GEF-6 PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: Medium-sized Project
TYPE OF TRUST FUND:GEF Trust Fund

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PART I: PROJECT INFORMATION

Project Title:	Strategic program to promote renewable energy and energy efficiency investments in the electricity sector of Sao Tome and Principe		
Country(ies):	Sao Tome and Principe	GEF Project ID:[1]	
GEF Agency(ies):	UNIDO	GEF Agency Project ID:	150124
Other Executing Partner(s):	Ministry of Infrastructure, Natural Resources and Environment (MINRE), Agência Fiduciária de Administração de Projeto (AFAP), ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE)	Submission Date:	08/31/2017
GEF Focal Area(s):	Climate Change	Project Duration (Months)	48
Integrated Approach Pilot	IAP-Cities ☐ IAP-Commodities ☐ IAP-Food Security ☐	Corporate Program: SGP ☐	
Name of parent program:	[if applicable]	Agency Fee ($)	149,679

A. INDICATIVE FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES[2]

Objectives/Programs (Focal Areas, Integrated Approach Pilot, Corporate Programs)	**Trust Fund**	**(in $)**	
		GEF Project Financing	**Co-financing**
CCM-1 Program 1	GEFTF	1,575,571	10,455,000
Total Project Cost		**1,575,571**	**10,455,000**

B. INDICATIVE PROJECT DESCRIPTION SUMMARY

Project Objective: to promote investments in renewable energy and energy efficiency solutions with high GHG emission reduction and local value creation potential in the electricity sector

Project Components	**Financing Type[3]**	**Project Outcomes**	**Project Outputs**	**Trust Fund**	**(in $)**	
					GEF Project Financing	**Co-financing**
1. Strengthening the policy, legal and regulatory framework for sustainable energy solutions	TA	1.1 A conducive policy, legal and regulatory framework for renewable energy and energy efficiency is created and its implementation facilitated	**1.1.1** A National Renewable Energy and Energy Efficiency Policy is developed and its adoption and implementation facilitated	GEFTF	300,000	1,000,000
			1.1.2 A renewable energy law is developed and its adoption and implementation facilitated			
			1.1.3 Efficiency standards for electric appliances with potential			

[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 and CBIT guidelines.
[3] Financing type can be either investment or technical assistance.

			to reduce the national peak load demand by at least 1 MW are developed and their implementation facilitated			
2. Promoting investments in sustainable energy solutions	TA	2.1 Enabling investment framework for renewable energy and energy efficiency is created and its implementation facilitated	**2.1.1** A GIS based National Renewable Energy Resource Mapping identifying high-impact priority sites is developed and disseminated	GEFTF	158,337	400,000
			2.1.2 A National Renewable Energy and Energy Efficiency Investment Plan is developed and presented to investors and financiers in at least two (2) investment fora			
	INV		**2.1.3** Innovative renewable energy projects (small hydro, solar, wind and bioenergy) with a total installed capacity of at least 5 MW are developed to financial close and their implementation is facilitated	GEFTF	724,000	7,600,000
			2.1.4 Based on existing instruments a national renewable energy facility is created and undertakes regular call for proposals to support project development and investments			
3. Strengthening capacities on sustainable energy island solutions	TA	3.1 The capacities and knowledge-base of institutions and experts on renewable energy and energy efficiency island issues are strengthened	**3.1.1** Based on a capacity needs assessment: a qualification, certification and accreditation framework on sustainable energy is developed and its implementation facilitated	GEFTF	200,000	1,000,000
			3.1.2 Enhanced capacities of EMAE, AGR, MINRE and other authorities to integrate and manage on-grid/off-grid renewable			

			energy systems and to enforce, monitor, and verify standards on efficient electric appliances			
			3.1.3 At least one (1) on-line training program on sustainable energy solutions for island is developed in Portuguese and applied by capacity building institutions and experts in Sao Tome and Principe, Cape Verde and Guinea Bissau			
			3.1.4 At least five (5) capacity building institutions and fifteen (15) certified trainers engage in capacity building courses on renewable energy and energy efficiency issues			
			3.1.5 One hundred (100) national stakeholders are trained on sustainable energy issues by certified local trainers			
4. Project monitoring and evaluation	TA	4.1 Effective and efficient implementation of the project	**4.1.1** Project monitoring and evaluation system established and executed	GEFTF	50,000	255,000
			4.1.2 Terminal evaluation report			
			Subtotal		1,432,337	10,255,000
			Project Management Cost (PMC)[4]	GEFTF	143.234	200,000
			Total Project Cost		**1,575,571**	**10,455,000**

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	Ministry of Infrastructure, Natural Resources and Environment	In-kind	500,000
Recipient Government	Ministry of Finance and Public Administration (through the World Bank)	Grant	5,000,000

[4] For GEF Project Financing up to $2 million, PMC could be up to10% 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.

Recipient Government	Ministry of Finance and Public Administration (through the European Investment Bank)	Loan	2,000,000
GEF Agency	UNIDO	Grants	51,000
GEF Agency	UNIDO	In-kind	104,000
Donor Agency	AECID, ADA, European Union	Grants	500,000
GEF Agency	African Development Bank (AfDB)	Grant	500,000
Intergovernmental Organization	ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE)	Grant	300,000
Private Sector	To be identified	Equity and loans	1,500,000
Total Co-financing			**10,455,000**

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

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	(in $) GEF Project Financing (a)	(in $) Agency Fee (b)[b)]	(in $) Total (c)=a+b
UNIDO	GEFTF	Sao Tome and Principe	Biodiversity	(select as applicable)	1,575,571	149,679	1,725,250
Total GEF Resources					**1,575,571**	**149,679**	**1,725,250**

a) Refer to the Fee Policy for GEF Partner Agencies.

E. PROJECT PREPARATION GRANT (PPG)[5]

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: $ 50,000 PPG Agency Fee: $ 4,750

GEF Agency	Trust Fund	Country/ Regional/Global	Focal Area	Programming of Funds	(in $) PPG (a)	(in $) Agency Fee[6] (b)	(in $) Total c = a + b
UNIDO	GEF TF	Sao Tome and Principe	Biodiversity	(select as applicable)	50,000	4,750	54,750
Total PPG Amount					**50,000**	**4,750**	**54,750**

F. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS

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	*Hectares*
2. Sustainable land management in production systems (agriculture, rangelands, and forest landscapes)	120 million hectares under sustainable land management	*Hectares*

[5] 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.

[6] PPG fee percentage follows the percentage of the Agency fee over the GEF Project Financing amount requested.

