



GEF-6 PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: Full-sized Project

TYPE OF TRUST FUND: GEF Trust Fund

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PART I: PROJECT INFORMATION

Project Title:	Project of hybridization of diesel engines of multifunctional platforms with solar systems		
Country(ies):	Togo	GEF Project ID: ¹	
GEF Agency(ies):	BOAD (select) (select)	GEF Agency Project ID:	
Other Executing Partner(s):	- Ministry of environment and forest resources - Ministry of Grassroots Development - Support Program to Grassroots Development - Ministry in charge of energy - Togo Electricity Company	Submission Date:	
GEF Focal Area(s):	Climate Change	Project Duration (Months)	36
Integrated Approach Pilot	IAP-Cities <input type="checkbox"/> IAP-Commodities <input type="checkbox"/> IAP-Food Security <input type="checkbox"/>	Corporate Program: SGP <input type="checkbox"/>	
Name of parent program:	[if applicable]	Agency Fee (\$)	240,561.454

A. INDICATIVE FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES²

Objectives/Programs (Focal Areas, Integrated Approach Pilot, Corporate Programs)	Trust Fund	(in \$)	
		GEF Project Financing	Co-financing
(select) CCM-1 Program 1 (select)	GEFTF	2,672,905.05	16,768,000
(select) (select) (select)	(select)		
(select) (select) (select)	(select)		
Total Project Cost		2,672,905.05	16,768,000

B. INDICATIVE PROJECT DESCRIPTION SUMMARY

Project Objective: Increase access to electricity through the development and use of solar energy technologies in the villages of Togo						
Project Components	Financing Type ³	Project Outcomes	Project Outputs	Trust Fund	(in \$)	
					GEF Project Financing	Co-financing
1. Strengthening of regulatory, policy and institutional framework for Renewable Energy and rural electrification	TA	Outcome 1 : The country has a revised national energy policy, rules and regulations supportive of renewable energy with focus on solar electrification	Output 1-1: Formulated and agreed policies, rules and regulations suitable for RE and energy efficient systems with focus on solar energy in rural electrification. Output 1-2: Completed review of CEET national energy regulations to include RE with the socio-economic, climate change considerations Output 1-3: Formulated and recommended institutional framework for the	GEFTF	165,000	150 000

¹ Project ID number will be assigned by GEFSEC and to be entered by Agency in subsequent document submissions.

² When completing Table A, refer to the excerpts on [GEF 6 Results Frameworks for GETF, LDCF and SCCF](#).

³ Financing type can be either investment or technical assistance.

			<p>implementation of RE including institutional mechanisms</p> <p>Output 1.4 : Development of the National Appropriate Mitigation Actions (NAMA) in renewable energy including its funding scheme</p>			
<p>2 Knowledge and capacity development and support to public and private sector to provide better quality of service to the rural areas</p>	TA	<p>Outcome 2.1 : Trained technical staff with understanding of RE and capable of designing and maintaining hybrid diesel/PV installations</p> <p>Output 2.2: Well-informed and aware political and social players are bought in expanded use of RE in rural electrification in Togo</p> <p>Outcome 2.3: Local companies have skills needed to prepare business plans and are able to deliver higher quality products and services</p>	<p>Output 2.1.1: Developed curriculum for training in planning and evaluation of RE as well as designing, implementation and maintaining hybrid diesel/PV to targeted to national, private and local partners and technical staff;</p> <p>Output 2.1.2 : One national planning workshop and five regional technical training workshops (1 in each of the 5 project regions) for the design, implementation and maintenance of hybrid systems;</p> <p>Output 2.2.1 : communication and awareness-raising materials and programs (flyers, TV and radio broadcasts) for the promotion of renewable energy and hybrid diesel/solar PV</p> <p>Output 2.2.2 : Dissemination of material, TV and radio programmes organized to inform and sensitize populations of the environmental health and social benefits of RE</p> <p>Output 2.2.3 : Widespread outreach through local events consultations and meetings organized by villages used as a platform to sensitize rural communities on the benefits of solar energy; possibly 1 tailored event in each of the 5 regions</p> <p>Output 2.3.1: Strategy for the private sector for business plans development and accessing loans to expand their operations</p>	GEFTF	116 623,86	1 408 000

3. Availability of, and access to financing of Renewable Energy and Energy Efficiency Projects	TA	Outcome 3.1: Financial mechanisms suitable for sustainable solar electrification are implemented	<p>Output 3.1.1: Review of the pricing, billing, and operational management system of electricity in rural areas</p> <p>Output 3.1.2: Completed design and development of sustainable financing schemes for solar electrification including establishment of a system of customs tax exemption as well as systems of subsidies to encourage private actors</p> <p>Output 3.1.3: Operational financing scheme for sustainability of RE integration in rural electrification projects (using the example of solar energy) established and tested through public - private partnership</p>	GEFTF	100 000	2 036 000
4. Deployment of hybrid solar energy Technologies Applications	Inv	<p>Outcome 4.1: Hybrid solar energy capacity installed and added value is demonstrated</p> <p>Outcome 4.2: Local interest groups are engaged through support and group activities</p>	<p>Output 4.1.1: Designs and implementation plans for the demonstration of the commercial applications of solar technologies are validated by stakeholders</p> <p>Output 4.1.2: Operational teams established for demonstration projects in pilot communities</p> <p>Output 4.1.3: Diesel/solar hybrid PV demonstration systems of 20 KWPPV in 50 villages and 50 kits of solar pumps for irrigation and drinking water supply installed and functional</p> <p>Output 4.2.1 : Selected agro-food/artisanal products marketing channels identified in PRADEB study are engaged in the use of electricity to promote expansion of their marketing and generate additional resources</p> <p>Output 4.2.2: Increased number of local youth trained in output 2-</p>	GEFTF	2 060 000	7 965 000 ⁴

⁴ From the 7 965 000 USD, 4 436 000 USD are planned by the PRADEB (loan from BOAD) for the installation of multifunctional platforms (PTMF), 3 529 000 USD are planned to support the promotion of the solar energy market expansion. It is not allocated to finance the solar plant. The solar plant will be financed by the GEF Trust Fund.

			1-3 are employed in rural electrification projects and or expanded agro-food networks			
5 Monitoring and evaluation; information dissemination and replication	TA	Outcome 5-1: Project evaluated, corrective actions taken and experience documented Outcome 5.2 : Effectiveness of outputs evaluated and lessons learned disseminated in support of replication	Output 5.1.1 : Operationalization of a system for monitoring and evaluating the results of this project, integrating the assessment of the environmental and socio-economic benefits Output 5.1.2 : Independent evaluation of the project by an external expert firm Output 5.2.1: Evaluation of lessons learned and recommendations in terms of the impact of hybrid diesel/solar energy technologies on rural livelihoods as input to support implementation of other similar projects Output 5.2.2: Experience gained through this project shared with all national entities and also with at least three other countries in the region Output 5.2.3: Preparation of rollout project to ensure the implementation of lessons learned and recommendations	GEFTF	104,000	5,009,000
			Subtotal		2,545,623,86	16,568,000
			Project Management Cost (PMC) ⁵	GEFTF	127281,193	200,000
			Total Project Cost		2,672,905.05	16,768,000

For multi-trust fund projects, provide the total amount of PMC in Table B, and indicate the split of PMC among the different trust funds here: ()

C. INDICATIVE SOURCES OF CO-FINANCING FOR THE PROJECT BY NAME AND BY TYPE, IF AVAILABLE

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount (\$)
Recipient Government	Grassroots Development Support Program(PRADEB)	Grants	3,502,000
GEF Agency	BOAD	Loans	12,000,000
Beneficiaries	Grassroots Development Support Program(PRADEB)	In-kind	1,266,000
Total Co-financing			16,768,000

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

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

a)

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	(in \$)		
					GEF Project Financing (a)	Agency Fee (b) ^{b)}	Total (c)=a+b
BOAD	GEFTF	Togo	Climate Change	(select as applicable)	2,672,905.05	240,561.454	2,913,466.5
(select)	(select)		(select)	(select as applicable)			
Total GEF Resources					2,672,905.05	240,561.454	2,913,466.5

a) Refer to the [Fee Policy for GEF Partner Agencies](#).

E. PROJECT PREPARATION GRANT (PPG)⁶

Is Project Preparation Grant requested? Yes No If no, skip item E.

PPG AMOUNT REQUESTED BY AGENCY (IES), TRUST FUND, COUNTRY (IES) AND THE PROGRAMMING OF FUNDS

Project Preparation Grant amount requested: \$ 79,388.505					PPG Agency Fee: 7,144.9654		
GEF Agency	Trust Fund	Country/ Regional/Global	Focal Area	Programming of Funds	(in \$)		
					PPG (a)	Agency Fee ⁷ (b)	Total c = a + b
BOAD	GEFTF	Country (Togo)	Climate Change	(select as applicable)	79,388.505	7,144.9654	86,533.47
(select)	(select)		(select)	(select as applicable)			0
(select)	(select)		(select)	(select as applicable)			0
Total PPG Amount					79,388.505	7,144.9654	86,533.47

F. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS⁸

Provide the expected project targets as appropriate.

Corporate Results	Replenishment Targets	Project Targets
1. Maintain globally significant biodiversity and the ecosystem goods and services that it provides to society	Improved management of landscapes and seascapes covering 300 million hectares	<i>Hectares</i>
2. Sustainable land management in production systems (agriculture, rangelands, and forest landscapes)	120 million hectares under sustainable land management	<i>Hectares</i>
3. Promotion of collective management of transboundary water systems and implementation of the full range of policy, legal, and institutional reforms and investments contributing to sustainable use and maintenance of ecosystem services	Water-food-ecosystems security and conjunctive management of surface and groundwater in at least 10 freshwater basins;	<i>Number of freshwater basins</i>
	20% of globally over-exploited fisheries (by volume) moved to more sustainable levels	<i>Percent of fisheries, by volume</i>
4. Support to transformational shifts towards a low-emission and resilient development path	750 million tons of CO _{2e} mitigated (include both direct and indirect)	The Total Direct emission saving by the GEF PILOT project will be 62 109 tCO ₂ (2020-2039).The Indirect Bottom-up Emission Savings by the hybridization of the

⁶ PPG requested amount is determined by the size of the GEF Project Financing (PF) as follows: Up to \$50k for PF up to \$2m (for MSP); up to \$100k for PF up to \$3m; \$150k for PF up to \$6m; \$200k for PF up to \$10m; and \$300k for PF above \$10m. On an exceptional basis, PPG amount may differ upon detailed discussion and justification with the GEFSEC.

⁷ PPG fee percentage follows the percentage of the Agency fee over the GEF Project Financing amount requested.

