWh/yr)	22	19
Annual Energy Consumption: Improved CFL (kWh/yr)	24	29
Percentage Energy Savings		33%

*Notes*


**Market Assumptions**

	Default	User-Specified
Annual Sales in Year 2016		602,978
Annual Sales Growth Rate		2.8%

*Notes*

The remaining CFLs

**Baseline Assumptions**

	Default	User-Specified
Market Share of LED Lighting in Year 2016		0%
Baseline Annual Increase in LED Lighting Market Share	2%	1.0%
Annual reduction in energy consumption: LED Lighting	0%	0%
Annual reduction in energy consumption: Improved CFL	1%	1%

*Notes*


**Standard/Labeling Program Effectiveness**

	Default	User-Specified
Year Standard in Force		2025
Percent New Sales Compliant with Standard		80%

*Notes*


<b>TOTALS</b>	Energy Avoided 2016-2018 (MWh)	0	Direct GHG Avoided 2016-2018 (tCO2)	0
	Direct Energy Avoided 2019-2028 (MWh)	0	Direct GHG Avoided 2019-2028 (tCO2)	0
	Direct Post-project Energy Avoided 2019-2028 (MWh)	38,075	Direct Post-project GHG Avoided 2019-2028 (tCO2)	16,637

**Results: Demonstration/Diffusion Project Components**

	Cumulative			Annual			
	Total	2016-2018	2019-2028	2016	2018	2026	2036
Direct Electricity Savings (MWh)	532	48	484	0	48	48	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	1,917	174	1,742	0	174	174	0
Direct GHG Emission Savings (tCO2)	233	21	211	0	21	21	0
Direct Post-project GHG Emission Savings (tCO2)							
Indirect Bottom-up Emission Savings (tCO2)	952		952				

**Component 1: HPS replaced by LED -- General Inputs**

**Component Specifications**

	Default	User-Specified	Per Unit
Annual Electricity Savings (MWh)		0.1100	
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Useful Lifetime of Investment	15	15	

*Notes*

Savings for one street lamp replaced. Assuming 100W on average for current HPS and 70W for the LEDs. Hours of operation: 12hours/day and 326 days/year.

**Baseline Assumptions**

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

*Notes*

Procurement and installation of LED lamps will be financed by the GEF grant.
--

**Indirect Bottom-up Estimate**

	Default	User-Specified
Number of s Implemented During Project Period		440
Number of Replications Post-project as Spillover		3
Total		1,320

*Notes*

440 LED street lamps will be directly procured and installed in participant municipalities.

<b>TOTALS</b>	Direct Energy Avoided 2016-2018 (GJ)	174	Direct GHG Avoided 2016-2018 (tCO2)	21
	Direct Energy Avoided 2019-2028 (GJ)	1,742	Direct GHG Avoided 2019-2028 (tCO2)	211
	Direct Post-project Energy Avoided 2019-2028 (GJ)	0	Direct Post-project GHG Avoided 2019-2028 (tCO2)	0

<b>INDIRECT BOTTOM-UP SAVINGS</b>	2019-2028	952 tCO2
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## Step 4: Consider Indirect, Top-Down Impacts

<i>User-Specified</i>	
Total Market Potential (tCO2)	9,233,826
Causality factor	60%
Indirect Top-Down Emission Reductions (tCO2)	5,540,296

### *Notes*

Based on 100% new sales compliance with standards.

This GEF project will substantially contribute to efficient lighting market transition in Bolivia.

## ANNEX E: CONSULTANTS TO BE HIRED FOR THE PROJECT USING GEF RESOURCES <sup>2</sup>

Position Titles	\$/ Person Week*	Estimated Person Weeks**	Total	Tasks To Be Performed
<b>For Project Management</b>				
<b>Local</b>				
Project Manager	808	156	126,000	The PM will be responsible for the day-to-day project operations, financial accounts, periodic reporting to UNEP and the PSC and for allocation of the GEF grant according to the quarterly and annual work plans and budgets in coordination with UNEP and MoE. The PM will also act as secretary of the PSC. The PM will prepare, at the end of the project, the project Terminal Report.
Justification for travel, if any: participation in international specialized technical meetings that could include: lighting fairs; laboratory training in Beijing (at GELC laboratory facilities); 5-day training course in the Ambilamp Academy (Madrid), with field trip to Bilbao, covering the following topics: international regulations, extended producer responsibility, CRSOs creation and operation, case studies, and hands-on activities for strategy development.				
<b>For Technical Assistance</b>				
<b>Local</b>				
National Consultants for efficient lighting	567	156	88,400	Planning and preparation stocktaking and assessment of the national situation on efficient lighting strategy development: field work, data collection, analysis, consultation, adoption Designing LED and control demonstration program
National Consultants for MEPS design	567	156	88,400	Supporting the design of MEPS
National Consultants for MVE	567	156	88,400	Assessing and proposing the strengthening of MVE Supporting the MVE international trainers Supporting the analysis of national lab testing capacities and needs Supporting the training of lab technicians
National Consultants for ESM	567	156	88,400	Analysing issues and options and proposals for environmentally sound management of lighting products Supporting the design of the ESM operational framework Supporting the design of a collection and recycling services organization for lighting products
National Consultants for communication campaigns	567	130	73,400	Designing communication, information and awareness raising for efficient lighting and collection and recycling of spent lamps
National Consultants for gender mainstreaming	567	26	15,000	Mainstreaming gender concerns in the project, mapping and understanding the gender situation in Bolivia, design Gender Action Plan
<b>International</b>				
International MEPS specialist	2,761	6	16,564	Supporting the design of national MEPS and the strategy development
International ESM - CRSO specialist	2,905	35	101,660	Developing the regulatory framework and policy for sustainable management at the end of lamps' life Developing an environmentally sound management scheme with a robust legal framework Designing a national quality control mechanism to ensure compliance with the lighting MEPS Analysing issues and options and proposals for ESM Support for the design of a CRSO
Justification for travel, if any: national consultants may travel for workshops, consultations or trainings. All international specialists will travel to Bolivia for fact-finding missions and presentation of results.				



Bolivia has requested UNEP en.lighten to provide technical support in delivering the following activities : assessment of the status of the existing national testing capacities, and proposal for strengthening labs and testing capacities; assessment of the status of the existing lighting safety and efficiency tests in the national labs, and proposal for improvement; design of an operational framework and strategy for collection, recycling and disposal of used lamps; development of labels and/or MEPS for LED lamps; trainings related to different elements of the four components of the project.



	Comp. 1	Comp. 2	Comp. 3	Comp. 4	PMC	Total	Year 1	Year 2	Year 3	Total
<b>30 TRAINING COMPONENT</b>						-				
3200 Group training						-				
3201 Training on communications for use of efficient lighting (including LEDs and controls), and on collection and recycling campaigns			10,000	10,000		20,000	10,000	10,000		20,000
3202 Training on procurement processes of lighting technologies: processes and case studies		3,000		3,000		6,000		6,000		6,000
3281 MVE training for government authorities and customs administration officials (includes fee; and logistics such as facilities; catering, translation, materials)		44,876				44,876	11,219	33,657		44,876
3282 Training of lab technicians and gov. officials (includes fee and logistics such as facilities; catering, translation, materials)		66,563		33,281		99,844	24,961	74,883		99,844
3283 Training from Ambilamp on CRSOs for spent lamps (includes fee, trainees and trainers travels and logistics such as facilities; catering, translation, materials)			130,440			130,440		130,440		130,440
3284 Training from specialist on CRSOs for spent lamps (includes fee, trainees and trainers travels and logistics such as facilities; catering, translation, materials)			59,500			59,500		59,500		59,500
3285 Training on LED and controls technologies and applications (includes fee; trainers' travels and logistics such as facilities; catering, translation, materials)				27,016		27,016		27,016		27,016
<b>3299 Sub-total</b>	-	<b>114,439</b>	<b>199,940</b>	<b>73,297</b>	-	<b>387,676</b>	<b>46,180</b>	<b>341,496</b>	-	<b>387,676</b>
3300 Meetings/Conferences						-				
3301 Meetings of national coordinating committee (working sessions for planning, preparation, strategy development, and adoption, translation services if needed)	12,000					12,000	6,000	6,000		12,000
3302 Consultation meetings for MEPS, MVE and ESM design		5,000	5,000	5,000		15,000		15,000		15,000
3303 Conferences/meetings for government authorities and customs administration officials on labels, MEPS, MVE, ESM, LED technologies		10,000	10,000	10,000		30,000		30,000		30,000
3304 Inception workshop (includes travel, fees and logistics)	2,500					2,500	2,500			2,500
3305 Steering Committee (includes travel, fees and logistics)	3,125	3,125	3,125	3,125		12,500	4,167	4,167	4,167	12,500
3381 Consultation/Workshops ( includes fees, travel of specialist and logistics such as catering, facilities, materials)			52,800			52,800	13,200	19,800	19,800	52,800
<b>3399 Sub-total</b>	<b>17,625</b>	<b>18,125</b>	<b>70,925</b>	<b>18,125</b>	-	<b>124,800</b>	<b>25,867</b>	<b>74,967</b>	<b>23,967</b>	<b>124,800</b>
<b>3999 Component total</b>	<b>17,625</b>	<b>132,564</b>	<b>270,865</b>	<b>91,422</b>	-	<b>512,476</b>	<b>72,047</b>	<b>416,463</b>	<b>23,967</b>	<b>512,476</b>