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;	*Number of freshwater basins*
	20% of globally over-exploited fisheries (by volume) moved to more sustainable levels	*Percent of fisheries, by volume*
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)	*201,000 metric tons of direct emission reduction over a period of 20 years. 402,000 metric tons of emission reduction if indirect emissions are considered (replication factor of 2).*
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)	*metric tons*
	Reduction of 1000 tons of Mercury	*metric tons*
	Phase-out of 303.44 tons of ODP (HCFC)	*ODP tons*
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	*Number of Countries:*
	Functional environmental information systems are established to support decision-making in at least 10 countries	*Number of Countries:*

PART II: PROJECT JUSTIFICATION

1. *Project Description*

The Democratic Republic of Sao Tome and Principe (STP) consists of two main volcanic islands and several islets located off the west coast of Central Africa. Príncipe is the closest island to mainland Africa and has an area of 142 km2 with a population estimated at 7,500 inhabitants. São Tomé, the largest island, lies further out and covers an area of 859 km² with about 180,000 inhabitants (World Bank, 2016). The country is divided into six districts (Agua Grande, Cantagalo, Caué, Lembá, Lobata, and Mé-Zóchi) plus the Autonomous Region of Príncipe, which has been self-governed since 1995.

The archipelago is geographically situated in the Gulf of Guinea, a region known for its important biological diversity and its dense hydrographic network. Due to its location in the so-called tropical belt, both Sao Tome and Principe islands are drained by major basins such as Rio Io-Grande, Rio Papagaio, and Abade. According to the 1999 Inventory, forest ecosystems occupy 90% of the overall archipelago, among which 40 percent (about 240 km2 in Sao Tome and 40 km2 in Principe) are made of ecosystems classified as primary forests. The archipelago is home of high numbers of endemic forest species.

As a Small Island Developing State (SIDS), STP faces specific challenges in relation to its size, remoteness from large markets, dependence on a small number of economic sectors, direct investment and remittances inflow, lack of resources and a significant trade deficit. Moreover, the country is dependent on expensive fossil fuel imports and key sectors of the economy are highly vulnerable to natural, climate, and external economic shocks.

However, over the last decade, the country made considerable progress in terms of social and economic development, as well as political stability. In 2015, STP ranked 142 out of 188 countries in the Human Development Index (HDI) with an index of 0.574, which is higher than the average for Sub-Saharan Africa (0.523). Still, the country situation remains fragile. Sao Tome and Principe is a lower-middle-income country. Gross national income per capita is estimated at US$1,200 in Purchase Power Parity (PPP) terms; whereas, gross domestic product (GDP) per capita is US$1,692. One-third of the population lives with less than US$1.90 per day in PPP terms and more than two-thirds of the population are categorized as poor by considering the poverty threshold of US$3 PPP per day.

The country's most important sector is that of services. The main economic activities are in tourism, retail, transport, communication, and construction. Agriculture and fishing are mainstays for the majority of the population, despite their modest contribution to the GDP. About a third of the population is active in agriculture, livestock, and fisheries. The agriculture sector contributes with 17.2 percent to the country GDP, and 26.2 percent of the active population is directly dependent on the sector (IMF, 2012). The main agriculture product is cocoa, whose production is largely exported, although export volumes have declined in the last couple of years due to weather-related problems. Tourism occupies a pivotal place in STP economy, generating more foreign currency inflow than cocoa. The manufacturing sector is almost inexistent.

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

Climate change mitigation and interlinkages to adaptation and resilience

The economy of STP is highly challenged by the interplay of climate change mitigation, resilience and adaptation needs. The country contributes only minimally to global GHG emissions but is highly impacted by negative effects of climate variability. In business as usual scenarios (BAU) this trend is projected to be further accelerated.

In terms of climate change mitigation, Sao Tome and Principe is contributing only with a small fraction to global GHG emissions. The country is a net carbon absorber, thanks to its important forestry ecosystem that captures more carbon than it emits (-689.14 Gg in the inventory of 2005). The Second National Communication of STP to the United Nations Framework Convention on Climate Change (2012), identifies the energy sector as the first contributor to greenhouse gas emissions (GHG) with 66.29 Gg inventoried. The sector relies on traditional biomass for cooking and on diesel for electricity generation. 93.3 percent of STP electricity generation is from thermal units powered by diesel imported from Angola. 73.9 percent of households in rural areas and 34.6 percent in urban areas use charcoal and/or firewood for cooking. Access to modern energy services such as electricity remains limited to around 59 percent of the population (World Energy Outlook, 2016).

In terms of adaptation to climate change, the small archipelago state is particularly vulnerable to climate-related hazards such as floods, coastal/river mouth flash floods, storms and recurrent drought episodes, which impact the infrastructure (mostly located in the coastal zone) as well as agriculture and fisheries. Historically established in the vicinities of flood-prone river deltas, the communities of Neves, Ribeira Afonso, Malanza, Santa Catarina and Sundy (in Principe Island) are considered as the most vulnerable locations in the country. All these coastal sites share a common feature of recurrent climate related hazards of overlapping storm surges and torrential rains in community livelihoods that rely on artisanal fishing and small scale agriculture. Nearly 20 percent of the country's workforce is employed in artisanal fisheries (about 2,000 people directly and an additional 18,000 people indirectly).

Population growth presents another serious challenge to the archipelago resilience and adaptation needs, further exacerbated by the consequences of climate variability on natural ecosystems. In the last decade alone the population grew by approximately 70%, one of the fastest rates in the world (UNDP, 2012). This increasing population impacts the natural ecosystem through: (1) an intensive exploitation of forest species with commercial values such as São Tomé Peach (Chytranthus mannii) listed in IUCN Red list of species endangered, and (2) clearing of the primary montane forest zones of Pico Quioveo and Pico Santa Mina for food crops production, contributing to increase the level of erosion. According to the World Wildlife Fund (WWF), this over exploitation of forest resources threatens the survival of endemic fauna species.

Between the country adaptation and mitigation needs exist remarkable interdependencies. The increasing expenses on fossil fuel imports leave less resources for financing adaptation/resilience measures, and the unsustainable use of traditional biomass for cooking accelerate trends towards overexploitation of forest resources. The lack of access to electricity services in rural and remote areas hinders the efforts of communities to implement climate change adaptation measures. The change of rain patterns impacts the hydroelectric potential, and extreme weather events impact the transmission and distribution infrastructure.

Root causes for GHG emissions in the STP electricity sector and mitigation barriers

Universal access to electricity services and the decoupling of power generation from GHG emissions require a transformational shift in the STP electricity system in the upcoming years. In the BAU scenario the GHG emissions of the energy sector will more than double by 2030 – considering the 2012 baseline. Therefore, there is urgent need to make use of renewable energy and energy efficiency potentials.

The STP electricity system is characterized by low levels of supply-side and demand-side efficiency. The low efficiency of power generators increase the fuel demand leading to an average 1,000 barrels of diesel imported per day (UNDP, 2013). The national utility Empresa de Água e Electricidade (EMAE) mainly relies on a thermal electricity production which represents over 93% of the overall installed capacity of 26 MW. The potential

exploitation domestic off-shore petroleum and gas resources in the coastal area of the country has not materialized so far. There is no clear indication when these resources will be available and how the country will benefit.

