



**United Nations Development Program  
Country: Cabo Verde  
PROJECT DOCUMENT<sup>1</sup>**

**Project Title:** Cabo Verde Appliances & Building Energy-Efficiency Project (CABEEP)

**COUNTRY PROGRAMME / UNDAF Outcome(s) #4:** Institutions reinforce environmental governance and integrate principles of environmental sustainability, climate change and disaster relief reduction; public and private institutions adopt a holistic approach to conservation and protection of critical habitats and biodiversity.

**Outcome Indicator:** a) % of public resources allocated to environment b) number of key sector strategies integrating environmental dimension.

**UNDP Strategic Plan Environment and Sustainable Development Primary Outcome:** Energy and environment for sustainable development and green growth

**UNDP Strategic Plan Secondary Outcome:** Area of development work: sustainable development pathways

**Expected CP Outcome(s):** Growth and development are inclusive and sustainable, incorporating productive capacities that create employment and livelihoods for the poor and excluded

**Expected CPAP Output (s):** Integration of climate change and disaster risk reduction into territorial plans; national institutions and CSO strained and strengthened in environmental management.

**Executing Entity/Implementing Partner:** Directorate General of Energy (DGE) under Ministry of Tourism, Industry and Energy and Directorate General for Environment (DGA) under Ministry of Environment, Housing and Land Use.

**Responsible Partners:** Directorate General of Energy(DGE)

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<sup>1</sup>For UNDP supported GEF funded projects as this includes GEF-specific requirements

### Brief Description

The primary objective of the project is to remove barriers to energy efficiency in buildings and appliances in Cabo Verde. The aim is to enable and facilitate market transformation leading to substantial energy savings and greenhouse gas reductions. The project implementation is estimated to result in direct emission reductions of 297.8 ktCO<sub>2</sub>e through pilot demonstration projects, minimum energy efficiency and water efficiency standards for buildings and appliances. The indirect emission reduction is expected to be nearly 703.9 ktCO<sub>2</sub>e resulting from replication and dissemination activities from project implementation. The outcome will be significant in supporting the country's economic development, improving quality of life and leading to significant environmental benefits in accordance to the national plans and priorities. This is achieved through activities designed to support and strengthen legal, regulatory and institutional framework, enhance the existing capacity, and raise awareness. This is facilitated by introducing a new law on building energy codes and introducing standards and labelling programme for imported domestic appliances thus resulting in significant energy savings.

Programme Period:	48 Months	Total resources required	\$ 11,642,052
Atlas Award ID:	00075997	Total allocated resources:	\$ 11,642,052
Project ID:	00087601	• Regular	
PIMS #	4996	• GEF	\$ 1,918,400
Start date:	1/2015	• UNDP CO ( in-cash )	\$ 300,000
End Date	1/2019	• Other: ( parallel co-financing)	
Management Arrangements:	National	• Government (MTIE)	\$ 4,911,336
Implementation		• ECREEE	\$3,900,000
PAC Meeting Date	TBC	• APP	\$ 612,316
		• UNICV	\$ 313,346

Agreed by (Government):

Date/Month/Year

Agreed by (Executing Entity/Implementing Partner):

Date/Month/Year

Agreed by (UNDP):

Date/Month/Year

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## List of Acronyms

ADF	African development fund
AEB	Águas e Energia de Boavista
ANMCV	National Municipality Association
APN	Águas de Porto Novo
ARE	Economic Regulatory Agency
AWP	Annual Work Progress
BAU	Business as-Usual
CCISS	Chamber of Commerce Industries and Services Sotavento
DGC	General Directorate Customs
DGE	Directorate General for Energy
DGIC	General Directorate for Industry and Commerce
DGOTDU	Directorate General of Land-use planning and urbanization
DGT	General Directorate for Tourism
DSM	Demand Side Management
ECM	Energy Conservation Measures
ECOWAS	Economic Community Of West African States
ECREEE	ECOWAS Centre for Renewable Energy and Energy Efficiency
EEB	Energy Efficient Buildings
EEEP	ECOWAS energy efficiency Policy
ELECTRA	National Electricity and Water Company
EREP	ECOWAS Renewable Energy Policy
EOP	End of Project
EU	European Union
GEF	Global Environment Facility
GHG	Greenhouse Gases
GDP	Gross Domestic Product
HDI	Human Development Index
INE	National Statistics Institute- Cabo Verde



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INGT	National Institute of Land Management
INPSS	National Social Insurance Fund
INMG	Institute of Meteorology and Geophysics
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent Power Producers
IFH	Housing Development Institute
IGQ	Instituto de Gestão de Qualidade/ Quality Management Institute
JICA	Japan International Corporation Agency
kWh	Kilowatt hour
LEC	Civil Engineering Laboratory Cabo Verde
LLC	Limited Liability Company
LUXDEV	Luxembourg Development Agency
MAHOT	Ministry of the Environment Housing and Land Use Planning
MEPS	Minimum Energy Performance Standards
MTIE	Ministry of Tourism, Industry, and Energy
M&V	Monitoring and Verification
MW	Megawatts
NAMA	Nationally Appropriate Mitigation Actions
NPD	National Project Director
NPM	National Project Manager
OAC	Order of Architects of Cabo Verde
PANA II	National Action Plan for the Environment
PMU	Project Management Unit
PSC	Project Steering Committee
SE4All	Sustainable Energy for All
S&L	Standards and Labeling
UNFCCC	United Nations Framework Convention on Climate Change
WE	Water Efficiency

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## SECTION I: SITUATION ANALYSIS

### 1.1 Country situation

Cabo Verde is a small island country located in the Atlantic Ocean, approximately 570 kilometres off the coast of West Africa. The country is a horseshoe-shaped cluster of ten (10) islands<sup>2</sup> (nine inhabited) and thirteen islets constituting an area<sup>3</sup> of 4,033 km<sup>2</sup>. As per the latest estimates, the country has a population of 531,046 (July 2013 estimates)<sup>4</sup>. The population has grown in the last 30 years at a different pace in the inter-census periods. The population growth rate, depending on migration flows in 1999-2000 (last census data) was approximately 2.4 % and dropped to 1.41% in 2012. Latest estimates states that the country's 62.6% of population lives in urban areas with 2.12% of annual rate of urbanization<sup>5</sup>.

In climate terms, the country lies in the Sub-Saharan African climatic zone. It has a dry tropical climate with two distinct seasons: a dry season and a rainy season. The islands are under the influence of the Azores subtropical anticyclone, the low equatorial pressures, cold current from the Canaries and thermal depression over the African continent during summer. The country experiences an average rainfall of 225 mm/year, approximately 20% of the water from the rainfall is lost through surface runoff, 13% infiltrates, recharging aquifers, and 67% evaporates<sup>6</sup>. Only ten percent of the land is arable because rainfall accumulation is minimal and irregular, the terrain is rough with high wind erosion. The annual average temperature is around 25° C for coastal areas, reaching 19° C in areas above 1,000 meters of altitude.

The country has poor natural resource including poor soil for agriculture. Share of food production is low, nearly 82% of food is imported. The country is living in water scarcity, with less than 500m<sup>3</sup>/year of fresh water per capita to meet the country's needs in terms of human consumption, agriculture, industry, energy and environment. Cabo Verde experiences long periods of droughts, with underground and surface sources are insufficient to meet the demand. Currently, major cities of Praia and Mindelo as well as tourist destinations Sal, Maio and Boa Vista are using desalinated water for human consumption, which is already a rather controversial<sup>7</sup> and expensive measure to increase water availability. Forecasts for water demand show a steep increase in the upcoming years.

The country is presently facing several climate change issues including extreme weather events, such as torrential rains and tropical storms, prolonged droughts, increased temperature and out-of-season precipitations. Impacts of these events further aggravate other environmental challenges experienced by the country such as soil erosion, desertification, salt intrusion in underground aquifers and low-lying land; and coastal erosion. Additional anthropogenic pressures on the environment, such as: deforestation due to demand for wood used as fuel; overfishing and illegal capture of protected species; landscapes and water pollution due to unsustainable waste treatment, industrial, husbandry and agriculture practices or transport sector's operations; and predation of endangered species. These activities threaten several world-protected species of birds and reptiles, and endanger valuable ecosystems and the services they provide. In general, over exploitation of natural resources – such as illegal inert extraction (beach and catchment-area sand and gravel extraction for construction purposes) or uncontrolled water-pumping, as well as the above mentioned

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<sup>2</sup>The main islands are: Barlovento (windward northern island group)—Santo Antão, Sao Vicente, Santa Luzia, Sao Nicolau, Sal, Boa Vista, and Sotavento (leeward southern island group)— Maio, Santiago, Fogo, Brava.

<sup>3</sup>Portal of the National Institute of Statistics, Cabo Verde

<sup>4</sup>Portal of the National Institute of Statistics, Cabo Verde

<sup>5</sup>Portal of the National Institute of Statistics, Cabo Verde

<sup>6</sup>UNFCC-Cape Verde

<sup>7</sup>From an environmental point of view, given that water desalination consumes fossil fuels in large quantities and changes the water temperature on location.

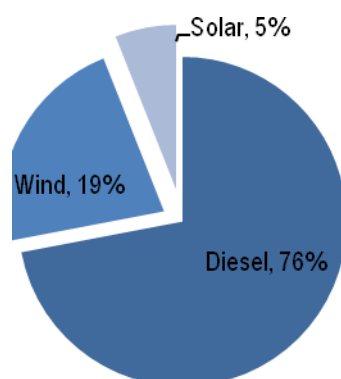
processes, reinforce negative climate change impacts experienced in the country and/or projected for small island states and contribute to world's GHG's emissions at the origin of climate change.

In recent years there has been a positive economic growth in the country, with GDP per capita grew significantly from \$ 2,080 (USD) in 2000 to \$ 4,200 (USD) in 2012, according to the data from the World Development Indicators Database (2012). The country's Human Development Index (HDI) is 0.586, which is higher than the average Sub-Saharan African countries (HDI 0.475)<sup>8</sup>. It is a stable democracy with levels of literacy and education significantly higher than all other countries in West Africa. The economy is service-oriented with about three –fourths of GDP accounting from commerce, transport, tourism, and public services. Tourism has been the fastest growing sector in recent years, with 26% increase (19,247 million Escudos) between 2002 and 2006. In 2007, tourism contribution to GDP was 19.2%, reflecting some dependence of the economy on this sector<sup>9</sup>.

## 1.2 Energy situation

### Overview

Cabo Verde's energy sector is strongly characterized by consumption of fossil fuels (derived oil—primarily imported oil), biomass (wood) and use of renewable energy particularly wind and solar power. The country's high dependence on petroleum products is increasing with the demand for electricity, which is growing by 8.1% per year.<sup>10</sup> This represents a heavy burden on the national economy. The installed capacity increased from 82.3 MW in 2010 to 155.8 MW in 2013. The country's total energy matrix as of 2013 (figure 1) includes the installed capacity by technology as 76% by diesel (imported), 19 % by wind, 5% by solar<sup>11</sup>.



Source: ELECTRA, 2013

Figure 1: Installed generation capacity by technology (2010)

Figure 2 shows the total energy consumed by various sectors in 2010 with residential sector contributing to 29% of the total energy demand. Electricity production comes majorly from imported diesel oil with a share of renewable energy (wind farms) connected to the grid. Increased import dependency as shown in figure 3 and increased demand prices make the country highly vulnerable to future fuel price shocks and demand risk.

<sup>8</sup>UNDP, Human Development Report (2013)

<sup>9</sup>2<sup>nd</sup> National Communication on Climate Change of Cape Verde- October 2010

<sup>10</sup> Cape Verde: Country Strategy paper (2014-19)

<sup>11</sup>IRENA Project Navigator Workshop- The current situation of RE- status and challenges – ELECTRA – Cabo Verde

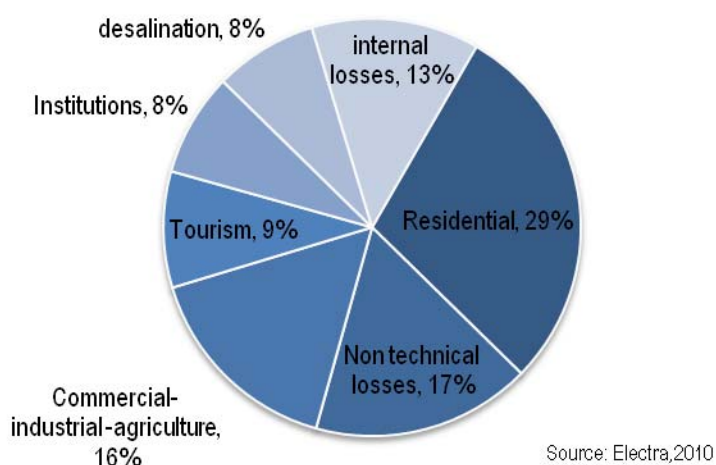
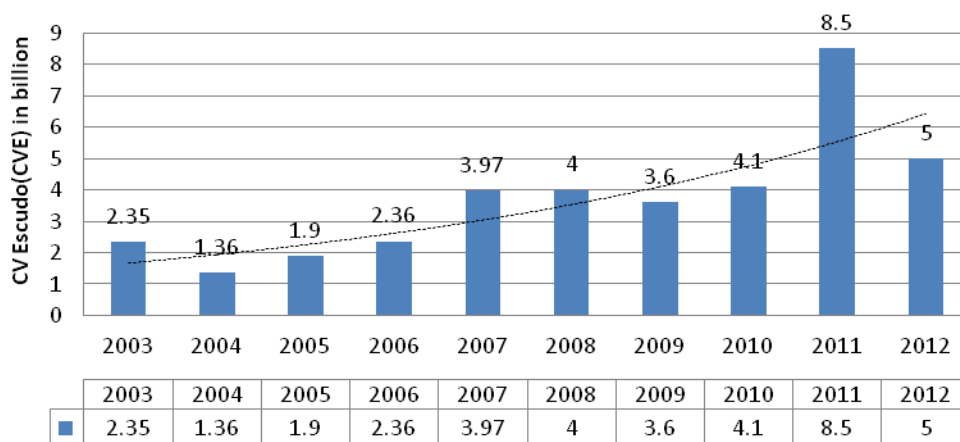


Figure 2: Sectoral Shares of Total Energy Consumed (2010)



Source: Analysis from DG Customs data

Figure 3: Diesel Oil Imports (2003-12)

The country has high renewable energy potential including solar energy, wind and biomass. The share of renewable in the energy mix has increased to 21% in 2012. The Government's National Energy Policy (2008) sets target to achieve 50% of its electricity through renewable sources by 2020. The country is now looking at an ambitious target of reaching 100% of its electricity from renewable<sup>12</sup>. Similarly under the Barbados Declaration, 2012 the Government of Cabo Verde has also established a target to increase energy efficiency by 30% by 2020.

<sup>12</sup> Cabo Verde: Country strategy paper 2014-18

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## Electricity Sector

The electricity consumption in the country has doubled in the last 10 years. In future, the installed power to produce electricity will increase from 155.8 MW in 2013 to 300 MW by 2020<sup>13</sup>. In 2012, energy consumption was reported 647 kWh per capita per annum and power prices at over \$0.40 per kWh, which are the highest in Africa, majorly due to high import fuel costs and high-energy thefts. Given that, Cabo Verde GDP is estimated to be \$3,900 per year by the World Bank at, which at \$ 330 per month, suggests that on an average, approximately 15-20% of an individual's income spent on energy costs, which is very high<sup>14</sup>. The cost of electricity is nearly 70% higher than that in the European Union. This implies that many inhabitants in Cabo Verde face fuel poverty situation. Growth rates from 2001-2010, shown in the table 1<sup>15</sup>, affirm that electricity production has increased by 94% with growth in demand escalating to 114% in the last decade.

Table 1: Energy Growth Rate (2001-10)<sup>16</sup>

Indicator	Growth rate
Electricity Production	+94%
Installed Capacity	+78%
Demand	+114%
GDP	+70%

As an archipelago, each island of Cabo Verde has its own local power station running on petroleum products and its own electrical grid. Table 2 <sup>17</sup>shows the multiple fold increase in fossil fuel consumption for electricity generation.

Products	Growth rate
Diesel	+180%
Fuel	+500%
Price Increase	Diesel (+122%) Fuel (+85%)

Table 2: Fossil Fuel Growth Rate for Electricity Generation (2001-10)

The electricity power system has reported high growth in the past, achieving coverage of 90 % of the country in 2010. Since early 90s, an important Rural Electrification Programme was implemented extending the electrical grid to the most remote rural areas. The coverage of the urban areas is almost 100%<sup>18</sup>. The National Electricity and Water Company (ELECTRA) <sup>19</sup>held by the government (85%) and municipalities (15%) is responsible for supplying electricity and desalinated water in the most parts of the country. In Boa Vista Island there is Aguas e Energia de Boa Vista (AEB) providing electricity and desalinated water to final consumers under a subcontractor agreement with ELECTRA.

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<sup>13</sup>Cabo Verde: country strategy paper 2014-2018

<sup>14</sup>Energy Policy of Cape Verde -2008

<sup>15</sup> IRENA Renewable and Islands Global Summit - Malta 2013 Eng. José Brito

<sup>16</sup> IRENA Renewable and Islands Global Summit - Malta 2013 Eng. José Brito

<sup>17</sup> IRENA Renewable and Islands Global Summit - Malta 2013 Eng. José Brito

<sup>18</sup>Cabo Verde: energy analysis and recommendation undertaken by UNIDO and ECREEE

<sup>19</sup> Cabo Verde electricity transmission network development project: African Development Fund

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Additionally, APP provides electricity to some resorts in Sal Island. APP/APN supply desalinated water in Sal and Santo Antão by the municipalities in Maio and Sao Nicolao and by ELECTRA in other islands. In addition, few companies like Cabo Eolica and Electric produce electricity from renewable energy (RE) (wind farms) and sell it to ELECTRA under a power purchase agreement (PPA). The electricity sales have registered an average annual increase of 3.6% during the last five years, having registered in the last two years an annual increase of about 4.9%.<sup>20</sup> This is the result of rural electrification programs and grid extension projects in urban areas. This is the result of rural electrification programs and grid extension projects in urban areas.

#### BOX 1: THE NATIONAL ELECTRICITY COMPANY (ELECTRA)

The National Electricity Company (ELECTRA) is a limited liability company (LLC) that holds monopoly over electricity transmission and distribution in Cabo Verde. It is also responsible for the production and distribution of drinking water in some municipalities. The state owns 77.74% of ELECTRA's share capital, the National Social Insurance Fund (INPSS) 16.59% and municipalities the remaining 5.67%.

##### **The Electricity Transmission and Distribution Network Development Project:**

The project financed by the African Development Fund (ADF), the Japan International Cooperation Agency (JICA) and the Government of Cabo Verde helped to upgrade power distribution networks to improve access to electricity, service efficiency and quality in Cape Verde. The project contributes to achieving the electricity sector development strategy, which seeks to raise power utility quality in Cabo Verde to international standards (network loss rate of between 5% and 10%, power outages of less than 100 min /year etc.). It contributes to improving the technical, commercial and financial performance of the National Electricity Company (ELECTRA).