⁸ Provide those indicator values in this table to the extent applicable to your proposed project. Progress in programming against these targets for the projects per the *Corporate Results Framework* in the [GEF-6 Programming Directions](#), will be aggregated and reported during mid-term and at the conclusion of the replenishment period. There is no need to complete this table for climate adaptation projects financed solely through LDCF and/or SCCF.

		others 150 PTMF of the PRADEB (by replication of the pilot project) will be 186 328 tCO ₂ in 20 years (2020-2039). The Indirect Top-down Emission Savings by hybridization of the 800 others PTMF planned under the National program of development of the multifunctional platform in Togo is 993 744 tCO ₂ if the regulatory, legal and financial framework are strengthened
5. Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern	Disposal of 80,000 tons of POPs (PCB, obsolete pesticides)	<i>metric tons</i>
	Reduction of 1000 tons of Mercury	<i>metric tons</i>
	Phase out of 303.44 tons of ODP (HCFC)	<i>ODP tons</i>
6. Enhance capacity of countries to implement MEAs (multilateral environmental agreements) and mainstream into national and sub-national policy, planning financial and legal frameworks	Development and sectoral planning frameworks integrate measurable targets drawn from the MEAs in at least 10 countries	<i>Number of Countries:</i>
	Functional environmental information systems are established to support decision-making in at least 10 countries	<i>Number of Countries: 1</i>

PART II: PROJECT JUSTIFICATION

1. *Project Description.* Briefly describe: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed; 2) the baseline scenario or any associated baseline projects, 3) the proposed alternative scenario, GEF focal area⁹ strategies, with a brief description of expected outcomes and components of the project, 4) [incremental/additional cost reasoning](#) and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and [co-financing](#); 5) [global environmental benefits](#) (GEFTF) and/or [adaptation benefits](#) (LDCF/SCCF); and 6) innovation, sustainability and potential for scaling up.

1) The global environmental and/or adaptation problems, root causes and barriers that need to be addressed

Photovoltaics, and other renewable energy technologies, can significantly contribute to economic and social development. To date, about 1.5 billion people in the world, many of whom live in isolated areas, still do not have access to clean water, primary health care, education and other basic services. All these depend, to a large extent, on access to electricity.

Togo, a country of 56,600 km² with an estimated population of 8,646,153 people in 2014, is historically a lower greenhouse gas emitter but it is already facing adverse consequences of climate change. The average Gross National Product (GNP) in Togo is 440 USD against an average of 842 USD in sub-Saharan Africa and an average of 650 USD for low-income countries.

Although it is one of the least developed countries and has to address other significant development and adaptation needs, Togo wishes nevertheless to contribute to the international efforts to limit the temperature increase to 1.5 °C (according to the Paris Agreement) by taking mitigation measures. The country recognizes that economic development requires booming of energy provision to its population; while this is being addressed through the PTMF project, the country is striving to ensure that future energy demands are met with renewable sources in order to contribute to a slower growth of GHG emissions to the atmosphere and hence to the ultimate objective of the UNFCCC, which is to achieve “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.”

The commitment of Togo on a low-carbon development trajectory confirmed through its recent Intended Nationally Determined Contributions (INDCs) under the United Nations Framework Convention on Climate Change, will require international cooperation and financial support (CPDN Togo, 2015).

⁹ For biodiversity projects, in addition to explaining the project’s consistency with the biodiversity focal area strategy, objectives and programs, please also describe which [Aichi Target\(s\)](#) the project will directly contribute to achieving.

Climate trends and greenhouse gas emissions in the energy sector

The analysis of climate data from Togo, from 1961 to 2012, shows a downward trend in the rainfall and a tendency to temperature increase (+ 1 °C). The aridity index¹⁰ is also declining, confirming the trend towards climate aridification. Daily temperatures for the months of February, March and April exceed most frequently 35 °C, which results in the upsurge of extreme heat during this period. The analysis of climatic data also indicates that major climate hazards that occurred during the period 1961 to 2012 are a series of droughts and floods. This paradox creates great concern to rural communities.

The period from 1986 to 2012 has particularly been marked by a warming that is felt differently from the North to the South of the country. However, since 2005, a recovery of precipitation, although irregular was observed in some weather stations. This recovery was due to an increase in the intensity of rain and rainfall, which would explain the recurrent floods recorded in recent years in the country.

For the last climate scenarios, it is estimated that in the worst case scenario (RCP 8.5), there would be an increase of the global annual temperatures from their current levels. Temperatures would increase from 0.60 to 0.71 °C by 2025 and 3.6 to 4.5 °C in 2100 depending on the latitude considered. During the same time period, the annual precipitation would experience an increase in all parts of the territory from 4 to 8 mm in 2025 and 18-39 mm of rain in 2100 respectively from their current level (Togo Third National Communication, 2015).

Several areas will be impacted by these disturbances and the regions of Togo that are already facing a significant poverty issue will demonstrate a low capacity in responding to these disturbances. These regions will instead be subject to an increased food and nutrition insecurity and an increase in poverty. The supply of fuelwood, agricultural products, meat and fish to urban centres would become difficult and could lead to social tensions, the decline in the income of the producers, the loss of biodiversity, land degradation, and the disappearance of the wetlands.

These likely impacts that are already being felt are associated with greenhouse gas emissions (GHG) that have increased globally from 40 Gt of CO₂-e in 2000 to 49 Gt of CO₂-e in 2010 (IPCC, 2014) (annex1). At the national level, the trend in aggregate emissions¹¹ of direct GHG (CO₂, CH₄, N₂O) for the period 1995-2010 shows an increase from 10,361,710 T of CO₂-e to 20,758,120 T of CO₂-e, or an increase rate of 100.33%. In addition, CO₂ emissions remain the most important and move from 6,281,000 to 14,500,000 T CO₂-e, or an increase rate of 130.85% (annex 1). The national GHG inventory shows that the energy sector has contributed 9.38% and 15% of emissions respectively in 2005 and 2010 and this increasing trend is likely to continue.

Presentation of the basic program: The PRADEB

In order to promote integrated and inclusive development of all social strata of Togo, the Strategy for Accelerated Growth and Employment Promotion (SCAPE) for the period 2013-2017 was adopted in 2012. As part of the implementation of the SCAPE, a Grassroots Development Support Program (PRADEB) was established.

The overall objective of the PRADEB is to contribute to the reduction of poverty through support to grassroots development and the promotion of youth employment. The specific objectives of the program are to: (i) consolidate the institutional basis and professionalize economic interest groupings; (ii) facilitate access of rural populations to modern energy services; and (iii) reduce youth unemployment. The main expected outcomes of the first phase of the program are as follows: (i) 500 economic interest groupings are coached and have access to credit; (ii) 200 multifunctional platforms are installed and operational; and (iii) 3,750 micro and small enterprises are created or consolidated for the benefit of young graduates and craftsmen.

The components of this program are: (i) support to the economic activities of the groups; (ii) support to the installation of multifunctional platforms (operating with diesel for energy supply in villages from 600 to 2000 inhabitants); (iii) support for the promotion of youth employment; (iv) monitoring and evaluation and support for mentoring; and (v) Organization and management of the program.

A program management cell (PMC) provides programming and coordination of the interventions, the administration of contracts and agreements and the financial management of the program. The PMC and the Local Relay Agency (LRA) are equipped with Information Technology equipment, office furniture and rolling stock necessary for conducting their activities.

¹⁰ Aridity index = Rainfall / Potential Evapotranspiration

¹¹ Analysis in the Third National Communication on Climate Change Togo, 2015

The first phase of the 5 year PRADEB, currently running, has received a funding of 6,000 M CFA Francs from the West African Development Bank (BOAD) in 2012, bringing the total funding of the project to 8,384 M CFA Francs (approximately 16,768,000 USD). It will enable the establishment of 200 PTMF (Multi-functional Platform). Additional financing was requested from BOAD for the installation of the remaining 800 PTMF (Multi-functional Platform) out of 1000 planned under the program.

To reduce GHG emissions, the Ministry of the environment and forest resources (MERF) proposed to use three (3) million US dollars of the Togo STAR funding of the GEF to hybridize the PTMF with solar systems. This action is in perfect alignment with: (i) GEF-6 strategy in the field of climate change mitigation that aims at "supporting developing countries and economies in transition to make transformational shifts towards a low-emission, resilient development path" (ii) the SCAPE that relies on four main areas, including setting up a legislative, regulatory and institutional framework and the promotion of renewable energies¹², and (iii) the recent Intended Nationally Determined Contributions of Togo.

Barriers and solutions proposed by the hybridization project of the PTMF

As with any multi-faceted problem, reducing poverty and moving towards sustainable development while preserving the global environment and minimizing climate change, necessarily involves making innovative choices. Business as usual approaches to economic development especially as they relate to energy area do not address the root causes of climate change and GHG emissions. More specifically traditional energy production through fossil fuel use has significant deleterious impacts on climate through emissions of CO₂ and other short-lived climate forcers.

At present the Togolese energy sector is characterized by: (i) a great fragility of the production and distribution of energy due to many technical, climatic (water resources) and management shortcomings; (ii) the existence of strong regional disparities between energy supply and demand; and (iii) a relatively high energy loss due to the large share of traditional energy sources with very low yields. Moreover the fragility of production and distribution systems and the high cost of renovation are obstacles to meeting the total electric coverage needs. However, energy requirements are becoming higher and higher due to an increasing population.

The private sector, on the other hand, is actively involved in the renewable energy sector but the lack of financial support and the absence of a regulatory and legal framework, prevents this sector from playing its full role. They are reluctant to shifting to solar energy systems because of acquisition costs that they consider as being high and consumers in addition do not know the real benefits of solar energy. The establishment of stronger institutions, the enhancement of awareness and understanding as well as improvement of the governance of the energy sector would facilitate the planning of rural electrification through public - private partnership.

While the PRADEB contributes to achieving development objectives in Togo, particularly, poverty reduction and the promotion of youth employment¹³, the operation of multifunctional platforms envisioned for electricity production contributes to the degradation of the environment through greenhouse gas (GHG) emissions. Togo intends to offset the environmental impact of PRADEB by promoting renewable energies. Solar energy is envisioned, but producers of electrical energy in Togo see the initial costs of installation of solar units as exorbitant and the benefits are not immediately apprehended. Producers therefore prefer thermal installations that they feel most comfortable with, despite the GHG emissions they generate. Indeed, the analysis of the sector of renewable energies in Togo reveals that the sector is faced with financial difficulties.

The detailed barriers that this project is planning to overcome during its implementation are among others: (i) the lack of awareness of the benefits of renewable energy; (ii) the lack of technical capacity in the area of renewable energy; (iii) the absence of institutions dedicated to the promotion of renewable energy sources; (iv) the lack of access to financing; (v) the lack of information on the existing flexibility mechanisms in the context of the climate finance; (vi) the lack of incentives for the promotion of solar energy; (vii) the inadequacy of fiscal policy to encourage the promotion of solar energy and (viii) the absence of national standards for energy efficiency¹⁴. It is overall, a lack of consistent policies with appropriate regulations to regulate the renewable energy sector. The combination of these barriers maintains a business-as-usual situation in which access to renewable energy is hampered, while lack of energy and other infrastructure could severely limit economic development.

¹² The other three axes concern: (i) the household access to cheaper energy alternative to wood energy, the implementation of a program to promote efficient stoves and a second program for the extension of the gas butane for domestic use. (ii) the strengthening of subregional and international cooperation in the field of environmental management, and (iii) the increase of national environmental management skills.

¹³ SCAPE. Accelerated Growth Strategy and Employment Promotion (SCAPE) from 2013 to 2017. Pp. 97-101.