The sector is characterized by poor management of the power production, transmission and distribution infrastructure. Grid losses represent 42 percent of the power generation among which 27 percent are estimated to be non-technical losses. These commercial losses are mainly attributed to illegal connections and non-metered legal connections. The scattered geographic distribution of remote rural areas, made of a succession of mountains (peak of 2,024 meters above sea level in Sao Tome and 948 meters above sea level in Principe) and valleys, also makes it more challenging to build new connection infrastructure.

There is lack of public and private investment in the maintenance of and new energy infrastructure. In the Public Investment Program (PIP) for the period of 2003 to 2010, energy investments represented only around 3.8 percent of total investments. Moreover, investments remain uncoordinated. Since 2010, the Government has increased the generation capacity from 12.3 MW in 2012 (UNDP) to 26 MW in 2015. However, due to a lack of investment into the transmission and distribution infrastructure the grid losses remain high and a significant part of the new generation capacity gets lost in technical and commercial terms.

The many difficulties of EMAE in power generation, transmission, and distribution result in frequent power cuts and outages. The repetition of power cuts in the country convinced a number of large consumers such as hotels and existent agribusinesses to invest in decentralized diesel-based generation. The configuration of some remote parts of the country makes grid extension a cost intensive option. Under these conditions, decentralized renewable energy mini-grids are the more cost-effective option.

There is also unequal access to energy services across social groups. Low-income groups spend significantly more of their income for energy services. Similar to experiences in other developing islands, the national electricity consumer tariff is compared to domestic income level on the very high side (USD 0.21 per kWh). In rural off-grid areas, which depend on diesel powered mini-grids, the tariff level is even significantly higher. Electricity coverage in STP extends to about 59% (World Energy Outlook, 2016) and is projected to increase to 80% during the next decade.

Universal access to sustainable energy in STP requires the replacement of old diesel generators and investments into new transmission and distribution infrastructure. Upcoming investment decisions in the energy sector will determine the GHG emission profile of the country for the next decades. Because of the electricity generation dependence on diesel imports at fluctuating prices, significant parts of the foreign exchange income generated from agro-business (e.g. cacao), fishery and tourism are spent in the energy sector. Moreover, there are no energy efficiency standards for buildings and electric household appliances (e.g. lighting, air conditioning) in place.

2) The baseline scenario or any associated baseline projects

Baseline scenario

The GEF project builds on the political commitment of the Government of STP to initiate a transformation in the energy sector towards universal electricity access, renewable energy and energy efficiency. To reduce the GHG emissions of the country, there is an urgent need to decrease the use of fossil fuels and increase the use of domestic renewable energy potentials, as well as supply-side and demand-side energy efficiency. By looking at the current energy baseline and ongoing projects and programs it becomes obvious that without as systematic and strategic approach the Government will not reach its set energy, climate and development targets by 2030.

In previous years, the penetration of renewable energy in the national grid has even decreased due to the shut-down and efficiency losses of small hydro-power stations and the increase of thermal production. Apart from one small-scale hydro power station and some PV stand-alone systems there are currently no on-grid or off-grid renewable energy systems in operation. It is estimated that the total installed PV capacity in cooperatives, community centres, schools, public lighting and health centres lies below 200 kW. Since the independence of the country no new hydro power station has been built. So far, small-scale renewable energy solutions were not introduced systematically to promote the productivity of economic key sectors such as agro-business (e.g. solar water pumping), fishery (e.g. solar ice production) and tourism (e.g. solar thermal water heating).

Despite the availability of vast biomass residues there is no experience with all forms of bioelectricity (e.g. gasification, biogas, combustion). In some rural areas biogas digesters for cooking purposes are in place. Existing decentralised rural mini-grids and back-up capacities in urban areas are exclusively powered by diesel generators. Small hydro power stations are either out of operation or operate, such as the 2 MW plant at Rio Contador far below its capacity. Because of the low efficiency of both thermal and hydropower generation systems, from the 26 MW capacity only 17 MW were available in 2015.

In this context, the GEF project will assist the Government to address the project specific barriers hindering the uptake of renewable energy and energy investments:

1. There is need for a coherent policy, legal and regulatory framework for renewable energy and energy efficiency. So far the country has no national energy policy in place and operates on the basis of several plans and laws. In the NDC and other national documents, the Government of STP aims at a renewable energy penetration in the electricity mix of 40% by 2020 and 47% by 2030. There is the rough vision that by 2030 around 34% might come from small-hydropower sources and 13% from solar PV. The “Lei de Bases do Sector Electrico” (Basic Electricity Sector Law) approved in 2014 highlights renewable energy, energy efficiency and the role of independent power producers but does not specify fiscal and non-fiscal incentives, feed-in or net-metering regimes. The law does not include specific incentives or regulations concerning renewable energy based electrification or mini-grids. In addition, there is an absence of standard procedures (e.g. Power Purchase Agreements) to guide the involvement of Independent Power Producers (IPPs) or Public Private Partnerships (PPPs). So far the Government has not set any specific targets or standards for energy efficiency. The annual work plans of the Government “Grandes Opções do Plano” just speak about the need to establish an energy efficiency program.

2. So far there is no comprehensive GIS based mapping of the theoretical economic and technical renewable energy potential available. There exists no reliable information on the exact potential for each of the renewable energy sources. Existing data indicate that the country can rely on a wide range of renewable energy potentials which could provide base load and peak load capacities in more competitive terms than the diesel alternative. Even for most of the known small hydro power sites no on-site measurements have been undertaken so far. A hydropower assessment financed by Taiwan, a province of China, is based on topographic and river flow data and identifies 34 potential sites with an overall estimated theoretical electric capacity of 61 MW. This includes also the colonial sites Do Ouro (74 kW), Manuel Jorge (640 kW) and Contador (2 MW) in Sao Tome and Papagaio (128 kW) in Principe. In the meantime, only Contador is still operating at a 50% capacity. Theoretically, hydro power could cover major parts of the projected electricity demand of the country. This was already the case in colonial times when most of the electricity was generated by hydro power stations. The modelling-data of the hydro assessment would have to be updated by more detailed site assessments and measurements. The potential impact of climate change on river flows

would have to be considered. According to the Government, the systematic collection of hydrological data was reestablished recently in some areas. So far no detailed wind measurements have been undertaken. Also the potential for ocean energy technologies remains unknown.

3. There are significant economic barriers for renewable energy and energy efficiency. Existing diesel subsidies combined with a tariff system which is contrary to the principle of cost-recovery makes it difficult for renewable energy technologies to compete. It also removes pressure to increase energy efficiency at all levels. In parallel to the GEF project, the World Bank will work with the Government and the utility on a more sustainable management and tariff-scheme.