The project concerns 492,000 inhabitants (or 94% of the total population) of Cabo Verde living on six of its islands. It contributes to increasing the overall rate of access to electricity from 88% in 2010 to 98% by 2018, and facilitates the electrification of some fifty localities in rural areas.

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<sup>20</sup>ELECTRA

## BOX 2: REINFORCEMENT OF ELECTRICITY PRODUCTION ON FOUR ISLANDS PROJECT

### Santo Antão, Fogo, São Nicolau and Boavista

The project is financed by the Government of the Kingdom of the Netherlands and the Government of the Republic of Cabo Verde. It consists of construction of new power plant on Santo Antão, Fogo and Sao Nicolau islands; and installation of power production equipment on all three islands in addition to Boavista; creating one integrated network on each island with a uniform distribution voltage of 20kV

- The project focuses on predominantly rural islands and pursues the following objectives:
- Improve efficiency and security of electricity supply
- Facilitate the access network connection to rural families
- Decommissioning of the existing power plant which are within residential areas causing noise and environmental pollution

Decommissioning of micro-power plants still operating in these island and reduce the cost of production

Cabo Verde makes the energy sector to account for 92.9% of CO<sub>2</sub> emissions by fossil fuel consumption, which is the main source of GHG emissions. In 2000, the transport sub-sector accounted for 44.5% of CO<sub>2</sub> emissions in the energy sector, remainder being divided between other sub-sectors of energy industries (31.4%) general industries (6.8%), other uses (10.2%) and land change use and forestry sector (7.1%)<sup>21</sup>. According to the world development indicators, CO<sub>2</sub> emissions in the country are 356 thousand metric tons in 2010 with nearly 300% rise between 1990-2010<sup>22</sup>. Emissions from consumption of fossil fuels has increased from 0.174 million metric tons of CO<sub>2</sub> in 2000 to 0.43 million metric tons in 2011 (with annual growth rate of 12.75 %)<sup>23</sup>.

Table 3: CO<sub>2</sub> Emissions in Cabo Verde

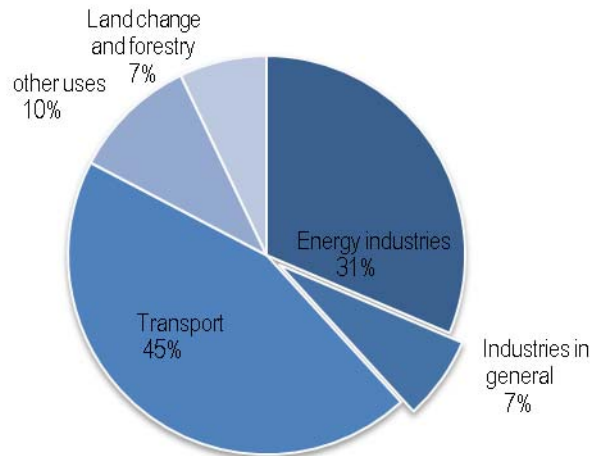
Sector	1995	2000	Fraction of Total (in 2000)	Change (1995-2000)
	kTon			%
Energy	217.52	284.95	92.9	31.0
Energy industries	62.10	96.22	31.4	54.9
Industries in general	21.12	20.80	6.8	-1.5
Transport	106.90	136.66	44.5	27.8
Other uses	27.40	31.27	10.2	14.1
Land change and forestry	57.08	21.84	7.1	-61.7
Total	522.12	591.74	100	11.7

Source: 2<sup>nd</sup> Communications –UNFCCC

<sup>21</sup>2<sup>nd</sup> Cabo Verde National communications to the UNFCCC

<sup>22</sup>2013: World development Indicators: Trends in Greenhouse gas emissions

<sup>23</sup>U.S. Energy Information Administration



Source : 2nd National Communications of Cabo Verde to the -UNFCCC

Figure 4: CO<sub>2</sub> Emissions in 2000(Fraction of total)

The country's energy plan for the next 10 years aims at mitigating GHG emissions, by achieving a renewable energy penetration rate of 25% by 2011, 50% by 2020 and 100% by 2030 and having at least one of the islands using 100% renewable sources of energy<sup>24</sup>. At the same time promoting energy conservation and efficiency in the energy sector; expanding electricity production capacity; single power plants; increasing efficiency production and distribution, improving storage capacity and grid improvement programs.

### 1.3 Barrier analysis

Energy efficiency has been identified by the Government of Cabo Verde as a key area in which important cost savings can be made, GHG emissions can be reduced, and also bring down the high cost of electricity. The National Action Plan for the Environment (PANAI) updated in 2010<sup>25</sup> mentions energy efficiency and renewable energy as important tools to promote sustainable development. There are a number of challenges to promote energy efficiency in buildings and appliances in the country. One of the key barriers is the lack of awareness among users, so they do not pull the market towards energy savings. This follows the dearth of information on potential savings with correct measures to achieve the same. Architects and builders have limited knowledge of bioclimatic building practices and materials in the country. The various ministries and institutions responsible for buildings have limited experience and capacity to implement appropriate framework. These barriers compounds through minimal public policies, institutional and regulatory mechanisms to promote energy efficiency in buildings and appliances. The proposed project aims to address legal and regulatory frameworks legislation and nationally coordinated policies in Cabo Verde to address the issue for energy efficiency in both buildings and appliances. Energy efficiency is economically very attractive, however it has seen a slow uptake due to a number of legal, regulatory, institutional, policy, financial, and awareness barriers. The project implementation will address following barriers in Cabo Verdean built environment.

<sup>24</sup>ECOWAS Initiative on energy efficiency in buildings –concept note (Draft), October 2013

<sup>25</sup>Cabo Verde government elaborated the Second National Environmental Action Plan (PANA II), which has a 10-year horizon (2004-2014). The Plan's general objective is to provide the country with a strategy that promotes a rational use of natural resources and a sustainable management of economic activities.



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## Legal and Regulatory Barriers

Cabo Verde- National Energy Policy, 2008 sets out objectives to decrease the over dependence of fossil fuel based energy sector. The policy aims for energy conservation, energy efficiency and strengthening of legal framework within the energy sector. The government has acknowledged the importance of reducing the dependence on imported fossil fuels. The country has recently made positive steps towards a supportive framework for renewable energy and has implemented support mechanisms such as allowing the private sector to operate through Independent Power Producers (IPPs), a licensing regime, a regulatory body (ARE) and clear responsibilities within the energy sector for policy, regulation and provision of energy. It has recently enacted the Decree-Law on the promotion and incentives for the use of renewable energy (DLn.1/2011, of 3<sup>rd</sup> of January)<sup>26</sup> that supports renewable energy development and incentivizes the development of this market in Cabo Verde. This decree-law establishes a conducive regulatory framework that will stimulate investment by both local and international investors into medium to large-scale renewable energy projects.

Currently, similar robust legal framework for energy efficiency buildings and appliances is limited; the proposed project implementation will support the development of an effective legislation, regulatory framework and implementation to strengthen the market for energy efficiency. Thus, the government of Cabo Verde needs to develop the enabling legal and regulatory framework for energy efficiency projects in the built environment.

- *Existing building code and building legislation:* For buildings, there is a building code as a legal regime for buildings (2011), there is also a technical code of buildings (2012), which contains few provisions on energy efficiency <sup>27</sup>. Respective municipalities control the local building regulations including construction permits, energy and efficiency of buildings etc.
- *Minimum Energy Performance Standard (MEPS):* There are no MEPS for buildings and no legally binding target. The proposed project will develop a new building code focused on energy savings and develop minimum energy performance standards. The project will support the development of new regulations for construction permits including robust enforcement mechanism.
- *ECOWAS Centre for renewable energy and energy efficiency (ECREEE Program), in Praia, Cabo Verde:* Under the ECOWAS program, an initiative has been taken for energy efficiency in buildings which aim at promoting reliable and affordable energy services, both in urban and in rural areas. The program builds upon various national activities and adds value to the challenges related to energy efficiency in buildings. The Governments of the ECOWAS region propose to address the challenges and barriers for market penetration of technologies through five thematic programmes: tailored policy frameworks and quality standards, facilitate capacity building, advocacy, awareness raising, knowledge management and networking, implementation of renewable energy programs, and implementation of energy efficiency programs.
- *Standard and labelling of appliances:* For efficient household appliances, any legislation or regulatory framework is non-existent, customs department checks the imports of specific items, and comply with tax structure, which is usually the same for most appliances. World Trade Organizations (WTO) regulations with requirements for inspection and testing of import items exists but have limited implementation due to lack of availability of framework and procedures.

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<sup>26</sup>UNDP – Project Document Cape Verde: SPWA-CC Promoting market based development of small to medium scale renewable energy systems in Cape Verde.

<sup>27</sup>ECOWAS Initiative on energy efficiency in Buildings Concept note- (Draft)

A new law or a regulatory decree for building sector and S&L program for imported appliances will be a stepping-stone towards a long-term commitment towards sustainability in the built environment. Cabo Verde has committed to the EU normative convergence process as part of the special partnership agreements and ECOWAS programs to support the promotion of energy efficiency in buildings.

BOX 3: EXISTING LEGISLATION AND REGULATIONS IN CABO VERDE – (RELATED TO ENERGY SECTOR)

**Decree-law nº14/2006, and Decree-Law nº54/99**, which establishes the bases for the electricity system in Cabo Verde and aims to promote national economic and social development; environmental preservation; ensuring a safe and reliable supply at a reasonable price (fair and not discriminatory); encourages the use of renewable resources. It promotes efficiency and technological innovation in generation, transmission, distribution and use of electricity in the country. Similarly Decree-law nº41/2006 was established to deal with electric energy crisis, the law also identifies the authorities in charge for managing energy crises.

**An Economic Regulatory Agency (ARE)** was created under the **Decree-Law nº 26/2003** is an independent administrative authority that regulates energy, water and wastewater, urban collective transports. ARE's main goal is to promote economic efficiency and maintain the financing balance within the sectors for which it is responsible for (energy, electricity and fuels, water and wastewater, urban collective transports and maritime collective transports).

**ECOWAS Treaty** : Cabo Verde is part of the ECOWAS Treaty - The Economic Community of West African States (ECOWAS) Treaty entered in 1975. ECOWAS Department of Energy is responsible within the ECOWAS Commission for providing the technical expertise in energy and for design and implementation of technical projects for the region decided by the ECOWAS President. The ECOWAS members are fifteen (15) West African countries including Cabo Verde. ECREEE leads the initiative as the institutional structure, under the political umbrella of ECOWAS.

The recently enacted decrees related to renewable energy are resulting in a robust package for legislation and incentives (for large independent producers) for developing renewable energy projects in the country. However, there is limited effort to coordinate and develop energy efficiency sector in conjunction with the renewable energy sector, as such, interventions would be appropriate and cost effective. The institutional capacity and competencies within the energy sector are limited, especially in relation to the formulation and implementation of policies as well as in regulations.

In Cabo Verde, the Government is making efforts to develop or establish an agency or institution to deal with energy efficiency in buildings and appliances along with new DSM programs. Currently, respective municipalities are responsible as regulatory bodies to oversee the construction activity in the country. Key institutions that will play a significant role in project implementation are:

- *General Directorate of Energy (DGE)*: The DGE will be responsible for promoting and implementing measures for energy savings and for developing new policies and legislation. The DGE currently assists Cabo Verde with meeting its obligations under the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol by promoting renewable energy policies and reporting on the sector GHG's emissions through the inventory system to support National Communications preparation.
- *ECOWAS Regional Centre for Renewable Energy and Energy Efficiency (ECREEE)* is a specialized agency, which acts as an independent body within the legal, administrative and financial framework of ECOWAS rules and regulations. The objective is to create framework conditions and an enabling

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environment for renewable energy markets by supporting activities directed to mitigate and reduce existing barriers.

- *Economic Regulatory Agency (ARE)*: The agency regulates energy, electricity and fuels, water and wastewater, urban collective transports and maritime collective transports, it provides economic efficiency and the financial balance of the regulated sectors to offer services of public interest and benefits for the society.
- *Municipalities - Technical Cabinets*: technical cabinets on each of the 22 municipalities of the country are currently responsible for land use planning, zoning enforcement and building permitting process on the land under their jurisdiction. They receive construction permit requests and their team reviews projects and evaluate against existing building regulations. However, not all municipalities currently have a structured technical cabinet, nor all of them have the financial resources to engage or maintain skilled and certified technical staff.

Development of a new law and regulatory decrees on energy efficiency in buildings will define the institutional responsibilities necessary to promote energy savings and nationally coordinated efforts for buildings and appliances through the project implementation.

### *Policy Barriers*

There is a need for a strong integrated energy efficiency policy or strategy by the government of Cabo Verde to guide activities, raise awareness and motivate investments specific to energy efficiency measures. Currently, there are only a few policies for the energy sector, which could also provide a framework for specific building and appliances related policies.

The government is in the process of developing a new policy strategy on energy demand-side to address the absence of a consistent legal and regulatory framework on energy efficiency for buildings and appliance. This strategy will establish the policy guidelines for implementation, especially in regards to electric installations certification, efficiency in all sectors of final energy consumptions, labeling of appliances and energy production in the consumption points (electricity micro-generation and solar thermal). The strategy proposed within this project will be developed in alignment with the main policy orientations already identified. This project encompasses the development of two priority axis identified within the new policy document being drafted.

Thus project implementation will support the development of policies conducive to market development, and will gain further support from the following existing policies and programs:

- *Cabo Verde National Energy Policy, 2008<sup>28</sup>*: The Council of Ministries approved Cabo Verde National Energy Policy in June 2008. The policy sets out the objectives for the energy sector and for the renewable energy sub-sector. The policy aims to promote energy conservation and energy efficiency within the energy sector, strengthen institutional capacity and regulatory framework providing a base to develop energy efficiency frameworks.
- *Second National Communications of Cabo Verde to the UNFCCC*: UNFCCC's second national communication provides information on GHG's emissions and capacity to mitigate them, vulnerability to

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<sup>28</sup>Cape Verde: energy analysis and recommendation - Undertaken by UNIDO and ECREEE

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climate change etc. The communications provide a framework for mitigation measures and programs, strategic adaptation actions, transfer of clean technologies at sector level.

- *ECOWAS Energy Efficiency Building (EEB)*: Regional framework document for energy efficiency in buildings (ECOWAS- EEB-guideline) is developed. This provides relevant basic requirements for energy efficiency in buildings under the building permits procedure, including criteria of tropical architecture and the link to urban planning, well arranged in one document, serving as a template for country-specific customization during the process of developing energy efficiency building code.
- *ECOWAS standards and labelling initiative (S&L)*: The ECOWAS S&L initiative will support department of energy efficiency policies, tools e.g. MEPS; design of an ECOWAS energy efficiency label; long term monitoring and verification of the effects of standards, and labels. The ECOWAS initiative requires a strong political commitment from the Government, and develops a holistic long-term approach along with broad stakeholder participation. The UNDP –GEF project could develop synergies with the proposed S&L initiatives.

### *Financial Barriers*

So far, Cabo Verde Government gives little attention towards developing funding opportunities and financial mechanism for energy efficiency in building. There is a lack of financial incentive for construction companies, individual households or public institutions to invest in energy efficiency. Developers and builders have little incentive to construct efficient buildings as the benefits largely accrue to the occupants, thus split incentives lead to low uptake by the developer community. In order to incentivise to build energy efficient buildings, developers could be granted an extra *Floor-Area Ratio* (FAR) or *Floor Space Index* (FSI)<sup>29</sup> allowance at no additional cost, increasing the value of their property. Revision of regulatory framework is necessary regarding duty relaxation, incentives and tax benefits. In addition, energy efficiency financing is not too lucrative for financial institutions due to uncertainty about returns. There is a lack of awareness among the financial stakeholders return on investments from project financing. There is a need for innovative financing schemes to promote energy efficiency in buildings.

For buildings, increased capital cost for adopting energy efficiency measures is a major deterrent with lack of financial incentives for building construction. For appliances high upfront cost of efficient appliances, lack of information on life cycle cost analysis and other financial barriers result in no demand for energy efficient appliances. Proposed GEF project implementation will explore financial incentives to encourage state sector organizations and intervention to raise awareness of financial institutions to invest in energy efficiency.

A state-owned company, IFH, builds social housing in the country. The largest social housing program ever undertook in the country, “*Kasa para todos*,” currently under implementation; it has been financed through a foreign concessional loan. The conditions under which the credit line was negotiated and the arrangements for the construction of the housing units (procurement restricted to donor country (Portugal) companies in consortia with Cabo Verdian firms and evaluated by technical and financial proposal (price by square meter for projects delivered as “turn-key” by the construction companies). This did not provide many incentives for developers to propose innovative energy efficiency measures neither the financial conditions negotiated with Portugal creditors. The affordability concerns for potential buyers (low income families) of the housing units did not positioned well the contracting authority (IFH) to include much specifications on energy efficiency

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<sup>29</sup> The FAR is a measure of the built-up floor area relative to the size of the plot it is built on.

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standards in tenders or award criteria. While Solar thermal, PV-powered public lighting, sustainable construction practices – such as structural masonry and stucco to reduce sand utilization, water saving appliances, grey water treatment and reutilization were introduced in a small scale in some of the developments, limited attention was given to bioclimatic architecture considerations or other energy efficient measures.

The large dependency of the state budget on custom taxes revenue hampers the implementation of some fiscal incentives through custom tax exemptions since decision-makers frequently perceive abatements as a risk to the state revenue.

### *Awareness and Knowledge Barriers*

There is a general lack of awareness among decision makers about the importance and economic benefits of implementing energy efficiency in buildings. There is no easily accessible information on energy efficiency like real life case studies; technology demonstrations and information, index of professional services and suppliers, financing information, information on professional experts to guide and support e.g. building owners or developers. There is lack of easily available sufficiently detailed statistics and energy performance information on buildings for comparison and benchmarking. Currently, there is a lack of incentive to integrate different building functions (planning, engineering, architecture, energy systems, use patterns and so on), even though the greatest efficiency gains require such integration.

There are few cultural and social barriers to awareness, e.g. the prevalent practice of self-construction (with no technical study or architectural project) that could be also illegal (not submitted to formal approval process, whether developed on legally owned land or not, this is the case especially in rural areas or slum areas). Potential of energy efficiency measures on housing and commercial projects is not communicated among general public and property owners. Moreover, consumers lack reliable information on energy performance of potential measures, technologies and appliances, cost of the different measures and equipment, as well as their potential savings.

Additionally, property management companies and public facilities managers lack awareness on the behaviour and management practices that increase energy waste. Building practitioners, especially architects and engineers have in many cases been trained abroad and are not familiar with architectural design and building construction practices and materials adapted to the climatic conditions prevailing in the country. Vocational training and university degrees taught in country currently does not support the introduction of energy efficiency measures since bioclimatic architecture, energy management and sustainable construction practices are not generally part of the taught curriculum.