¹⁴ National needs Technologies. Climate Change Project PROJECT CNCC / UNDP / GEF / TOG97 / G32

The lack of awareness of the benefits of renewable energy: photovoltaic solar demonstration projects in the villages will help educate the public on the benefits of photovoltaic solar energy in rural areas. Components 2., Knowledge and capacity development and support to public and private sector to provide better quality of service to the rural areas, component 4., Deployment of hybrid solar energy technologies, and component 5., Monitoring and evaluation, information dissemination and replication of the project aim at addressing the lack of awareness of the benefits of renewable energy.

The lack of technical capacity: The technology shift induces a change in the required technical skills of operators and installers. Capacity building, training, promotion of the technology and support allocated to local equipment and service providers is needed in order to obtain private promoters' buy-in . There is also a low technical capacity in the chain of officials and actors (private promoters of solar systems, public services, the Ministry of environment and forest resources (MERF), the Ministry of energy, end users), in undertaking the required procedures on projects involving solar energy. In addition, there is within the MERF and the Ministry in charge of energy a low capacity to develop, execute, monitor and evaluate programs or projects on solar energy. These technical barriers will be addressed through training and targeted capacity-building activities. Components 1 and 2 of the project will achieve this goal by building technical capacity for renewable energy.

The absence of institution for the promotion of renewable energy: there is a lack of an institutional framework for the assessment of quality standards and procedures of implementation of solar systems by which the MERF and the Ministry in charge of energy can assess renewable solar energy systems. Component 1. will address this barrier by preparing the National Appropriate Mitigation Actions (NAMA) on renewable energy, the creation of an agency for the promotion of renewable energies and the review of the energy master plan.

The lack of access to financing: the capacity of the private sector to finance solar photovoltaic projects in the villages is very low due to lack of capital, lack of financial assets, and lack of fund raising capacity. In addition, the risk of non-payment has been so far higher in rural areas because of the larger number of poor people with very limited revenues. Component 3 through 3.1.2 and 3.1.3 as well as component 4 through 4.2.1 and 4.2.2 will address this key developmental issue.

Lack of information on the existing flexibility mechanisms in the context of the climate finance: decision-makers and other key actors have little knowledge about how carbon finance could induce additional investments in the solar energy sector. The development of a NAMA for solar PV in the villages, with component 1, will provide a reasonably solid foundation for increased investment.

The lack of financial incentives: Because of their low population density and scattered settlements, providing electricity services in rural areas is difficult to achieve without any kind of subsidy system. Existing subsidy schemes include subsidy on investments (equipment for generation and infrastructure, customers' connections, etc.) and subsidy on operating costs (typically subsidy on fuel expenses borne by local operators). In countries where electricity is subsidized, end users do not pay the real cost of power, this implies that shifting from a conventional diesel power plant to a PV / diesel hybrid system induces a displacement of the subsidy from the operating costs to the initial investment. Incentives and subsidized loans may make the financing of solar photovoltaic projects in the villages more attractive. In Togo, the production cost of one KWh of electricity is higher than the retail price to the poor population. A national workshop can be staged in the present pilot project to study the complexities of this socio-economic problem and identify *financial incentives* for the promotion of renewable energy. Component 3 of the project aims at addressing such financial barriers.

The lack of fiscal policy to encourage the promotion of solar energy: Although solar panels are exempt from custom duties, the other components of a solar system including batteries, converters, regulators, freezers, water heaters and solar pumps are not tax exempted. This results in an increase in the cost of solar systems. Component 3 will support the extension of tax exemption to all solar facilities without exception in order to reduce the acquisition cost of solar systems by the population.

The absence of national standards for energy efficiency: the project will contribute to the establishment of institutional and regulatory frameworks conducive to the development of the renewable energy sector through component 1 and will therefore institutionalize the concept of renewable energy as a means to rural development.

Without the support of the GEF to improve the physical planning process, refine the institutional and regulatory frameworks and support the demonstration projects, it will be very difficult to raise the awareness of populations, to build capacity of players in the chain of installation and maintenance, to offset the initial cost of installation and therefore engage local promoters in Togo to shift to renewable energy schemes.

2) The baseline scenario or any associated baseline projects

Emission of GHG and fossil energy consumption of the PTMF under the PRADEB

The first phase of the PRADEB financed by the BOAD will install 200 PTMF in 5 years. The present GEF project will hybridize 50 PTMF of the 200 programmed for the first phase. If the GEF finances the present pilot project, it will be replicated 3 times to hybridize all the 200 PTMF.

In fact, in the framework of the National program of development of the multifunctional platform in Togo, it is planned to install 1,000 diesel oil generator (PTMF) with 75% of PTMF of 10 kVA (750 units) and 25% of PTMF of 15 kVA (250 units). So, in the 10 coming years, the Government of Togo will install 800 PTMF with diesel oil generators. So, the GEF contribution is critical and nothing would have happened in the baseline if the pilot project is not implemented.

In the first phase of the PRADEB, the average operating time for a PTMF is 15 h per day for 312 days a year. The hourly consumption of diesel by a PTMF of 10 kVA is 1.5 liters or 22.5 liters per day and 7,020 liters per year. For a 15 kVA PTMF is 2 liters per hour, 30 liters per day and 9,360 liters per year. Referring to data from the Energy Policy Division, Natural Resources Canada, the diesel energy conversion factor is 38.68GJ/m³ of diesel oil (please see the link: http://www.csaregistry.ca/cleanprojects/emission_estimation_resources_f.cfm). In this case: 7,020 liters of diesel oil of 10 kVA correspond to 271.5336 GJ and 9,360 liters of diesel oil of 15 kVA correspond to 362.0448 GJ per year. According to the GEF EE Tool v1.0, the conversion factor is 3.6GJ/MWh. Thus, one generator of 10 kVA will produce 75.426 MWh and generate a year and the generator of 15 kVA will produce 100.568 MWh a year. All the generators to be hybridized in the framework of the GEF project are off-grid. According to the methodological tool of UNFCCC “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” (Version 01), the determination of the emission factor for electricity generation base on scenario B: Electricity consumption from an off-grid captive power plant, option B2, a conservative default value can be used if the electricity consumption source is a project: this value is 1.3 tCO₂/MWh. See UNFCCC, EB 39 Report Annex 7, page 8. Thus, one generator of 10 kVA will generate 98.0538 tCO₂ per year and one generator of 15 kVA will generate 130.7384 tCO₂ a year.

For the 50PTMF planned to be hybridized in the framework of the pilot project, the corresponding annual emissions of CO₂ is 5,294.9052 tons (with 38 PTMF of 10 kVA and 50 PTMF of 12 kVA). The CO₂ emissions by the 50 PTMF will be 105,898.104 tons in 20 years. The consumption of diesel fuel of these 50 PTMF could reach 7,581,600 liters at a cost of 4,283,604,000 FCFA (8,567,208 USD) at the current price of diesel fuel (565 CFA Francs per liter) for the 20 years.

For the 150 others PTFM installed by the first phase of PRADEB and for which hybridization is not planned in this pilot project and will be hybridized in the framework of the replication of the GEF pilot project, the corresponding annual emissions of CO₂ will be 15,950.0848 tons (with 112 PTMF of 10 kVA and 38 PTMF of 15 kVA). The CO₂ emissions will be 319,001.696 tons in 20 years. The consumption of diesel fuel of these 150 PTMF could reach 22,838,400 liters at a cost of 12,903,696,000 FCFA (25,807,392 USD) for 20 years at the current price of diesel fuel (565 CFA Francs per liter).

With the 800 PTMF planned to be installed in the framework of the National program of development of the multifunctional platform in Togo after the first phase of PRADEB, the corresponding annual emissions of CO₂ will be 84,979.96 tons (with 600 PTMF of 10 kVA and 200 PTMF of 15 kVA). The CO₂ emission by these 800 PTMF will be 1,699,599.2 tons in 20 years. The consumption of diesel fuel could reach 121,680,000 liters at a cost of 68,749,200,000 FCFA (137,498,400 USD) for 20 years at the current price of diesel fuel (565 CFA Francs per liter).

To address this setback, environmentally sustainable solutions must be found. If no durable solution is envisaged to address the situation, the PRADEB will lead to (i) significant investment of rural populations to cover fuel costs needed to run the PTMF and (ii) a significant contribution to the increase of GHG emission in the energy sector at the national level with an impact on adverse climatic trends in Togo. The GEF pilot project is proposed to reduce these emissions, fossil fuel consumption and fuel expending.

Analysis of the energy needs of the Togolese population and the low access to energy power especially in rural areas

Togo imports over 70% of its electrical energy from neighbouring countries including Ghana, Côte d’Ivoire and Nigeria. To compensate its deficit, despite the fluctuation of prices on the market, the country produces a portion of its electricity from Diesel generators and for this purpose remains dependent on petroleum products. The total electrical energy delivered in 2012 in Togo amounted to 1042 GWh with 886 GWh delivered to the CEET by the “Communauté Electrique du Bénin” (CEB). The own production of the CEET from the thermal power plants in 2012 amounted to 14.3 GWh, representing 1.3% of the demand. Until 2014, the access to electricity in Togo remained low with 30% of urban households and 13% of rural households with access to electricity (DPI/CEET, 2015). This shows a disproportionate distribution of State resources vis-à-vis the rural areas in terms of

access to electricity. However, the total energy demand of rural areas will increase from 11.2 million GJ in 2005 to 21.9 million GJ in 2030 with a strong contribution of biomass, or an increase of 95.5% in 25 years (from 2005 to 2030) (TCN Togo, 2015). Therefore in addition to environmental problems caused by the use of diesel there are others collateral impacts of oil pricing, as rural communities resort to firewood and charcoal for their operations when they cannot afford diesel. This in turn contributes to increased emission of GHG and distortion of carbon stocks.

In this context, it is important to undertake actions contributing to the promotion of the use of clean energy sources to mitigate GHG emissions in the energy sector, but also to meet energy needs while reducing pressure on fuel wood resources. The hybridization project of the PTMF by solar systems will contribute to avoid the worsening of GHG emissions in Togo and in particular in the energy sector.

3) The proposed alternative scenario, GEF focal area¹⁵ strategies, with a brief description of expected outcomes and components of the project

This alternative scenario builds on interlinked interventions focusing on policy and regulatory frameworks, capacity building for market players, pilot demonstration, and scaling up. By addressing systemic barriers related to policy and regulatory framework, the project will create an environment conducive to private sector led investment activities in renewable energy systems in rural communities and transition toward a low-carbon development path. It will be characterized by:

- Increased awareness of the population about the benefits of renewable energy sources, in particular solar energy, and knowledge about their productive uses in rural areas through flyers, radio broadcasts, and sensitization meetings;
- Strengthened technical capabilities of national actors in the planning and implementation of projects of solar energy with a sufficient level of technical services, financial support and local stakeholder engagement to warrant a sustainable operation;
- The development of a coherent policy framework to promote renewable energy technology for rural electrification and remove existing barriers to its implementation through dialogue between private developers, government and other main stakeholder;
- Institutional strengthening through the implementation of an institution (agency) for rural electrification, and the installation of a regulatory and legal framework taking into account the renewable energy systems in order to create a conducive framework for their promotion;
- Review and further development and operationalization of a financial mechanism for sustainable development of solar electrification as an example of renewable energy source including establishment of a system of custom tax exemption and systems of subsidies to encourage private actors. The revision of the system of pricing, billing, in rural and urban areas as well as the review of the master energy plan of the CEET will help improving the current tax policy to encourage the promotion of renewable energy and solar energy in particular;
- Creation of an enabling environment for local youth employment and small agro-food business networks that will generate increased local income through engagement in the deployment of installations and the productive use of electricity.