	Comp. 1	Comp. 2	Comp. 3	Comp. 4	PMC	Total	Year 1	Year 2	Year 3	Total
<b>40 EQUIPMENT AND PREMISES COMPONENT</b>						-				
4100 Expendable equipment						-				
4101 Communications and information awareness equipment	3,000		3,000	3,000		9,000	3,000	3,000	3,000	9,000
4102 Office supplies					1,000	1,000	333	333	333	1,000
<b>4199 Sub-total</b>	<b>3,000</b>	<b>-</b>	<b>3,000</b>	<b>3,000</b>	<b>1,000</b>	<b>10,000</b>	<b>3,333</b>	<b>3,333</b>	<b>3,333</b>	<b>10,000</b>
4200 Non-expendable equipment						-				
4201 Communications and information awareness equipment	4,000					4,000		2,000	2,000	4,000
4202 Technical Assistance Support for selected testing labs: lab equipment		468,655				468,655		312,437	156,218	468,655
4203 LED and controls training equipment				5,000		5,000	5,000			5,000
4204 LED and controls for demonstration project				440,000		440,000		440,000		440,000
4205 Office equipment					3,000	3,000	3,000			3,000
4206 CRSO related equipment						-	-			-
<b>4299 Sub-total</b>	<b>4,000</b>	<b>468,655</b>	<b>-</b>	<b>445,000</b>	<b>3,000</b>	<b>920,655</b>	<b>5,000</b>	<b>754,437</b>	<b>158,218</b>	<b>920,655</b>
4300 Premises						-				-
4301 Premises						-				-
<b>4399 Sub-total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>4999 Component total</b>	<b>7,000</b>	<b>468,655</b>	<b>3,000</b>	<b>448,000</b>	<b>4,000</b>	<b>930,655</b>	<b>8,333</b>	<b>757,770</b>	<b>161,552</b>	<b>930,655</b>
<b>50 MISCELLANEOUS COMPONENT</b>						-				
5100 Operation and maintenance of equipment						-				
5101 Communications and information awareness equipment maintenance	1,025	1,025	1,025	1,025		4,100	1,367	1,367	1,367	4,100
5102 MVE Lab equipment maintenance		5,000				5,000		2,000	3,000	5,000
5103 Ambilamp Academy operations miscellaneous			2,000			2,000		2,000		2,000
<b>5199 Sub-total</b>	<b>1,025</b>	<b>6,025</b>	<b>3,025</b>	<b>1,025</b>	<b>-</b>	<b>11,100</b>	<b>1,367</b>	<b>5,367</b>	<b>4,367</b>	<b>11,100</b>
5200 Reporting costs						-				
5201 Reporting: Project Implementation Review (PIR), Half Yearly progress report, Quarterly financial report, Co-financing report, Final report	1,500	1,000	1,000	1,000		4,500	1,500	1,500	1,500	4,500
5202 Printing	2,000	400	400	400		3,200	800	1,600	800	3,200
<b>5299 Sub-total</b>	<b>3,500</b>	<b>1,400</b>	<b>1,400</b>	<b>1,400</b>	<b>-</b>	<b>7,700</b>	<b>2,300</b>	<b>3,100</b>	<b>2,300</b>	<b>7,700</b>
5300 Sundry						-				
5301 Other miscellaneous	5,000	5,000	5,000	5,000	5,000	25,000	8,333	8,333	8,333	25,000
5302 Communication postage	240	240	240	240		960	320	320	320	960
5303 Audit	2,500	2,500	2,500	2,500		10,000	3,333	3,333	3,333	10,000
<b>5399 Sub-total</b>	<b>7,740</b>	<b>7,740</b>	<b>7,740</b>	<b>7,740</b>	<b>5,000</b>	<b>35,960</b>	<b>11,987</b>	<b>11,987</b>	<b>11,987</b>	<b>35,960</b>
5400 Hospitality and entertainment						-				
5401						-				
<b>5499 Sub-total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
5500 Evaluation						-				
5501 Measurement of progress indicators	1,250	1,250	1,250	1,250		5,000		2,500	2,500	5,000
5581 Mid-term/Terminal evaluation	12,500	12,500	12,500	12,500		50,000			50,000	50,000
<b>5599 Sub-total</b>	<b>13,750</b>	<b>13,750</b>	<b>13,750</b>	<b>13,750</b>	<b>-</b>	<b>55,000</b>	<b>-</b>	<b>2,500</b>	<b>52,500</b>	<b>55,000</b>
<b>5999 Component total</b>	<b>26,015</b>	<b>28,915</b>	<b>25,915</b>	<b>23,915</b>	<b>5,000</b>	<b>109,760</b>	<b>15,653</b>	<b>22,953</b>	<b>71,153</b>	<b>109,760</b>
<b>99 GRAND TOTAL</b>	<b>274,510</b>	<b>868,752</b>	<b>945,780</b>	<b>820,319</b>	<b>150,000</b>	<b>3,059,361</b>	<b>583,502</b>	<b>1,872,465</b>	<b>585,394</b>	<b>3,059,361</b>

**F2. Reconciliation between GEF budget and co-finance budget**

**ANNEX F-2 - RECONCILIATION BETWEEN GEF BUDGET AND CO-FINANCE BUDGET (TOTAL GEF & CO-FINANCE US\$)**

Project title: Delivering the transition to energy efficient lighting  
 Project number: 5299  
 Project executing partner: Ministry of Hydrocarbons and Energy and Ministry of Environment and Water  
 Project implementation period: 2016 - 2018

\*Name of institution providing co-finance

UNEP Budget Line	GEF Cash A	Ministry of Hydrocarbons and Energy		Ministry of Environment and Water		Private sector (Philips, NLTC)		UNEP		Municipality of La Paz		Total	
		Cash B	In-kind C	Cash D	In-kind E	Cash F	In-kind G	Cash H	In-kind I	Cash J	In-kind K	Cash A+B+D+F+H+J	In-kind C+E+G+I+K
<b>10 PERSONNEL COMPONENT</b>													
1100 Project personnel													
1101 Project manager (Bolivia)	126,000											126,000	-
1102 Project Director - Energy elements (Bolivia)	-		18,000									-	18,000
1103 Project Co- Director Environment elements	-		61,714		7,200							-	68,914
1104 Other national staff	-				150,000						40,000	-	190,000
1181 International technical support	225,000											225,000	-
1182 UNEP technical support	-							80,000				-	80,000
<b>1199 Sub-total</b>	<b>351,000</b>		<b>79,714</b>		<b>157,200</b>			<b>80,000</b>		<b>40,000</b>		<b>351,000</b>	<b>356,914</b>
1200 Consultants													
1201 National Consultants for efficient lighting	88,400		185,143									88,400	185,143
1202 National Consultants for MEPS design	88,400						250,000					88,400	250,000
1203 National Consultants for MVE	88,400											88,400	-
1204 National Consultants for ESM	88,400				100,000		100,000					88,400	200,000
1205 National Consultants for communication campaigns	73,400				102,857		100,000					73,400	202,857
1206 National Consultants for gender mainstreaming	15,000											15,000	-
1281 International MEPS specialist	16,564											16,564	-
1282 International ESM - CRSO specialist	101,660											101,660	-
<b>1299 Sub-total</b>	<b>560,224</b>		<b>185,143</b>		<b>202,857</b>		<b>450,000</b>					<b>560,224</b>	<b>838,000</b>
1300 Administrative Support													
1301													
1302													
<b>1399 Sub-total</b>	<b>-</b>		<b>-</b>		<b>-</b>		<b>-</b>		<b>-</b>		<b>-</b>	<b>-</b>	<b>-</b>
1600 Travel on official business (only UNEP staff)													
1601 Project manager or director travel	15,000				30,000							15,000	30,000
1681 International project staff travel ( includes ticket, hotel and DSA, for 3	22,926											22,926	-
<b>1699 Sub-total</b>	<b>37,926</b>		<b>-</b>		<b>30,000</b>		<b>-</b>		<b>-</b>		<b>-</b>	<b>37,926</b>	<b>30,000</b>
<b>1999 Component total</b>	<b>949,150</b>		<b>264,857</b>		<b>390,057</b>		<b>450,000</b>		<b>80,000</b>		<b>40,000</b>	<b>949,150</b>	<b>1,224,914</b>
<b>20 SUB-CONTRACT COMPONENT</b>													
2100 Sub-contracts (MOUs/LOAs for cooperating agencies)													
2101													
<b>2199 Sub-total</b>	<b>-</b>		<b>-</b>		<b>-</b>		<b>-</b>		<b>-</b>		<b>-</b>	<b>-</b>	<b>-</b>
2200 Sub-contracts (MOUs/LOAs for supporting organizations)													
2201													
2281 Ambilamp - International ESM specialists (support the strategy development, and the ESM operational framework and strategy)	9,064											9,064	-
2282 GELC - International MVE specialists (support the strategy development and the design of an MVE scheme)	108,256						300,000					108,256	300,000
<b>2299 Sub-total</b>	<b>117,320</b>		<b>-</b>		<b>-</b>		<b>300,000</b>		<b>-</b>		<b>-</b>	<b>117,320</b>	<b>300,000</b>
2300 Sub-contracts (for commercial purposes)													
2301 Stocktaking and assessment (market	20,000						15,000					20,000	15,000
2302 Design and application of many communication campaigns on energy efficient lighting and on collection and	360,000				40,000		1,000,000					360,000	1,040,000
2303 Demonstration LED and controls program (design and installation)	60,000						20,000					60,000	20,000
<b>2399 Sub-total</b>	<b>440,000</b>		<b>-</b>		<b>40,000</b>		<b>1,035,000</b>		<b>-</b>		<b>-</b>	<b>440,000</b>	<b>1,075,000</b>
<b>2999 Component total</b>	<b>557,320</b>		<b>-</b>		<b>40,000</b>		<b>1,335,000</b>		<b>-</b>		<b>-</b>	<b>557,320</b>	<b>1,375,000</b>
<b>30 TRAINING COMPONENT</b>													
3200 Group training													
3201 Training on communications for use of efficient lighting (including LEDs and controls), and on collection and recycling	20,000				10,000							20,000	10,000
3202 Training on procurement processes of lighting technologies: processes and case	6,000											6,000	-
3281 MVE training for government authorities and customs administration officials (includes fee; and logistics such as facilities; catering, translation, materials)	44,876											44,876	-
3282 Training of lab technicians and gov. officials (includes fee and logistics such as facilities; catering, translation, materials)	99,844											99,844	-
3283 Training from Ambilamp on CRSOs for spent lamps (includes fee, trainees and trainers travels and logistics such as facilities; catering, translation, materials)	130,440											130,440	-
3284 Training from specialist on CRSOs for spent lamps (includes fee, trainees and trainers travels and logistics such as facilities; catering, translation, materials)	59,500				6,000							59,500	6,000
3285 Training on LED and controls technologies and applications (includes fee; trainers' travels and logistics such as facilities; catering, translation, materials)	27,016						15,000					27,016	15,000
<b>3299 Sub-total</b>	<b>387,676</b>		<b>-</b>		<b>16,000</b>		<b>15,000</b>		<b>-</b>		<b>-</b>	<b>387,676</b>	<b>31,000</b>