The project implementation will launch government supported public awareness campaigns to outline the benefits of energy efficiency. This will require a comprehensive set of building solutions and incentives for innovation, awareness raising measures, proper standards and rating systems, and various forms of market suasion, such as energy pricing and tax incentives for relevant investments. These campaigns should also target raising awareness of potential savings with more energy efficiency appliances or currently incurred costs due to the use of inefficient appliances.

### *Inadequate data on building energy use*

There is limited information on the advantages and benefits of implementing energy savings measures in a cost effective manner. There is an absence of formal structured system like an energy management system (EMS) to collect and analyze baseline data. Efforts should be made to transfer and emulate best practices on EMS, such as the Croatian EMS model developed by UNDP that could be transferred and customized to

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Cabo Verde needs. Additionally, public institutions rarely monitor regular energy consumption on their building neither they use any specific guidelines for procurement of efficient appliances for their facilities.

DGE makes efforts in conducting sessions to train the technicians in energy auditing techniques and awareness raising methods. Launch of sensitization campaigns- like households' awareness on energy efficiency or inefficient bulbs' replacement program in partnership with professional association, non-profit organization and schools. The DGE in collaboration with a non-profit association have conducted energy audits in government-owned buildings at the request of the corresponding institutions. The ECOWAS-ECREEE program organized training programs to build capacity among professionals (architects, engineers, tradesmen, students etc.) of the sector.

The technical capacity and experience of local professional with required skills and expertise to carry out energy efficient architectural projects is limited. There is a strong need to conduct train the trainers programs and introduce training courses on energy efficiency in buildings at the national universities (University of Cabo Verde, Uni Piaget) and vocational training schools to build capacity for civil engineering and electricity installations.



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BOX 4: ON-GOING INITIATIVES: (ECOWAS – CONCEPT NOTE – ENERGY EFFICIENCY IN BUILDINGS)

- The DGE has been taking initiatives to increase the awareness and train technicians, decision makers and private sector partners for greater energy efficiency knowledge. Inefficient incandescent bulbs replacement campaign was undertaken between 2008 and 2009 with an output of 300,000 bulbs replaced across the archipelago. DGE developed some awareness and education materials (flyers and TV spots) and conducted door-by-door sensitization on energy installation security, appliances efficiency and energy saving behaviors.
- UNESCO and the Business School of New Technologies in Praia together launch environmental education and awareness campaign “Poupa” using comic strips, cartoons and theater pieces was launched with some pilot schools
- Between 2012 and 2013, DGE partnered with the local association for social service and community intervention (ASSIC) to conduct awareness campaigns on safe energy use and efficient behaviors. Those campaigns have reached over 5,000 families.
- Since 2012, DGE has conducted energy audits in some public buildings as a means to raise public officials’ awareness on the relevance and need to invest in energy efficient measures and renewable energies. Additionally, some technicians were trained on auditing techniques as a first step on promoting the development of a private auditing market.
- Seminars on energy efficiency in buildings have been organized by various entities to sensitize population. Additionally, the DGE participation on FIC (International Fair on Construction and Housing) since 2009 has provided a platform to discuss on bioclimatic issues with building sector stakeholders.
- The Jean Piaget University began to promote energy efficiency and renewable energy through an annual conference (on the World Energy day)
- UNDP, Uni-CV (public university) and OAC (Order of Architects in Cape Verde) is planning to organize an event focusing on bio-climatic architecture and on the presentation of existing examples in Cabo Verde.
- The Cabo Verdean Government created a Quality Management and Intellectual Property Institute (IGQPI) to promote competitiveness, as one of the construction sector’s quality initiative with focus on energy efficiency
- OAC and the Mindelo International School of Arts, M-EIA participated on a “sustainable architecture” European project (SURE- Africa: Sustainable Urban Renewal- energy efficient building for African countries) and contributed for a publication on *Sustainable Architecture in Cabo Verde: good practices manual*. Additionally, OAC has launched their first magazine on architecture in Cabo Verde (Arq & Urb–Cadernos OAC), with a special focus on sustainable construction and energy efficiency and through the National Architecture Award has been identifying and recognizing sustainable architecture examples throughout the country.

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## 1.4 Stakeholder Analysis

The following paragraphs sets out an analysis of stakeholder roles and attitudes towards increasing energy efficiency in buildings and appliances. There are a number of key stakeholders including government agencies, regional institutions, and private sector entities to ensure the success of the project.

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Box 5: Stakeholder Analysis

Stakeholder	Role
<b>Government</b>	
Directorate General for Energy (DGE)-(National Implementing Partner)	The DGE is the government agency responsible to elaborate and implement government policies in the field of industry, energy, mines, and geology. The DGE will act as the executing agency for this project and takes key responsibilities for monitoring, reporting, and verification of energy efficiency in buildings and for appliances. The Project Management Unit (PMU) will be located in the DGE. DGE will align this project strategy with broader Energy Demand Side Management policies proposed in the country. Role of DGE is to ensure timely implementation and delivery of project outputs. DGE is key body to undertake the baseline data analysis and advance the adoption, implementation and enforcement of the national regulatory framework for energy efficiency in main productive sectors.
Ministry of Tourism, Industry, and Energy (MTIE)	The MTIE is responsible for the development of government policies related to tourism, industry, and energy. The MTIE will play a key role in undertaking the baseline data analysis for the public buildings and for coordinating the work with ELECTRA, the national utility. MTIE will ensure that the project implementation logic contributes is aligned with the policy orientations of the Energy Sector Demand Side Management that is been drafted.
The General Directorate for Industry and Commerce (DGIC)	Under the DGIC liberalization of trade ECOWAS treaty region was developed. It provides coordination and harmonization of policies targeted to environmental protection. DGIC promotes the establishment of joint production enterprises within the ECOWAS member states. The ministry fosters local industry and is responsible to promote sector policies and regulations. DGIC will be a partner to promote new import regulations for appliances.
The General Directorate of Tourism (DGT)	The DGT is responsible for recognizing the tourism sector and develop strategies for the economic development of Cape Verde. The DGT has developed a public private partnership (PPP) model strategy for sustainable tourism in Cabo Verde (2010-2015). The DGT is responsible for the growth of new hotels and resorts in the country. DGT's role is to



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**Box 5: Stakeholder Analysis**

Stakeholder	Role
	support audits for tourism buildings and develop baseline for existing buildings. The DGT will help in pilot project identification and will support dissemination of lessons learned and best practices demonstrated within this project among tourist sector operators and investors.
Directorate General of Environment (DGA)	DGA is responsible for coordination with other agencies with respect to all matters pertaining to environment and for managing EIA. DGA is responsible for the national environmental education program and the environmental information system (SIA). It will collaborate in project implementation, especially on the design of outreach campaigns with environmental education programs. It will be a partner as well on integrating energy efficiency considerations on the construction project EIA (environmental impact assessment) and will be responsible for integrating the project in a broader low emission and climate resilient national strategy.
Institute of Meteorology and Geophysics (INMG)	The INMG is a National Institute under the Ministry of the Environment Housing and Land Use Planning (MAHOT), responsible for promoting coordination and implementation of government policy measures and actions in the fields of Meteorology and Geophysics. As the designated authority and focal point of Cabo Verde for the UNFCCC, INMG will collaborate on the implementation of all MRV measures to quantify GHG emissions offsets and to implement energy information system related initiatives.
DG Customs- Ministry of Finance and Planning	Customs control the import and inspection of all goods coming into the country and will have a key role to play in enforcing the energy efficiency standards and labelling program for appliances. They will collaborate on the design and implementation of appliances import regulations and standards. In general, they will facilitate implementation of component 2 of the project.
DGI – General Directorate of Infrastructure	<p>DGI is the central agency responsible for the execution of civil construction and public works policy, including industrial infrastructure, economic and social, hydraulic works and public buildings.</p> <p>DGI will be an important partner in obligation and incorporation of energy efficiency as the main criterion in all public buildings.</p>
<b>Municipality</b>	
National Municipality Association	The National Municipality Association (ANMCV) includes all major cities and municipalities in the country and mandates to represent their

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**Box 5: Stakeholder Analysis**

Stakeholder	Role
(ANMCV)	interests. According to the legal statutes creating the association, the ANMCV has the mission to promote, advocate, represent local authorities and support them in assuming their jurisdiction and reinforcing their financial autonomy. ANMCV could support capacity development activities targeting municipal authorities. Additionally, ANMCV support will be valuable in designing awareness raising and reinforcement activities for municipal decision-makers, planners and technical staff involved on the permitting process. .
Municipalities	Cabo Verde counts with 22 municipalities across the 9 inhabited islands. Within the municipalities, the technical cabinets are responsible for land-use planning, zoning enforcement and building permitting approval in their jurisdiction. The Municipal Charter and the Decentralization Act (Law nº 69/VII/2010, of 16th August) determines the main responsibilities to municipalities. Responsibilities over land-use & urban planning, social action and interventions, civil protection and municipal police, culture promotion, transportation water, public health, sports and social equipment/facilities, environment and sanitation, housing, education, internal commerce, employment and economic development and entrepreneurship promotion sectors have been partially assumed by municipalities. In regards to energy, according to the existing regulatory framework, municipalities have competences over rural electrification and public lighting. However, rural electrification programs have been implemented mainly by state institutions
IGQPI-Management Quality and Intellectual Property Institute	IGQPI is responsible to coordinate the national quality management system. It promotes and coordinates activities targeted to demonstrate the credibility of economic agents, as well as develop functions as the national metrology lab. IGQ is responsible for coordination of all normalization and standardization processes, metrology and conformity assessment. IGQ is responsible for recognizing and qualify as Sector Normalization Organism the public or private entities on which IGQ will delegate technical normalization on specific activity sectors. ICQ will be relevant partner on capacity development activities and other initiatives to implement S&L for appliances and establish testing procedures.
National Institute on Land Management( under installation after Decree creation in April 2014) , The INGT	INGT is responsible to develop and implement policies in land-use planning and management, urban development, cadastre, housing, cartography, geodesy, toponimia, and Spatial Data Infrastructure. It will integrate and cover the responsibilities of the old DGOTDU and Housing policies cabinet.
Cabinet on support of housing	DGOTDU is the government unit responsible for land-use planning

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**Box 5: Stakeholder Analysis**

Stakeholder	Role
policies & Directorate General of Land-use planning and urbanization (DGOTDU) –  Ministry of Environment, Housing and Land-use planning	<p>policies. The Directorate assumes the responsibilities over study, promotion, coordination and execution on land management policies and urbanism. Promotion of land-use guidelines, support, review and clearance of island-wide and municipal level land-use plans are under its responsibility.</p> <p>In collaboration with municipalities, and IFH, the cabinet on housing policies support and is responsible for the promotion of requalification, rehabilitation of housing units and promotion of urban renewal initiatives.</p> <p>DGOTDU and Housing policies cabinet will support detail identification and selection of demonstration projects on social housing programs. They are also expected to support initiatives of sustainable urban planning and promotion of energy efficiency considerations on zoning and neighbourhood detail planning</p>

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**Electricity Sector Bodies**

ELECTRA	<p>Electra is a limited company that produces and distributes electricity across the territory of Cabo Verde, with a current rate of 75% coverage, as well as the production and distribution of drinking water in S. Vicente, Sal and in Praia on Santiago with a coverage rate of 50%, and the collection, treatment and reuse of wastewater in Praia. ELECTRA, as the major utility collaborates on the design of inefficient appliances replacement and its financial mechanisms. Additionally, it will support awareness raising activities.</p>
AEB - Aguas e Energia de Boavista	<p>AEB, under a subcontractor agreement with ELECTRA is responsible as a utility running water and electricity production and distribution services in Boavista island. It will collaborate on the design of inefficient appliances replacement and its financial mechanisms. In addition, it will also support awareness raising activities.</p>
APP/APN	<p>Aguas de Ponta Preta/ Aguas de Porto-Novo are the partner companies responsible for water production in Sal and Santo Antão Island. Additionally, they produce and sell electricity to some resorts in Sal islands and they have partnered with the Porto-Novo Municipality ( in Santo Antão island) for a RE-based small grid in a remote rural community (Tarrafal de Monte Trigo)</p>
Economic Regulatory Agency (ARE)	<p>An Economic Regulatory Agency (ARE) was created under the Decree-Law nº 26/2003, is an independent administrative authority that regulates the water, energy, transport sectors. Multi-sectoral agency</p>

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**Box 5: Stakeholder Analysis**

Stakeholder	Role
	sets regulations for energy and water sector, transportation. ARE gives technical support and advisory to the government and its collaboration will be essential to device incentives schemas and awareness raising campaigns.
Other Organizations	
Regional Centre for Renewable Energy and EE (ECREEE)	<p>Provide relevant guidance on ECOWAS rules and regulation to ensure that regulatory framework and policies are in line with regional and international guidelines.</p> <p>Synergies with ECREEE will be promoted for demonstration projects selection and implementation, awareness raising. Collaboration with ECREEE is essential to ensure S&amp;L and testing procedures proposed are in line with ECOWAS-region orientation and regulations.</p> <p>Additionally, synergies will be developed with the regional initiative for Energy efficiency in buildings, as well as in regards to the solar-thermal regional project which implementation is planned to start in 2015</p>
OAC- Architects Order	A professional association, the Chamber of Architects represents the sector practitioner's interest and is responsible for licensing the professional to work in the country. They will be a key partner on all technical discussion to propose a new energy efficient building code and building permitting process review, which are appropriate to the country climate and reality. They are expected to partner as well on all capacity development initiatives, dissemination of best practices and sector practitioners awareness raising.
OEC (Engineers Order)	A professional association, the Chamber of Engineers represents the sector practitioner's interest. Thermal, industrial and civil engineers are member of this order. They should participate on the process to prepare new building codes and the definition of compliance mechanism. They will be associated with all the activities related to curriculum development and capacity building.
Universities and vocational training schools/IEFP	The different public (UniCv) and private universities across the country have established (1) Architecture and several Engineering schools to locally train professional on this areas. National Employment and vocational training Institute (IEFP) is responsible for management of a national system of vocational training schools. Some professional families, linked to electricity and construction sector have been developed through professional training programs. Universities and

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**Box 5: Stakeholder Analysis**

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Stakeholder	Role
	training centres are expected to participate on curriculum revision initiatives and to collaborate for delivering new training and raising awareness among practitioners.
Luxembourg Development Agency -(LUXDEV)	LUXDEV oversees the bilateral development programs in the country and ensures the overall operational coordination. Currently, the agency is supporting the implementation of the project -“Support to the national employment and vocational training programme”; moreover, the project supported capacity building to enhance the needed skills for the day-to-day management of the institutions and the drafting of new curricula for new courses.
The European Union (EU) -	The European Union has created SE4All Technical Assistance Facility to support Cabo Verde and other developing countries, which are committed to reach the SE4All objectives through appropriate sector reforms and scaling up of investment in the energy sector. Examples of areas of support include national energy sector policies and reforms, capacity building particularly in the policy and regulatory areas, technical support in preparation of investment projects, mobilization of funds and facilitation of partnerships, industrial and technology cooperation, and project demonstrations.
IFH (Housing Development Institute)	<p>IFH is a public real estate and housing corporation established in 1999. A social and public housing real estate developer, IFH address the Cabo Verde housing deficit as well as upgrading existing housing stock. IFH is responsible for affordable housing development and social housing management, public land urbanization and servicing projects. It estimates that housing deficit in the country is at around 42,000 dwellings in 2010. In 2009, the government launched a new housing policy: a national social housing system, which was established as the new legal framework to attract investments in public housing by minimizing housing and infrastructure cost and promote housing developments and public housing programs management efficiency.</p> <p>IFH is responsible for the implementation of the public housing program “Kasa Para todos. This program contemplated the delivery of the construction of three classes of accommodation: economic, social and controlled costs, in addition to the rehabilitation of social housing in several municipalities in the country to citizens as housing units to buy, to rent or resolvable rent and sale contracts. With about 1,460 buildings constructed (economic, cost controlled and social housing), 1,450 rehabilitated housing and management of state assets of about 390 properties, the IFH has assumed responsibility with its function of</p>

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**Box 5: Stakeholder Analysis**

Stakeholder	Role
	promoting and structuring of urban space in the country
Chamber of Commerce Industries and Services Sotavento (CCISS) and the Chamber Commerce, Industry and Services Barlovento (CCIsB)	The Chambers of Commerce Industries and Services (CCISS) are organizations of private law public utility. CCISS was established in 1995, to influence the public policies of promotion and corporate citizenship through corporate social responsibility. Chambers of commerce have been delegated the authority to manage commerce, import and export licensing system. The Chamber of commerce will support awareness rising among importers and retailers to achieve market transformation.
Civil Engineering Laboratory Cabo Verde (LEC) - Ministry of Infrastructure and Maritime Economy	The LEC aims to undertake, promote and coordinate scientific research, technological development, and activities necessary for the progress and good practice of civil engineering. The relevant duties of the LEC include conducting studies in the field of standards and technical regulations, testing thermal properties of construction materials and providing quality certification of materials, components and other construction products
Private Sector Partner/(s)	Various Private sector partners will play a key role in the co-financing of project activities and replicating best practices This includes commercial and industrial associations, industrial/commercial enterprises/business groups, construction companies, oil companies/gas companies/production and distribution companies of conventional and renewable energy. Private sector partners may include participation and contribution in increasing energy efficiency in the building sector. They will contribute to technology transfer related to low emission climate resilient development strategy; participate in the evaluation of GHG emissions in industry and GHG mitigation.
Civil society, consumer associations (ADECO) , association for social service and community intervention (ASSIC); and community organizations	Some local associations, such as the above mentioned ASSIC has been involved in community awareness campaigns on energy use safety and energy efficiency. Other environmental NGOs, such as ADAD have advocated for other environmental causes, such as plastic bags banning. Consumer association ADECO, and all relevant associations and NGOs would be partners to develop and implement awareness raising campaigns. ADECO will be an important partner in developing a national S&L system for appliances.
Media (Community radios, National TV and private radios and press)	Media sector is large and diverse in Cabo Verde. Public TVs, community and state radios, private newspapers and radios have most of them developed some type of scientific and educational programs or special editions, journalist to participate in trainings and awareness raising

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Box 5: Stakeholder Analysis

Stakeholder	Role
	campaign. Their insights on public opinion in the country will be relevant to target well the messages on the communications and educational materials and to ensure dissemination of best practices and results achieved through this project

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## 1.5 Baseline analysis

### *Domestic Appliances: Baseline*

International experience suggests that 30% of savings in energy consumption in the domestic sector with market transformation of energy efficient electrical appliances. S&L programme could pave the way to Minimum Energy Performance Standards (MEPS) for domestic appliances sector and contribute to a significant reduction in the electricity consumption and corresponding GHG emissions.

Cabo Verde's energy demand is growing at a faster rate (114%) than its production capacity (94%) in the last decade. This will continue with increasing population and expanding economy. This will stimulate demand growth for electrical domestic appliances as well. The application of S&L in Cabo Verde will support in reduction of energy demand and deal with high growth rate of energy consumption. Figure 5, below elaborates the typical energy use in residential sector through appliances. Energy efficiency programmes such as S&L for the domestic sector have a long and proven history, with the generation of substantial energy savings in many countries.