The alternative scenario will accelerate the implementation of demonstration projects for diesel engines hybridization and installation of solar pumps for drinking water and irrigation. The visible positive socio-economic impacts in project communities will in effect result in more renewable energy projects that will reduce diesel consumption in rural communities and reduce GHG emissions. At the local level, the use of renewable energy systems will eliminate the reliance on fossil fuel and the attendant local environmental challenges. The project will accelerate uptake of mitigation technology.

Other alternatives were considered during the formulation of the hybridization of the PTMF project: (i) implementing a project of solar photovoltaic electrification (PV) requires batteries whose replacement would be costly for rural populations. In addition, given the fact that batteries pollute the environment and Togo has a limited capability to manage pollution induced by batteries, it was decided to consider projects whose management costs would be more accessible to rural populations and to target interventions in a sequenced way; (ii) the financing of rural electrification projects with Government funds with an ad hoc intervention for the use of solar energy was rejected due to the important needs for institutional and regulatory capacity building that are best addressed within a multi-year project dedicated to access to solar energy; (iii) the full integration of an 'energy' component in a project of planning and tarring of national roads and co-financed by BOAD was rejected because of the difference in the scheduling of the two operations and the risk of sizeable implementation; and (iv) the option to proceed without the technical assistance of GEF to organizational, institutional capacity-building and the creation of technical framework would result in a very slow process to provide access to electricity in rural areas in Togo.

¹⁵ For biodiversity projects, in addition to explaining the project's consistency with the biodiversity focal area strategy, objectives and programs, please also describe which [Aichi Target\(s\)](#) the project will directly contribute to achieving.

Presentation of the project of the PTMF hybridization

The hybridization project of the PRADEB's multifunctional platforms is a pilot project whose general objective is to promote increased access to electricity in villages of Togo while ensuring that emission of GHG will be kept low through the development and use of solar energy technologies. Specifically, this project will help: (i) to strengthen the institutional and regulatory framework at the national level for developing off-grid renewable energy; (ii) to strengthen technical capacities of promoters and developers; (iii) to develop financing mechanism for Renewable Energy and Energy Efficiency Projects and to facilitate investments in solar energy for power supply in rural communities; (iv) to demonstration the value of hybridization technology with installation of diesel/solar PV equipment coupled with the creation of income source for local population ensuring sustainability of the exploitation of the installations; and (v) to support awareness-raising, communication, monitoring and evaluations for maximization of project outcome and promoting replication.

This project planned for a duration of 3 years.

Component 1: Strengthening of Regulatory, Policy and Institutional Frameworks for Renewable Energy and Rural Electrification

This component will address barriers related to the inadequacy of policies, regulatory and institutional frameworks that support the promotion and application of RE in electricity production in Togo. The activities will lead to enhanced and clearly defined, as well as enforceable policies and regulations. The implementation will involve working closely with all concerned agencies i.e., the Ministry of environment and forest resources, the Ministry of Grassroots Development, the Support Program to Grassroots Development, the Ministry in charge of energy and Togo Electricity Company (CEET).

The Outcome is that the country has a revised national energy policy, rules and regulations supportive of renewable energy with focus on solar electrification and an institution responsible for implementation. To achieve this outcome, the following activities are proposed: (i) Output 1.1. Review of the regulatory and legal framework suitable for renewable energy and energy efficiency systems. The texts governing the regulatory and legal framework will be revised or developed to promote systems of renewable energy and energy efficiency; (ii) Output 1.2. Review of the energy master plan of the CEET to incorporate the promotion of renewable energies. The aim will be to revisit the master plan of the CEET in order to integrate guidelines that promote the use of renewable energy systems and to validate the new master plan; (iii) Output 1.3. Preparation and seeking for funding of the National Appropriate Mitigation Actions (NAMA) in renewable energy is about promoting programs with appropriate national financial incentives to reduce emissions and contribute to a sustainable national development. To accelerate the implementation of this output, steps will be taken to mobilize the necessary additional resources; (iv) Output 1.4. Establishment of an institution for the promotion of renewable energies consists of taking steps for the establishment of an institution whose major role will be to seek financing for the implementation of projects for the promotion of renewable energy in Togo.

Component 2: Knowledge and capacity development and support to public and private sector to provide better quality of service to the rural areas;

The project will organize and implement a coherent programme to develop the required technical skills of operators and installers necessitated by the technology shift. This will encompass capacity building, training, promotion of the technology and technical support to various target groups such as local promoters and designers as well as service providers to facilitate sustainable operation of the demonstration and replication projects. Efforts will be made to ensure that both women and men have equal opportunity to participate in and benefit from all capacity building activities. A gender-analysis will be conducted to define concrete targets of female participation and to identify a strategy to give equal opportunities to both women and men. The involvement of local authorities will be promoted to ensure long-term viability. This component will ensure coordinated information and awareness raising throughout the project. Awareness-raising activities and materials will be developed and used from the inception of the project to the final evaluation and replication phase. The initial awareness raising materials will be used to engage stakeholders at project inception. Knowledge and data generated during the project will help the country accelerate towards more effective energy access and energy efficiency, as well as enhancing Togo's contribution to climate change mitigation. Also this component will help the learning process by documenting lessons and challenges, and making them available during implementation, as well as at the end of project for replication.

Outcome 2.1: Trained technical staff with understanding of RE and capable of designing, implementing and maintaining hybrid diesel/PV installations. Activities contributing to the achievement of this outcome are the development of training curriculum, provision of guidelines and other technical materials for planning, designing, implementing and maintaining hybrid diesel/PV targeted national, private and local partners and technical staff (Output 2-1-1); One national planning workshop and five regional

technical trainings (1 in each of the 5 project regions) for the design, implementation and maintenance of hybrid systems (Output 2.1.2) will be implemented.

Outcome 2.2: will ensure through solid awareness raising programme that all players from the political, economic and social levels buy in the expansion of RE use in rural electrification in Togo. To achieve this, flyers, TV sketches and radio broadcasts for the promotion of renewable energy and hybrid diesel/solar PV will be produced (Output 2.2.1) and disseminated (Output 2.2.2); planned local events, consultations and meetings organized by villages will also be used as a platform to sensitize rural communities on the benefits of solar energy and, possibly, 1 national awareness raising workshop for policy makers, private sector partners and local leaders will be convened.

Outcome 2.3 will ensure that local companies have skills needed to prepare business plans and are able to deliver higher quality products and services and will generate a strategy for business plan development and accessing financing for their operations.

Component 3: Improved availability of, and access to financing of Renewable Energy and Energy Efficiency Projects.

This component is primarily aimed at addressing the shortage of financing for RE production and application. The expected outcome from achievement of the deliverables under this component is the improved availability and accessibility of financial support as well as the development of a more secure environment for encouraging private investors to participate in the rural electrification sector. Financing opportunities, including micro financing methodologies, and development of financial arrangements for productive uses of energy will be assessed and Public-private partnerships will be promoted and facilitated for the sustainability of the project outcomes. The main outcome that is to have an implemented financial mechanism suitable for solar electrification will be achieved through 3 outputs. The existing pricing, billing, and operational management system of electricity in rural areas will be reviewed, assessed and amended (output 3.1.1); sustainable financing schemes for solar electrification will be developed including establishment of a system of customs tax exemption and systems of subsidies to encourage private actors. Texts will be developed, adopted and implemented to reduce or exempt all items entering in a solar system from customs taxes and customs services; as well, a grant system will be developed by the actors involved in the promotion of solar energy and will be deployed as a catalyst for the sale of quality certified equipment by private companies. (Output 3.1.2); the financing scheme for sustainability of RE integration in rural electrification projects (using the example of solar energy) will be operationalized and tested using public - private partnership. National banks, BOAD, financial institutions and the private services of installation of solar systems, the Ministry in charge of energy, the CEET and other actors involved in the promotion of solar energy will carry out working sessions to develop and operationalize a financial mechanism suitable for public-private partnerships regarding the development of renewable energies (Output 3.1.3).

Component 4: Deployment of Hybrid Solar Energy Technologies

This component will consist of the installation and operation of hybrid solar energy capacity, the demonstration of their added value in enhancing access of rural communities to electricity, improved water access with resulting positive health and social impacts and improved local business opportunities and income (outcome 4.1). It will be implemented hand in hand with activities in support of sustainability and social improvement with the engagement of local interest groups (outcome 4.2).

Output 4.1.1 covers the pre-installation stage; it will see the production of designs and implementation plans for the solar hybrid technologies with the engagement of relevant local stakeholders; the operational teams will be established (Output 4.1.2) to support the installation of 50 Diesel / solar PV Hybrid systems having each up to 20 KWP PV in 50 villages. Fifty (50) platforms around which more activities are developed will be targeted, and through the project will be hybridized with 20 KWP PV solar panels. Rural populations will therefore test the system in their areas of activity; 50 kits of solar pumps for irrigation and drinking water supply will be installed and functional allowing rural populations to experience solar energy in areas such as agriculture and access to drinking water (Output 4.1.3).

The project will piggy-bag on development projects initiated by the PRADEB (100 rural groupings targeted over 36 months) and will promote income-generating activities for youth as well as productive uses of electricity for agri-food/artisanal networks as the foundation for its sustainability. This effort will identify Economic Interest Groups (GIE), record their requests for support, train them, support them in preparing income-generating micro-projects and facilitate their access to credit. This will secure additional income, thus alleviating poverty in these areas and providing financial resources to ensure the sustainability of the rural electrification initiative. In Output 4.2.1, for each project region one (1) to two (2) agro-food/artisanal products marketing channels identified in PRADEB study will be engaged in the use of electricity to promote expansion of their operations and generate additional resources; Output 4.2.2: will provide for the increased employment, in rural electrification settings, of local youth trained in output 2.1.3. This will result in reducing unemployment among young people through the development of the entrepreneurial culture and the facilitation of access to financial services for this segment of the population.

Component 5: Monitoring and evaluation (M&E) of the project activities; dissemination of results and replication

The project activities will be managed in accordance with the requirements of the GEF and BOAD; it will be subjected to mid-term review and final evaluation. Based on the independent mid-term evaluation, follow-up corrective actions will be taken if needed. An independent final evaluation will be conducted prior to the terminal review meeting. The final evaluation will look at the impact and sustainability of results, including the contribution towards capacity development and the achievement of global environmental and social benefit goals. The final evaluation will also provide recommendations for follow-up activities. The project will involve continuous monitoring. After completion, seminars will be organized and the project experiences will be disseminated to various interested stakeholders in order to increase the replication potential. Various tools such as leaflets, website, etc. will be used for effective dissemination.

This component targets two (2) outcomes: (i) Outcome 5.1: project activities evaluated, corrective actions taken and experience documented; and (ii) Outcome 5.2: the outputs and lessons learned are disseminated in support of replication.

To achieve outcome 1, the following activities will be implemented: (i) Output 5.1.1. Operationalization of a system for monitoring and evaluating the results of this project, integrating the assessment of the environmental, socio-economic benefits.