UNEP Budget Line	GEF Cash A	Ministry of Hydrocarbons and Energy		Ministry of Environment and Water		Private sector (Philips, NLTC)		UNEP		Municipality of La Paz		Total	
		Cash B	In-kind C	Cash D	In-kind E	Cash F	In-kind G	Cash H	In-kind I	Cash J	In-kind K	Cash A+B+D+F+H+J	In-kind C+E+G+I+K
3300 Meetings/Conferences													
3301 Meetings of national coordinating committee (working sessions for planning, preparation, strategy development, and adoption, translation services if needed)	12,000											12,000	-
3302 Consultation meetings for MEPS, MVE and ESM design	15,000											15,000	-
3303 Conferences/meetings for government authorities and customs administration officials on labels, MEPS, MVE, ESM, LED technologies	30,000											30,000	-
3304 Inception workshop (includes travel, fees and logistics)	2,500				500							2,500	500
3305 Steering Committee (includes travel, fees and logistics)	12,500				600							12,500	600
3381 Consultation/Workshops ( includes fees, travel of specialist and logistics such as catering, facilities, materials)	52,800				15,000							52,800	15,000
<b>3399 Sub-total</b>	<b>124,800</b>	-	-	-	<b>16,100</b>	-	-	-	-	-	-	<b>124,800</b>	<b>16,100</b>
<b>3999 Component total</b>	<b>512,476</b>	-	-	-	<b>32,100</b>	-	<b>15,000</b>	-	-	-	-	<b>512,476</b>	<b>47,100</b>
<b>40 EQUIPMENT AND PREMISES COMPONENT</b>													
4100 Expendable equipment													
4101 Communications and information awareness equipment	9,000											9,000	-
4102 Office supplies	1,000		6,000		6,000							1,000	12,000
<b>4199 Sub-total</b>	<b>10,000</b>	-	<b>6,000</b>	-	<b>6,000</b>	-	-	-	-	-	-	<b>10,000</b>	<b>12,000</b>
4200 Non-expendable equipment													
4201 Communications and information awareness equipment	4,000											4,000	-
4202 Technical Assistance Support for selected testing labs: lab equipment	468,655											468,655	-
4203 LED and controls training equipment	5,000											5,000	-
4204 LED and controls for demonstration project	440,000											440,000	-
4205 Office equipment	3,000		40,000		12,000							3,000	52,000
4206 CRSO related equipment	-									10,000		-	10,000
<b>4299 Sub-total</b>	<b>920,655</b>	-	<b>40,000</b>	-	<b>12,000</b>	-	-	-	-	<b>10,000</b>	-	<b>920,655</b>	<b>62,000</b>
4300 Premises													
4301 Premises													
4302													
<b>4399 Sub-total</b>	<b>-</b>	-	-	-	-	-	-	-	-	-	-	<b>-</b>	<b>-</b>
<b>4999 Component total</b>	<b>930,655</b>	-	<b>46,000</b>	-	<b>18,000</b>	-	-	-	-	<b>10,000</b>	-	<b>930,655</b>	<b>74,000</b>
<b>50 MISCELLANEOUS COMPONENT</b>													
5100 Operation and maintenance of equipment													
5101 Communications and information awareness equipment maintenance	4,100											4,100	-
5102 MVE Lab equipment maintenance	5,000											5,000	-
5103 Ambilamp Academy operations miscellaneous	2,000											2,000	-
<b>5199 Sub-total</b>	<b>11,100</b>	-	-	-	-	-	-	-	-	-	-	<b>11,100</b>	-
5200 Reporting costs													
5201 Reporting: Project Implementation Review (PIR), Half Yearly progress report, Quarterly financial report, Co-financing report, Final report	4,500				100,000							4,500	100,000
5202 Printing	3,200				20,000							3,200	20,000
<b>5299 Sub-total</b>	<b>7,700</b>	-	-	-	<b>120,000</b>	-	-	-	-	-	-	<b>7,700</b>	<b>120,000</b>
5300 Sundry													
5301 Other miscellaneous	25,000											25,000	-
5302 Communication postage	960											960	-
5303 Audit	10,000											10,000	-
<b>5399 Sub-total</b>	<b>35,960</b>	-	-	-	-	-	-	-	-	-	-	<b>35,960</b>	-
5400 Hospitality and entertainment													
5401													
5402													
<b>5499 Sub-total</b>	<b>-</b>	-	-	-	-	-	-	-	-	-	-	<b>-</b>	<b>-</b>
5500 Evaluation													
5501 Measurement of progress indicators	5,000				2,500							5,000	2,500
5581 Mid-term/Terminal evaluation	50,000											50,000	-
<b>5599 Sub-total</b>	<b>55,000</b>	-	-	-	<b>2,500</b>	-	-	-	-	-	-	<b>55,000</b>	<b>2,500</b>
<b>5999 Component total</b>	<b>109,760</b>	-	-	-	<b>122,500</b>	-	-	-	-	-	-	<b>109,760</b>	<b>122,500</b>
<b>60 NATIONAL SECTORIAL PROGRAMS</b>													
6100 National sectorial programs													
6101 Energy Efficiency programmes/projects	-		7,079,143							70,000		-	7,149,143
6102 Solid and hazardous waste management programmes/projects	-				3,397,343					77,575		-	3,474,918
<b>6199 Sub-total</b>	<b>-</b>	-	<b>7,079,143</b>	-	<b>3,397,343</b>	-	-	-	-	<b>147,575</b>	-	<b>-</b>	<b>10,624,061</b>
<b>6999 Component total</b>	<b>-</b>	-	<b>7,079,143</b>	-	<b>3,397,343</b>	-	-	-	-	<b>147,575</b>	-	<b>-</b>	<b>10,624,061</b>
<b>99 GRAND TOTAL</b>	<b>3,059,361</b>	-	<b>7,390,000</b>	-	<b>4,000,000</b>	-	<b>1,800,000</b>	-	<b>80,000</b>	<b>-</b>	<b>-</b>	<b>3,059,361</b>	<b>13,467,575</b>

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

M&E Activity	Description	Responsible Parties	Timeframe	Indicative GEF budget (USD)
Inception Workshop (IW) and Report	<ul style="list-style-type: none"> <li>Report prepared immediately following the IW; it includes:               <ul style="list-style-type: none"> <li>A detailed Work Plan and budget (AWPs) for the first year, as well as an overview of AWP for subsequent years, divided per output and inputs (budget lines);</li> <li>A more detailed narrative of roles of UNEP, PMU and PSC: institutional responsibilities, coordinating actions and feedback mechanisms;</li> <li>Detailed Project Supervision and a M&amp;E Plan.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Execution: PMU, MHE and UNEP</li> </ul>	<ul style="list-style-type: none"> <li>Immediately following, within 2 months of project start-up.</li> </ul>	GEF: 2,500 Co-fin: 500
Half-yearly progress report; Quarterly financial reports	<ul style="list-style-type: none"> <li>Part of UNEP procedures for project monitoring;</li> <li>Quarterly financial reports: detailed financial reports (in Excel), with justification of any change;</li> <li>Bi-annual progress:               <ul style="list-style-type: none"> <li>Analyzes project performance over the reporting period UNEP; Describes constraints experienced in the progress towards results and the reasons;</li> <li>Describes Work Plan for the next period in an Annex and the detailed budget divided per output and inputs (budget lines).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Execution: UNEP</li> <li>Support : PMU</li> </ul>	<ul style="list-style-type: none"> <li>Two bi-annual reports for any given year (July 31 and January 31);</li> <li>Quarterly financial reports;</li> <li>Last progress &amp; financial reports within 60 days of project closure of operations.</li> </ul>	GEF: Part of project manager tasks Co-fin: 40,000
Measurement of progress indicators	<ul style="list-style-type: none"> <li>Measurement of project indicators (outcome, progress and performance indicators, GEF tracking tools) at national and global level, including measurement and further analysis of the logical framework indicators after the project's inception and before the project's end.</li> </ul>	<ul style="list-style-type: none"> <li>Execution: PMU</li> <li>Inputs by government counterparts</li> </ul>	<ul style="list-style-type: none"> <li>Outcome indicators: start, mid and end of project;</li> <li>Progress/performance indicators: annually.</li> </ul>	GEF: 5,000 Co-fin: 2,500
Technical and thematic Reports; Publications of lessons learnt	<ul style="list-style-type: none"> <li>Technical and thematic periodic reports could also be prepared to focus on specific issues or areas of activity covered by the project.</li> </ul>	<ul style="list-style-type: none"> <li>Execution: PMU</li> <li>Support: MHE</li> </ul>	<ul style="list-style-type: none"> <li>As necessary for the thematic reports.</li> </ul>	GEF: Part of project components
Project Implementation Review (PIR); Co-financing report	<ul style="list-style-type: none"> <li>Analyzes project performance over the reporting period; describes constraints experienced in the progress towards results and the reasons;</li> <li>Draws lessons and makes clear recommendations for future orientation in addressing the key problems in the lack of progress;</li> <li>The PIR is discussed at PSC meetings.</li> </ul>	<ul style="list-style-type: none"> <li>Execution: PMU</li> <li>Support: UNEP and government counterparts</li> <li>Discussed and accepted at PSC (Project Steering Committee) meetings</li> </ul>	<ul style="list-style-type: none"> <li>Yearly, by 31 July latest;</li> <li>Co-financing report within 1 month of PIR.</li> </ul>	GEF: Part of project manager tasks Co-fin: 40,000
Project Steering Committee	<ul style="list-style-type: none"> <li>Policy-level meeting of the parties directly involved in project</li> </ul>	<ul style="list-style-type: none"> <li>Government counterparts and</li> </ul>	<ul style="list-style-type: none"> <li>At least once a year (by mid-</li> </ul>	Co-fin: 15,600



meetings and reporting; Monitoring visit to field sites	implementation.	UNEP	year) or more frequent as needed; <ul style="list-style-type: none"> <li>• PSC report within 1 month of PSC meeting;</li> <li>• Monitoring visits on as-needed basis.</li> </ul>	
Final Report	<ul style="list-style-type: none"> <li>• The project team will draft and submit a Project Final Report, with other docs (such as last PIR) that can serve as Project Final Report to UNEP, at least two weeks before the PSC meeting for their review and comments; this meeting decides whether any action is needed to achieve the sustainability of project results; and draws lessons to be captured into other projects;</li> <li>• Comprehensive report summarizing all activities, achievements, lessons learned, objectives met or not achieved structures and systems implemented, etc. Lays out recommendations for any further steps that may need to be taken to ensure the sustainability and replication of project activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Execution: PMU</li> <li>• Input: Government counterparts</li> <li>• Support: UNEP</li> </ul>	<ul style="list-style-type: none"> <li>• Final report at least two-three months of the project completion date.</li> </ul>	Part of project manager tasks Co-fin: 20,000
Mid-term review/evaluation and Terminal Evaluation	<ul style="list-style-type: none"> <li>• Mid-term review/evaluation and independent Terminal evaluation</li> <li>• The MTE looks at learning and check progress and the TE looks at the impacts and sustainability of the results, including the contribution to capacity development and the achievement of global environmental goals.</li> </ul>	<ul style="list-style-type: none"> <li>• Execution: UNEP Evaluation Office</li> <li>• Input: PMU, UNEP, MHE</li> </ul>	<ul style="list-style-type: none"> <li>• One to three months prior to the TTR meeting.</li> </ul>	GEF: 50,000
Audits	<ul style="list-style-type: none"> <li>• Financial audits.</li> </ul>	<ul style="list-style-type: none"> <li>• Execution: PMU</li> </ul>	<ul style="list-style-type: none"> <li>• Annually.</li> </ul>	GEF: 10,000
<b>TOTAL indicative COST</b> (Excluding project team staff time and UNEP staff and travel expenses)			<b>GEF: USD 67,500</b> <b>USD 118,600</b>	