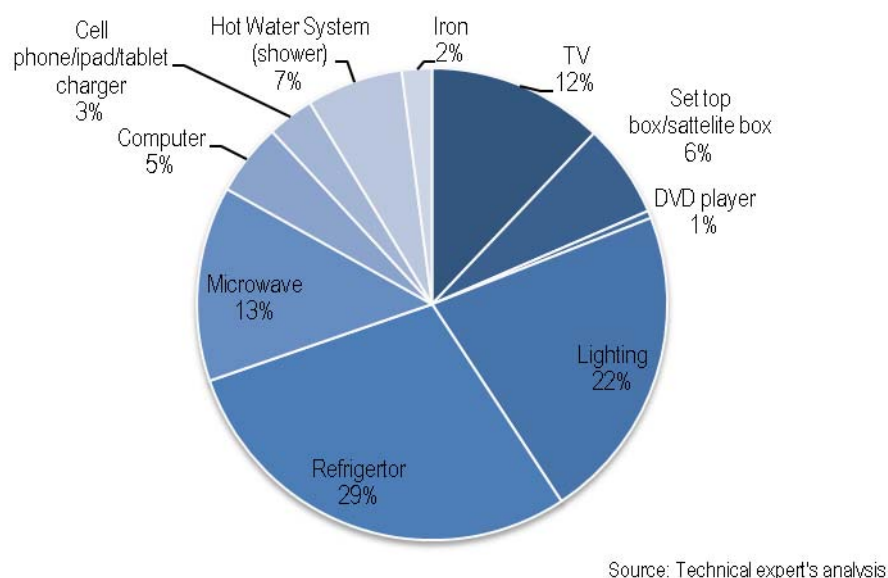


Figure 5: Typical Residential Energy Use (kWh/yr)

Data collected by the General Directorate of Energy local team form the basis for developing the baseline and represents the current end use of appliances in a typical middle-income household. The data obtained from the Directorate General Customs (DGC) shows the gross import values, weights, and the country of origin of appliances imported. With handful of local manufactures, most appliances in the country are imported. Figure below represents imports from the country of origin. Most of products are imported from European countries with major share from Portugal, followed by the Netherlands and Spain.



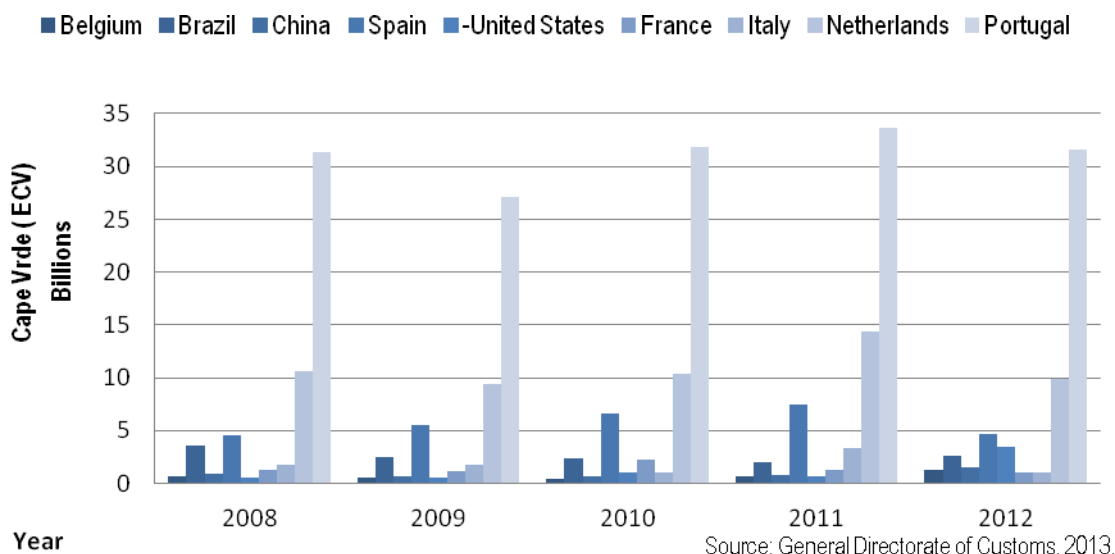


Figure 6: Appliances Imports by Country of Origin (2008-12)

### Baseline Energy use

From the list of imported products, five appliances are selected for the initial standards and labelling program: air conditioners, refrigerators and freezers, electric water heaters, televisions and bulbs. The selection was based on the annual energy saving potential of the equipment, based on their hours of usage per year, annual energy consumption, and projected growth in future demand as the basis.

Table 4: Energy Consumption per appliance estimate

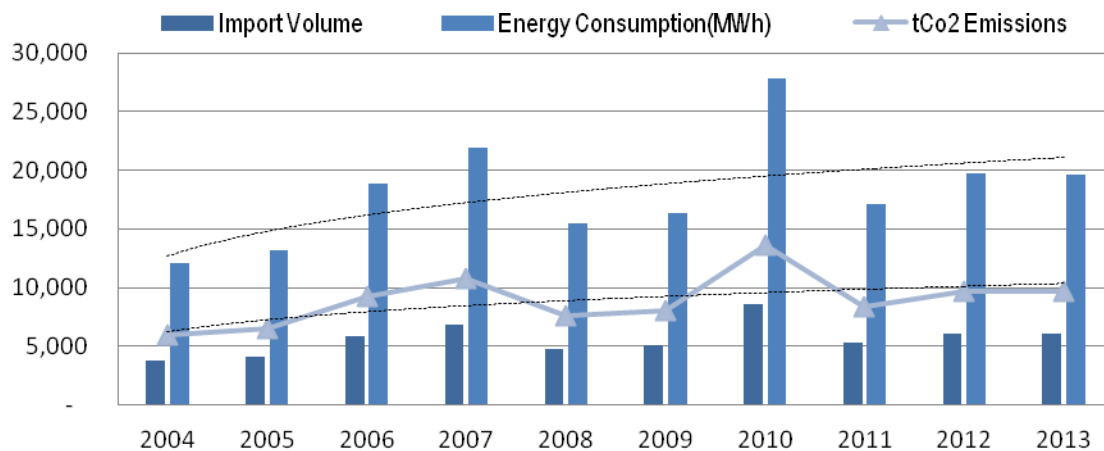
Product	Average Energy Use (Watts/hr)	Daily Usage (Hours/Day)	Annual Usage (Days/yr)	Usage by single unit per annum (kWh/yr)
Air Conditioners	3,000	4	269	3,228
Refrigerators & Freezers	200	24	365	1,752
Electric Water Heaters	1,500	1	365	548
Televisions	120	6	365	263
Light Bulbs	60	4	365	88

Source: Survey Data: Manufacturers and Importers

The baseline situation for each of the selected product is summarized in the following sections, including information about the sales volume and usage of appliances. Some statistical information used for the projection is based on a survey conducted by national team and information provided by the DG Customs. Currently, there are no energy performance standards for appliances and no law to mandate import of energy efficiency appliances. The proposed project will focus on introducing a national framework and new legislation for standards and labels for appliances. Specifically, the project will focus on introducing a system for labelling of appliances sold in Cabo Verde. This will be combined with adopting regulations for MEPS for the selected appliances as well as developing national certification procedures for them.

## a. Air Conditioners

Data collected for air conditioners shows a gradual growth trend in the import volume over the last decade<sup>30</sup>. The volume of import almost doubled from 3,734 units to 6081 units between 2004 -13, with an average air conditioner unitary energy consumption of 3,228 kWh/yr (table 4). Baseline projections assume same unitary energy consumption without this project implementation for next decade with same annual growth of 6.3% per annum. In 2010, as per the national institutes of statistics, nearly 2.4% of households are in the ownership of air conditioners. Figure 7, depicts the import volume of air conditioners from 2004-13, its corresponding energy consumption and CO<sub>2</sub> emissions with respect to the import in that year. OLG, Norm, Fairline, Orima and WestPoint are few of the popular brands imported in the country.



Source: Analysis from DG Customs data-2013

Figure 7: Air Conditioner (Baseline): Import Volume, Energy Use and tCO<sub>2</sub> Emissions

## b. Refrigerators and Freezers

As per the National Institute of Statistics (INE), 2010 nearly 59% of households own refrigerators and 10.4% own freezers. Import volume of refrigerators is increasing with an annual growth rate of nearly 4%<sup>31</sup>. The baseline projection assumes no improvement in efficiency of the product in the absence of this project. Figure 8, elaborates the import volume with corresponding energy use and CO<sub>2</sub> emissions in that year. Tropicool and OLG are the highest selling brands in the country followed by Samsung, West point, Radiso, whirlpool, and others.

<sup>30</sup> Assumed that the total sales volume is equal to the total import volume of the respective year

<sup>31</sup> Analysis from DG Customs data of import volume of refrigerators (2002-2012), Annexure C

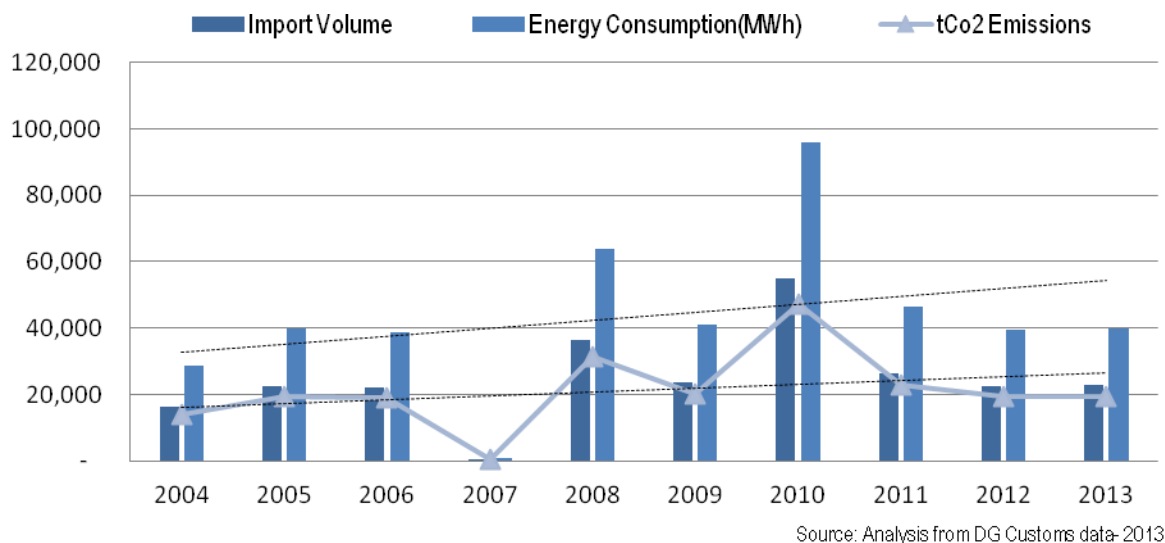


Figure 8: Refrigerators and Freezers (Baseline) - Import Volume, Energy Use, and tCO<sub>2</sub> Emissions

### c. Electric Water Heaters

Import volume of electric water heaters increased at the rate of 5.5% per annum over the last ten years<sup>32</sup>. The import units have increase from 6,216 to 9,640 units in the country from 2004 to 2013. The unitary energy consumption of water heaters is 547.5 kWh/yr (table 4)<sup>33</sup>. Figure five, shows the import units with energy use and corresponding CO<sub>2</sub> emissions.

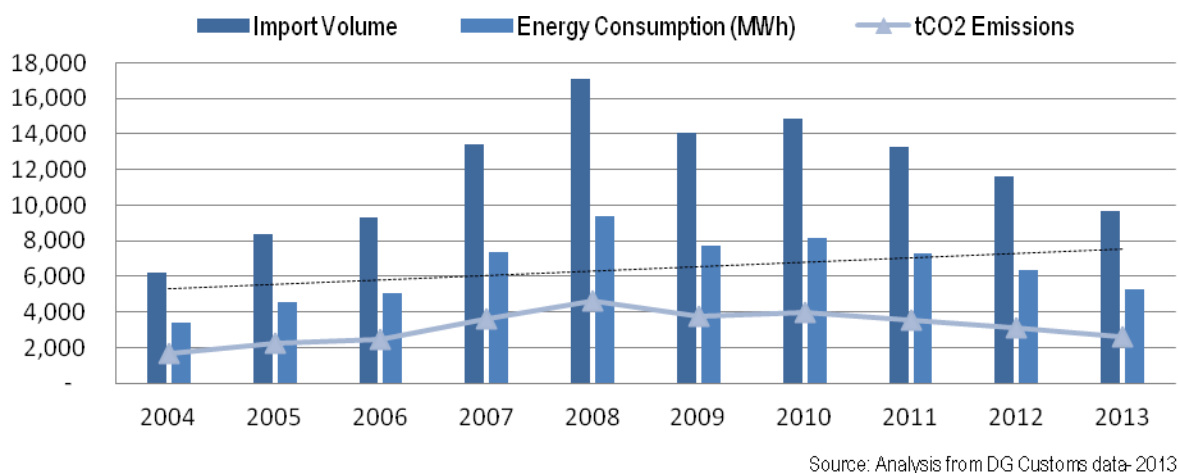


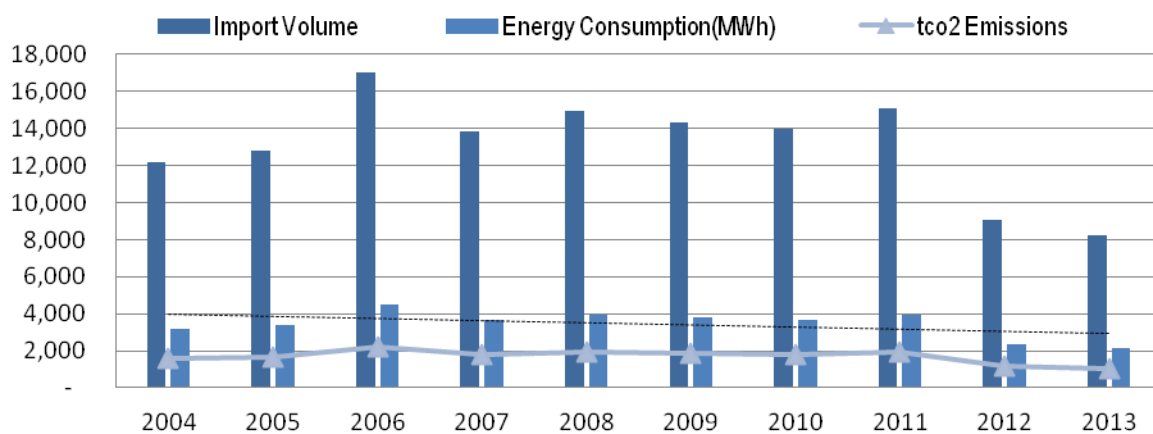
Figure 9: Electric Water Heaters (Baseline) - Import Volume, Energy Use, and tCO<sub>2</sub>emissions

<sup>32</sup>Analysis from DG Customs data of import volume of refrigerators (2002-2012), Annexure C

<sup>33</sup> Analysis from DG Customs data of import volume of refrigerators (2002-2012), Annexure C

#### d. Televisions

Nearly 74% of the country's households own televisions<sup>34</sup>. Most of the televisions are imported, however due to increase in domestic manufacturing of the televisions; there is a gradual decline in the import volume over the years. The average annual energy consumption of a typical TV is about 262 kWh/yr (table 4)<sup>35</sup>. Samsung, OLG are the highest selling televisions brands in the country followed by Crown, Sharp, and Grundig<sup>36</sup>.

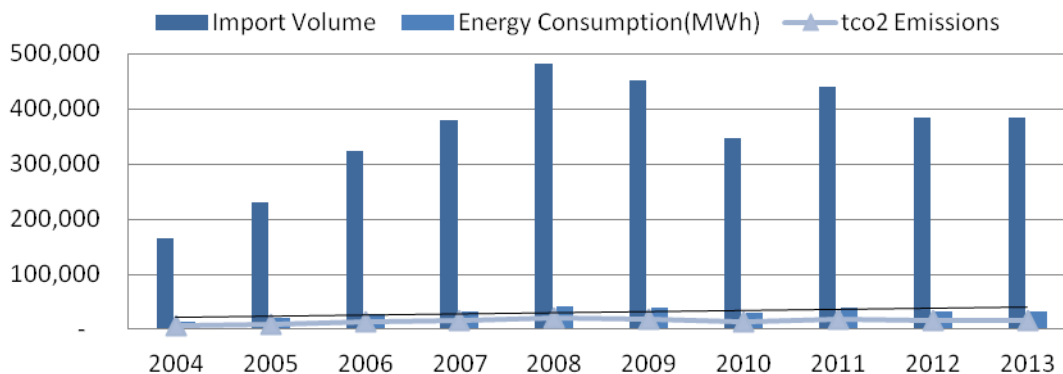


Source: Analysis from DG Customs data-2013

Figure 10: Televisions (Baseline): Import Volume, Energy Use and tCO<sub>2</sub> emissions

#### e. Light Bulbs

Light bulbs are imported in huge quantity in the country with an annual growth rate of 1.1% per annum<sup>37</sup>. Total units imported into the country increased from 164,500 units to 384,613 units between 2004 and 2013. Average energy consumption for each light bulb is approximately to be 87 kWh/yr (table 4).



Source: Analysis from DG Customs data-2013

Figure 11: Bulbs (Baseline): Import Volume, Energy Use and tCO<sub>2</sub> emissions

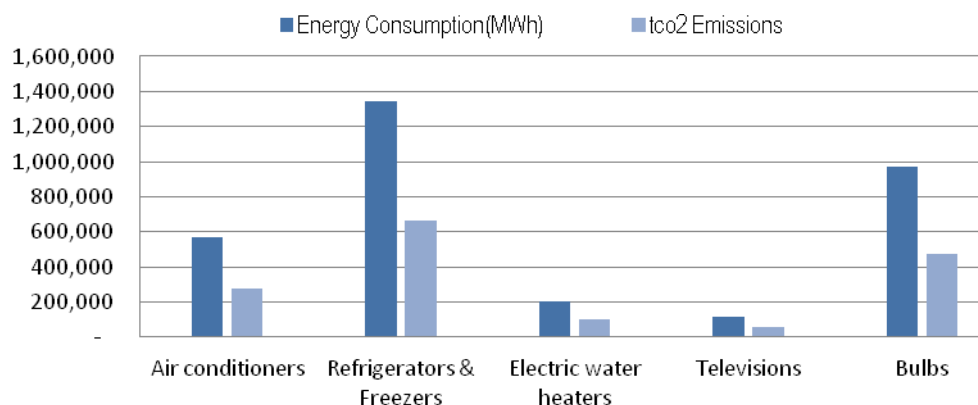
<sup>34</sup> National Institute of statistics (2010)

<sup>35</sup> Analysis from DG Customs data of import volume of refrigerators (2002-2012), Annexure C

<sup>36</sup> Data collected from survey

<sup>37</sup> Analysis from DG Customs data of import volume of refrigerators (2002-2012), Annexure C

The selected appliances (refrigerators & freezers, air-conditioners, televisions, bulbs, electric water heaters) have contributed significantly to the energy consumption of the country in the past decade. The growth in the import volume of these appliances clearly shows the increasing demand of these appliances. Figure 12 elaborates the cumulative energy consumption<sup>38</sup> of the appliances by each category from 2004-13. Refrigerators and freezer, and bulbs have significantly contributed to the energy consumption and GHG emissions as compared to other appliances. The combination of growing population, and a stable economy, and improving affordability will increase the demand for appliances such as air conditioners, water heaters etc. Average energy consumption of a single unit of a typical appliances imported in the country is shown in Table 4<sup>39</sup>.