Monitoring and evaluation tools will be developed, inspired by already existing and operational devices within PRADEB, and the actors involved in the management of the project will be trained in their use; (ii) Output 5.1.2: Independent evaluation of the project by an external audit firm. A firm will be recruited to highlight indicators of performance of the project and lessons learned.

In implementing for Outcome 5.2, the following will be produced: Output 5.2.1: Evaluation of lessons learned and recommendations in terms of the impact of hybrid diesel/solar energy technologies on rural livelihoods as input to support implementation of other similar projects, and, output 5.2.2: Experiences from this project shared with all national entities and also with at least three other countries in the region. Flyers, TV and radio broadcasts as well as brochures will be developed for information, sensitization and dissemination of results and groups of villages will be encouraged to organize consultations and meetings to the same end; documentaries and radio and TV programs will be designed to disseminate knowledge on solar energy; ; Output 5.2.3 Preparation of follow-up project to ensure the implementation of lessons learned and recommendations with the view of ensuring the replication and sustainability of results. On the basis of the project evaluation, which will be carried out by a firm, a larger scale project that will affect all 1000 PTMF will be formulated.

4) The incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, and co-financing

As said above, for the 50PTMF planned to be hybridized in the framework of the pilot project, the corresponding annual emissions of CO₂ is 5,294.9052 tons. The CO₂ emissions by the 50 PTMF will be 105,898.104 tons CO₂ in 20 years¹⁶. The consumption of diesel fuel of these 50 PTMF could reach 7,581,600 liters at a cost of 4,283,604,000 FCFA (8,567,208 USD) at the current price of diesel fuel (565 CFA Francs per liter) for the 20 years. For the 150 others PTFM installed by the first phase of PRADEB and for which hybridization is not planned in this pilot project and will be hybridized in the framework of the replication of the GEF pilot project, the corresponding annual emissions of CO₂ will be 15,950.0848 tons (with 112 PTMF of 10 kVA and 38 PTMF of 15 kVA). The CO₂ emissions will be 319,001.696 tons in 20 years. The consumption of diesel fuel of these 150 PTMF could reach 22,838,400 liters at a cost of 12,903,696,000 FCFA (25,807,392 USD) for 20 years at the current price of diesel fuel (565 CFA Francs per liter). If no durable solution is envisaged to address the situation, the PRADEB will lead to (i) significant investment of rural populations to cover fuel costs needed to run the PTMF and (ii) a significant contribution to GHG emission increase in the energy sector at the national level with adverse climatic impacts in Togo¹⁷.

Although solar energy is a clean energy, producers of electrical energy in Togo see the initial costs of installation of solar units as exorbitant and the benefits are not immediately apprehended. Producers therefore prefer thermal installations that they feel most comfortable with despite the GHG emissions they generate. Indeed, the analysis of the sector of renewable energies in Togo reveals that the renewable energy sector is faced with financial difficulties. There is also a lack of technical and regulatory and institutional framework for the promotion of renewable energies.

Without the mobilization of external financial resources, the private sector, but also all those involved in the energy sector, will always find it difficult to develop the renewable energy sector and move towards effective rural electrification respectful of the

¹⁶ 20 years correspond to the life of the solar panels in case PTMF were to be hybridized.

¹⁷ If the present pilot is implemented, the Total Direct emission saving by the GEF project will be 62 109 tCO₂ (2020-2039). Additionally 202 176 liters will be saved per year which correspond to 4 043 520 liters in 20 years and the fuel purchase cost will be 2 284 588 800 FCFA (4 569 177 USD¹⁷) at the current price of diesel fuel (565 CFA Francs per liter) in 20 years. If the pilot project is replicated 3 time to hybridized the others 150 PTMF of the PRADEB, the emission savings will be 186 328 tCO₂ and the fuel savings will be 12 180 480 liters in 20 years. The corresponding fuel purchase cost will be 6,881,971 200 FCFA (13,763,942.40 USD) in 20 years. Thus, if the 200 PTMF planned to be installed in the first phase of PRADEB are hybridized, 248,437 tCO₂ could be saved and 16,224,000 liters of fuel consumption could be reduced. The 16,224,000 liters reduced correspond 9,166,560,000 FCFA (18,333,120 USD).

environment. The mobilization of funding for the promotion of solar energy through the implementation of devices for the hybridization of 1000 multifunctional platforms is needed to sensitize the population on the benefits of solar energy and it will create a sustainable framework for rural electrification with renewable energy.

The activities outlined above are best catalyzed by the use of a GEFTF grant that will address existing barriers related to policy and regulation, capacity and knowledge gaps, and lack of appreciation of the technical feasibility and commercial viability of integrated renewable energy systems for productive uses.

The GEF will therefore support the strengthening of the institutional and regulatory framework governing the energy sector, the knowledge and capacity development as well as the implementation of demonstration projects of solar energy, the management and the monitoring and evaluation of the project. GEFTF support will also be used to provide targeted trainings to market players in order for them to support the uptake of renewable energy systems in rural areas. The co-financing of the PRADEB will implement the PTMF and will provide support to the management and the monitoring and evaluation of the project.

The project will generate several other additional benefits. Households will have: (i) easy access to electricity that will allow them to have access to information and business opportunities through the use of the means of communication and telecommunications (radio, television, mobile phones...); (ii) easy access to drinking water and irrigation of agricultural areas; (iii) improvement of lighting quality and the possibility of extending the working day; (iv) the ability to create income-generating activities; (v) better conditions for learning and work for children, young people in educational institutions and the youth enrolled in vocational training; (vi) a reduction of indoor pollution and (vii) an improvement of human health.

The project interventions will contribute to climate change mitigation by using solar resources to replace diesel-fuel systems used in a business as usual model. The alternative with renewables will contribute to reduce GHG emissions, including CO₂ emissions from fossil fuels burning. The facilitation and enabling of the application of RE technologies will be done through the removal of barriers associated with regulations and institutional mechanisms, limited capacity and knowledge about the application, design, financing and operation of hybrid systems.

5) Global environmental benefits (GEFTF)

The project is in line with the primary objective of the GEF 6 on the mitigation of climate change “Promote Innovation, Technology Transfer, and Supportive Policies and Strategies”, including its program 1 "Promote the timely development, demonstration, and financing of low-carbon technologies and mitigation options ". The project component 4 " Demonstration projects for production and sustainable exploitation of solar energy" will proceed to the hybridization of 50 PTMF (with 38 generators of 10 kVA and 12 generators of 15 kVA). The operating time of a generator in the baseline is 15 hours per day for 312 days during the year. The consumption of diesel oil by a generator is 1.5 liters for the generator of 10 kVA and 2.0 liters per hour for the generator of 15 kVA. In the framework of the GEF pilot project, the solar plant will generate electricity in 8 hours per day to substitute the diesel generator. Thus, the diesel oil economy in one year for one plant of generator will be: 3,744 liters for 10kVA and 4,992 liters for 15 kVA. According to the tools referenced above in the baseline scenario, the annual energy saving is 40.2159 MWh for one PTMF of 10 kVA hybridized and 53.6212 MWh for one PTMF of 15 kVA hybridized. Thus, the average Direct Electricity Savings (MWh) for the 50 plants in one year is: $(40.2159 \text{ MWh} \times 38) + (53.6212 \text{ MWh} \times 12) = 2172 \text{ MWh}$. The Direct emission saving during the first 3 years of the project (2017-2019) is 7 764 tCO₂. The Direct emission saving during 20 years after the project has been implemented (2020-2039) is 54 346 tCO₂. The Total Direct emission saving by the GEF project will be 62 109 tCO₂ (2020-2039). Additionally 202 176 liters will be saved per year in the project framework which correspond to 4 043 520 liters in 20 years. The corresponding fuel purchase cost will be 114 229 440 FCFA (228 359 USD¹⁸) per year and 2 284 588 800 FCFA (4 569 177 USD) in 20 years (see appendix 3).

The Indirect Bottom-up Emission Savings by the hybridization of the others 150 PTMF of the PRADEB will be 186 328 tCO₂ in 20 years (see appendix 3). Additionally 609 024 liters will be saved per year in the project framework which correspond to 12 180 480 liters in 20 years. The corresponding fuel purchase cost will be 344 098 560 FCFA (668,197.12 USD) per year and 6,881,971 200 FCFA (13,763,942.40 USD) in 20 years.

The Indirect Top-down Emission Savings by hybridization of the 800 others PTMF planned under the National program of development of the multifunctional platform in Togo is 993 744 tCO₂ if the regulatory, legal and financial framework are strengthened (see appendix 3). Additionally 3,244,800 liters will be saved per year in the project framework which correspond to 64 896 000 liters in 20 years. The corresponding fuel purchase cost will be 1 833 312 000 FCFA (3,666,624 USD) per year and 36 666 240 000 FCFA (73 332 480 USD) in 20 years.

¹⁸ 1USD=500 FCFA

The Direct Electricity Savings (MWh) and GHG Emission Savings (tCO₂), the Indirect Bottom-up Emission Savings (tCO₂) and the Indirect Top-down Emission Savings (tCO₂) are calculated on the base of the Manual for calculating GHG benefits of GEF projects: energy efficiency and renewable energy projects, April 2008, the GEF EE Tool v1.0 and the methodological tool of UNFCCC “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” (Version 01)¹⁹.

The project will therefore accomplish several global benefits:

- The overriding global environmental benefits of the proposed GEF project will come from GHG emission reductions from fossil fuel use in electricity generation and the protection of the natural environment. In the pursuit of its development strategy, the early shift of Togo to renewable energy will ensure that the growing energy needs will not go hand in hand with increased consumption of fossil fuel and therefore will not lead to increased emissions of GHG;
- The proposed project is also within the context of sustainable development particularly in the rural areas and, it will bring about local benefits such as the improvement of the living conditions of rural populations;
- Additionally it will contribute to several international objectives such as The Sustainable Energy for All initiative, which is a multi-stakeholder partnership between governments, the private sector, and civil society. Launched by the UN Secretary-General in 2011, it has three interlinked objectives to be achieved by 2030: Ensure universal access to modern energy services; Double the global rate of improvement in energy efficiency; Double the share of renewable energy in the global energy mix;
- Under the GEF-supported alternative scenario, the value added resulting from a ‘productive use of energy (PUE)’ program will contribute to sustainable development in rural areas, seeking to bring employment and other economic as well as social benefits to the rural population. The project will seek increased local benefits through two separate energy-related approaches.

6) Innovation, sustainability and potential for scaling up

The feature of this project is to be the pioneer of a new paradigm for the sustainable development of renewable energies in rural areas affected by poverty and deprived of essential infrastructure. Innovation is a major characteristic of the project because of the emphasis on the combination and sequencing of different technologies and the fact that the project approach will help reaching synergistically various areas of intervention. The component 4 of the hybridization project will help in proving the reliability of the technologies.

The project sustainability hinges on its intervention strategy that focuses on both policy and regulatory schemes, as well as, support to pilot projects on the ground. Institutionally, sustainability will come from the collaboration established between several line ministries and the ability to incorporate the concept of renewable energy as a means to integrated rural development, which is a declared priority of the government of TOGO as shown through the activities of the “Ministere du developpement a la base de l’artisanat de la jeunesse et de l’emploi des jeunes (ref: devbase.gouv.tg). The installation of the multifunctional platforms is a component of the strategic approach to the improvement of revenues of 100 rural groupings and the development of rural employment in villages. By working on the policy and regulatory framework, the project will create an environment that will be conducive to private sector investments in renewable energy systems in rural areas well beyond its implementation period. The confidence of private sector will also be promoted by the strengthened technical capacity and network of services able to provide and maintain solar equipment.