4. Renewable energy and energy efficiency projects continue to face financial barriers. Due to the small island project size, the high risk and the regulatory uncertainty there is only low interest of banks and financiers to invest in the sector. Moreover, the domestic capacities to develop bankable feasibility studies and appraise project proposals are very low. Currently, no systematic bundling of projects and investment promotion takes place. Small-scale renewable energy projects – particularly in the hydro power sector – are in many cases more economic in a life-cycle view but tend to have higher initial investment costs and longer pay-back periods than conventional alternatives. Moreover, experiences from other islands (e.g. Cape Verde) demonstrate that renewable energy projects tend to be more expensive than in industrialized countries (e.g. transport costs, small quantities, high risk). Very high interest rates of domestic banks for such projects make investments unattractive. Currently, there are no tailored financing instruments (grant, lending, micro-credits) for grid-connected and off-grid solutions available.

5. Technical barriers are derived from the current poor energy transmission and distribution grid. The introduction of intermediate grid-connected renewable energy sources is limited (e.g. solar, wind) and needs sufficient dispatch capacities. Due to its hydro potential and limited seasonal river flow variations this challenge will not play a major role in STP. There are also technology supply limitations. In STP it is difficult to have access to renewable energy and energy efficiency equipment as there is no local production and the import processes are bureaucratic. Moreover, in contrast to diesel generators there are no well-established logistical and maintenance structures for renewable energy in place. The use of PV is limited due to the scarce space available. Also the use of wind power will be limited due to the land roughness in STP.

6. Capacity, knowledge and awareness barriers concern all relevant key stakeholders (policy makers on federal and municipality level, utility, regulator, consultants, project developers, businesses and industry, banks, civil society). In STP there is no qualification, certification and accreditation framework for sustainable energy in place. There is lack of training courses and educational programs at all levels (e.g. higher education, vocational training). Studies in energy engineering are taken outside of the country. There exists weak knowledge of the characteristics, economics and benefits of renewable energy and energy efficiency solutions. There is limited technical capacity to design, evaluate, install and operate on-grid and off-grid renewable energy (hybrid) systems (e.g. mini-grids). Moreover, there exists very little experience with business models, operating models and tariff setting schemes for renewable energy based (hybrid) mini-grids. Sustainable energy entrepreneurs, energy service companies (ESCOs) and renewable energy service companies (RESCOs) are nearly non-existent. The technical capacities of the utility and the regulator to deal with sustainable energy are weakly developed and mainly focused on conventional solutions (e.g. diesel generators). This explains also the poor servicing of colonial hydropower stations. In rural areas the capacity and knowledge barriers are even more severe. There is very poor awareness of renewable energy (hybrid) mini-grids and other renewable energy solutions with the potential to promote productive uses in agro-

business or fishery (e.g. water pumping, ice production). Local customs at ports and airports have only very weak capacities to check energy efficiency and labeling standards.

Baseline projects

The GEF project is fully in line with the described policy and strategy framework of the Government and will create strong synergies to the ongoing or just starting programs and projects supported by international development partners. There is only a very small number of partners active in the energy sector. The GEF project will complement and create strong links to the following energy baselineprograms and projects:

In recent years, the Government of STP has taken first steps to promote renewable energy and energy efficiency. The main players in this process are the Ministry of Infrastructure, Natural Resources and Environment (MINRE), the Empresa de Água e Electricidade (EMAE) and the Autoridade Geral de Regulação (AGR). In the NDC and other national documents, the Government of STP aims at a renewable energy penetration in the electricity mix of 40% by 2020 and 47% by 2030. The "Lei de Bases do Sector Electrico" (Basic Electricity Sector Law) approved in 2014 highlights renewable energy, energy efficiency and the role of independent power producers. The annual work plans of the Government "Grandes Opções do Plano" just speak about the need to establish an energy efficiency program.

European Union Energy Initiative Partnership Dialogue Facility (2011)

In 2011, the EUEI-PDF has undertaken a scoping study tour to Sao Tome and Principe in order to assess the country's readiness and the potential for the introduction of renewable energy technologies as new sources of electricity generation. There was agreement that there is need for a coherent policy and regulatory framework for renewable energy and energy efficiency. UNIDO and EUEI-PDF agreed that this GEF project will contribute to this activity.

World Bank – European Investment Bank (2017-2021)

It was agreed to create close links to the starting "*São Tomé and Príncipe Power Sector Recovery Project"*. The project is funded with grants and loans by the World Bank (WB) and the European Investment Bank (EIB) and is partly executed by the Agência Fiduciária de Administração de Projeto (AFAP) based in STP. The main beneficiaries of the project are EMAE and AGR. The project includes the development of a least cost power development plan, an electricity demand forecast, a cost-recovery based tariff-structure and the improvement of the metering and tariff collection system. Moreover, the project aims at strengthening the operational performance and governance of EMEA by installing a management information system, a management improvement plan, a revenue protection program, the complete reinstallation of the metering system, as well as a gender-sensitive community outreach campaign. Finally, the project will support the rehabilitation of the Contador hydro power station, as well as the rehabilitation of parts of the grid system. The GEF project will complement the project activities by providing support for the development of a renewable energy and energy efficiency policy, as well as respective laws and standards. Moreover it will support the upgrading of the existing hydro station Contador and provide hydro power training to EMAE.

United Nations Development Programme (UNDP) - GEF-5 (2013-2017)

The objective of the ending project *Promotion of environmentally sustainable and climate-resilient grid-based hydroelectric electricity through an integrated approach in Sao Tome and Principe"* is to introduce an integrated energy and ecosystems-based approach to on-grid and decentralized small hydro-electricity generation in Sao Tome and Principe, by leveraging $ 20.7 million in multilateral and private sector financing over its five-year implementation period. This, in turn, is expected to generate direct global benefits of 137,200 tons CO2e over the

same period in avoided greenhouse gas (GHG) emissions. The main objective was to set up a guarantee fund for hydropower projects to reduce the investment risks for private investors. However, the continued low interest of the private sector has demonstrated that further support for the mitigation of other pre-investment barriers is needed. For example, one major barrier for the private sector is the availability of risk capital for the development of pre-investment studies. With UNDP it was agreed that the UNIDO project will particularly focus on mitigating the pre-investment barriers for project developers.

3) The proposed alternative scenario, GEF focal area[7] strategies, expected outcomes and components of the project

The GEF project addresses the existing energy challenges of STP by promoting renewable energy and energy efficiency investments in the electricity sector. The combined and integrated interventions in the areas of technology demonstration, policy support, capacity building and SIDS-SIDS cooperation will create an enabling environment. The project will contribute to the transformational change of the electricity sector to a sustainable low-carbon development path. Without the GEF intervention the main trends of the "business as usual" scenario would continue. The dependence of the power generation system of STP on diesel generation would further intensify. The project features four (4) components:

Component 1: Strengthening the policy, legal and regulatory framework for sustainable energy solutions

This component contributes to the general power sector reform and will strengthen the policy, legal and regulatory framework for the integration of renewable energy and energy efficiency. Following the baseline report developed under the PPG phase and parallel to the renewable energy resource mapping under component 2, the GEF Project will support the development of a renewable energy and energy efficiency policy (output 1.1.1). The policy will establish concrete targets in the various sectors and will include also an action plan and time-frame for the implementation of the policy. The policy will include particular elements for gender-mainstreaming.