Source: Analysis from DG Customs data-2013

Figure 12: Cumulative Energy Consumption by Appliances (2004-13)

Table 5: Cumulative Energy Consumptions and by Appliance Category (2004-13)

Appliances	Energy Consumption (MWh) - Cumulative	CO <sub>2</sub> Emissions (tons) - Cumulative
Air Conditioners	566,763	277,886
Refrigerators and Freezers	1,347,133	660,504
Electric Water Heaters	204,231	100,135
Televisions	116,068	56,908
Light Bulbs	9,676,610	474,423

Source: Analysis from DG Customs data-2013

Based on the import volume of each appliance in a given year, total energy consumption and CO<sub>2</sub> emissions were calculated (emission factor: 0.00049 tCO<sub>2</sub>/ kWh). Cumulative energy consumption was calculated while assuming that 20% of the appliances from the previous year are replaced or not contributing to the energy consumption. Table 5 and Figure 12, depicts annual cumulative energy consumption from all the appliances put together. Figure 13 shows the cumulative energy consumption growth of all the appliances and elaborates an exponential growth both in energy consumption and in CO<sub>2</sub>emissions.

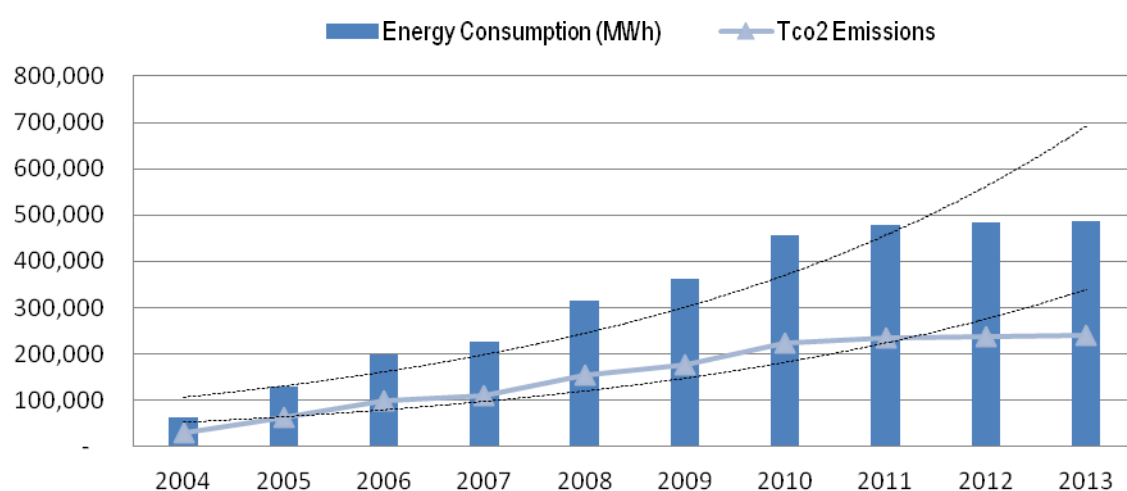
<sup>38</sup>For cumulative energy consumption it is assumed that 20% of the appliances are replaced from the previous year stock.

<sup>39</sup> Data provided by Directorate General of Customs and standards from CLASP

Table 6: Total Cumulative Energy Consumption in each year (2004-13)

Year	Energy Consumption (MWh)	CO <sub>2</sub> Emissions (tons)
2004	61,843	30,322.11
2005	130,543	64,005.69
2006	199,913	98,018.17
2007	227,113	111,354.43
2008	316,224	155,045.82
2009	361,629	177,308.08
2010	455,347	223,258.58
2011	477,527	234,133.26
2012	483,856	237,236.39
2013	487,811	239,175.54

Source: Analysis based on DG Customs data -2013



Source: Analysis based on DG Customs data-2013

Figure 13: Annual Energy Consumption (MWh) – Cumulative

### *Appliances: Business as Usual (BAU) Scenario vs. Alternative Scenario*

Most of the appliances stock in the country is inefficient. The selected appliances have significant energy efficiency potential that can be harnessed without compromising the quality and performance of the service they provide. Through the UNDP-GEF project intervention, the government will be able to support the market transformation by introducing mandatory energy efficiency standards. There are several legal, institutional, technical, policy, and financial barriers to mainstreaming energy efficiency appliances in the country. The project implementation will result in development of MEPS as well as a comparative labelling program. There are no laboratories for testing appliances and there is no mechanism for regulating, monitoring, labeling, or certification of appliances imported or sold in the country. In the BAU scenario it is clear that GHG emission and energy consumption of appliances will continue to rise (refer figure 14).

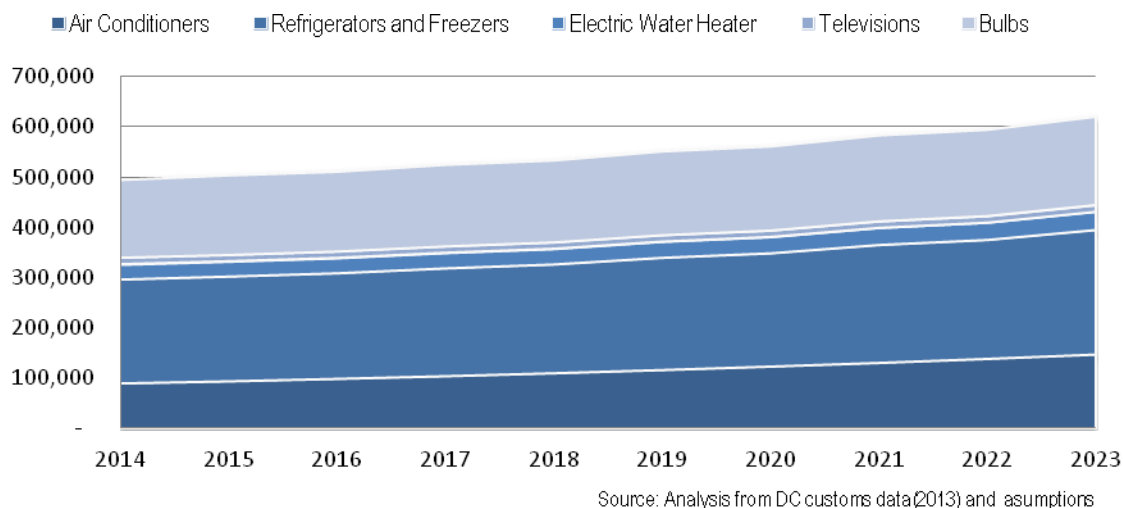


Figure 14: Business as Usual – Total Energy Consumption by Appliances

### Alternative Scenario

Under the alternative scenario, MEPS will be proposed along with comparative labels as a result of GEF project intervention and implementation and this is expected to lead to energy savings of nearly 1.6 million MWh of energy by 2025(table 7). In addition, because of increased marketing and awareness activities energy efficiency becomes a priority consideration in consumer's decisions in the purchase of new equipment. With GEF project implementation, energy efficient refrigerators, air conditioners, and water heaters, televisions and lighting products will meet the new quality, environmental and energy performance standards and are diffused widely on the national market. Projections in alternative scenario from 2015-25 resulting in substantial energy savings (table 7).

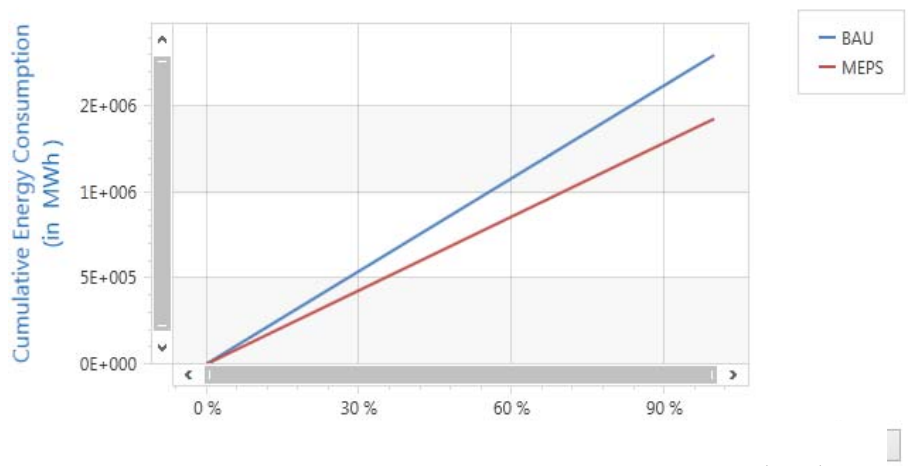
Table 7: Scenario 1: MEPS Labels – Energy Savings (MWh), GHG Abatement Potential (ktCO<sub>2e</sub>)

Product	Base Case (Watts)	Alternative Scenario(watts) - MEPS	Cumulative stock until 2025	Cumulative energy savings (MWh)	GHG abatement potential (KtCO <sub>2e</sub> )
Air Conditioners	2100-3000	1500- 2550	656,365	370,910	200
Refrigerators &Freezers	140-200	90-170	2,208,543	773,824	300
Electric Water Heaters	1050-1500	800-1425	881,364	52,273	100
Televisions	90-120	50-90	539,889	41,380	0.0
Bulbs	40-60	15-40	12,616,297	414,419	200
Total Savings				1,652,806	800 (approx.)

Source: DG Custom's data and MEPS projections

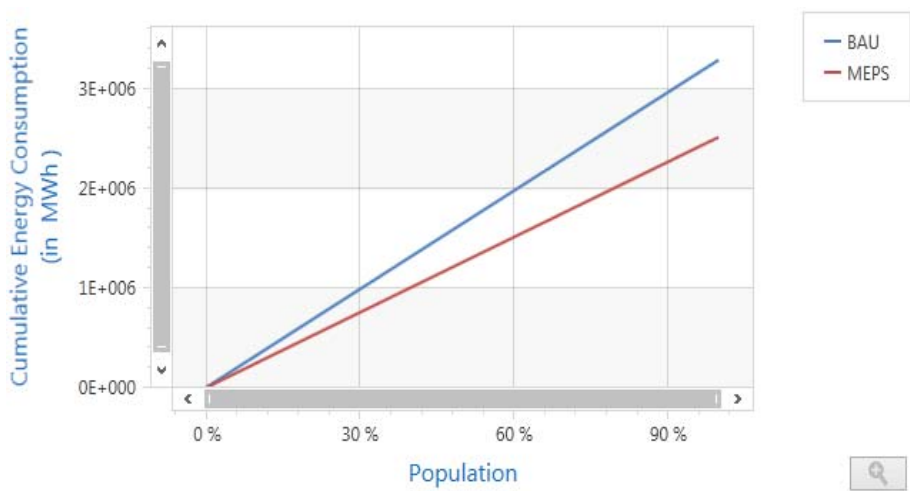
From Table 7, it is observed that total cumulative savings from implementation of MEPS for appliances will result in savings of 1.65 million MWh of energy with corresponding GHG abatement potential of 800 ktCO<sub>2</sub>equivalent (2015-25). Following figures show cumulative energy consumption in BAU and MEPS scenarios corresponding to the population (%) having access to the each selected appliance. The BAU projections show the cumulative energy consumption (MWh) with respect to population access or market penetration of each appliance. The MEPS projection shows the reduction in cumulative energy consumption

with similar market access as that of BAU scenario (PPAT tool)<sup>40</sup>. This is the result of minimum energy performance standards, which is introduced because of the GEF project implementation.



Source: Analysis based on Product Policy Analysis Tool (PPAT)

Figure 15: Air Conditioners – BAUv/s MEPS scenario

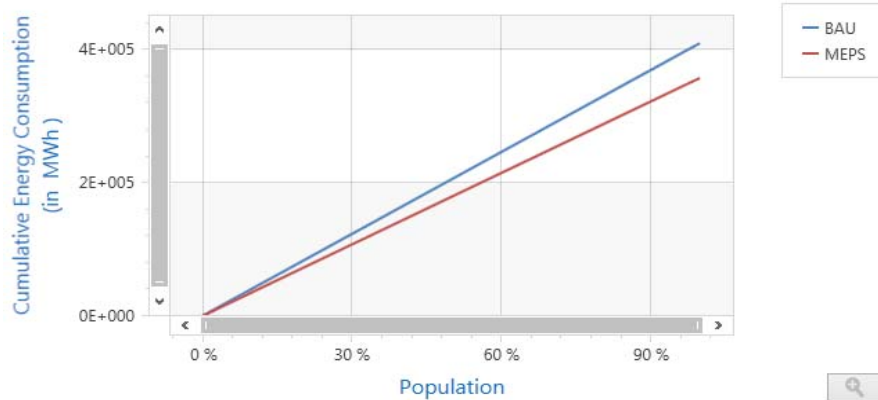


Source: Analysis based on Product Policy Analysis Tool (PPAT)

Figure 16: Refrigerators and Freezers: BAU v/s MEPS Scenario

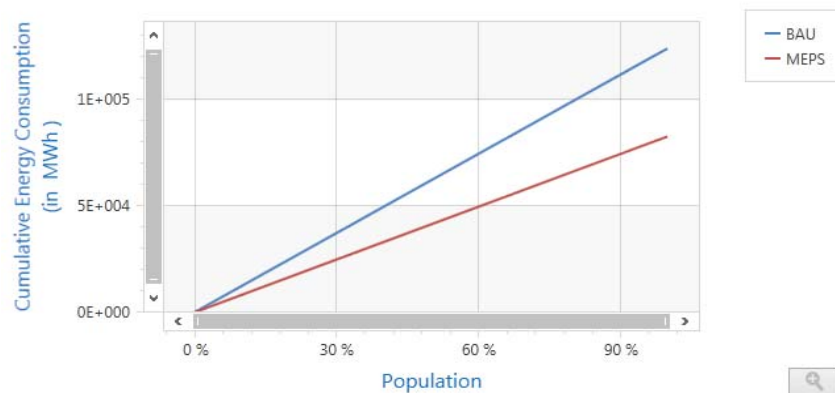
<sup>40</sup>PPAT: Policy Product analysis tool developed to assist policy makers to make informed decisions on energy saving potentials of various products





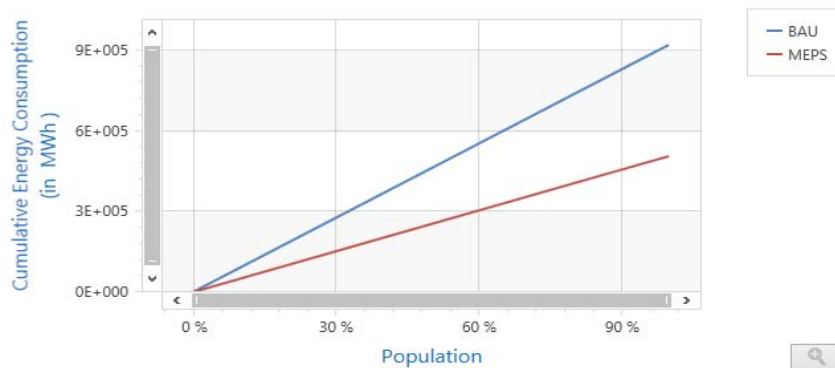
Source: Analysis based on Product Policy Analysis Tool (PPAT)

Figure 17: Electric Water Heaters: BAU v/s MEPS Scenario



Source: Analysis based on Product Policy Analysis Tool (PPAT)

Figure 18: Televisions: BAUv/sMEPS Scenario



Source: Analysis based on Product Policy Analysis Tool (PPAT)

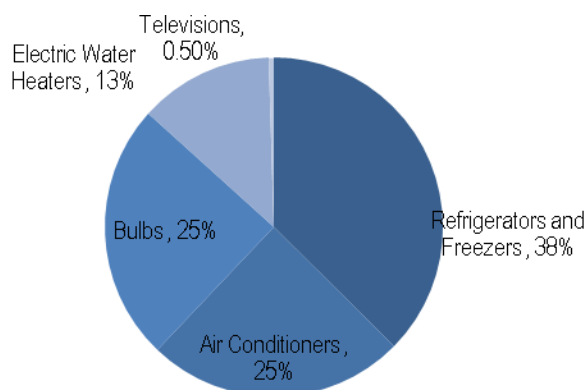
Figure 19: Bulbs - BAU v/s MEPS scenario

The comparative labelling program will also produce significant energy savings from the UNDP GEF project implementation. Following table elaborates cumulative energy savings generated from scenario two- the comparative labels program. From alternative scenario 2, targeted comparative labelling program will further result in increased saving of more than 25% than the MEPS label. Figure 20, elaborates on GHG abatement potential (%) of each selected appliances.

*Table 8: Alternative Scenario 2: Labelling Programme*

Product	Alternative Scenario (Comparative labels – saving %)	Cumulative energy savings (MWh)	GHG abatement potential (ktCO <sub>2</sub> e)
Air Conditioners	15-50 %	539,655	200
Refrigerators &Freezers	15-65%	856,778	300
Electric Water Heaters	5-45%	74,678	100
Televisions	25-60%	56,736	000
Light Bulbs	33-75%	550,682	200
Total Savings		2,078,529	800(approx.)

Source: Analysis based on Product Policy Analysis Tool (PPAT)/primary data from DG Customs



Source: Analysis based on Product Policy Analysis Tool (PPAT)

*Figure 20: GHG Abatement Potential tCO<sub>2</sub>e by Appliance Category*

### ***Buildings Sector: Baseline***

High-energy consumption of buildings, based on the imported model for design and construction in Cabo Verde has lead to decades of regular building practices contributing more to GHG emissions. Under a BAU scenario, new buildings will have more or less similar energy consumption to the current building energy performance. Due to absence of strict policy measures in the country, there will be fewer energy efficient buildings and the percentage of such buildings in the country's building stock in the next 10-15 years is likely to remain constant. In the last two years, annual electricity sales have increased by 4.9 %<sup>41</sup>. Table 9 shows the electricity annual sales distribution by sectors of activities during the last few years.