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

The Project is financed with funding from the Global Environment Facility (GEF) with the United Nations Environment Programme (UNEP) acting as the GEF Implementing Agency. UNEP as the GEF Implementing Agency will be responsible for the supervision of project execution to ensure consistency with GEF and UNEP policies and procedures, and will be responsible for overall project reporting. UNEP will formally participate in meetings, the mid-term and final evaluations, clearance of half yearly and annual reports, technical review of project outputs, and additional technical assistance for the execution of the project as may be requested. The Ministry of Hydrocarbons and Energy (MHE), as the local GEF executing agency, will be accountable to the Government and UNEP/GEF for ensuring:

- (vii) Proper achievement of the objectives of the Project;
- (viii) Monitoring and evaluation of the project outputs and outcomes;
- (ix) Effective use of both international and national resources allocated to it;
- (x) Timely availability of financing to support project implementation;
- (xi) Proper coordination among all project stakeholders; in particular national parties; and
- (xii) Timely submission of all project reports, including work plans and financial reports.

The Ministry of Hydrocarbons and Energy will execute the Project and will enter into agreement with UNEP for this purpose. In Bolivia, the GEF operational focal point is the Vice Minister of Environment and Water.

The Ministry of Environment and Water will lead the activities related to Component 3 “Ensuring environmentally sound management for a sustainable transition to efficient lighting” through its National Program of Persistent Organic Pollutants (PRONACOP’s – *Programa Nacional de Contaminantes Orgánicos Persistentes*). This program depends on the Viceministry of Environment, Biodiversity, Climate Change and Forestry Management and Development as well as on the General Directorate of Integrated Solid Waste Management (DGGIRS - *Dirección General de Gestión Integral de Residuos Sólidos*).

The project implementation arrangement is comprised of the following:

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

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

Within the MHE, responsibility will be with a high-ranking official, likely to be the Vice Minister of Energy Development or National Director of Planning and Energy Integration, who will act as National Project Director and thus assume responsibility for the Project on behalf of the national Government.

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

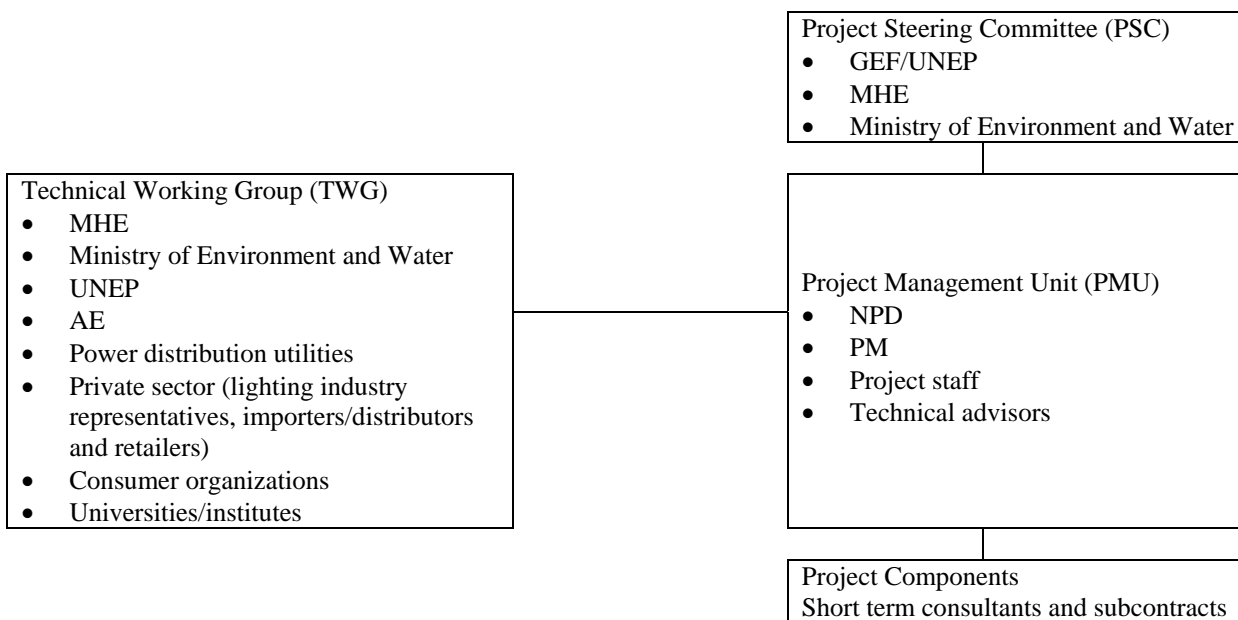
The Project Steering Committee (PSC), described in A.5.2), is the highest decision-making authority of this project. The main role of the PSC is (i) to guide and oversee the technical progress and performance of the Project, and (ii) to enhance and optimize the contributions of various partner organizations through coordination of all activities and inputs. The PSC meetings will be formally called by the National Project Director (as Chairperson of the PSC) at least once a year to discuss the project performance and provide future guidance. Extraordinary meetings will be held if deemed necessary by one of the PSC members. The PSC is likely to include high level representatives from the Ministry of Hydrocarbons and Energy (MHE); the Ministry of Environment and Water; the Ministry of Development Planning; Ministry of Economy and Public Finance; the Ministry of Productive Development and Plural Economy, the Ministry of Public Works, Services and Housing, and National Customs; the Federation of Municipal Associations of

Bolivia; and UNEP. Other stakeholders (e.g. main lighting industry representatives, universities...) can be invited to attend meetings on an as-needed basis.

### Project Management Unit

The Project Management Unit (PMU) will be formally headed by the National Project Director (in-kind contribution of the MHE) and a co-director from the Ministry of Environment and further consists of (i) the Project Manager (PM, paid for with GEF funds) assisted by (ii) technical advisors (partly funded by the GEF) that will provide advice and guidance in selected project areas, and (iii) professional and support staff fully financed by the MHE. An international consultant acting as the technical advisor (TA) will not be a permanent staff but will be recruited from time to time to assure the quality of the outputs over the project lifetime and provide guidance on impact monitoring. The PMU will be physically placed at the MHE or as a small unit at other premises. The PM will be responsible for the day-to-day project operations, financial accounts, periodic reporting to UNEP and the PSC and for allocation of the GEF grant according to the quarterly and annual work plans and budgets in coordination with UNEP and the MHE.

To interact with stakeholders at the institutional level, it is foreseen that a Technical Working Group (TWG) will be formed, consisting of the government entities participating in the PSC, power distribution utilities, private sector entities (lighting industry representatives, importers/distributors and retailers) as well as consumer organizations, universities/institutes and NGOs. The TWG will meet regularly during project implementation.



### Technical Working Group (TWG)

To interact with stakeholders at the institutional level, it is foreseen that a Technical Working Group (TWG) will be formed as described in A.5.2.

### International Technical Support

Bolivia has requested UNEP en.lighten to provide technical support in delivering certain activities as stated in Annex E.

## ANNEX I: KEY DELIVERABLES, WORK PLAN AND BENCHMARKS

### Key Deliverables

Energy savings and GHG emission reduction of alternative vs. baseline scenario:

#### Overall Results

#### All Components

	Cumulative		
	Total	2016-2018	2019-2028
Direct Electricity Savings (MWh)	532	48	484
N/A	0	0	0
N/A	0	0	0
N/A	0	0	0
Direct Total Energy Savings (GJ)	<b>1,917</b>	174	1,743
Direct GHG Emission Savings (tCO <sub>2</sub> )	<b>233</b>	21	212
Direct Post-project GHG Emission Savings (tCO <sub>2</sub> )	<b>3,498,662</b>		3,498,662
Indirect Bottom-up Emission Savings (tCO <sub>2</sub> )	<b>952</b>		952
Indirect Top-down Emission Savings (tCO <sub>2</sub> )	<b>5,540,296</b>		5,540,296







**ANNEX J: GEF TRACKING TOOL**





## Tracking Tool for Climate Change Mitigation Projects (For CEO Endorsement)

### Special Notes: reporting on lifetime emissions avoided

**Lifetime direct GHG emissions avoided:** Lifetime direct GHG emissions avoided are the emissions reductions attributable to the investments made during the project's supervised implementation period, totaled over the respective lifetime of the investments.

**Lifetime direct post-project emissions avoided:** Lifetime direct post-project emissions avoided are the emissions reductions attributable to the investments made outside the project's supervised implementation period, but supported by financial facilities put in place by the GEF project, totaled over the respective lifetime of the investments. These financial facilities will still be operational after the project ends, such as partial credit guarantee facilities, risk mitigation facilities, or revolving funds.

**Lifetime indirect GHG emissions avoided (top-down and bottom-up):** Indirect emissions reductions are those attributable to the long-term outcomes of the GEF activities that remove barriers, such as capacity building, innovation, catalytic action for replication.

Please refer to the Manual for Calculating GHG Benefits of GEF Projects.