An additional and essential element of sustainability will come from the promotion of local buy-in by the communities and end-users. Adequate capacity building and training courses for local operation and maintenance will be provided to ensure long-term viability, and local authorities will be involved from project planning to project implementation and monitoring. In addition, social sustainability will be strengthened due to the systematic gender mainstreaming throughout the project cycle.

The introduction of solar energy in rural households has a great replication potential. Once the financial mechanism is put in place, it can be either used by other investors, international and national financial institutions as a catalyst for the deployment of solar energy in other rural villages in Togo. This project can also be replicated with other renewable energy technologies. Several activities will generate outputs that will be used to demonstrate how approaches and lessons can serve in the country and the region. It is envisaged to design a rollout programme for renewable energy-based systems for 3 other countries of the region. The replicability also comes from the project’s ability to clearly demonstrate the financial and social benefits of productive uses

¹⁹ Determination of the emission factor for electricity generation base on scenario B: Electricity consumption from an off-grid captive power plant, option B2, a conservative default value can be used if the electricity consumption source is a project: this value is 1.3 tCO₂/MWh. See UNFCCC, EB 39 Report Annex 7, page 8.

of renewable energy. By close coordination with Togo PSAEG (Projet de soutien aux activités économiques des groupements) the project will demonstrate that income stream, generated through productive uses of electricity, provide benefits to both end users and electricity producers through the increased payment capacity, in which the end-users have clear commitments and willingness to pay tariffs needed for a long-term maintenance, operation and expansion of the installations. Thus, the project will also stimulate investment in renewable energy by other stakeholders, rather than relying entirely on government's financing or donor grants.

2. *Stakeholders*. Will project design include the participation of relevant stakeholders from [civil society organizations](#) (yes /no) and [indigenous peoples](#) (yes /no)? If yes, identify key stakeholders and briefly describe how they will be engaged in project preparation.

The stakeholders involved in this project are: (i) the Ministry of the environment and forest resources (MERF); (ii) the Ministry in charge of energy; (iii) the Togo electricity company; (iv) the Ministry of the economy and finance; (v) the Ministry of Grassroots Development (vi) the West African Development Bank; (vii) national banks; (viii) the rural populations; (ix) rural organizations and NGOs; (x) private companies of solar system installation; (xi) international financial institutions and international partners.

The Ministry of environment and forest resources (MERF) will be responsible for implementing the project in collaboration with the PRADEB and the Ministry of energy. The Ministry in charge of energy apart from participating in the coordination of the project will ensure compliance with its strategy. The CEET will be in charge of the follow-up of the project based on agreements between stakeholders of the project. It will be in charge of conducting performance tests on the use of the hybrid systems and solar pumps kits annually. The Ministry of economy and finance will help the establishment and operationalization of financial mechanisms and incentives, as well as the national banks. Private companies of solar system installation will provide information on solar technologies, sales, after-sales services, warranties, and maintenance of equipment and will benefit from incentives to promote solar energy. BOAD, a GEF implementing agency, will approve the design documents, evaluate and supervise the project and will provide technical support to the project. The rural populations, local/rural organizations and NGOs will participate in the design and implementation of the project, in sensitization campaigns, and also in sharing rural and traditional knowledge. International Financial Institutions and international partners will ensure synergy with current or recent projects and serve as support for exchanges of experience. As public participation is vital in the whole process of providing electricity services to remote rural areas the project management cell will maintain very close contact with the rural end-users in the local communities.

3. *Gender Equality and Women's Empowerment*. Are issues on [gender equality](#) and women's empowerment taken into account? (yes /no). If yes, briefly describe how it will be mainstreamed into project preparation (e.g. gender analysis), taking into account the differences, needs, roles and priorities of women and men.

The beneficiaries of the project are villages of 600 to 2000 inhabitants. Assuming 1000 inhabitants per village in average, the beneficiaries of hybridization of 50 PTMF will be at least 50,000 total or 25,700 women (women account for 51.4% of the population of Togo according to the strategy for accelerated growth and employment promotion (2013 - 2017). Specific effort will be undertaken in project component 2 to identify rural women's needs, and to engage them in the project and exploit the opportunities created by access to electricity in rural areas. This could create income-generating activities. The use of electricity will help in: facilitating access to water and therefore reduce time and energy devoted to these chores; increasing the time dedicated to their activities and better marketing of their products in order to improve their living conditions and those of their children; facilitating beneficiation and transformation of agricultural products usually carried out by women; providing school girls with access to light thus improving their schooling conditions; and capacity-building of youth and women in creating companies in renewable energy (renewable energy and energy efficiency) and in particular solar energy. Women also will be encouraged to apply for the various positions in the project.

4 *Risks*. Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design (table format acceptable).

The project faces various types of risks (political, technical, environmental and social, financial and sociocultural...) but the implementation of mitigation measure should help reduce them significantly.

Type of risk	Risks	Level of risk	Proposed mitigation measures
Political risk	The lack of political support may jeopardize the achievement of immediate outcomes and the impact of the project	Low	Initial consultations with the Government of Togo have indicated interest and willingness to promote solar energy. Strong political support is provided to the project.
Technical risk	Solar systems based on individual kits or mini-networks are not technically viable for the production of electricity	Weak	These technologies of solar energy in isolated site are mature and have demonstrated their effectiveness in the context of the Decentralized Rural Electrification Project. During the operational phase, strengthening the capacities of the actors of the project and the beneficiaries will mitigate this risk.
Environmental and social risk	The project may result in negative impacts on the environment and rural populations	Weak	The environmental and social impacts of solar photovoltaic are linked to the use of land, loss of habitat, and the use of drinking water. These should be minimal because this project finances autonomous kits of pumping on a small scale at the level of villages. However, the project will be executed in accordance with new environmental and social policies and procedures of BOAD, approved by the GEF to ensure risk mitigation.
Economic risk	The purchasing power of people in the project area does not allow the population to subscribe to the fixed rate scheme for electric energy consumption	Medium	Access to electricity in rural areas will enable the beneficiaries, mainly women, to carry out income-generating activities. Financially, the population having agriculture as main source of income will benefit from the opportunity to add value to agricultural products, through their transformation thanks to available clean energy. On the organizational level, the establishment of a local cell of the hybridized platforms management will be useful
Risk of lack of co-financing	The co-financing of 18 million US\$ equivalent, could not be materialized	High	The cost of the PRADEB (see annex 4) is considered to be a counterpart of the hybridization project
Socio-cultural risk	The rate of acquisition of solar kits will be affected by the sudden change of traditional practices.	Weak	This risk will be mitigated by the sensitization

5. Coordination. Outline the coordination with other relevant GEF-financed and other initiatives.

The proposed project will avoid duplication and seek to find synergy with other ongoing projects and programs, particularly the initiatives listed below which are not included as baseline activities but nonetheless have strong linkages with the proposed project activities. Collaboration will be done via communications with the responsible entities mentioned below and the entities will be invited to participate in stakeholder consultation meetings and will be consulted in all relevant project phases.

- Togo efficient lighting project implemented by World Bank to introduce energy efficiency and quality standards for efficient light bulbs in Togo through consumers' awareness and a bulk procurement scheme. The project is part of the GEF's West Africa Energy Programme.

- UNIDO/ECOWAS Center on RE and EE project Promoting Coherence, Integration and Knowledge Management under Energy Component of SPWA; multi-country project covering Benin, Burkina Faso, Burundi, Cape Verde, Cote d'Ivoire, Chad, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo. The specific objective is to improve the coordination and coherence of the Strategic Program for West Africa (SPWA) Energy Component, as

well as to contribute to sustainable development in West Africa through the promotion of reliable and affordable renewable energy and energy efficiency technologies and services. The project aims at supporting low carbon economic development in West African countries through knowledge sharing, capacity building including training and coherence in the projects approved under the energy component, strengthening integration, providing solutions to issues of regional dimension and deepening programmatic framework approach adopted under the GEF SPWA.

- Togo Rural electrification project by the Compagnie Energie Electrique du Togo (CEET). The project has received \$11m of funding from the Islamic Development Bank. The project involves the engineering, supply and installation of electrical equipment for a power network in the Kara and Savannah regions, comprises construction of 251km of 20-33kV lines and 67km of low-tension lines and street lighting, as well as posts, connection equipment and prepayment meters.

- ACP-EU funded project implemented by the West African Power Pool (WAPP). The aim of the project is to enable improvement of quality of life and enhancement of socio-economic activities for citizens of Barlanka, N'Tchourou, Soudou, Tchambere (Togo), Tchambere (Benin), Sirka, Amonde, Doloude, and N'Djei in northern Togo by providing access to electricity supply to serve as a catalyst for wealth creation and poverty alleviation. Specifically, the project will facilitate the construction of cross border (MV) interconnections from Benin to nine towns in Northern Togo and, hereby providing access to electricity for up to 15,778 persons living in target areas.

The Ministry of environment and forest resources (MERF) will be responsible for implementing the project in collaboration with the PRADEB and the CEET. In the implementation of the project, two bodies will be put in place namely Project Steering Committee (PSC) and the Project Management Cell (PMC). The Steering Committee, chaired by the Secretariat General of the MERF will include representatives from the Ministry of energy, the Ministry of finance, the Ministry of Grassroots development, youth and youth employment, the CEET, PRADEB, professional organization of banks, the Board of Trades (solar professionals), of NGOs and beneficiaries. An inter-ministerial decree shall appoint the members of the PSC. The Ministers in charge of environment, grassroots development, and energy will sign the decree.

The project management cell will carry out a range of administrative and financial management activities and will be attached to the coordination of the PRADEB. Its mission will be coordinating the project, the administration of contracts and agreements, financial and technical management and monitoring and evaluation. This management unit will use relevant guidelines and tools to measure project performance and the actors involved. Monitoring and Evaluation tools will be developed based on the already existing and operational features of PRADEB (record of survey, further investigation of the effects/impact evaluation, follow-up activities, thematic studies, nominative targeting device, dashboards). The project management cell should install a good system of monitoring and evaluation to enable wise decisions of the Steering Committee and for a final evaluation of the project. The members of the management cell will be recruited on call for applications.

6. *Consistency with National Priorities.* Is the project consistent with the National strategies and plans or reports and assessments under relevant conventions? (yes /no). If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.

The project aligns perfectly with the Strategy for Accelerated growth and employment promotion (SCAPE), national communications on climate change, Intended Nationally Determined Contributions, energy policy being adopted, the Program of public investments 2016-2018 and the Heavily Indebted Poor Countries Initiative (HIPC).

National Communications: The project will support the key issues in the countries' second and third national communications. Indeed, the options proposed in Chapter 3 of the Second National Communication (DCN) revolve around three strategic areas including the development of renewable energy technologies including solar. With regard to the third national communication (TCN), the priority options selected in the field of energy relate, among other things, to rural solar photovoltaic electrification (see point 4.1.2 of the TCN).

Intended Nationally Determined Contributions (CPDN) of Togo: It provides mitigation measures in the energy sector, the introduction of solar equipment in household and the strengthening of the capacities of the various actors concerned (see point 3.2 of the CPDN).