Based on the policy document the GEF project will support the development of a renewable energy law which will take the lessons learned of Cape Verde and other SIDS into account (output 1.1.2). The law will be developed in close coordination with the Ministry, the EMAE and the Autoridade Geral de Regulação (AGR). It will particularly guide the feed-in modalities and incentives (e.g. tax and duty exemptions) for PPPs and IPPs in the renewable energy sector (incl. net metering for private households). It will also include specific incentives and regulations for renewable energy (hybrid) mini-grids in rural and remote areas. Finally the GEF project will also facilitate the development of an energy efficiency standard for electric appliances (output 1.1.3). Under the capacity building component the GEF project will strengthen the capacities of EMAE, AGR and other authorities (e.g. customs) to enforce the new legislation.

In this context, UNIDO agreed on close cooperation with the *"São Tomé and Príncipe Power Sector Recovery Project"* which includes the development of a least cost power development plan, an electricity demand forecast, a cost-recovery based tariff-structure and the improvement of the metering and tariff collection system. A sound tariff structure is an important basis for the viability of grid-connected renewable energy projects. The standard for efficient appliances goes hand in hand with the efforts of the World Bank to reduce technical and non-technical losses in the transmission and distribution system. The GEF project will coordinate the policy activities also closely with the African Development Bank (AfDB) which indicated its readiness to co-fund policy activities.

[7] 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.

Component 2: Promoting investments in sustainable energy solutions

This component aims at creating a sound and enabling national investment framework for renewable energy and energy efficiency solutions with a strong replication and leverage effect. UNIDO will particularly focus on project preparation and bundling, as well as technology demonstration.

The GEF project includes the development of a GIS based renewable energy resource mapping (output 2.1.1) which will identify and provide basic information (e.g. coordinates, size, costs) on- and off-grid priority sites in various technology areas (e.g. hydro, bioenergy, PV, wind). The mapping will contribute to a better integration of renewable energy into the Least Cost Power Development Plan (LCPDP) of STP to be financed by the World Bank. The LCPDP will provide guidance to the utility for the next 20 years for all segments of the electricity supply chain (generation, transmission, and distribution). The resource mapping will provide essential information to plan better the interplay between grid-connected and off-grid options.

The mapping and the LCPDP will lead to the development of the National Sustainable Energy Investment Plan (NSEIP) comprising a project pipeline directed to attain the targets in the Renewable Energy and Energy Efficiency Policy to be developed under component 1 and the NDC (output 2.1.2). It includes project information such as the promoters, the development status, the need for additional studies, and the volume and type of co-financing requirements. In partnership with ALER (Associação Lusófona de Energias Renováveis), the NSEIP will be presented to investors and financiers in at least two (2) investment fora in Portugal and STP. STP will also benefit from the experiences of Cape Verde and Guinea Bissau which have already developed such investment plans.

Selected projects of the NSEIP with a total electric capacity of 5 MW will be brought to financial close with support of the GEF project and their implementation will be facilitated with co-finance from the Government, banks and private investors (output 2.1.3). The GEF grant will be used to fund the incremental costs of the selected projects. The selected projects will be highly innovative when considering the baseline in Sao Tome and Principe. Apart from one small-scale hydro power station and some PV stand-alone systems there are currently no renewable energy systems in operation. The supported scope of projects will include grid-connected small-hydro power stations, mini-grid (hybrid) systems (between 300 to 700 kW) as well as innovative renewable energy solutions to increase the productivity of agro-processing, fishery and tourism. Concerning the latter, particular focus will be given to nexus solutions with high local value creation effects will be laid (e.g. bioelectricity). Possibilities to use renewable energy as a tool to promote eco-tourism will be studied. Through the implemented projects the feasibility and viability of various renewable energy technologies will be demonstrated.

Knowledge exchange with Cape Verde and Guinea Bissau on already implemented PV mini-grid hybrid projects (e.g. systems in Bambadinca, Bissora, Monte Trigo) will be established through ECREEE. UNIDO will contribute with its lessons learned from installations undertaken under the GEF Projects “Promoting market based development of small to medium scale renewable energy systems in Cape Verde (GEF ID 3923) and “Promoting investments in small to medium scale renewable energy technologies in the electricity sector of Guinea Bissau” (GEF ID 5331).

In the initial phase, priority will be given to the revitalization and upgrading of the colonial hydro power stations Do Ouro (74 kW), Manuel Jorge (640 kW) and Contador (2 MW) in Sao Tome and Papagaio (128 kW) in Principe. During the PPG phase the pre-investment activities will focus particularly but not exclusively on these sites. Under the investment component, UNIDO will closely partner with the World Bank (WB), European Investment Bank (EIB) and the African Development Bank (AfDB).

This will include also cooperation with the UNIDO hosted Private Financing Advisory Network (PFAN) regarding the financial structuring of projects and matchmaking with investors. PFAN is a multilateral public private partnership and identifies promising clean energy projects at an early stage and provides mentoring for development of a business plan, investment pitch, and growth strategy, significantly enhancing the prospect of financial closure. Thus far, 87 projects have achieved financial closure with over US$ 1.2 billion of investment raised. UNIDO will also partner with UNDP which intends to have the renewable energy guarantee fund fully operational by 2018.

Finally, the project will facilitate the creation of the Sao Tome and Principe Sustainable Energy Facility (STP-SEF) which will execute regular call for proposals to support renewable energy and energy efficiency project development and investments with small grants. The calls will be funded by the GEF grant and other co-financiers. The experiences and lessons learned of Cape Verde and Guinea Bissau with similar facilities will be considered (output 2.1.4). UNIDO will contribute with its experience in the establishment of the ECOWAS Renewable Energy Facility (EREF) which was established in partnership with ECREEE in 2011. The Facility is still operating. The regional SIDS-SIDS activities will be supported through co-funding.

Component 3: Strengthening capacities on sustainable energy island solutions

The component aims at mitigating the existing capacity constraints in the renewable energy sector of STP. The activities are directed to strengthen the capacities of key market enablers (e.g. policy makers, developers, companies, utility, and banks) on different aspects of renewable energy and energy.

Based on a capacity and training needs assessment a national qualification, certification and accreditation framework on sustainable energy will be developed (output 3.1.1). Its implementation will be facilitated in close cooperation with other national and international partners. In line with the investment component, priority will be given to the strengthening of the capacities of EMAE, MINRE, and AGR to integrate and manage on-grid/off-grid renewable energy systems (output 3.1.2). In line with the policy component, the GEF project will also provide targeted training to relevant national authorities (e.g. customs) to monitor, verify and enforce standards on efficient electric appliances.