[Manual for Energy Efficiency and Renewable Energy Projects](#)  
[Manual for Transportation Projects](#)

For LULUCF projects, the definitions of "lifetime direct and indirect" apply. Lifetime length is defined to be 20 years, unless a different number of years is deemed appropriate. For emission or removal factors (tonnes of CO<sub>2</sub>e per hectare per year), use IPCC defaults or country specific factors.

General Data	Target at CEO Endorsement	Notes
<b>Project Title</b> Delivering the transition to energy efficient lighting		
GEF ID	5299	
Agency Project ID	944	
Country	Bolivia	
Region	LCR	
GEF Agency	UNEP	
Date of Council/CEO Approval		Month DD, YYYY (e.g., May 12, 2010)
GEF Grant (US\$)	3,059,361	
Date of submission of the tracking tool		Month DD, YYYY (e.g., May 12, 2010)
Is the project consistent with the priorities identified in National Communications, Technology Needs Assessment, or other Enabling Activities under the UNFCCC?	1	Yes = 1, No = 0
Is the project linked to carbon finance?	0	Yes = 1, No = 0
Cofinancing expected (US\$)	13,467,575	

### Objective 1: Transfer of Innovative Technologies

#### Please specify the type of enabling environment created for technology transfer through this project

National innovation and technology transfer policy		Yes = 1, No = 0
Innovation and technology centre and network		Yes = 1, No = 0
Applied R&D support		Yes = 1, No = 0
South-South technology cooperation		Yes = 1, No = 0
North-South technology cooperation		Yes = 1, No = 0
Intellectual property rights (IPR)		Yes = 1, No = 0
Information dissemination	1	Yes = 1, No = 0
Institutional and technical capacity building	1	Yes = 1, No = 0
Other (please specify)		

Number of innovative technologies demonstrated or deployed 2

#### Please specify three key technologies for demonstration or deployment

Area of technology 1	Energy Efficiency	
Type of technology 1	LED	specify type of technology
Area of technology 2	Energy Efficiency	
Type of technology 2	Controls	specify type of technology
Area of technology 3		
Type of technology 3		specify type of technology

Status of technology demonstration/deployment 2

0: no suitable technologies are in place  
 1: technologies have been identified and assessed  
 2: technologies have been demonstrated on a pilot basis  
 3: technologies have been deployed  
 4: technologies have been diffused widely with investments  
 5: technologies have reached market potential

Lifetime direct GHG emissions avoided	tonnes CO <sub>2</sub> e (see Special Notes above)
Lifetime direct post-project GHG emissions avoided	tonnes CO <sub>2</sub> e (see Special Notes above)
Lifetime indirect GHG emissions avoided (bottom-up)	tonnes CO <sub>2</sub> e (see Special Notes above)
Lifetime indirect GHG emissions avoided (top-down)	tonnes CO <sub>2</sub> e (see Special Notes above)

Objective 2: Energy Efficiency		
Please specify if the project targets any of the following areas		
Lighting	1	Yes = 1, No = 0
Appliances (white goods)	0	Yes = 1, No = 0
Equipment	0	Yes = 1, No = 0
Cook stoves	0	Yes = 1, No = 0
Existing building	0	Yes = 1, No = 0
New building	0	Yes = 1, No = 0
Industrial processes	0	Yes = 1, No = 0
Synergy with phase-out of ozone depleting substances	0	Yes = 1, No = 0
Other (please specify)	0	
Policy and regulatory framework	4	0: not an objective/component 1: no policy/regulation/strategy in place 2: policy/regulation/strategy discussed and proposed 3: policy/regulation/strategy proposed but not adopted 4: policy/regulation/strategy adopted but not enforced 5: policy/regulation/strategy enforced
Establishment of financial facilities (e.g., credit lines, risk guarantees, revolving funds)	0	0: not an objective/component 1: no facility in place 2: facilities discussed and proposed 3: facilities proposed but not operationalized/funded 4: facilities operationalized/funded but have no demand 5: facilities operationalized/funded and have sufficient demand
Capacity building	4	0: not an objective/component 1: no capacity built 2: information disseminated/awareness raised 3: training delivered 4: institutional/human capacity strengthened 5: institutional/human capacity utilized and sustained
Lifetime energy saved	1,916,640	MJ (Million Joule, IEA unit converter: <a href="http://www.iea.org/stats/unit.asp">http://www.iea.org/stats/unit.asp</a> ) Fuel savings should be converted to energy savings by using the net calorific value of the specific fuel. End-use electricity savings should be converted to energy savings by using the conversion factor for the specific supply and distribution system. These energy savings are then totaled over the respective lifetime of the investments.
Lifetime direct GHG emissions avoided	233	tonnes CO2eq (see Special Notes above)
Lifetime direct post-project GHG emissions avoided	3,498,662	tonnes CO2eq (see Special Notes above)
Lifetime indirect GHG emissions avoided (bottom-up)	952	tonnes CO2eq (see Special Notes above)
Lifetime indirect GHG emissions avoided (top-down)	5,540,296	tonnes CO2eq (see Special Notes above)

**ANNEX K: OFP ENDORSEMENT LETTER**



La Paz, 13 SEP 2012

MMAyA/VMA/No. 1599 2012

To:
Maryam Niamir-Fuller
DIRECTOR, GEF COORDINATION OFFICE
Block 2, North Wing, Ground Floor
United Nations Environment Programme, UNEP
PO Box 30552 Nairobi, Kenya
Email: maryam.niamir-fuller@unep.org

Subject: ENDORSEMENT FOR DELIVERING THE TRANSITION TO ENERGY EFFICIENT LIGHTING BOLIVIA

In my capacity as GEF Operational Focal Point for Bolivia, I confirm that the above project proposal (a) is in accordance with my government's national priorities [including, if available, the priorities identified in the National Adaptation Plan of Action and/or the National Capacity Self-Assessment ] and our commitment to the relevant global environmental conventions; and (b) was discussed with relevant stakeholders, including the global environmental convention focal points.

I am pleased to endorse the preparation of the above project proposal with the support of the GEF Agency (ies) listed below. If approved, the proposal will be prepared and implemented by the Ministry of Hydrocarbon and Energy . I request the GEF Agency (ies) to provide a copy of the project document before it is submit to the GEF Secretariat for CEO endorsement .

The total financing (from GEFTF, LDCF, SCCF and/or NPIF) being request for this project is US\$3,325,000. Inclusive of project preparation grant (PPG), if any, and Agency fees for project cycle management services associated with the total GEF grant. The financing requested for Bolivia is detailed in the table below

Table with 7 columns: Source of Funds, GEF Agency, Focal Area, Project preparation, Project, Fee, Total. It details the financing breakdown for the project, showing a total of 3,325,000 US\$.



Estado Plurinacional de Bolivia



[WHERE THE SOURCE OF FUNDING IS GEF TRUST FUND ONLY (I.E. EXCLUDING LDCF AND/OR SCCF) AND THE FOCAL AREA FALLS UNDER THE STAR MODEL, INCLUDE THE FOLLOWING:

I consent to the utilization of Bolivia's allocations in GEF-5 as defined in the System for Transparent Allocation of Resources (STAR)

Sincerely,

JPC/dac  
VICEMINISTERIO DE MEDIO AMBIENTE  
BIODIVERSIDAD CAMBIOS CLIMATICOS Y DE  
GESTION Y DESARROLLO FORESTAL  
MMAyA

JPC/dac

Copy to (delete as necessary): Convention Focal Point for UNFCCC  
Convention Focal Point for UNCBD  
Convention Focal Point for UNCCD  
Convention Focal Point for Stockholm (POPs)

---

VICEMINISTERIO DE MEDIO AMBIENTE, BIODIVERSIDAD CAMBIOS CLIMATICOS Y DE GESTION Y  
DESARROLLO FORESTAL

Av. Camacho No. 1471 – Telf.: 2146382 – 2146383- 2146385-2146374

"2012 Año de la No violencia Contra la Niñez y Adolescencia en el Estado Plurinacional de Bolivia"

**ANNEX L: CO-FINANCING COMMITMENT LETTERS**

**Ministry of Hydrocarbons and Energy**

**Ministry of Environment and Water**

**Municipality of La Paz**

**Philips**

**National Lighting Test Center**

**UNEP**





ESTADO PLURINACIONAL DE BOLIVIA  
*Ministerio de Hidrocarburos y Energía*

La Paz, 29 de abril de 2016

**MHE-03530 VMDE-00096**

Señora

L. Brennan van Dyke

**COORDINADORA EJECUTIVA GEF DEL PNUMA**

**DIRECTORA ADJUNTA, DIVISION DE OPERACIONES, PNUMA**

Presente.-

**REF.: COMPROMISO DE CONTRAPARTIDA AL PROYECTO GEF5  
"DELIVERING THE TRANSITION TO ENERGY  
EFFICIENT LIGHTING IN BOLIVIA"**

De mi consideración:

Con respecto al proyecto "Delivering the Transition to Energy Efficient Lighting in Bolivia" bajo el liderazgo de este Ministerio en sinergia con el Ministerio de Medio Ambiente y Agua del Estado Plurinacional de Bolivia; proyecto realizado de manera conjunta con el Programa de las Naciones Unidas para el Medio Ambiente (PNUMA), como agencia implementadora del Fondo para el Medio Ambiente Mundial (GEF por sus siglas en inglés).

El citado proyecto, tiene como componente principal la sustitución de las lámparas y productos de iluminación ineficientes, por las de bajo consumo, lo cual es un componente clave del Programa Nacional de Eficiencia Energética, contribuyendo a los mecanismos de cambio climático para el Vivir Bien en el contexto de la Ley 300 Marco de la Madre Tierra y Desarrollo Integral para Vivir Bien. Adicionalmente el proyecto plantea el componente de gestión ambiental para la recolección, reciclaje y disposición final de los residuos de lámparas, incluidos los peligrosos (tales como mercurio u otras sustancias químicas).