Energy Policy being adopted: It promotes the development of solar energy with an estimated potential of 4.5 to 5.5 kWh/m² / day. Through this policy, the Government has initiated programs of pre-electrification by solar energy for remote rural localities of the electricity grid. The objectives are to increase the rate of electrification in the country by 21% in 2009 to 42% in 2022. The strategic directions of the policy are: (i) to promote the thermal conversion of solar energy to meet certain domestic and industrial

needs in order to save other forms of commercial energy; (ii) to encourage the use of renewable energy in isolated sites, out of electrical networks and in environments where environmental problems arise; (iii) to study the promotion of electricity from renewable energy. This policy recommends: (i) to encourage the private sector to get involved in the trade of solar equipment and related services while guaranteeing the quality of products; (ii) to inform regularly, to the extent possible, on the evolution of the technology or equipment using renewable energy; (iii) to seek financing for pilot projects or of national character; (iv) to join some international or regional networks to Exchange and share experiences and data, find the expertise and cooperation and funding opportunities; (v) to undertake feasibility study of options which are considered important for the future of the country; and (vi) to study, in the medium and long term, the development of renewable energy plan.

Strategy for Accelerated Growth and Employment Promotion (SCAPE): From 2013 to 2017, the Government expects to increase the energy production capacity of the country from 161 MW in 2010 to at least 300 MW in 2015 and 500 MW in 2020. With regard to the distribution of electrical energy, the objective is to improve access of populations to the power utilities, moving it from 23% in 2010 to 40% in 2017 and 42% in 2020. In rural areas, the rate of access over this period should move respectively from 5% to 16% and 18%. The adoption of a strategy for rural electrification, the creation of a national rural Electrification Agency and the implementation of a rural electrification Fund will accompany rural electrification project. The SCAPE provides for measures such as: (i) the implementation of a legal and regulatory framework encouraging the promotion of renewable energies.

Public Investment Program 2016–2018: The public investment program providing for modern electrical energy to 60% of the population in Togo through traditional means would need to increase the production capacity of diesel generators (generators) or the extension of the conventional network. This would require an investment of 280 million EURO over 3 years, or at least 80 million EURO per year. However, these diesel generators are sources of GHG with high operating costs due to fuel costs. The project will contribute to greening the public investment program.

Heavily Indebted Poor Countries Initiative (HIPC): Togo was the subject of a preliminary assessment of eligibility for assistance to development in the context of this initiative. An improvement at the national level of network of rural electrification has been identified among the medium-term priorities.

7. Knowledge Management. Outline the knowledge management approach for the project, including, if any, plans for the project to learn from other relevant projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.

The project has planned in component 5, an evaluation of the project to identify any lessons learned. This evaluation will also help in preparing a new project that will capitalize the lessons learned from the current one. The project component 1 also includes: strengthening the regulatory, institutional and sustainable financing framework of rural electrification, an activity dedicated to the dissemination of information on the benefits of solar energy.

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


A. RECORD OF ENDORSEMENT²⁰ OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S):

(Please attach the [Operational Focal Point endorsement letter](#)(s) with this template. For SGP, use this [SGP OFF endorsement letter](#)).

NAME	POSITION	MINISTRY	DATE (MM/dd/yyyy)
Yao Dziwonou FOLLY	GEFOFP Directeur de l'Inspection des Ressources Forestières	MINISTERE DE L'ENVIRONNEMENT ET DES RESSOURCES FORESTIERES	JANUARY, 11 TH 2016

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF policies²¹ and procedures and meets the GEF criteria for project identification and preparation under GEF-6.

Agency Coordinator, Agency name	Signature	Date (MM/dd/yyyy)	Project Contact Person	Telephone	Email
Almamy M'BEMGUE West African Development Bank		MARCH, 29 TH 2016	Fatoumata TOURE SANGARE ftoure@boad.org	+228 22 21 59 06	ambengue@boad.org

C. ADDITIONAL GEF PROJECT AGENCY CERTIFICATION (APPLICABLE ONLY TO NEWLY ACCREDITED GEF PROJECT AGENCIES)

For newly accredited GEF Project Agencies, please download and fill up the required [GEF Project Agency Certification of Ceiling Information Template](#) to be attached as an annex to the PIF.

²⁰ For regional and/or global projects in which participating countries are identified, OFP endorsement letters from these countries are required even though there may not be a STAR allocation associated with the project.

²¹ GEF policies encompass all managed trust funds, namely: GEFTE, LDCE, and SCCF

ANNEX

ANNEX1: Gas emissions greenhouse at the global level and at the national level

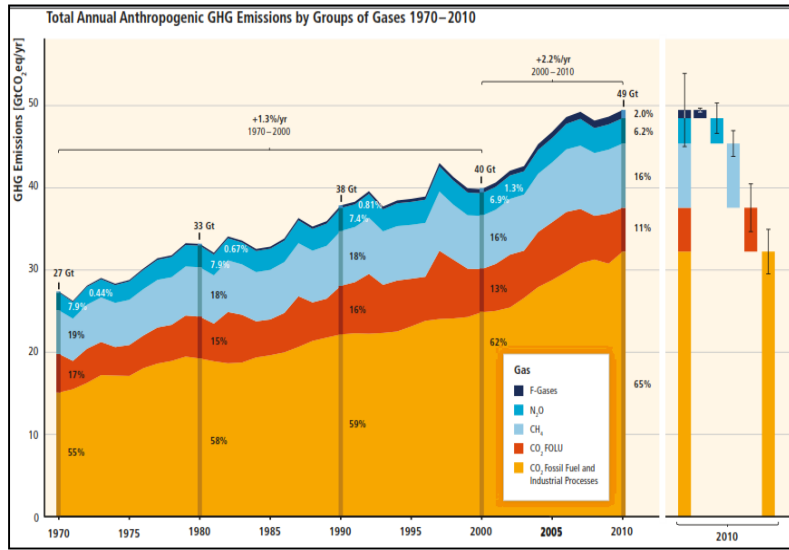


Figure 1: Trend of emissions of different GHG from anthropogenic sources from 1970 to 2010 (in Gt CO₂-e/year) (IPCC Working Group III, 2014)

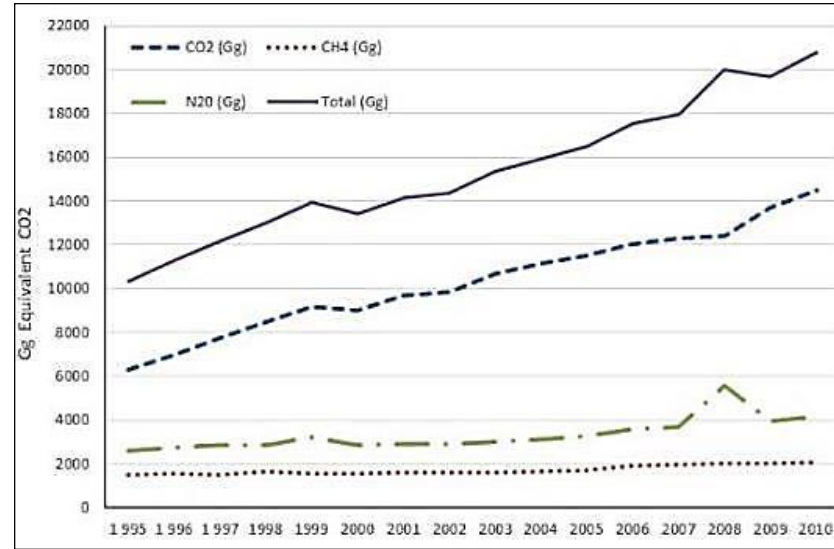
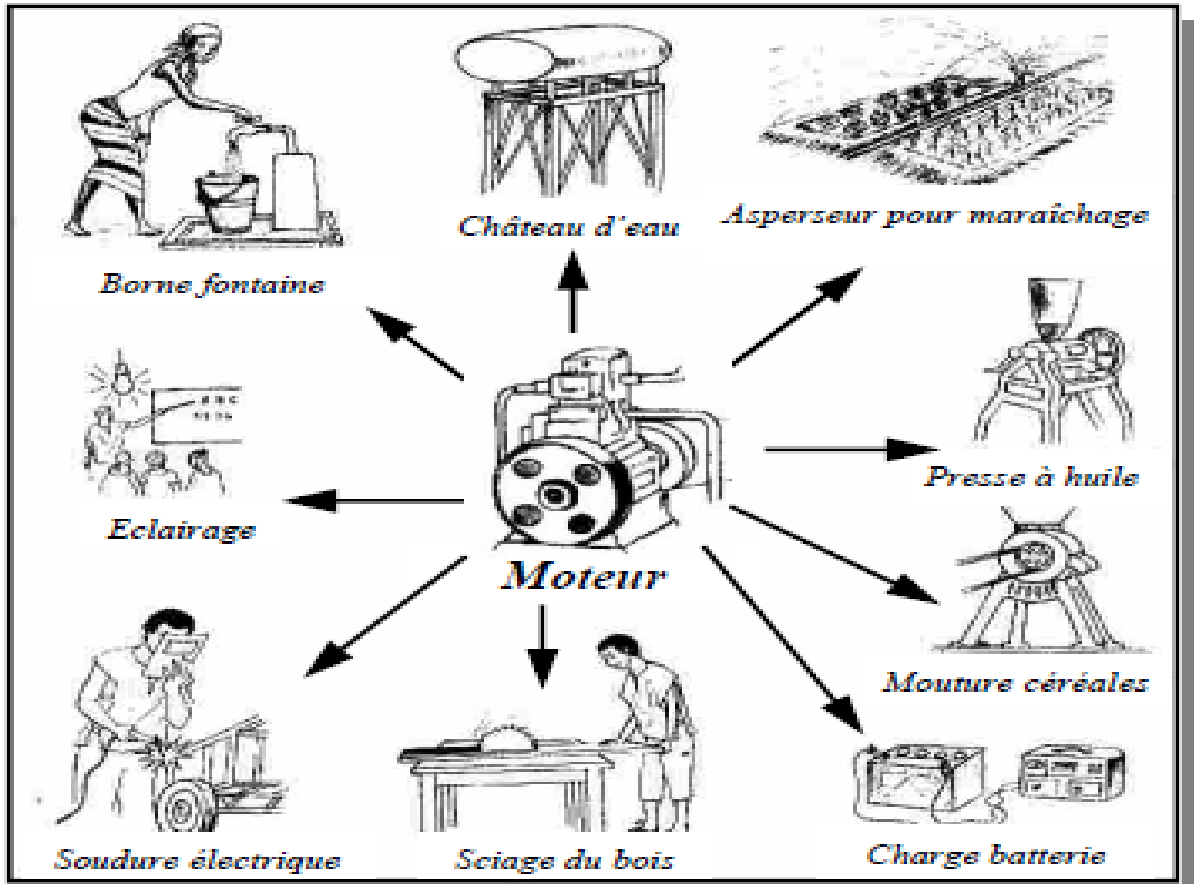


Figure 2: Emission trends of different direct GHG from 1995 to 2010 to Togo (Source: TCN Togo, 2015)

ANNEX 2: Diagram of a multifunctional platform (motor and modules that can be connected to the engine)



ANNEX 3: Emission reduction calculation

The Energy saving and emission reduction are calculated on the base of the Manual for calculating GHG benefits of GEF projects: energy efficiency and renewable energy projects, April 2008, the GEF EE Tool v1.0 and the methodological tool of UNFCCC “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” (Version 01)²².