These GEF activities will complement and sustain the results of the "*São Tomé and Príncipe Power Sector Recovery Project"*. The success of the grid-connected renewable energy projects highly depends on the improved performance and management capacity of EMAE and AGR. In parallel to the GEF project, the World Bank will strengthen the key operations of both institutions by strengthening the planning, management and information systems, introducing a cost-recovery based sustainable tariff structure, as well as an improved metering and tariff collection system.

In addition, the capacity building activities will focus particularly on the implementation of train-the-trainer approaches. At the end of the project at least five (5) domestic capacity building institutions and fifteen (15) certified trainers are offering capacity building courses on renewable energy and energy efficiency issues (output 3.1.4). Moreover, at least one hundred (100) energy key stakeholders are trained by the certified domestic trainers (output 3.1.5). A particular focus will lie on tools to plan, implement and monitor renewable energy on-grid and off-grid projects. Special emphasis will be laid in this context on hydro power and hydrological measurements. In this context, UNIDO will closely cooperate with the regional training activities of ECREEE.

Under the SIDS DOCK umbrella the capacity building component will also include important elements of SIDS-SIDS cooperation between the Portuguese speaking countries STP, Cape Verde and Guinea Bissau. The regional SIDS-SIDS activities will be supported through co-funding. An exchange of lessons learned will be established by ECREEE based on the results of ongoing GEF energy projects in all three countries. ECREEE will include experts

from STP in its ongoing regional capacity building activities. To address the scarcity of domestic training resources in Portuguese, an online-training program on sustainable energy island solutions (output 3.1.3) will be developed and applied by capacity building institutions and experts in all three countries. In this context, UNIDO will partner with the Research Centre for Energy, Environment and Technology (CIEMAT). CIEMAT will develop the on-line modules (with co-finance provided by AECID).

Component 4: Project monitoring and evaluation

This component will establish a detailed and extensive monitoring and evaluation scheme in compliance with UNIDO and GEF procedures. This will allow not only the monitoring of the project's progress but also the design of an overall project impact assessment on a rolling periodic basis, built-up from achievements under the project's different components. The monitoring and evaluation of the project activities combined with the assessment of the project results impact will provide a frame for periodic reviews of the project's 'Theory of Change' and the update of subsequent implementation strategies and work plans. The achievements of the project through its three above components will be monitored by the Project Steering Committee in line with the established result framework in the CEO Endorsement Document. This project should also contribute to Sao Tome and Principe attainment of the sustainable development goals SDG-7 (universal sustainable energy access), SDG-9 (sustainable and inclusive industrialization focusing on the transformation sector), and SDG-13 (climate action).

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

The Government is currently far behind its commitments to increase the renewable energy penetration to 40% by 2020 and 47% by 2030. Moreover, the current ongoing programs and projects of international development partners are not substantial enough to stimulate the needed transformation. Through the adopted strategic approach, the GEF project will be instrumental to facilitate this transformation. It is expected that particularly the investment component of the GEF project will have a high leverage effect. Through targeted pre-investment and investment support the project will leverage co-funding from the private and public investors and financiers. In the case of investment support the GEF funding will help projects to break-even. The pre-investment support will help projects to reach the stage of financial close. With this approach the small GEF grant will have a significant leaverage effect. The GEF funding through GEFTF represents 15 percent of the total project cost. Through grants and loans provided by the World Bank (WB) and the European Investment Bank (EIB), the Government of STP will contribute with 57% of the total project costs. Around 28% will come from the private sector or other international development partners (ECREEE, UNIDO, and AfDB). Furthermore, GEFTF financing will ensure this project is implemented according to international standards in order to ensure success and replicability. Synergies to other GEF-UNIDO projects on renewable energy in Cape Verde and Guinea Bissau will be harnessed.

5) *Global environmental benefits (GEFTF)*

The project environment benefits can be described as follows:

Mitigated GHG emissions through the addition of 5 MW of renewable energy generation capacity: Considering hydropower, which is the most accessible renewable energy option in the country, the direct and indirect (replication factor of 2) greenhouse gas emissions reduction is estimated with 402,000 CO2e over 20 years (201,000 CO2e direct emission reduction). The detailed GHG emission reductions will be calculated in line with the established GEF methodologies during the PPG phase based on the selected projects under the investment component.

Mitigated GHG emissions through improved energy efficiency standards for electric appliances: It is estimated that the introduction of energy efficiency standards for electric appliances will reduce the national peak load demand by

at least 1 MW. Thanks to better efficiency of appliances GHG emissions will be reduced. The GHG emission reductions expected from this activity will be calculated in detail during the PPG phase in line with the established GEF methodologies.[8]

6) Innovation, sustainability and potential for scaling up

Innovation: The project is highly innovative when considering the baseline. The first time the Government will introduce a systematic programmatic approach to upscale renewable energy and energy efficiency investments in the electricity sector. STP is one of the few SIDS countries, which has no policy for renewable energy and energy efficiency. Apart from one small-scale hydro power station and some PV stand-alone systems there are currently no renewable energy systems in operation. The supported scope of projects will include grid-connected small-hydro power stations, mini-grid (hybrid) systems (between 300 to 700 kW) as well as innovative renewable energy solutions to increase the productivity of agro-processing, fishery and tourism.

Sustainability: To ensure the financial sustainability of investments strong emphasis on mature operation and management models, as well as tariff setting and collection schemes will be laid. Investments will be combined with targeted capacity building activities. In general, the capacity building component will apply a train-the-trainer approach as much as possible. The envisaged SIDS-SIDS cooperation with the Portuguese speaking Cape Verde and Guinea Bissau will contribute to the continued use of project deliverables after closure of the GEF project. The results will be widely disseminated through the ECOWAS Observatory for Renewable Energy and Energy Efficiency (ECOWREX) operated by ECREEE.

Scaling up and replication: SIDS-SIDS knowledge exchange will be also facilitated in partnership with the other regional sustainable energy centers based in Tonga (PCREEE) and Barbados (CCREEE). The centers are part of a UNIDO promoted SDG-7 partnership, which aims at the creation of a network of regional sustainable energy centers for SIDS in Africa, Pacific, Caribbean and Indian Ocean. The sub-network is part of the Global Network of Regional Sustainable Energy Centers (www.se4allnetwork.org).

2. Stakeholders. Will project design include the participation of relevant stakeholders from civil society organizations (yes ☒ /no☐) and indigenous peoples (yes ☐ /no☒)?

A Project Management Unit (PMU) will be established in the Ministry of Infrastructure, Natural Resources and Environment. A National Project Manager (NPM) will be responsible for the execution of the day-to-day activities. A Project Steering Committee will be created. It will comprise the main players of the electricity sector (e.g. Ministries, utility, regulator), international partners (e.g. EU, World Bank, AfDB), as well as civil society (e.g. TESE) and private sector (Chamber).