El Ministerio de Hidrocarburos y Energía, desarrolla inversiones financiadas por la cooperación internacional orientadas a cubrir la cobertura eléctrica principalmente con proyectos que hacen un uso racional y eficiente de la energía en iluminación, considerando a las energías renovables como fuente importante de energía. En este sentido, el Ministerio de Hidrocarburos y Energía a través del Programa de Electricidad para Vivir con Dignidad (PEVD) presenta la contribución de cofinanciamiento en especie por el monto total requerido como contraparte nacional de acuerdo al siguiente desglose:



ESTADO PLURINACIONAL DE BOLIVIA  
Ministerio de Hidrocarburos y Energía

PROYECTOS DE CONTRAPARTE PARA EL PROYECTO GEF DE ILUMINACIÓN EFICIENTE - BOLIVIA				
N°	Proyecto	Período de Ejecución	Observaciones	Monto considerado como contraparte para el período del proyecto GEF (\$US)
1	Ampliación Cobertura Eléctrica en el Área Rural (IDTR II)	2015-2021	Además de proyectos de densificación de redes eléctricas, el proyecto considera la provisión de 12.600 Sistemas Fotovoltaicos con lámparas LED en los departamentos de Chuquisaca y Potosí. Asimismo, en el costo del suministro de los SFV está incluido la instalación y capacitación en O&M a los usuarios.	2.000.000
2	Construcción Sistema de Electrificación Rural Energías Renovables	2005-2018	El costo del proyecto considera la capacitación y conformación de Empresas Operadoras Locales para O&M de 8 Pequeñas Centrales Hidroeléctricas a construir. Como este proyecto no contempla la provisión de luminarias, será precisamente el Proyecto GEF que dotará de lámparas eficientes LED, donde se construyan los sistemas de electrificación.	3.370.000
3	Suministro de Sistemas Fotovoltaicos en escuelas y postas de salud	2015-2018	El objetivo del Proyecto es el de proveer de energía eléctrica para iluminación y otros usos menores a 75 Postas de Salud y 300 Escuelas en el Altiplano Boliviano correspondiente a los departamentos de La Paz, Oruro y Potosí, mediante la instalación de 375 Sistemas Fotovoltaicos con al menos 1.125 luminarias eficientes LED. El costo de los 375 SFV comprende la provisión, instalación y capacitación en O&M a los usuarios.	1.750.000
4	Suministro de Pico Sistemas Fotovoltaicos	2015-2018	El objetivo del Proyecto es el de proveer de energía eléctrica para iluminación y otros usos menores a familias del área rural de nueve municipios de la región Chiquitana del departamento de Santa Cruz, mediante la instalación de 1.566 Pico Sistemas Fotovoltaicos con luminarias eficientes LED. El costo de los 1.566 Pico SFV comprende la provisión, instalación y capacitación en O&M a los usuarios.	270.000
<b>Monto Total de Contraparte (considerando la ejecución programada en el período de ejecución del Proyecto GEF)</b>				<b>7.390.000</b>



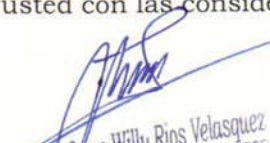


ESTADO PLURINACIONAL DE BOLIVIA  
*Ministerio de Hidrocarburos y Energía*

En concordancia con nuestras competencias en eficiencia energética, se ratifica que nuestras acciones son compatibles y complementarias con los componentes y resultados del proyecto "Delivering the Transition to Energy Efficient Lighting in Bolivia".

Consecuentemente, se reitera el compromiso y la conformidad del Ministerio de Hidrocarburos y Energía con el proyecto, a través de las inversiones programadas por el PEVD equivalentes a **\$US. 7.390.000 (SIETE MILLONES TRESCIENTOS NOVENTA MIL 00/100 DÓLARES AMERICANOS)** para el periodo 2017-2019 constituirán el cofinanciamiento nacional del Ministerio de Hidrocarburos y Energía, que superan a los \$US.4.975.000 (CUATRO MILLONES NOVECIENTOS SETENTA Y CINCO MIL 00/100 DÓLARES AMERICANOS)

Sin otro particular, saludo a usted con las consideraciones más distinguidas.

  
Dr. Ing. Jorge Willy Ríos Velásquez  
VICEMINISTRO DE DESARROLLO ENERGÉTICO  
MINISTERIO DE HIDROCARBUROS Y ENERGÍA



JWRV/jlq/yig  
Adj. lo indicado  
cc: Archivo



La Paz, 09 DIC 2015

MMAyA/DESPACHO N° 1310 /2015

Señora  
L. Brennan van Dyke  
**COORDINADORA EJECUTIVA GEF DEL PNUMA**  
**DIRECTORA ADJUNTA, DIVISION DE OPERACIONES, PNUMA**  
Presente.-

**REF.: COMPROMISO DE CONTRAPARTIDA AL PROYECTO GEF5 "DELIVERING THE TRANSITION TO ENERGY EFFICIENT LIGHTING IN BOLIVIA"**

De mi consideración:

Tengo el agrado de escribirle respecto al proyecto "Delivering the transition to energy efficient lighting in Bolivia" bajo el liderazgo del Ministerio de Hidrocarburos y Energía en sinergia con el Ministerio de Medio Ambiente y Agua del Estado Plurinacional de Bolivia; proyecto realizado de manera conjunta con el Programa de las Naciones Unidas para el Medio Ambiente (PNUMA), como agencia implementadora del Fondo para el Medio Ambiente Mundial (GEF por sus siglas en inglés).

El citado proyecto, además del componente principal de la sustitución de las lámparas y productos de iluminación ineficientes, por las de bajo consumo, lo cual es un componente clave del Programa Nacional de Eficiencia y contribuye al mecanismo de mitigación del cambio climático para Vivir Bien en el marco de la Ley 300 marco de la Madre Tierra y Desarrollo Integral para Vivir Bien, plantea también el componente de gestión ambiental para la recolección, reciclaje y disposición final de los residuos de lámparas, incluidos los peligrosos (tales como mercurio u otras sustancias químicas).

El Programa Nacional de Contaminantes Orgánicos Persistentes (PRONACOP's), dependiente del Viceministerio de Medio Ambiente, Biodiversidad, Cambios Climáticos y de Gestión y Desarrollo Forestal dependiente del Ministerio de Medio Ambiente y Agua en el marco de la Convención de Minamata sobre Mercurio y el Convenio de Basilea desarrolla inversiones de la Gestión Ambiental de Sustancias químicas y Desechos Peligros por lo que contribuirá en el cofinanciamiento en especie (se adjunta nota de cofinanciamiento PRONACOPs).



Estado Plurinacional de Bolivia



En tanto, que la Dirección General de Gestión Integral de Residuos Sólidos (DGGIRS) del Viceministerio de Agua Potable y Saneamiento Básico dependiente del Ministerio de Medio Ambiente y Agua implementa proyectos de gestión integral de residuos sólidos (se adjunta nota de cofinanciamiento VAPSB)

En concordancia con nuestras competencias en gestión ambiental y sanitaria de residuos sólidos de origen eléctrico, se ratifica que **nuestras acciones son compatibles y complementarias con los componentes y resultados del Proyecto "Delivering the transition to energy efficient lighting in Bolivia"**.

Consecuentemente, esta nota sirve para hacer *constar la conformidad del Ministerio de Medio Ambiente y Agua con el proyecto y el compromiso de que las inversiones programadas por PRONACOPs y el VAPSB en el marco de Gestión Ambiental de Sustancias químicas y Desechos Peligros y la Gestión Integral de residuos, respectivamente; equivalentes a un total \$us 4.000.000 (CUATRO MILLONES 00/100 Dólares Americanos) para el periodo 2016-2018, constituirán el cofinanciamiento nacional del MMAyA.*

Con este motivo, aprovecho la oportunidad para reiterar las seguridades de mi distinguida consideración.

Alexandra Moreira López  
MINISTRA DE MEDIO AMBIENTE Y AGUA

AML/GSZ/IVB  
c.c.: Arch







ESTADO PLURINACIONAL DE BOLIVIA

Ministerio de Medio Ambiente y Agua  
Viceministerio de Agua Potable y Saneamiento Básico



MMAY A  
Ministerio de Medio Ambiente y Agua

Martes, 13 de octubre de 2015  
CAR/MMAYA/VAPSB/DGGIRS N 0706/2015

Señor:  
Lic. Gary Suarez  
DIRECTOR GENERAL DE PLANIFICACION  
MINISTERIO DE MEDIO AMBIENTE Y AGUA  
Presente.-

Ref: COFINANCIAMIENTO PARA EL PROYECTO "REALIZANDO LA TRANSICIÓN A LA ILUMINACIÓN EFICIENTE"

De mi consideración:

La Dirección General de Gestión Integral de Residuos Sólidos (DGGIRS), dependiente del Viceministerio de Agua Potable y Saneamiento Básico, en concordancia con la responsabilidad ambiental nacional, reconoce la importancia del Proyecto "Realizando la Transición a la Iluminación Eficiente".

Para fines de ejecución del Proyecto, mediante la presente se informa que la DGGIRS tiene programado respaldar la contrapartida para el proyecto de referencia en un monto de 3.650.000 \$us. (Tres millones seiscientos cincuenta mil 00/100 Dólares Americanos) vinculada a la temática de Gestión Integral de Residuos Sólidos, para el periodo comprendido entre las gestiones 2016 al 2018. A continuación, se detalla los Programas de la inversión ejecutada y la contraparte para el Proyecto "Realizando la Transición a la Iluminación Eficiente", correspondiente a la DGGIRS:

LISTA DE PROGRAMAS	SIGLA DEL FINANCIADOR	MODALIDAD	FECHA INICIO	FECHA FIN	CONTRAPARTIDA Proy. Energia GEF5 (\$US)
PROASRED	CAF	CREDITO	07-ago-14	01-jul-18	2 630.000
GIRS SANTA CRUZ	CAF	DONACION	08-ago-13	08-feb-16	20.000
BID - RESIDUOS SOLIDOS	BID	CREDITO	14-ago-13	13-dic-18	1.000.000
TRIANGULAR BOLIVIA-BRASIL -ESPAÑA	AECID	DONACION	01-may-15	01-may-17	19.000
TRIANGULAR ALEMANIA COSTA RICA -BOLIVIA	GIZ-PERIAGUA	DONACION	01-jul-15	01-jul-18	21.000
<b>TOTAL</b>					<b>3.650.000</b>

Con este particular motivo, reciba cordiales saludos. Atentamente,

c.c.: Arch  
RAME/glv

*[Handwritten Signature]*  
Ing. Rubén Méndez Estrada  
VICEMINISTRO DE AGUA POTABLE  
Y SANEAMIENTO BÁSICO  
MINISTERIO DE MEDIO AMBIENTE Y AGUA



Estado Plurinacional de Bolivia



La Paz, 23 de Julio, 2015

NI/MMAYA/VMABCCGDF/DGMACC/COPS N° 244/2015

Señor  
Lic. Gary Suarez  
**DIRECTOR GENERAL DE PLANIFICACION**  
**MINISTERIO DE MEDIO AMBIENTE Y AGUA**  
Presente.-

Ref: COFINANCIAMIENTO PARA EL PROYECTO  
"REALIZANDO LA TRANSICIÓN A LA ILUMINACIÓN  
EFICIENTE"

De mi consideración:

El Programa Nacional de Contaminantes Orgánicos Persistentes (PRONACOP's), dependiente del Viceministerio de Medio Ambiente, Biodiversidad, Cambios Climáticos y de Gestión y Desarrollo Forestal, en concordancia con nuestra responsabilidad ambiental nacional, reconoce la importancia del Proyecto "Realizando la Transición a la Iluminación Eficiente".