<sup>41</sup>ELECTRA-2012

Table 9: Annual sales by sectors of activities

Consumers	2005	2006	2007	2008	2009	2010	2011	2012
Public Buildings	16,548	16,677	18245	18548	20,508	22,929	22,893	23,321
Domestic sector	80,977	82,331	81,297	85,234	90,754	95,857	98,761	96,945
Institutions/Social Organizations	2,779	2,896	3,075	3,255	3,793	4,434	5,110	4,643
<b>Total Buildings</b>	<b>100,304</b>	<b>101,905</b>	<b>102,619</b>	<b>107,037</b>	<b>115,056</b>	<b>122,584</b>	<b>126,765</b>	<b>124,911</b>
Others	61,371	62,868	65,852	69,315	70,052	80,871	79,778	79,770
<b>Total</b>	<b>161,675</b>	<b>164,774</b>	<b>168,471</b>	<b>176,352</b>	<b>185,109</b>	<b>203,456</b>	<b>206,544</b>	<b>204,682</b>

Source: ELECTRA sales data (2012)

From ELECTRA sales data in Table 9, the domestic sector is the major consumer of electricity with nearly 50% of demand coming from the household consumption. Public sector includes energy sales from central government and municipalities which together accounts to 10.5 % of total sales. Under the baseline situation, electricity consumption and corresponding emissions will continue to grow under the absence of mitigation measures. To compound the baseline energy use from the building stock, electricity sales from public sector, domestic sector and institutions and organizations are combined.

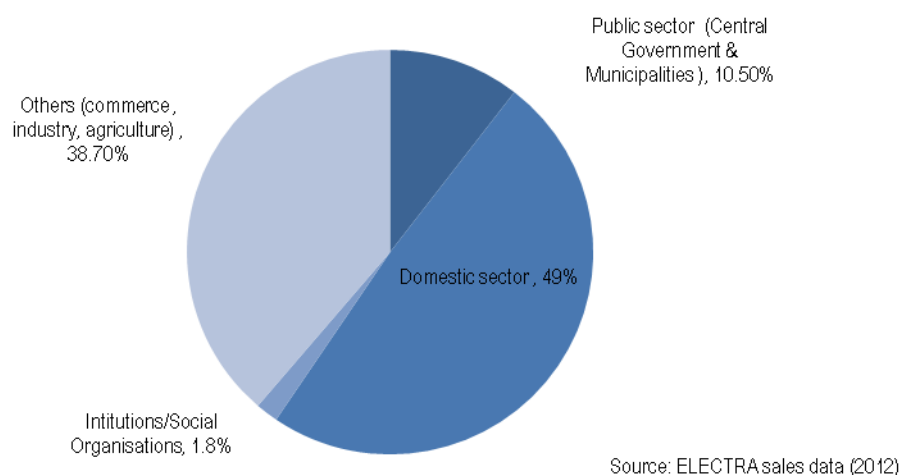
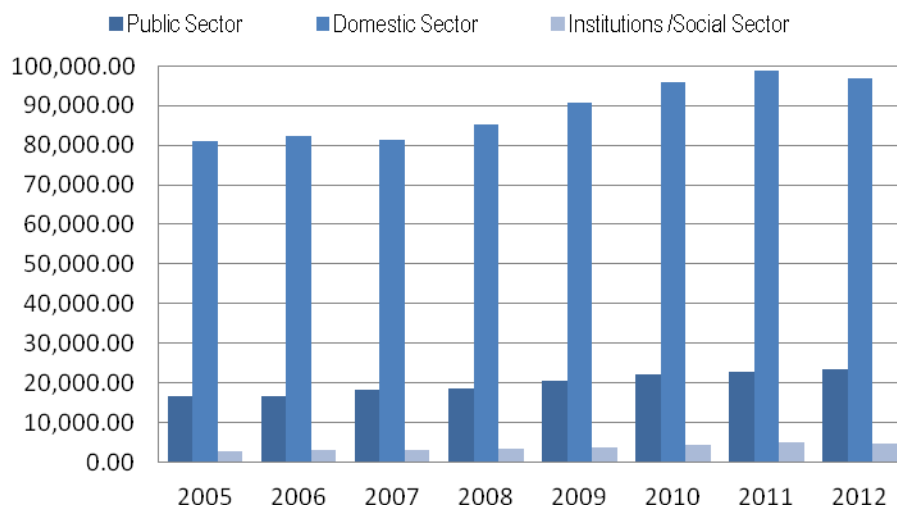


Figure 21: Electricity Sales by sector (2012)

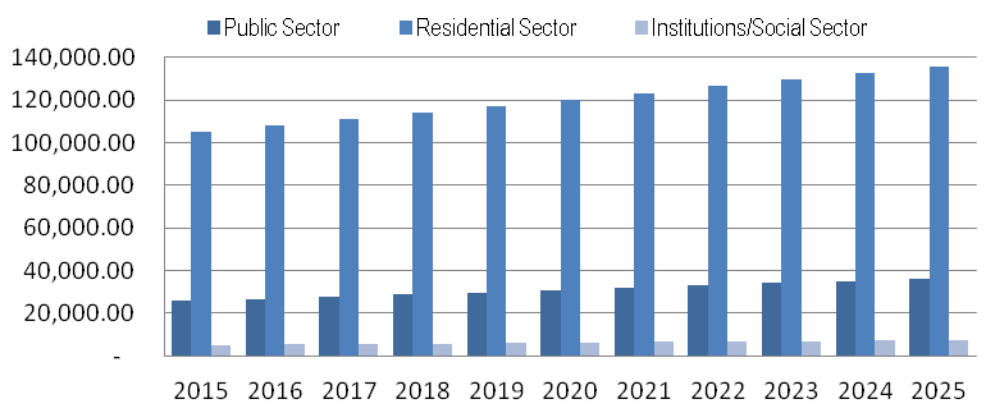


Source: ELECTRA sales data-2012

Figure 22: Energy Consumption (MWh) - Buildings Sector (2005-12)

### Buildings: BAU v/s Alternative Scenario

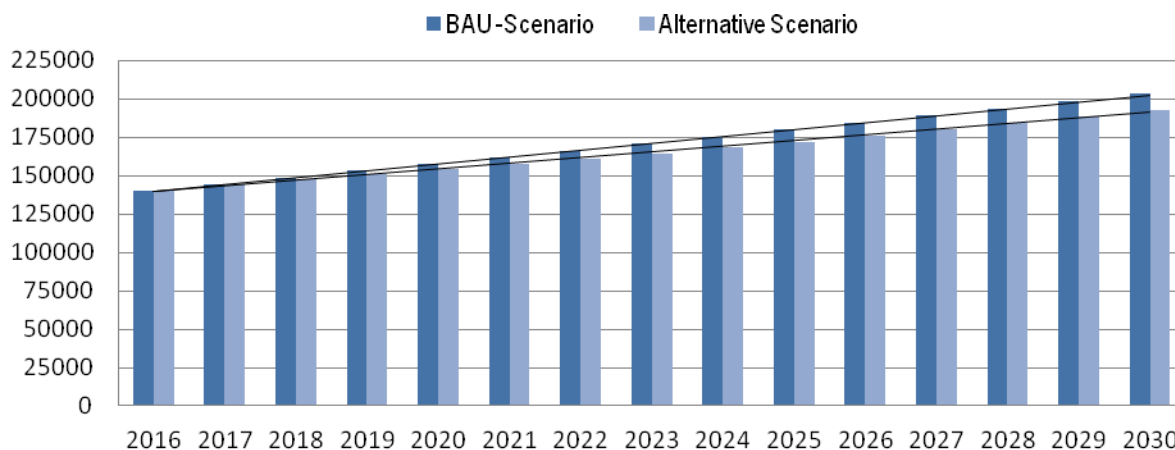
UNDP–GEF's project intervention will focus on developing the policy, institutional, and legislative framework needed to support energy efficiency in Cabo Verde through introduction of a new modern building code for the country. The proposed code for all building types will be developed; however, the project implementation will target public buildings through several pilot demonstration projects. As per BAU and alternative scenario projections, the Energy Efficiency Building Code (EEBC) code as the project outcome will lead to cumulative energy saving of 38,462 MWh corresponding to GHG abatement potential of 18,864 tCO<sub>2</sub> emissions(cumulative till 2025)<sup>42</sup>.



Source : Analysis based on ELECTRA sales data

Figure 23: Business as Usual (energy consumption -MWh)

<sup>42</sup>Based on the assumption that EEBC code is developed and implemented from 2016 onwards, thus assuming nearly 30% of new buildings, including demonstration projects built thereafter will comply with new energy performance standards. Cumulative energy savings are calculated until 2030.



Source : Analysis based on ELECTRA sales data and assumptions

Figure 24: BAUv/s Alternative Scenario for EEBC Implementation

Table 10: Cumulative Energy Savings and GHG Savings

Year	Energy savings (MWh)	Cumulative Energy Savings (MWh)	Cumulative tCO <sub>2</sub> emission savings
2015	0	0	0
2016	211	211	103
2017	434	645	316
2018	1,449	2,095	1,026
2019	2,508	4,602	2,255
2020	3,389	7,992	3,916
2021	4,312	12,304	6,029
2022	5,278	17,582	8,615
2023	6,289	23,871	11,697
2024	6,951	30,822	15,103
2025	7,640	38,462	18,846
<b>TOTAL</b>		<b>38,462 MWh</b>	<b>18.8kt CO<sub>2</sub>e</b>

Source: Based on ELECTRA sales data and assumptions: Annexure c

Table 11: Summary of energy savings and CO<sub>2</sub>emissions savings

Sector	Total Energy savings (cumulative 2015-2025)- MWh	Total Cumulative emission reduction (ktCO <sub>2</sub> e)
Appliances (S&L program)	2,078,529	800
Buildings (EEBC Code)	38,462	18.8
<b>TOTAL (Approx.)</b>	<b>2,116,991</b>	<b>818.8</b>

Source: from table 8 and 10

## GEF CO<sub>2</sub> Calculation Methodology

The GEF CO<sub>2</sub> emissions calculation methodology to estimate the direct and indirect emission reductions resulting from the project implementation was applied (refer annexure C).

### Direct Emissions Reduction

Direct emissions reductions due to project investment from demonstration projects during project implementation phase are expected. The emissions for appliance and buildings are separately calculated. It is expected that after year one, energy efficiency building code (EEBC) will be developed and implemented, similarly S&L programme for appliances will be launched and contributing in direct emissions reductions.

Table 12: Direct Emissions Reductions - Buildings and Appliances

Buildings	Direct Emissions Reductions
Annual electricity saved after all investments	1150 MWh <sup>43</sup>
Average useful investment life	30 yrs.
Direct emission reductions	16.91ktCO <sub>2</sub> e
Appliances	
Annual electricity saved after all investments	111,184 MWh
Average useful investment life	5 yrs.
Direct emission reductions	272.4 ktCO <sub>2</sub> e
<b>Total Direct Emissions Reductions</b>	<b>289.3ktCO<sub>2</sub> e (approx.)</b>

Source: Based on STAP methodology for emission calculations

### Indirect Emissions Reductions

Indirect emissions because of replication and dissemination resulting from project implementation until 2028 are calculated.

Table 13: Indirect Emissions Reductions: Buildings And Appliances

Buildings	Indirect Emissions Reductions
Bottom up approach	
Replication Factor (RF) <sup>44</sup>	3
Indirect emission reductions	50.72 ktCO <sub>2</sub> e
Top Down Approach	
Causality Factor	100%
Indirect emission reductions	31.33ktCO <sub>2</sub> e
Appliances	
Bottom up approach	
Replication Factor (RF)	3
Indirect emission reductions	817.20 ktCO <sub>2</sub> e
Top Down Approach	
Causality Factor	80
Indirect emission reductions	655.70 ktCO <sub>2</sub> e
<b>Total Indirect Emissions (bottom-up)</b>	<b>867.99 ktCO<sub>2</sub>e (approx.)</b>

<sup>43</sup>Based on the assumption that the new building code with minimum energy performance standard will be developed and implemented 2016 onwards. Thus nearly it is assumed that nearly 30% of new buildings including the demonstration projects will contribute to direct emissions reductions

<sup>44</sup> [RF] is a replication factor, i.e., how often will the project's investments be repeated during the 10 years after project implementation, determined by expert and reflects the degree to which the project emphasizes activities which encourage replication

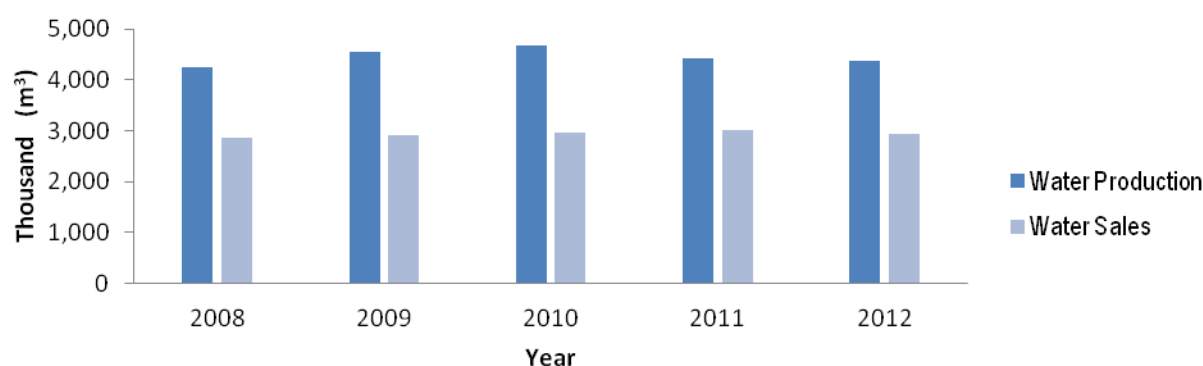
*Water Usage: Baseline*

Water is a scarce resource in Cabo Verde, with annual dependency on monsoon months of August and September and presence of no permanent or large rivers in the country. It is difficult to use surface water resources, which is estimated at 181 million m<sup>3</sup>, due to their torrential flow, high run-off rates due to steep relief and lack of adequate storage facilities<sup>45</sup>. Average coverage for water supply is nearly 89%, however significant disparities exist between different islands and population spread over nine islands and many of them are sparsely populated. Marked water scarcity (half the population lacks access to a public water supply) makes Cabo Verde rely on desalination to meet 85 percent of its human water needs, and made this energy-intensive process even more prohibitive by the high costs of energy. Water usage is closely connected to energy use. Table 14, shows the constant increase in water demand and increase in customers (ELECTRA is responsible for 90% of water supply in the country)

Table 14: Water usage data

ELECTRA DATA	2008	2,009	2,010	2011	2,012
No. Water Customers	32,172	35,069	37,345	40,160	44,772
Water Production (thousand m <sup>3</sup> )	4,237	4,539	4,675	4,423	4,384
Water sales (thousand m <sup>3</sup> )	2,866	2,912	2,970	3,005	2,941

Source: ELECTRA water sales data (2008-12)



Source: ELECTRA sales (2008-12)

Figure 25: Water Production and Sales (2008-12)

As per the baseline water usage, Cabo Verde may expect water shortages in the future, due to increase energy prices and natural disasters as droughts. Water tariffs at \$4.43 per cubic meter are the highest in Africa; the high prices reflect the scarcity of water resources, which has forced the country to rely on desalination. Water availability is estimated as 537m<sup>3</sup>per person per year, which is very low<sup>46</sup>. Moreover, the cost of the energy-intensive desalination process is particularly high due to its dependence on power generation. The power generation high costs are attributed to reliance on small-scale diesel generation and expensive imported oil. Energy efficiency has great potential therefore to alleviate problems due to water scarcity.

<sup>45</sup>Cabo Verde Strategy paper (2014-19)<sup>46</sup>Cape Verde's Infrastructure, A continual Perspective – The World Bank, African Region, 2011.

*Table 15: Water Desalination and Water Pumping (Energy Use (MWh), GHG Emissions)*

ELECTRA DATA	2012	2011	2010	2009	2008
Electricity Consumption (MWh)	18,833.32	16,058.34	19,158.30	20,253.50	22,947.20
ktCO <sub>2</sub> Emissions	9.22	7.86	9.38	9.92	11.24

Source: Electra, energy sales data (2008-12)

### *Water Usage: Alternative Scenario*

The new building code developed because of the GEF project implementation, should include standards for water efficiency with water conservation as a key priority. It is essential that the building code developed and implemented in component 1 with new regulations and revised by-laws will take into account the need to promote responsible water usage and conservation. This could be done by means of water efficient flow fixtures, flush fixtures – urinals, water closet, measures for rain water harvesting system, use of drip irrigation for landscape level and other methods to reuse and recycle water. The new law on buildings should include requirements for reservoir on the roof for water storage and put emphasis on rainwater harvesting systems. Cabo Verde built environment requires effective regulations and monitoring of water usage to promote the development of a climate resilient economy to withstand the future negative impacts from climate change. Energy efficient, water efficient buildings will therefore have significant potential to help Cabo Verde adapt to the impacts of climate change.

Water conservation will reduce the demand for water by nearly 20% due to project implementation. This shall result in reducing the burden of utility companies to use energy intensive methods for water desalination. Thus, water use to energy use is indirectly connected. The energy savings and corresponding GHG emissions from reduced water desalination demand as compared to business as usual scenario are calculated in table 16.

*Table 16 : GHG Emissions Savings from Water Efficiency*

Water Efficiency	Direct Emissions Reductions
Annual electricity saved due to reduced water demand	3484 MWh <sup>47</sup>
Average useful investment life	5 yrs.
Direct emission reductions	8.5 ktCO <sub>2</sub> e
	Indirect Emissions Reductions
Bottom up approach <sup>48</sup>	
Replication Factor	3
Indirect emission reductions	25.61 ktCO <sub>2</sub> e
Top Down Approach <sup>49</sup>	

<sup>47</sup>The new law on buildings with energy efficiency and water efficiency standards should be developed and implemented from 2016 onwards. Thus assuming that nearly 30% of new buildings built from 2016 will comply with new standards for water and energy, including the pilot demonstration projects. Thereafter, the demand for water desalination is expected to reduce from the building sector, thus resulting in energy and GHG emissions savings.

<sup>48</sup> The bottom-up approach for calculating indirect GHG reductions generally provides the lower extent in the range of possible indirect impacts from a project. It starts with the direct effects of the investments under a project, and multiplies that number by a factor representing the number of times the project is likely to be replicated in other places/markets.

<sup>49</sup> The underlying assumption of the top-down approach is that removing barriers and/or investing in the promotion of and capacity building for energy efficiency initiatives may allow successful projects to leverage the whole market for the relevant initiative. If all barriers to market implementation are removed, market forces should exploit the full economic potential offered by the respective market.



Causality Factor	80
Indirect emission reductions	16.8 ktCO <sub>2</sub> e
Source: Based on STAP methodology for emission calculations	

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## SECTION II: PROJECT INTERVENTION STRATEGY

### 2.1 Project Rationale and Policy Conformity

Under the Barbados declaration (2012), the Government of Cabo Verde has committed itself towards a target of reducing in greenhouse gases by 35% by 2020, a 30% improvement in energy efficiency and become a zero emitter country by 2030<sup>50</sup>. In 2013, the Government developed a national action plan to assist with participation in the UN Secretary General's Sustainable Energy 4 All Initiative (SE4All). Under the action plan, energy efficiency as an important priority area for GHG emission reduction is identified<sup>51</sup>. Similarly, 2<sup>nd</sup> National Communication to UNFCCC mentions energy efficiency and technological innovation as key to reduce dependence on imported energy and use of fossil fuel, in line with one of the strategies mentioned in National Energy Policy of Cabo Verde.