As the GEF Implementing Agency, UNIDO will lead the process of project preparation and development with the participation of key stakeholders from the Government and the private sector. The project execution will be undertaken through multiple contractual arrangements between UNIDO, national and international entities, and industry associations, depending on their comparative advantage and ability. On request of the Government, UNIDO will also provide targeted technical assistance and administrative execution support, which will be further discussed

[8] It will be calculated according to the established GEF methodologies: (a) Energy Efficiency Projects: Revised Methodology for Calculating Greenhouse Gas Benefits of GEF Energy Efficiency Projects (Version 1.0) and the (b) Renewable Energy Projects: Manual for Calculating GHG Benefits of GEF Projects: Energy Efficiency and Renewable Energy Projects (2008)

with national stakeholders during the PPG phase and elaborated in detail in the CEO Endorsement document. No indigenous people will be concerned by the project. Some of the key stakeholders are described below:

Table 1.1: Risks and mitigation measures

Partner	Potential Function
National Governmental Partners	
Ministry of Infrastructures, Natural Resources and Environment (MINRE)	As national partner, MINRE will provide technical guidance during the project preparation phase. The Ministry will supervise the effective execution of the project activities. The PMU will be established in the Ministry and a project coordinator will be recruited.
Empresa de Água e Electricidade (EMAE) and Autoridade Geral de Regulação (AGR)	Both are beneficiaries of activities across all components of the GEF project. They will benefit from a better regulatory framework, increased renewable energy penetration and capacity building.
International Partners	
African Development Bank (AfDB)	AfDB will be an important co-financier and technical partner to implement component #1 and #2.
World Bank (WB) and the subcontracted Agência Fiduciária de Administração de Projeto (AFAP)	The WB will be an important co-financier for the execution of the investment activities under the project component #1 and #2. UNIDO might subcontract AFAP with support concerning the upgrading of Contador.
Research Centre for Energy, Environment and Technology (CIEMAT)	CIEMAT will partner with UNIDO on the development of the sustainable energy island online capacity building program in Portuguese. AECID will co-fund this activity.
The Small Island Sustainable Energy and Climate Resilience Organization (SIDS DOCK) and the ECOWAS Center for Renewable Energy and Energy Efficiency (ECREEE)	UNIDO might subcontract both with the execution of selected SIDS-SIDS knowledge exchange and capacity building activities across all project components.
United Nations Development Programme (UNDP)	UNIDO will work closely with UNDP on small hydro power issues. Moreover, synergies to ongoing climate-resilience projects will be created.
Civil Society Organizations	
Association for the development of technology, engineering, health and education (TESE)	UNIDO might subcontract TESE with the execution of parts of project component #3.
Associação Lusófona de Energias Renováveis (ALER)	UNIDO might subcontract ALER with the execution of at

	least two (2) investment fora in Portugal and STP.
ENERGIA, International Network on Gender and Sustainable Energy	UNIDO intends to partner with ENERGIA on gender-mainstreaming strategies.

Other stakeholders will be identified during PPG phase.

3. Gender Equality and Women's Empowerment. Are issues on gender equality and women's empowerment taken into account? (yes ☒ /no☐).

A detailed gender analysis will be undertaken as part of the baseline assessment developed during the PPG phase. Although sustained efforts have been carried out over the last years for empowering women, particularly in the education and governance sectors, gender inequalities persist in Sao Tome and Principe as evidenced by the gender disaggregated figures of poverty and employment. According to the 2012 National Housing and Population Census female-led households, which account for 38 percent of all households, have lower incomes than male-led households and the rate of unemployment reaches 19.7 percent of active women compared to 9.3 percent of men active population. The project acknowledges the differentiated needs, roles for and impact on women in the energy sector. Therefore, it will demonstrate good practices in mainstreaming gender aspects into the development of climate resilient initiatives. Consequently, gender dimensions will be considered throughout the whole project cycle, although, depending on the type of intervention and scope of activities, the degree of relevance of gender dimensions may vary. Gender data will be included in the baseline report to be developed during the PPG phase. Gender indicators will be included in the result framework of the GEF CEO Endorsement and the participation of a gender group in the Project Steering Committee is foreseen. Gender mainstreaming elements will be included in the renewable energy and energy policy as well as the capacity building component of the project. Synergies to the envisaged gender-sensitive community engagement and outreach campaign of the "*São Tomé and Príncipe Power Sector Recovery Project"* will be created. Moreover, UNIDO will work with ENERGIA, International Network on Gender and Sustainable Energy, on gender-mainstreaming issues.

4. Risks and mitigation measures (table format acceptable).

At this stage of the concept development, the risks listed in Table 4.1 have been identified as having the potential to hinder the achievement of the project objectives. Measures to mitigate these risks are proposed.

Table 1.2: Risks and mitigation measures

Risks	Rating	Mitigation measures
Institutional and political risks: The commitment of the Government of STP on renewable energy and energy efficiency might change. Moreover, there might exist some resistance by other domestic stakeholders to implement the established policies, regulations and investment framework in practice (e.g. utility, petroleum company).	Medium	The project will establish a close partnership with the Government but also the utility and regulator from the very beginning. Moreover, UNIDO will closely cooperate with other international partners with influence (e.g. WB, EIB, AfDB, and EU). UNIDO will also build on SIDS-SIDS cooperation between Cape Verde, STP and Guinea Bissau. The GEF project will include awareness raising activities for stakeholders which might have the impression to lose from a switch to renewable energies.
Socio-economic and environmental risks: Some of the envisaged renewable energy investment projects might have some limited negative social, economic and environmental impacts for a limited	Low	The interventions under this project will comply with the requisite national environmental safeguards and the GEF and UNIDO environmental and social safeguard requirements. All impacts will be assessed and corrective measures taken whenever necessary. In the hydro power sector, the project only supports run-off-river projects