²² Determination of the emission factor for electricity generation base on scenario B: Electricity consumption from an off-grid captive power plant, option B2, a conservative default value can be used if the electricity consumption source is a project: this value is 1.3 tCO₂/MWh. See UNFCCC, EB 39 Report Annex 7, page 8.

The following table presents an extended data that were collected during the project concept preparation

	Unit	Value
Maximum Technology / Measure Lifetime	years	20
Target Technology		Hybridization Solar/Diesel Generator
Displaced Technology		Diesel generator
Daily Usage Diesel generator	Hr/day	15
Daily Usage solar plant	Hr/day	8
Daily usage of Diesel generator after it hybridization with solar plant	Hr/day	7
Daily usage each year	Days	312
Diesel oil Consumption of 10 kVA Generator	Liter/hour	1.5
Diesel oil Consumption of 15 kVA Generator	Liter/hour	2.0
Diesel oil Consumption of 10 kVA Generator	Liter/year	7 020
Diesel oil Consumption of 15 kVA Generator	Liter/year	9 360
Total Diesel consumption of 50 generators to be hybridized (38 of 10 kVA generators and 12 of 15 kVA generators)	Liter/year	379 080
Diesel oil consumption reduced by Solar substitution for 50 generators	Liter/year	202 176

Step 1: Enter Basic Project Information

Project Information

Project Title	Project of hybridization of diesel engines of multifunctional platforms with solar systems	
GEF ID Number	9393	
Country	Togo	
Region	EAP	
GEF Agency	BOAD	
Date of Submission of GHG Accounting	28 March 2016	
Contact Name	Mawuli Komi AMEGADJE	
First Year of Project	2017	
Year of Project Close	2019	
GEF Grant Amount (\$)	2,899,950	
Co-financing Amount (\$)	16,768,000	

General Parameters	Default	User-Specified
Length of Analysis Period (Years After Project Close)	20	20
First Post-project Year		2020
Last Post-project Year		2039
Maximum Technology / Measure Lifetime (Years)	20	20

Notes

Fuels and Emission Factors	Default	User-Specified
Grid Electricity T&D Loss Rate (%)	10%	10%
Grid Electricity Emissions (tCO ₂ /MWh)	N/A	1,3000
Fuel: Click here to select from list	0,0000	0,0000
Fuel: Click here to select from list	0,0000	0,0000
Fuel: Click here to select from list	0,0000	0,0000

Notes

All the generator to be hybridized in the framework of the GEF project are off-grid. According to the methodological tool of UNFCCC "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01), the determination of the emission factor for electricity generation base on scenario B: Electricity consumption from an off-grid captive power plant, option B2, a conservative default value can be used if the electricity consumption source is a project: this value is 1.3 tCO ₂ /MWh. See UNFCCC, EB 39 Report Annex 7, page 8.

Step 2: List Activity Components and Select Quantification Module

Activity Component	Sector/Subsector	Logframe Output	Module/Intervention Type
Deployment of hybrid solar energy Technologies Applications	Energy/Electricity	Output 4.1.3: Diesel/solar hybrid PV demonstration systems of 20 KWPPV in 50 villages and 50 kits of solar pumps for irrigation and drinking water supply installed and functional	Financial Instrument

Step 3: Model Activity Components

Component 1: Deployment of hybrid solar energy Technologies Applications -- General Inputs

Component Specifications	Default	User-Specified	Per Unit	Notes
Annual Electricity Savings (MWh)		43.4331	solar plant	The operating time of the generator in the baseline is 15 hours per day for 312 days during the year. The consumption of diesel oil by a generator is 1.5 liters for the generator of 10 kVA and 2 liters per hour for the generator of 15 kVA. In the framework of the project, the solar plant will generate electricity in 8 hours per day to substitute the diesel generator. Thus, the diesel oil economy in one year for one plant of generator will be: 3,744 liters for 10kVA and 4,992 liters for 15 kVA. Referring to data from the Energy Policy Division, Natural Resources Canada, the diesel energy conversion factor is 38.68GJ/m3 of diesel oil (please see the link: http://www.csaregistry.ca/cleanprojects/emission_estimation_resources_f.cfm). According the GEF EE Tool v1.0, the conversion from MWh is 3,6GJ/MWh (see sheet "fuel"). In this case the annual energy saving by 3,744 liters of diesel oil correspond to 40.2159 MWh and 4,992 liters of diesel oil correspond to 53.6212 MWh. It is planned to hybridize 50 Diesel generators with 38 generators of 10 kVA and 12 generators of 15 kVA. Thus, the average energy saving per one solar plant is: $((40.2159 \text{ MWh} \times 38) + (53.6212 \text{ MWh} \times 12)) / 50 = 43.4331 \text{ MWh}$.

Useful Lifetime of Investment	15	20		

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

Notes

Indirect Bottom-up Estimate	Default	User-Specified
Number of solar plants Implemented During Project Period		50
Number of Replications Post-project as Spillover		3
Total		150

Notes

The first phase of the PRADEB financed by the BOAD will install 200 PTMF in 5 years. The present GEF project will hybridized 50 PTMF of the 200 programmed for the first phase. If the GEF finances the present pilot project, it will be replicate 3 times to hybridize all the 200 PTMF.

Step 4: Calculate Indirect Top-Down Impacts

	<i>User-Specified</i>	<i>Notes</i>
Total Market Potential (tCO2)	993,744	The first phase of the PRADEB financed by the BOAD will install 200 PTMF in 5 years. The present GEF project will hybridized 50 PTMF of the 200 programmed for the first phase. If the GEF finances the present pilot project, it will be replicate 3 times to hybridize all the 200 PTMF. In fact, in the framework of the National program of development of the multifunctional platform in Togo, it is planned to install 1,000 diesel oil generator (PTMF) with 75% of PTMF of 10 kVA (750 units) and 25% of PTMF of 15 kVA (250 units). So, in the 10 coming years, the Government of Togo will install 800 PTMF to complete the 200 PTMF. The total Market Potential (tCO2) which will be avoided 993,744 tCO2.
Causality factor	100%	The GEF contribution is critical and nothing would have happened in the baseline if the project is not financed by the GEF.
Indirect Top-Down Emission Reductions (tCO2)	993,744	

Step 5: Review the Results

Overall Results

All Components	Cumulative			Annual			
	Total	2017-2019	2020-2039	2017	2019	2025	2035
Direct Electricity Savings (MWh)	43 433	5 429	38 004	1 086	2 172	2 172	2 172
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)	156 359	19 545	136 814	3 909	7 818	7 818	7 818
Direct GHG Emission Savings (tCO2)	62 109	7 764	54 346	1 553	3 105	3 105	3 105
Direct Post-project GHG Emission Savings (tCO2)	0		0	0	0	0	0
Indirect Bottom-up Emission Savings (tCO2)	186 328		186 328				
Indirect Top-down Emission Savings (tCO2)	993 744		993 744				

ANNEX 4 : Financing plan of the PRADEB

(MF CFA)

COMPOSANTES	Total HT	BOAD	BENEF	ETAT		TOTAL TTC
				HT	Taxes	
1. Soutien aux activités économiques des groupements	1 109	898	75	136	200	1 309
<i>Renforcement des capacités</i>	<i>171</i>	<i>148</i>		<i>23</i>	<i>31</i>	<i>202</i>
<i>Ligne de crédit court terme</i>	<i>450</i>	<i>450</i>			<i>81</i>	<i>531</i>
<i>Ligne de crédit moyen terme</i>	<i>300</i>	<i>300</i>			<i>54</i>	<i>354</i>
<i>Fonds de garantie</i>	<i>113</i>			<i>113</i>	<i>20</i>	<i>133</i>
<i>Apports bénéficiaires/crédit</i>	<i>75</i>		<i>75</i>		<i>14</i>	<i>89</i>
2. Appui à la mise en place des plateformes multifonctionnelles	1 880	1 399	400	81	338	2 218
3. Appui à la promotion de l'emploi des jeunes	1 471	1 254	75	142	265	1 736
<i>Renforcement des capacités</i>	<i>533</i>	<i>504</i>		<i>29</i>	<i>96</i>	<i>629</i>
<i>Ligne de crédit court terme</i>	<i>300</i>	<i>300</i>			<i>54</i>	<i>354</i>
<i>Ligne de crédit moyen terme</i>	<i>450</i>	<i>450</i>			<i>81</i>	<i>531</i>
<i>Fonds de garantie</i>	<i>113</i>			<i>113</i>	<i>20</i>	<i>133</i>
<i>Apports bénéficiaires/crédit</i>	<i>75</i>		<i>75</i>		<i>14</i>	<i>89</i>
4. Suivi-évaluation et appui à l'encadrement	918	868		50	165	1083
5. Organisation et gestion du Programme.	792	792			143	935
TOTAL COUT BASE	6 170	5 211	550	409	1 111	7 281
<i>Imprévus physiques (3%)</i>	<i>390</i>	<i>329</i>	<i>35</i>	<i>26</i>	<i>70</i>	<i>460</i>
<i>Imprévus pour hausse des prix (3% l'an)</i>	<i>545</i>	<i>460</i>	<i>48</i>	<i>37</i>	<i>98</i>	<i>643</i>
COUT TOTAL	7 105	6 000	633	472	1 279	8 384
	100%	84%	9%	7%		

ANNEX 5: GEF Financing ceilings for BOAD

PIF ANNEX ON GEF FINANCING CEILINGS FOR GEF PROJECT AGENCIES

Date: April 7th, 2016

To: The GEF Secretariat
Washington, DC 20433

Subject: GEF Project Agency Certification of Ceiling Information

Per requirement for newly accredited GEF Project Agency, I am pleased to inform you that :

- a) the largest project implemented (or executed) by the Banque Ouest Africaine de Développement is US\$ 60 million¹ as of the end of the last fiscal year 2015, and
- b) the total amount of all the projects currently under implementation is US\$ 450 million as of the end of the last fiscal year 2015.²

I certify that the value of the project **Project of hybridization of diesel engines of multifunctional platforms with solar systems for Republic of Togo** being submitted to GEF for 2 999 950 USD is smaller in terms of US dollars than the largest project that the Banque Ouest Africaine de Développement has implemented (or executed) to date.

I further certify that the total US dollar value of GEF financing currently under implementation by the Banque Ouest Africaine de Développement, including the requested GEF financing for this project, does not exceed 20 percent of the US dollar value of total projects that the Banque Ouest Africaine de Développement currently has under implementation.

Sincerely,



MBENGUE Almamy
GEF Project Agency Coordinator
Banque Ouest Africaine de Développement

¹ This amount excludes co-financing.

² In support of the above statements, a copy of the (a) signed loan/grant agreement for the largest project [name of Agency] has implemented (or executed), and (b) a list of all projects (together with their amounts in US dollars) will be sent via email under a separate cover to the GEF Secretariat's account at Project_Agency@theGEF.org with the understanding that these supporting documents will be treated with utmost confidentiality and will not be shared with any parties external to the GEF Secretariat.