The proposed GEF project implementation will support the alternative scenario from the baseline situation to reduce GHG emissions in the Cabo Verdean building sector by implementing mitigation measures from building and appliances. The UNDP GEF project implementation will pave the way for improved energy efficiency utilization in buildings and strengthen wide spread use of efficient appliances. The proposed project will achieve the objectives set out in the following sections.

### 2.2 Project Goal, Objective, Outcomes and Outputs/Activities

#### *Project Goal and Objectives*

The goal of the project is “removing barriers to energy efficiency in Cabo Verdean built environment and for appliances “. The primary objective is to transform the market for energy efficiency in the country by introducing a new law on building codes and for domestic appliances by introducing a labelling programme, new import regulations, testing procedures, and certification leading to significant improvements in energy efficiency in the country. The proposed project is grouped into four (4) components each consisting of a number of complementary activities designed to achieve the project goal. Listed below are the major components.

- **Component 1:** Enabling policy, institutional, and legislative framework for energy efficiency in buildings
- **Component 2:** Enabling energy efficiency improvements through S&L for appliances
- **Component 3:** Energy efficiency solutions in a selection of public buildings through selected pilot demonstration projects
- **Component 4:** Replication and dissemination of lessons learnt and best practices

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<sup>50</sup>UNDP: PROJECT: Enabling Activities for the Preparation of Cape Verde's Third National Communication to the UNFCCC

<sup>51</sup>UNDP: PROJECT: Enabling Activities for the Preparation of Cape Verde's Third National Communication to the UNFCCC

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## 2.3 Project Outcomes, Output and Activities

The increased adoption of energy efficiency in building design, practices and materials will lead to a reduction in energy consumption of new buildings (as compared to BAU approach). This will also result in reducing corresponding GHG emissions from the built environment. The project aims to achieve the goal by strengthening and enforcing new regulatory framework for energy efficiency in building, and introducing S&L programme for imported appliances, with certification and testing mechanisms in place. Following sections elaborate coordinated series of activities and expected deliverables for each component resulting in achieving the main project objective.

### **COMPONENT 1:** Enabling policy, institutional, and legislative framework for energy efficiency in buildings

Component 1 of the project will focus on developing the policy, institutional, and legislative framework needed to support energy efficiency in Cabo Verde through the introduction of a new modern energy efficient building code for the country. The new law on energy savings with introduction of a new building code will introduce concepts like energy audits, MEPS for buildings with a pilot action on public buildings. The process for obtaining a construction permit to take into account energy efficiency specification as well as water usage concerns will be modified. Under this component, activities for the development of an inventory and information system for energy efficiency in all new buildings will be conducted. Efforts will be made to adopt a cost efficient the energy management system. Feasibility of transferring to Cabo Verde and customizing the EMS developed by UNDP Croatia will be analysed. The database is important because monitoring and reporting are key tasks that need to be undertaken in order to promote energy efficiency properly. Box 5 briefly explains the energy efficiency building code development approach.

#### BOX 6: ENERGY EFFICIENCY BUILDING CODE DEVELOPMENT APPROACH

- Mandatory energy efficiency building code (EEBC), when formulated, and enforced, is effective and economic in delivering more energy efficient buildings. Energy efficient buildings can be defined as buildings with significantly reduced energy consumption for operational uses like space heating, cooling, ventilation, and lighting etc. without compromising the building function, comfort, health, and productivity of the occupants. The code sets the minimum energy efficiency standards for design and construction of buildings.
- To develop a comprehensive and robust EEBC code, *broad stakeholder participation* is necessary in developing the technical sections of the code, to frame the compliance procedures, and implementation strategies as per the specific requirements of Cabo Verde. The code development starts with *defining the scope and boundaries*, in terms of its applicability. Building sector comprise of broad spectrum of different building types (commercial, residential, institutional etc.) with varying sizes and energy demand. These *building types* are further divided into subcategories depending on the usage pattern like occupancy, density and peak loads and *prototypes are developed*. The process requires an initial baseline analysis of the current construction practices of Cabo Verde. Baseline analysis will define the standard construction specification and current energy use index for various building categories. Based on the baseline analysis, market potential for *energy conservation measures (ECM)*, *techno-economic feasibility*, and current energy scenario of Cabo Verde, the code prescribes the minimum energy performance criteria.
- The emphasis is to draw attention towards building components with maximum energy savings potential, like e.g. maximizing building envelope benefits, solar passive design strategies, lighting and comfort systems, hot water and pumping etc. The code boundaries are defined based on the energy saving potential to ensure significant impact of EEBC code adoption. Various energy efficient systems and techniques that can gain focus are: building envelope, HVAC systems, lighting systems, electrical systems etc., and may initially exclude plug loads and process loads for example. Once the ECMs are identified, *a code stringency level* is defined which focuses on minimum energy efficiency performance standard of each component included in the code. The stringency analysis will support the development of code levels for advance energy performance as well as reach standards. Thus define the increased code stringency with projected market growth and energy scenario. To maintain code flexibility and ease to adopt sustainable building practices, code compliances mechanism are developed and proposed. The two basic approaches through which code compliance is achieved are *prescriptive or whole building performance approach*. A prescriptive approach lays down mandatory measures to be followed for each building component. It clearly defines the criteria that applies to the construction, irrespective to the inter relation of one component, within the same system, on another. A whole building performance approach lays down the baseline of building components and defines the suitable trade-offs within a system or in between two systems of a building to optimize the energy performance with the cost.
- The code compliance for Cabo Verde could be predominately prescriptive approach with some performance based criteria. Compliance tools should be developed to effectively calculate the performance of each building component as a result of complying with the code stringency levels. Compliance forms and checklist is developed to evaluate the code compliance of buildings. Once the code is developed and launched, user manuals are published to raise awareness and provide practitioners with guidelines to adapt to EEBC code. . The code level is well analyzed with active stakeholder participation and review. Once the stringency level is defined the code is written ***in a legal language***. The first generation code should prioritize ease of use both in terms of requirements and language. With subsequent updates, the code can become stringent and comprehensive.

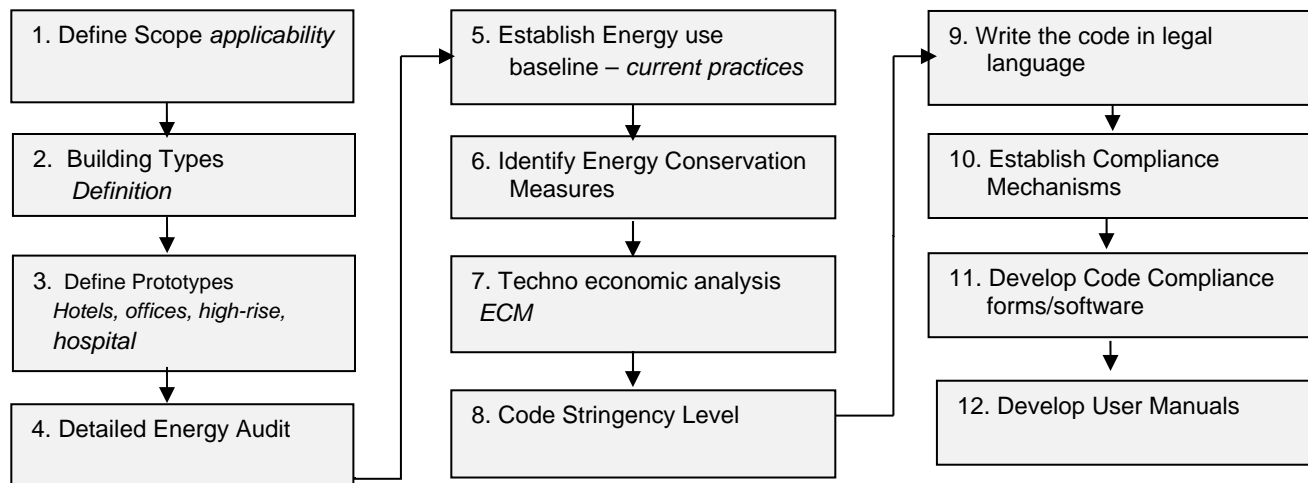


Figure 26: EEBC Code Development Approach

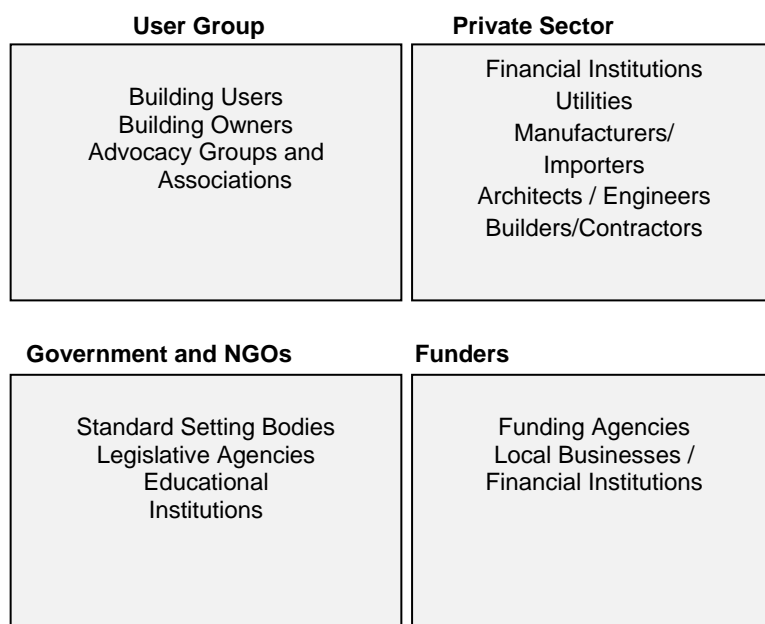


Figure 27: Stakeholder Engagement for EEBC Code Development

**Outcome 1:** Energy efficiency policies, legislation and secondary regulations are adopted, put in place and strengthened regulatory framework results.

**Output 1.1:** New building code focused on energy savings in Cabo Verde (includes minimum energy performance standards and energy passports) and which promotes climate resiliency and adaptation' and includes water usage (efficiency, recycling and reuse).

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### **Activity 1.1.1: Data collection for baseline formulation and current situation analysis**

Building baseline data is necessary to understand the current situation of energy and water consumption and analyze the impact of energy efficiency and water use efficiency in buildings. This will result in development of a comprehensive methodology to collect data for parameters associated with building energy and water consumption and analyze building categories within a defined framework. The outcome of the activity will give insight related to average specification of a building component and energy performance index of each building category (prototypes). The data collection will allow the formulation of benchmarks for different categories and help develop MEPS and water efficiency standards (e.g. water recycling, rainwater harvesting etc.). Initiatives on additional assessment and review of traditional building practices and construction materials in Cabo Verde should be taken. This will support in developing energy efficiency thresholds so that their performance in terms of energy savings could be well understood.

#### **Activity Output:**

- **Prepare baseline data report:** The report will consist of extensive data collected to conduct the baseline analysis. This will include data collected through energy and water audits. This report will give energy use intensity of each building category.
- **Prepare baseline analysis report:** Assimilate and analyse the collected data to define the baseline. It will result in classification of buildings with its sub categories, information on existing building stock, conventional construction practices; total energy consumption by specific building category, energy consumption by end use or energy use intensity, and GHG emissions from buildings. The report will also produce a methodology to develop energy benchmarks for buildings.

### **Activity 1.1.2: Develop code structure and define the scope**

Develop code structure and scope from the defined baseline and analysis from the previous activity. Based on the outcomes, define the scope of the new building code to target the components with highest energy and water saving potential e.g. building envelope, HVAC systems, lighting systems, electrical systems etc. Based on the identified energy conservation measures and techno –economic analysis of each component, develop the code structure and scope. Evaluate the provision for including scope for refurbishment of existing buildings.

#### **Activity Output:**

- **Prepare code structure and scope report:** Previous activity outcome will support in defining the new building code boundaries, and parameters to include building system component under the ambit of the new code. Conduct techno economic feasibility of each building systems for code.

### **Activity 1.1.3: Conduct code stringency analysis**

A code stringency level will define the minimum performance of each building component selected for the code. Analyse the code level with active stakeholder participation and review.

#### **Activity Output:**

- **Prepare stringency analysis report:** The proposed activity will result in a stringency analysis report, which will define the threshold of each energy efficiency component with specified performance level.

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#### Activity 1.1.4: Develop compliance forms and users manuals

The proposed new building code will state the specific requirement in a legally enforceable language; code enforcement will also require comprehensive technical manuals illustrating the process of design and approach towards meeting the energy efficiency specifications. The activity will also require the development of compliance forms to ensure integration of government approvals procedures. The two basic approaches through which code compliance is achieved are prescriptive or whole building performance approach.

##### Activity Output:

- Prepare code compliance report: The activity will result in defined compliance evaluation procedures and develop compliance checklist. The report will also feature methodology to prescriptive and whole building performance approach.
- Prepare user manuals: The activity outcome will result in producing technical user manuals with technical user guides for architects, engineers and other relevant stakeholders.
- Prepare Stakeholder Consultation report: A stakeholder consultation will be conducted covering the agenda of all the previous activities for component output 1.1. The consultation will support in development of technical sections of the proposed new building code.

Output 1.2: Inventory and information system for national energy balance, detailed consumption statistics and related GHG emissions in the buildings, by building category and major end-use (air conditioning,

#### Activity 1.2.1: Identification and classification of buildings

Baseline analysis performed in output 1.1 will project the different categories of buildings and develop prototypes. Based on the baseline analysis and defined scope, inventory and information system will be designed to monitor the current situation of building categories with maximum energy efficiency and water efficiency potential. Analysis will highlight building categories with maximum potential of energy efficiency impact. Develop an information dissemination system through which the data collected will be made available on a web based public platform.

##### Activity output:

- Same as activity 1.1

Activity 1.2.2: Develop Energy, GHG and water end use mapping for buildings in the country through preparation of an energy information and management system

Develop Energy management system (EMS) within this output, which will require listings of buildings are per categories, and sub categories. Consider transferring, customizing and enhancing the EMS that UNDP developed in Croatia as part of its UNDP GEF Energy Efficiency project in Croatia, which was completed in 2012. Integrate the EMS system with energy and water use data along with corresponding GHG emission data populated from the previous output. This will also provide provision to add latest energy, water consumption data from new code compliant buildings. Resulting in a reliable baseline for new building energy use (and related GHG emissions), and water use.

##### Activity output:

- Prepare energy, GHG and water management report: The proposed activity will result in a defined methodology to develop energy and water management tool such as EMS. This will result in appropriate mapping of building performance. The report will elaborate on the strategy to transfer and customize EMS Croatia to EMS Cabo Verde.

#### **Activity 1.2.3: Policy mechanism for periodic update and reporting of data for existing buildings**

The proposed development of an inventory and energy management system will support environmental impact assessment and Strategic Environmental Assessment (SEA), project the impact of energy efficiency measures, prioritize the policy requirements, and evaluate the impact of code application on existing buildings. After the successful implementation of the energy efficiency measures, such database will also help in suggesting future modification to the code as per the prevailing requirements.

Activity output:

- Prepare policy mechanism report: The activity will result in database update and reporting methodology.

Output 1.3: MRV protocol to measure energy savings, water usage, and emission reduction in public buildings

#### **Activity 1.3.1: Technical requirements for MRV for each building type**

The activity will define the rules and regulations to check the compliance and performance of the adopted energy efficiency measures after the building becomes operational. The process should be comprehensive to include all the measurement, reporting, and verification requirements to illustrate the performance in detail and suggest recommendations, if necessary.

Activity Output:

- MRV protocol report: The report will produce rules, regulations, and requirements to conduct MRV, and post occupancy compliance and performance checklist.

Output 1.4: Amendments to construction permit regulations to include mandatory requirements for minimum energy performance standards and including robust enforcement mechanism.

#### **Activity 1.4.1: Incorporation of energy code in the construction approval process**

The activity will first analyze the status of the building sector (for new and existing buildings) in terms of organizations, regulations, implementation structure, public awareness and experience gained from few energy efficiency measures to understand the gaps. This will also include an in-depth study of the current building approval process and proposed strategic approach to integrate the energy efficiency code compliance within the regulatory framework. The activity will also include the development of rules and regulations for the code compliance as well as roles and responsibilities of various government organizations involved in the compliance and enforcement mechanism. This will provide a roadmap and recommendations for the introduction of mandatory new building code.

- Activity output:



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- Prepare code implementation roadmap report: The activity will result in developing a code implementation mechanism and a roadmap to incorporate energy codes in construction approval process.

#### **Activity 1.4.2: Inspection and reporting mechanism for new building construction**

The activity includes the development of a mechanism to inspect new building construction and provide regular reporting. Doing this through including mandatory energy audits in compliance mechanism

- Activity output:
- Prepare inspection and reporting mechanism report: The report will provide requirement checklist for inspection and reporting mechanism for code compliance.
- Prepare technical working group report: A consultation will be required to get inputs from technical experts to develop all the proposed deliverables for outcome 1.

#### **COMPONENT 2: Enabling energy efficiency improvements through S&L for appliances**

Component 2 of the project will focus on introducing a national framework for S&L of appliances. This project will develop regulations for standards of specific appliances (air-conditioners, domestic refrigerators, lighting products and electric storage water heaters etc.) as well as developing and adopting national certification procedures for imported appliances. The S&L programme will develop strategies to associate and align with the normative European Convergence process and ECOWAS orientations. In addition, explore the provision for a study of a testing lab for imported appliances, in accordance with testing and certification mechanism, which are to be developed. Training materials will be prepared and training seminars on the new framework on standards and labels for key decision makers and appliance stakeholders (chamber of commerce, importer, retailers, and national administration).