number of stakeholders.		with a small impact on the environment. No big dams will be built.
Financial risks and low interest of the private sector and investors: Private financiers do not partner in business initiatives (incl. support mechanisms package, co-finance of investment projects etc.) for beneficiaries' access to financing.	Low	The project will focus on building a sound investment framework and will give the Government an important tool for decision-making and fund raising. This will break with the current practice where private project developers are presenting unrealistic and badly developed proposals to the Government. Due to the lack of a strategic plan it is difficult for officials to appraise the projects in terms of their priority, feasibility and viability. Moreover, the GEF project will reduce pre-investment risk for potential private investors and developers by providing grant finance for measurements, feasibility studies or the financial structuring of projects. To raise the attractiveness of small projects, UNIDO will focus on project bundling and matchmaking with investors and financiers. However, UNIDO will focus mainly on sustainable business models, which will promote the ownership of STP and maximize domestic value creation.
Technical and market risks: The renewable energy systems are not technically viable in the areas where they are installed and the business models proposed do not allow beneficiaries to invest in the technology	Medium	UNIDO will facilitate knowledge exchange with Cape Verde and Guinea Bissau where already similar projects where implemented (e.g. the solar PV hybrid mini-grids Bambadinca, Bissora, Monte Trigo).
Climate change risks: the availability of biomass and water resources, which are potential resources for investment projects, could be affected by climate variability	Medium	Feasibility studies will address the potential impact of climate change on the life-cycle of renewable energy projects. There is need to estimate the changes in the river-flows regarding hydro power development. In general, the increased use of renewable energy will have positive impacts and increase the ability of the domestic population to adapt to climate change. The use of traditional biomass for energy provision will have positive impacts on biodiversity.
Low prices of oil: Decrease of oil prices could eventually undermine the commitment of the utility and Government to invest in renewable energy solutions. This could particulalry happen if the domestic off-shore oil resources are finally available.	Medium	Awareness raising on the economics of renewable energy solutions will be undertaken. This awareness raising will include the comparison of life-cycle costs of diesel generation and other renewable energy technologies.

5. Coordination with other relevant GEF-financed initiatives and other initiatives.

As already described, there are only a few ongoing energy interventions in STP. The GEF project will build synergies to these projects in line with the principles of complementarity, replication and up-scaling. Close coordination will be established regarding the ongoing adaptation and mitigation oriented GEF funded projects.

Close links to the UNDP–GEF-5 project "Promotion of environmentally sustainable and climate-resilient grid/isolated grid-based hydroelectric electricity through an integrated approach in Sao Tome and Principe", approved in 2013, will be developed. The main objective of the project was to set up a guarantee fund to reduce the investment risks for private investors in cooperation with the central bank. However, the continued low interest of the private sector has demonstrated that further support for the mitigation of other pre-investment barriers is needed. With UNDP, it was agreed that the UNIDO project will particularly focus on mitigating the pre-investment barriers for project developers. UNIDO will also focus on other technology areas (e.g. PV, bioelectricity and wind).

As already described, close links to the starting *"São Tomé and Príncipe Power Sector Recovery Project"*. The project is funded with grants and loans by the World Bank (WB) and the European Investment Bank (EIB) and is partly executed by the Agência Fiduciária de Administração de Projeto (AFAP) based in STP. The main beneficiary of the project is the national utility EMAE. The GEF project will complement the project activities with providing support for the development of a renewable energy and energy efficiency policy, as well as respective laws and standards. Moreover it will support the upgrading of the existing hydro station Contador and provide hydro power training to EMAE.

SIDS DOCK will facilitate SIDS-SIDS cooperation and exchange of lessons learned with other SIDS countries, particularly Cape Verde and Guinea Bissau. ECREEE as the SIDS DOCK hub for African SIDS will be involved in the execution of the GEF project. Through ECREEE, UNIDO will facilitate knowledge exchange with Cape Verde and Guinea Bissau where already similar policies and projects where developed and implemented (e.g. renewable energy law, EE standards for appliances, the solar PV hybrid mini-grids Bambadinca, Bissora, Monte Trigo).

6. Consistency with National Priorities. Is the project consistent with the National strategies and plans or reports and assessments under relevant conventions? (yes ☒ /no☐).

The proposed project is in-line with the national priorities as highlighted in relevant documents among which are the country Nationally Determined Contributions to Climate Change Mitigation (2016), the Second National Communication (2012), the Poverty Reduction Strategy Programme II (2012) and the National Adaptation Programmes of Action on Climate Change (2006). STP signed the Paris Climate Agreement on 22 April 2016 and it ratified it on 02 November 2016. The main benefit of the project lies in the area of climate change mitigation. The interrelated adaptation benefits are a secondary effect.

Nationally Determined Contributions to Climate Change Mitigation (2016): The NDC was ratified the 2nd November 2016 and entered into force the 2nd December 2016.[9] The paragraph §3 under the chapter on Mitigation mentions "Taking into consideration the country's economic, social and environmental situation, Sao Tome and Principe will not present any unconditional contributions. The contributions of the country with regard to mitigation are conditioned by financial support, technological support and capacity-building that the country will receive from abroad''. The following paragraph (§ 4), states the aim at a renewable energy penetration in the electricity mix of 40% by 2020 and 47% by 2030. There is the vision that by 2030 around 34% might come from small-hydropower sources and 13% from solar PV.

Second National Communication to the United Nations Framework Convention on Climate Change (2012): The mitigation scenario in the NC projects a quantity of greenhouse gases emissions equivalent to 513.5 Gg CO2e with an overall generation capacity of 158 MW fully thermal by 2030. If 25 percent of this capacity is replaced by hydropower generation, emissions will decrease to 385.1 Gg CO2e.

Poverty Reduction Strategy Programme II (2012-2016): The program 8.4.1 for providing a reliable and low cost energy states "Investment for electrification is considered one of the important conditions for successfully stimulating economic and social development. In order to increase energy production and efficiency and reduce the country's dependence on imported fuel, consideration will be given to methods for rapidly increasing the share of

[9] http://unfccc.int/paris_agreement/items/9444.php

hydroelectric power and improving the technical capacity of the national Water and Electricity Corporation (EMAE)''.

National Adaptation Programmes of Action on Climate Change (2007): The NAPA of STP provides that considering the effects of climate change in the different sectors of the economy, the following measures, among others, should be considered for the sectors of agriculture, energy and water.

7. Knowledge Management

The GEF Project includes important elements to promote knowledge management. The involvement of SIDS DOCK and ECREEE will boost the exchange of knowledge and lessons learned between the Portuguese speaking SIDS countries STP, Cape Verde and Guinea Bissau. Particularly, Cape Verde has already progressed with regard to the development of policies, investment plans and the implementation of concrete grid-connected and decentralized mini-grid projects. Moreover, through the ECOWAS Observatory for Renewable Energy and Energy Efficiency (ECOWREX), operated by ECREEE, all project results and deliverables will be disseminated to a wider public, and particularly in West Africa. SIDS-SIDS knowledge exchange will be established in partnership with the other regional sustainable energy centers based in Tonga (PCREEE) and Barbados (CCREEE).

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

A. RECORD OF ENDORSEMENT[10] 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 OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE *(MM/dd/yyyy)*
Lourenço Monteiro de Jesus	GEF-Focal Point, Director of Environmental Education and Statistics	Ministry of Infrastructure, Natural Resources and Environment	04/06/2017

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF policies[11] 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
Mr. Philippe R. Scholtès, Managing Director, Programme Development and Technical Cooperation, UNIDO-GEF Focal Point		08/31/2017	Martin Lugmayr, Sustainable Energy Expert, Department of Energy,UNIDO	+43 1 26026 3595	m.lugmayr@unido.org

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

[10] 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.

[11] GEF policies encompass all managed trust funds, namely: GEFTF, LDCF, SCCF and CBIT