Mediante la presente se informa que durante las gestiones 2013 al presente, el PRONACOP's ha invertido 183.420,00 \$us. (Ciento Ochenta y Tres Mil Cuatrocientos Veinte 00/100 Dólares Americanos).

Por su parte, en el marco de las inversiones de la Gestión Ambiental de Sustancias Químicas y Desechos Peligrosos y dentro de lo establecido, el PRONACOP's planea invertir la suma de 61.140 \$us. (Sesenta y un mil ciento cuarenta 00/100 Dólares Americanos) hasta diciembre 2016, en actividades orientadas a la reducción del mercurio y desechos peligrosos.

A continuación se detalla los componentes de la inversión ejecutada:

PERIODO 2013/2015			
RUBROS	VALOR MENSUAL (\$us)	MESES	TOTAL (\$us)
Espacio de Oficina	1.200	36	43200
<b>Personal Asignado al Proyecto</b>			
Coordinadora (25%)	100	36	3600
Técnico (25%)	95	36	3420
<b>Personal Superior y Administración</b>			
Global	1000	36	36000



Estado Plurinacional de Bolivia



MMAyA  
Ministerio de Medio Ambiente y Agua

<b>Uso de Equipos e Insumos</b>			
Global	1000	36	36000
<b>Viajes y Viaticos</b>			
Coordinadora	200	36	7200
Técnico	200	36	7200
<b>Talleres y Reuniones</b>			
40 participantes, 2 veces al mes, 1 día	1.000	36	36000
Difusion y Publicidad	300	36	10800
<b>TOTAL (\$us.)</b>			<b>183420</b>

Con este particular motivo, reciba saludos cordiales.

Atentamente;

*[Handwritten Signature]*  
 Ing. Rocio R. Espinosa Escobar  
 COORDINADORA NACIONAL  
 PRONACOP'S  
 DIRECCION GENERAL DE MEDIO AMBIENTE  
 Y CAMBIOS CLIMATICOS  
 VIDA - MMAyA



REE/mcg  
c.c. PRONACOP'S  
HRI: 67242





La Paz, 16 DIC. 2015  
CITE: DESP. GAMLP N° 1319/2015

Señora  
L. Brennan van Dyke  
**COORDINADORA EJECUTIVA GEF DEL PNUMA**  
**DIRECTORA ADJUNTA, DIVISION DE OPERACIONES, PNUMA**

**Ref.: COMPROMISO DE CONTRAPARTIDA AL PROYECTO "DELIVERING THE TRANSITION TO ENERGY EFFICIENT LIGHTING IN BOLIVIA" – GEF5**

De mi consideración:

Tengo el agrado de escribirle respecto al proyecto "Delivering the transition to energy efficient lighting in Bolivia", cuyo liderazgo lo asume el Ministerio de Hidrocarburos y Energía en sinergia con el Ministerio de Medio Ambiente y Agua del Estado Plurinacional de Bolivia; realizado de manera conjunta con el Programa de las Naciones Unidas para el Medio Ambiente (PNUMA), con la agencia implementadora del Fondo para el Medio Ambiente Mundial (GEF por sus siglas en inglés).

Con relación a este proyecto, Cabe mencionar que el Gobierno Autónomo Municipal de La Paz desarrolla programas/proyectos vinculados a eficiencia energética y Gestión Integral de Residuos Sólidos, consecuentemente nuestras acciones son compatibles y complementarias a los componentes y resultados del proyecto de referencia, por lo cual es de nuestro interés participar en el proyecto mencionado.

Adicionalmente le hago conocer que las inversiones programadas y destinadas a eficiencia energética y gestión integral de residuos sólidos, son equivalentes a \$us. 197.575 (Ciento noventa y siete mil quinientos setenta y cinco 00/100 Dólares Americanos) para la gestión 2016, lo cual puede constituir el cofinanciamiento municipal.

Atentamente,

NOBRE  
CARGO  
ENTIDAD  
DIRECCIÓN  
CORREO ELECTRÓNICO

: Dr. Luis Revilla Herrero  
: Alcalde Municipal de La Paz  
: Gobierno Autónomo Municipal de La Paz  
: Calle mercado N° 1238  
: correspondencia@lapaz.bo



RECORD  
c.c. Arch.  
Adj. lo indicado



Global Environment Facility  
Attention of: Dr. Naoko Ishii  
CEO and Chairperson  
1776 G Street, NW  
Washington, DC 20006  
USA

Subject: Delivering the transition to energy  
efficient lighting in Bolivia

Fecha: 2014-08-26

Dear Dr. Ishii,

Philips lighting is pleased to participate, as a co-financier, in the Bolivia's project aiming at delivering the transition to energy efficient lighting. Philips is a partner to the UNEP-GEF en.lighten initiative since 2009 and shares the same objective of promoting the rapid deployment of energy efficient lighting technologies in developing and emerging countries.

Philips is a global leader in designing, manufacturing, procuring, marketing, and selling lighting products and has extensive expertise in providing sustainable lighting solutions.

Following the discussions with UNEP en.lighten about the project objective and based on the project documentation, Philip's estimated in kind co-finance contribution over 3 years is US\$ 1,500,000. This contribution is subject to project progress, economic developments and overall project delivery.

The Philips in kind contribution will mainly focus on policy framework development, technology quality standards, consumer education/awareness creation, lighting innovation technologies (e.g. LEDs and lighting controls), and participation in the project steering committee, working groups, and workshops.

Philips firmly believes in the importance of this project and its benefits; therefore, it commits to support Bolivia in its effort to implement the transition to energy efficient lighting, and move toward more sustainable, environment friendly lighting solutions.

Yours sincerely,

Gustavo A. Verna  
CEO Philips South Latam  
(Argentina, Bolivia, Chile, Paraguay & Uruguay)



Philips Argentina S.A.

Vedia 3892, Ciudad de Buenos Aires, Buenos Aires, C1420DAL, Argentina, Tel +54 (11) 4546 7853 Fax www.philips.com.ar



## National Lighting Test Center



Global Environment Facility  
Attention of: Dr. Naoko Ishii  
CEO and Chairperson  
1776 G Street, NW  
Washington, DC 20006  
USA

Subject: Delivering the transition to energy efficient lighting in Bolivia

Dear Dr. Ishii,

The National Lighting Test Centre (NLTC) is pleased to participate, as a co-financier, in the Bolivia's project aiming at delivering the transition to energy efficient lighting. NLTC is a partner to the UNEP-GEF en.lighten initiative since 2011 and shares the same objective of promoting the rapid deployment of energy efficient lighting technologies in developing and emerging countries. NLTC is highly experienced in the testing of energy efficient lighting products. The centre assists in the development of national and international standards, performs research into new testing techniques and equipment, offers technical services and training, and provides assistance to other countries regarding policy formulation and development.

Based on the project documentation, NLTC's estimated in kind co-finance contribution over 3 years is US\$ 300,000. This contribution is subject to project progress, economic developments and overall project delivery.

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

NLTC firmly believes in the importance of this project and its benefits; therefore, it commits to support Bolivia in its effort to implement the transition to energy efficient lighting, and move toward more sustainable, environment friendly lighting solutions.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'Selina Liuquian', written in a cursive style.

Selina Liuquian  
Deputy Director


**UNITED NATIONS ENVIRONMENT PROGRAMME**

 Programme des Nations Unies pour l'environnement    Programa de las Naciones Unidas por el Medio Ambiente  
 Программа Организации Объединенных Наций по окружающей среде    برنامج الأمم المتحدة للبيئة

联合国环境规划署


**UNEP**

Paris, 28 April, 2016

**Subject: UNEP/DTIE, co-financing towards the project "Delivering the transition to energy efficient lighting in Bolivia"**

Dear Brennan,

The UNEP Energy Branch has assisted the Plurinational State of Bolivia in the development of the above-mentioned project "Delivering the transition to energy efficient lighting". Further, the UNEP en.lighten program has committed towards the executing agency, the Ministry of Hydrocarbons and Energy, to support the implementation of this project.

I hereby confirm a co-finance contribution to this project of up to USD 80,000. This contribution comprises the following activities for the execution of the project:

- USD 60,000 of staff time and travel during three years from the UNEP Energy Branch, including the Deputy Director of UNEP/DTIE (D-1), Chief of the Energy Branch (D-1), the Head of the Technology Unit (P-5), and the Head of the Policy Unit (P-4), as well as from the Regional Office of Latin America and the Caribbean staff (D-1, P-4, and P-3). These officials will coordinate strategic activities in order to support Bolivia in its transition to more efficient lighting. UNEP officials will also contribute to showcase Bolivia's energy efficient lighting activities as an example of commitment and action towards mitigating climate change and achieving the energy efficiency target of Sustainable Energy for All (SE4ALL). They will also promote Bolivia's participation in high-level events related to energy efficiency and climate change.
- USD 20,000 of staff time of UNEP's administrative program assistants, who will oversee all the relevant administrative processes, including issuing of contracts, executing payments, and doing travel arrangements related to the activities executed by UNEP en.lighten.

Yours sincerely,

*for Mark Radka*  
 Mark Radka  
 Chief Energy *ric*

Ms. Brennan Van Dyke,  
 GEF Executive Coordinator

cc: Zitouni Ould-Dada, Head of Technology Unit,  
 Jonathan Duwyn, Programme Officer, UNEP DTIE

## ANNEX M: ENVIRONMENTAL AND SOCIAL SAFEGUARDS CHECKLIST

Please note that as part of the GEFs evolving Fiduciary Standards that Implementing Agencies have to meet is the need to address 'Environmental and Social Safeguards'.

To address this requirement UNEP-DGEF have developed this checklist with the following guidance:

1. Initially filled in during concept development to help guide in the identification of possible risks and activities that will need to be included in the project design.
2. A completed checklist should accompany the PIF
3. Check list reviewed during PPG phase and updated as required
4. Final check list submitted with Project Package clearly showing what activities are being undertaken to address issues identified

<b>Project Title:</b>	Bolivia: Delivering the transition to energy efficient lighting		
<b>GEF project ID and UNEP ID/IMIS Number</b>	<b>00944</b>	<b>Version of checklist</b>	<b>1</b>
<b>Project status (preparation, implementation, MTE/MTR, TE)</b>	<b>preparation</b>	<b>Date of this version:</b>	<b>17.12.12</b>
<b>Checklist prepared by (Name, Title, and Institution)</b>	<b>Geordie Colville, SPO, DTIE, UNEP</b>		

*In completing the checklist both short- and long-term impact shall be considered.*

### **Section A: Project location:**

If negative impact is identified or anticipated the Comment/Explanation field needs to include: Project stage for addressing the issue; Responsibility for addressing the issue; Budget implications, and other comments.

	<i>Yes/No/N.A.</i>	<i>Comment/explanation</i>
- Is the project area in or close to -		
- densely populated area	Yes	
- cultural heritage site	No	
- protected area	No	
- wetland	No	
- mangrove	No	
- estuarine	No	
- buffer zone of protected area	No	
- special area for protection of biodiversity	No	
- Will project require temporary or permanent support facilities?	No	
<i>If the project is anticipated to impact any of the above areas an Environmental Survey will be needed to determine if the project is in conflict with the protection of the area or if it will cause significant disturbance to the area.</i>		

**Section B: Environmental impacts, i.e.**

If negative impact is identified or anticipated the Comment/Explanation field needs to include: Project stage for addressing the issue; Responsibility for addressing the issue; Budget implications, and other comments.

	<i>Yes/No/N.A.</i>	<i>Comment/explanation</i>
- Are ecosystems related to project fragile or degraded?	No	
- Will project cause any loss of precious ecology, ecological, and economic functions due to construction of infrastructure?	No	
- Will project cause impairment of ecological opportunities?	No	
- Will project cause increase in peak and flood flows? (including from temporary or permanent waste waters)	No	
- Will project cause air, soil or water pollution?	No	The project aims to reduce GHG emission reductions.
- Will project cause soil erosion and siltation?	No	
- Will project cause increased waste production?	Yes	The project aims to accelerate the phase out of incandescent lamps, and replace them with CFL and LED lamps. The project will have a plan to collect and store waste.
- Will project cause Hazardous Waste production?	Yes	CFLs contain small levels of mercury so the Project includes a plan for collection and safe handling of mercury waste.
- Will project cause threat to local ecosystems due to invasive species?	No	
- Will project cause Greenhouse Gas Emissions?	No	
- Other environmental issues, e.g. noise and traffic	No	
<i>Only if it can be carefully justified that any negative impact from the project can be avoided or mitigated satisfactorily both in the short and long-term, can the project go ahead.</i>		

### Section C: Social impacts

If negative impact is identified or anticipated the Comment/Explanation field needs to include: Project stage for addressing the issue; Responsibility for addressing the issue; Budget implications, and other comments.

	<i>Yes/No/N.A.</i>	<i>Comment/explanation</i>
- Does the project respect internationally proclaimed human rights including dignity, cultural property and uniqueness and rights of indigenous people?	Yes	
- Are property rights on resources such as land tenure recognized by the existing laws in affected countries?	N/A	
- Will the project cause social problems and conflicts related to land tenure and access to resources?	No	
- Does the project incorporate measures to allow affected stakeholders' information and consultation?	N/A	
- Will the project affect the state of the targeted country's (-ies') institutional context?	Yes	It aims to build capacity in the promotion of energy efficient lighting.
- Will the project cause change to beneficial uses of land or resources? (incl. loss of downstream beneficial uses (water supply or fisheries)?	No	
- Will the project cause technology or land use modification that may change present social and economic activities?	No	
- Will the project cause dislocation or involuntary resettlement of people?	No	
- Will the project cause uncontrolled in-migration (short- and long-term) with opening of roads to areas and possible overloading of social infrastructure?	No	
- Will the project cause increased local or regional unemployment?	No	
- Does the project include measures to avoid forced or child labour?	No	
- Does the project include measures to ensure a safe and healthy working environment for workers employed as part of the project?	N/A	
- Will the project cause impairment of recreational opportunities?	No	
- Will the project cause impairment of indigenous people's livelihoods or belief systems?	No	
- Will the project cause disproportionate impact to women or other disadvantaged or vulnerable groups?	No	
- Will the project involve and or be complicit in the alteration, damage or removal of any critical cultural heritage?	No	
- Does the project include measures to avoid corruption?	No	
<i>Only if it can be carefully justified that any negative impact from the project can be avoided or mitigated satisfactorily both in the short and long-term, can the project go ahead.</i>		

**Section D: Other considerations**

If negative impact is identified or anticipated the Comment/Explanation field needs to include: Project stage for addressing the issue; Responsibility for addressing the issue; Budget implications, and other comments.

	<i>Yes/No/N.A.</i>	<i>Comment/explanation</i>
- Does national regulation in affected country (-ies) require EIA and/or ESIA for this type of activity?	No	
- Is there national capacity to ensure a sound implementation of EIA and/or SIA requirements present in affected country (-ies)?	N/A	
- Is the project addressing issues, which are already addressed by other alternative approaches and projects?	No	
- Will the project components generate or contribute to cumulative or long-term environmental or social impacts?	Yes	The project aims to reduce demand on the power grid, to make it more reliable, and to reduce utility costs to household budgets
- Is it possible to isolate the impact from this project to monitor E&S impact?	Yes	Reduction in energy consumption can be estimated and storage of CFLs can be monitored.

**ANNEX N:****ACRONYMS AND ABBREVIATIONS**

AE	Authority of Audit and Social Control of Electricity
AWP	Annual Work Plan
CC	Climate Change
CA	en.lighten Country Assessment
CCM	Climate Change Mitigation Results Framework (GEF)
CDM	Clean Development Mechanism
CHEM	Chemical Mitigation Results Framework (GEF)
CFL	Compact Fluorescent Lamp
CLA	Country Lighting Assessment
CRSO	Collection Recycling System Organization
EE	Energy Efficiency
ESCO	Energy Service Company
GEF	Global Environment Facility
GEFTF	Global Environment Facility Trust Fund
GELC	Global Efficient Lighting Centre
GW	Gigawatt
GWh	Gigawatt-hour
Hg	Mercury
hr	Hour
HID	High-Intensity Discharge lamp
HPS	High-Pressure Sodium lamp
INV	Investment
ktCO <sub>2</sub>	kiloton of carbon dioxide
kWh	kilowatt-hour
LA	Latin America
LCR	Latin America and Caribbean Region
LED	Light Emitting Diode
M&E	Monitoring and Evaluation
MEPS	Minimum Energy Performance Standards
MMAYA	Ministry of Environment and Water (acronym in Spanish)
MHE	Ministry of Hydrocarbons and Energy
MPDPE	Ministry of Productive Development and Plural Economy
MTS	UNEP Medium-Term Strategy
MVE	Monitoring, Verification and Enforcement
MW	Megawatt
NAMA	Nationally Appropriate Mitigation Action
NELS	National efficient lighting strategy
NGO	Non-Governmental Organization
NLTC	National Lighting Test Center China
NPD	National Project Director
NPIF	Nagoya Protocol Implementation Fund
OFP	GEF Operational Focal Point
PCB	Poly Chlorinated Biphenyls
PIF	Project Identification Form
PM	Project Manager
PMC	Project Management Cost
PMU	Project Management Unit
PPG	Project Preparation Grant
PSC	Project Steering Committee
PTR	Project Terminal Report
ROLAC	Regional Office for Latin America and the Caribbean
S&L	Standards and Labeling

SIN	National Interconnected System
STAP	Scientific and Technical Advisory Panel
tCO <sub>2</sub>	ton of Carbon Dioxide (-equivalent)
TA	Technical Assistance
TJ	Terajoule
TL	Tubular Fluorescent Lamp
TWG	Technical Working Group
TWh	Terawatt-hour
UNDAF	United Nations Development Action Framework
UNDP	United Nations Development Programme
UNEA	First UN Environment Assembly
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	US Dollar
yr	year



## **ANNEX O:**

## **TABLE OF CONTENT**

### **REQUEST FOR CEO APPROVAL**

#### **Part I Project Information**

- A. Focal area strategy framework
- B. Project framework
- C. Sources of confirmed co-financing for the project by source and by name
- D. Trust fund resources requested
- E. Consultants working for technical assistance components
- F. Does the project include a 'non-grant' instrument?

#### **Part II Project justification**

- A. Describe any changes in alignment with the project design of the original PIF
  - A.1 National strategies and plans
  - A.2 GEF focal area and/or fund(s) strategies, eligibility criteria and priorities
  - A.3 The GEF agency's comparative advantage
  - A.4 The baseline project and the problem it seeks to address
  - A.5 Incremental/additional cost reasoning (project framework details)
  - A.6 Risks
  - A.7 Coordination with other relevant GEF financed initiatives
- B. Additional information not addressed at PIF stage
  - B.1 Stakeholders and project management
  - B.2 Socio-economic benefits
  - B.3 Global environmental benefits and cost-effectiveness
- C. Describe the budgeted M&E plan

#### **Part III Approval by GEF Operational Focal Point and GEF Agency**

- A. Record of endorsement of GEF operational focal point on behalf of the government
- B. GEF Agency certification

### **ANNEXES**

- A-1. Project results framework
- A-2. Project theory of change
- B. Responses to project reviews
- C. Status of implementation of PPG activities and the use of funds
- D. Estimates of direct and indirect GHG emission reduction
- E. Consultants to be hired for the project using GEF sources
- F. Budget and co-financing
- G. M&E budget and work plan
- H. Project implementation arrangements
- I. Key deliverables, work plan and benchmarks
- J. GEF tracking tool
- K. OFP endorsement letter
- L. Co-financing commitment letter
- M. Environmental and social safeguards checklist
- N. Acronyms and abbreviations
- O. Table of content