#### BOX 7: STANDARDS AND LABELLING (S&L) PROGRAMME APPROACH

- Appliance mapping and energy performance benchmarking will provide policy makers and energy efficiency program managers with tools to compare test standards and efficiencies of appliances, and align Cabo Verde appliance market with international efficiency levels. A market assessment is recommended to determine the baseline performance level and growth rate of the market for each type of appliance. The assessment will evaluate the energy saving potential for each sub-category and establish a baseline for relative assessment.
- Appliance mapping will give an overview of appliance market in Cabo Verde; this includes collecting annual sales data (previous 5 years) of appliances selected for first phase of S&L program (*air conditioners, refrigerators and freezers, televisions, electric water heaters and bulbs*). The annual sales data will also give insight into market sector subcategories and technology trends in the country. The market sector sales will subcategorize sales in residential, commercial and public sector etc. Technology trend will provide information on type of appliances like e.g. for air conditioners - windows and portable (ACs) and split and packaged (ACs). The sales data will also provide growth trends of the appliances in market sector subcategory and with trends in technology.
- Majority of appliances are imported in the country with Portugal, Spain and Netherlands as primary country of origin for imports. Detailed sales volume by country of origin should be mapped for last 5 years. The study should also elaborate on domestic production of appliances and their share in annual sales. Existing domestic stock of appliances in the market should be mapped by integrating reports of annual sales data and accounting product replacement life cycles or retirement of older units.
- To develop a preliminary estimate of annual electricity usage of these appliances, calculations should be based on the installed stock, and assumptions on the average size, average energy efficiency ratio (EER) values, and changes in EER values over time, average hours of units operation in a typical year, and estimate peak demand of these appliances. As, majority of the appliances are imported, it is reasonable to assume that, manufacturers from these countries will export lower efficiency units in the country than the ones sold in their home markets (because of absence of minimum energy performance standards (MEPS) requirements in Cabo Verde). The study should also evaluate reduction in average unit energy consumption of appliances, due to increase in average EER over time.
- Government institutions or the agencies responsible for the development of Cabo Verde's S&L program, like Quality Management & Intellectual Property Institute, Directorate General of Commerce, Chambers of Commerce and Industry and General Directorate of Energy, should evaluate the energy saving potential, provide information on product energy performance requirements, and describe the products energy test procedures. The MEPS should be developed, where it becomes obligatory for each appliance to meet the minimum energy threshold. The agencies should introduce energy performance labelling requirements, compliance procedures, testing protocols, and enforcement strategies

- Testing standards and procedures should be given in MEPS regulations. Provision of regular update of these standards should be incorporated. The framework for energy efficiency labelling scheme should be developed which gives provision of information for consumers about energy efficiency of products for application, and communicate to the import departments of Cabo Verde to streamline the imported product as per the MEPS standard. The labelling requirements for appliances such as air conditioners will be: perform tests, provide calculations, and design the energy efficiency label, the energy efficiency label should be displayed on the product and in the user manual. The energy efficiency labelling could be subdivided into different sub categories of product, within each product, efficiency could be ranked among classes from “A” (highest efficiency) to “E” (lowest efficiency) according to their measured index of efficiency.
- The energy efficiency label developed in harmony with European design and in line with ECOWAS initiatives; should include the following information: energy efficiency class (in cooling mode), annual energy consumption (kWh), cooling capacity (KW), energy efficiency ratio (EER), and type of air –conditioner, for example.
- Accredited testing organizations or national certification body should certify the standards of equipment before they are sold into the market. New labelling regulations should be passed into a law. Customs regulation and procedure changes should be made to mandate import of appliances as per MEPS.
- With introduction of mandatory energy efficiency labelling program, it is recommended that Cabo Verde government consider the implementation of program by following initiatives: a) develop consumer outreach and education programs, b) establish an MV&E regime to verify the performance of products in order to ensure the collection of annual data, c) verify the efficiency ratings of different types of units imported for sale in Cabo Verde and d) compile efficiency trending and compliance information to support future policy decisions, such as regulating the MEPS of imported or manufactures appliances for sale in Cabo Verde.

**Outcome 2: Certification, labelling and enforcement mechanism to promote energy efficient end-uses and national testing, certification, labelling and enforcement mechanisms adopted**

**Output 2.1: Labelling programme for appliances imported in Cabo Verde in line with ECOWAS labelling programme**

### **Activity 2.1.1: Design of informative labels for appliances**

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The activity will comprise of the major steps required to develop the labelling programs for the appliances. The activity will be based on the projected energy efficiency potential in each appliance category, and technical analysis on the proposed energy efficiency labels. The design of the labels should illustrate all the important information critical for the consumer to make an informed decision.

### **Activity 2.1.2: Selection of appropriate testing procedure for each appliance**

Verification and enforcement plan is needed to perform energy tests. Almost every appliance requires a unique energy test setup. For example, a refrigerator requires an environmental chamber and an air conditioner requires a calorimeter chamber. The activity will include identifying and adopting national test procedures for the selected appliances (air conditioners, refrigerators, freezers, televisions and lighting products etc.). The project will provide the necessary technical assistance or support to build an enabling environment for product testing by accrediting facilities for testing and monitoring compliance (test facilities must be certified). A legal verification and enforcement system should be developed to follow up with import of non-compliant appliances.

### **Activity 2.1.3: Setting labeling threshold and range for each labelled appliance**

The activity includes a detailed technical energy efficiency analysis of each category to evaluate the energy efficiency potential and prescribe an appropriate threshold after considering the optimized results.

- Activities Output:
- Prepare appliance labeling programme report: The proposed activities will develop a labeling programme for shortlisted appliances that are imported in the country. The report will provide design of informative labels, appropriate testing procedures, labeling threshold and programme implementation methodology. The report will also provide pilot launch of S&L programme.

Output 2.2: Regulations including import regulations for energy efficiency standards for a first selection of

- Activity 2.2.1: Developing an implementation plan for mandatory S&L program

The proposed activity will develop an enforcement plan involving various steps to enforce the S&L program within the appliance industry. As the majority of the appliances are imported, the S&L program will provide the guidelines on the selection procedure of the imported appliances and develop new regulations for imports.

#### **Activity Output:**

- S&L program report: The activity will result in development of an implementation plan and program launch methodology to be in line with ECOWAS S&L labeling program.
- **Activity 2.2.2: Incorporating labelling requirements in import and sales regulations**

This activity involves the key steps required to integrate the S&L implementation and compliance plan within the import and sales regulations. This activity will streamline phase out of inefficient appliances, which would fail to pass the technical criteria on energy efficiency and only allow the market to purchase energy efficient products to ensure successful compliance.

#### **Activity Output**

- Prepare customs and sales regulations report: The proposed activity will result in development of revised customs regulations for import of energy efficient appliances

### **Activity 2.2.3: Requirement for MRV of sales and actual performance**

The activity will define the process to check the compliance and performance of new energy efficiency appliance. The process should be comprehensive to include all the measurement, reporting, and verification requirement to illustrate the performance in detail and suggest recommendations, if necessary.

Activity Output:

- Prepare MRV methodology report: The proposed activity will result in a comprehensive methodology for MRV and its requirement checklist.

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Output 2.3: Testing mechanism for selected appliances to be developed and established

Activity 2.3.1: Engagement of national and regional test facilities for appliance and feasibility of setting National test lab in Cabo Verde

The activity will establish a legal verification and enforcement system to follow up on non-compliance with the new regulations. ECOWAS is planning to set-up regional test facilities, which would leverage the combined testing requirements of many countries. This approach of regional test facilities will ensure consistency in compliance and enforcement within each country and harmonize requirements for the region. These test facilities will verify the data provided by the vendors, and calculate the energy efficiency label for each product. The product verified with MEPS will be suitable for sale across Cabo Verde. As a part of this activity, detailed feasibility of setting up a regional lab in Cabo Verde will be done in coordination with ECOWAS. This activity further includes the identification of regional testing facilities (which are certified) within the supervision of national and regional governments.

### **Activity 2.3.2: Periodic testing and reporting of labelled appliances**

The activity involves the periodic testing of the labelled appliances to ensure quality check and suggest recommendations, if needed. Trade inspection for distributors and retailer compliance will be established, which will help in checking on counterfeits and fraudulent products. Assess the capacities of various government organizations for checking distributors and retail outlets for product compliance. Conduct training programs for inspectors for compliance checking at distributors and retail outlets.

Activity output

- Prepare appliance-testing reports: Test mechanism of selected appliances MEPS and for appropriate labels. Develop a methodology to regularly test and report the labelled appliances.

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Output 2.4: National certification procedures to promote energy efficiency

**Activity 2.4.1: Design of a national certification program for selected appliances**

Based on the appliance test results, a national certification program will be launched which will be applicable across the country. This program will be applicable on the appliances category shortlisted for project implementation. The activity will include the completion of all the steps critical to ensure successful implementation of S&L program.

Activity Output:

- Prepare certification program report: the activity will result is a comprehensive certification program of standardized products.

Output 2.5: Public awareness programme and diffusion strategy – training seminars etc.

**Activity 2.5.1 Design of comprehensive awareness programs for key stakeholders – importers, retailers, consumers, enforcement agencies etc.**

The activity includes the provision of information, about the costs and benefits of energy efficient products, the test procedures and MEPS as well as an explanation of energy labels and classifications for appliances. After the successful implementation of the S&L program, major steps will be required to generate public awareness on the benefits of purchasing energy efficient appliances and associated returns. Develop a training program based on the understanding and role of importers, retailers, consumers, and enforcement agency. National awareness campaign activities should be launched about energy efficient appliance benefits. Develop and promote awareness materials (leaflet, posters, brochures, websites, etc.) to provide end-users with information about appliance energy efficient principles and related costs– benefit analysis. Develop training courses for distributors and retailers, focusing on the sales of more efficient products.

Activity Output:

- Prepare awareness program reports: The proposed activity will produce awareness raising programmes and target audience, appropriate training programs and various marketing products.

Output 2.6: Demand side management program, run by national utility, built around a “turn in or exchange”

**Activity 2.6.1: Developing an incentive mechanism for phasing out existing inefficient appliances through DSM program**

As the current appliance stock operating in Cabo Verde is inefficient and based on old technologies, it is important to replace all the existing appliances with new energy efficient appliance to maximize the GHG abatement potential of S&L program. Demand side management programs should be designed which could range from information or awareness programs (promoting user benefits and explaining no/low cost actions) to financial incentive programs to encourage the consumers (individuals and organizations) to discard the inefficient appliances from their daily usage. Financial incentive program in which all or part of the cost of

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energy efficient technology is paid by the utility. Strategic DSM program will facilitate this objective and ensure maximum impact of S&L program.

Activity 2.6.2: Implementing DSM for selected appliances with the most saving potential

DSM should be first tested on the appliances with most energy efficiency potential and slowly applied to all the appliance categories in partnership with commerce (importers, retailers) and commercial banks.

Activity output:

- Prepare DSM<sup>52</sup> program report: A draft methodology to phase-out inefficient appliances, with implementation strategies

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<sup>52</sup> Sustainability energy regulations and policy making for Africa –UNIDO and REEEP

## BOX 8: DEMAND SIDE MANAGEMENT PROGRAMS

Demand side management (DSM) programs consist of the planning, implementing, and monitoring activities of electric and gas utilities designed to encourage consumers to reduce their level and modify their pattern of electricity (or gas) usage.

DSM programs typically promote the use of high-efficiency technology and facility design among customers. DSM programs can range from information or training programs that do not provide any actual financial assistance to end users, to financial incentive programs in which all or part of the cost of the efficient technology or design is paid for by the utility. The benefits of DSM programs for consumers are reduced energy costs, capital requirements, and capital expenditures. The benefits to utilities include reductions in capital requirements and improve operating costs. DSM also has various other beneficial effects, including mitigating electrical system emergencies, reducing the number of blackouts and increasing system reliability.

The main types of DSM activities may be classified in three categories:

- Energy reduction programmes—reducing demand through more efficient processes, buildings or equipment ( e.g appliance labeling, efficient lighting, building regulations, Energy Management , Hiring an energy planner, housekeeping and energy auditing)
- Load management programmes—changing the load pattern and encouraging less demand at peak times and peak rates;( e.g load leveling, load control, tariff incentives or penalties)
- Load growth and conservation programmes.

DSM programmes and policies can be promoted and implemented at different levels of society, such as:

- Government policies and regulations;
- Utilities programmes;
- Energy consumer participation.

Each of these categories has its own significant role to play. But the optimum results can be obtained by coordinating all three. Government agencies can make various policies and regulations, and provide subsidies for these programmes. Utilities can implement these effectively through various programmes, preferably with customized programmes developed and operated in coordination with the end-users i.e. the energy consumers.

Output 2.7: The most relevant financial incentive is identified and introduced in a pilot programme for the scale up of energy efficient appliances

Activity 2.7.1: Develop and implement fiscal incentive programs for import of super efficient appliances and for large-scale replacement program

High upfront cost due to better technology may prove barrier for wider adoption of energy efficient appliances. Thus developing a financial mechanism and incentives on the purchase of energy efficient appliances will be necessary. Fiscal incentives will ensure that cost of energy efficient appliances are within



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the purchasing limit of the consumer and are cost effective to buy. The most successful financial schemes enable the consumers to overcome the higher first-cost of energy efficient appliances while also creating awareness about the operating cost and lifecycle cost benefits. A possible approach for Cabo Verde could be to set-up a revolving fund for a rebate program that provides no (or low) interest financial incentives for consumers to buy energy efficient appliances and allowing them to repay over a defined period of time through the savings achieved in the operating cost. Another possible incentive would be to reduce the import duty on the most efficient appliances being imported to the country. Because of this work, energy efficient refrigerators, air conditioners, and water heaters and bulbs meet the new quality, environmental and energy performance standards and diffuse widely on the national market.

Activity output:

- Prepare *energy efficiency* financial incentive program report: the proposed activity will provide feasibility analysis of various financing schemes and the most appropriate implementing agency(ies), in order to accelerate the adoption of selected energy efficient appliances.
- Prepare Fiscal incentive program implementation report which clearly explains and defines how the financial incentive program will be implemented including detailed breakdown of all costs and resources required, and provide technical support to the implementing agency.

### **Component 3: Energy efficiency solutions in a selection of public buildings through selected pilot demonstration projects**

Component 3 of the project is focused on the implementation of at least 4 demonstration projects in public buildings and 2 social housing programmes showcasing best practices related to energy efficiency (thermal insulation, sun protection, improved lighting, HVAC system, building control management, efficient water usage etc.) with selected co-financing partners. Each demonstration project will be based on international best practice and will significantly comply with the technical sections of the new energy efficiency building code developed under component 1 of the project.

The demonstration projects will start during the second year of the GEF project cycle. This will give sufficient time to select and /or confirm the most suitable demonstration project (shortlisted according to the key selection criteria's with maximum energy saving potential provided in the annexure). Meanwhile, this component will support training of relevant building stakeholders (architects, engineers, designers, developers, financial institutions) to understand the benefits of energy efficiency building options, energy efficiency of materials, monitor energy performance and validation of energy savings through an appropriate monitoring and reporting system (including meters, as required) for each of the demonstration project. Thus component 3, will start by conducting extensive training programs for design consultants, contractors and craftsmen to equip them with skills necessary for making demonstration projects a success.

Component 3 is focused on demonstrating and scaling up the potential for new investments in energy efficiency by displaying low carbon technology solutions. The main outcome of this component will be greater investment in buildings sector and additional GHG emission reductions, both direct from the demo projects themselves and indirectly from additional projects, which are implemented by the end of the project. The pilot demonstration projects aims to serve as a platform to raise awareness and drive additional investment in energy efficiency.

**Outcome 3: Energy efficiency solutions in a selection of public buildings through selected pilot demonstration projects.**

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Output 3.1: Selection of at least 4 public buildings and 2 social housing programmes for pilot demonstration projects in energy efficiency investment

potential (new and existing buildings/retrofits)

Evaluate potential pilot projects identified during project preparation phase based on pilot selection criteria (provided in annex) and most suitable project/s will be selected for energy efficiency demonstration. The final pilot selection could also be based on a bid, which will confirm interest and availability (this will ensure the confirmation on their funding availability, the co-finance for the project and will also coincide with UNDP project implementation schedule.)

#### Activity 3.1.2: Implementing energy efficiency measures

Based on the selected pilot programs, implement energy efficiency measures should be implemented on pilot projects to demonstrate the application and advantages of the energy efficient buildings. The demonstration projects should be provided with technical assistance from the consultants responsible for the project component and some of the additional cost that is incurred in integrating energy efficiency measures will be supported by this project. Both new and existing buildings can be selected for pilot demonstration. The technical assistance includes advisory on energy efficient building design, decision on appropriate energy efficient technologies, material specification, energy simulations, life cycle cost analysis etc. The selected demonstration projects should fulfil the primary objective of imparting technical skill and build capacity by training the design team and other stakeholders.

#### Activity output:

- Prepare pilot selection criteria and feasibility report: the activity will result in shortlisted pilot projects with significant demonstration ability. The report will detail out pilot selection criteria and the project feasibility. The report should define the energy efficiency measures that need to be implemented in the pilots.

Output 3.2: Building stakeholders trained to monitor energy performance, water usage at the selected buildings in accordance with information systems

#### **Activity 3.2.1: Developing a training and certification program for energy efficiency design, audit and skilled tradesmen**

This outcome is expected because of addressing the need to develop knowledge and expertise of building practitioners through training programs and workshops for architects, builders, contractors, building managers, and energy auditors as well as building material suppliers and testing facilities. The major activities include a skill set requirement mapping and develop a specific training program targeting different stakeholders. Conduct awareness workshops focusing on administrators, public and private sector decision makers and financial institutions. A university or an independent third party agency should provide this and GEF will provide advisory for developing the program of training the relevant stakeholders.

#### Activity 3.2.2: Develop and launch certification programs and accredited professional courses

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The activity includes development of an accreditation program to certify professionals who are successfully trained and demonstrate technical understanding of the subject as per the desired outcomes of the training programs.

- Activity Output: Prepare training and certification program report: The proposed activities should shortlist various training programs to be launched and methodology for accreditation programs.

Output 3.3: Monitoring and reporting system of energy performance/water usage for the demonstration
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#### Activity 3.3.1: Documenting demonstration projects

The activity involves comprehensive documentation of strategic approach, barriers, technical researches, key learning, and major outcomes from the selected demonstration projects. The documentation will be published for public awareness and replication as case study or documentary.

#### Activity 3.3.2: Develop Monitoring and Verification (M&V) plan for demonstration projects

The activity will define the procedures to check the compliance and performance of the adopted energy efficiency measures after the pilot becomes operational. The process should be comprehensive to include all the measurement, reporting, and verification requirement to illustrate the performance in detail and suggest recommendations, if necessary. The outcome of the pilot programs will apply on mass level to maximize the GHG abatement.

#### Activity Output:

Prepare pilot project report: The report should consist of pilot documentation checklist with comprehensive M&V plan

### **Component 4: Replication and Dissemination**

Component 4 focuses on replication and dissemination of the results of the project. Key activities will include a case study guide, a public awareness campaign, and lessons learned study. Each of these studies will focus not only on energy efficiency indicators but also on water performance and climate resiliency building codes. This component will also focus on operation and potential replication of energy management system developed within UNDP GEF project Croatia and develops a system of tracking labels and monitoring of energy efficient appliances. In addition, the ongoing annual monitoring requirements required by the new building codes will need to be effectively continued and carried out beyond the lifetime of the project. The main outcome of this component will be a sustainable institutional framework to support energy efficiency in the built environment in Cabo Verde and to broaden the target group, which will benefit from the outputs of this project and help ensure that there is a greater and wider interest in energy-efficiency in Cabo Verde.

A key activity will be training of key government stakeholders (key decision makers); practitioners (architects and engineers) of energy efficient buildings in particular the project will introduce energy efficiency technique and practices in Vocational Training Schools across the country. The project will also target separate training programs for real estate companies, banks, social housing companies etc. Apart from focusing on building construction and practices, this component could also focus on building life cycle components especially occupant's behaviour and facility management practices through targeted awareness raising programs. These programs could support facility management companies (like private offices, commercial (hotels) or public institutions.

In order to ensure that international best practices are followed, it will be important to regularly update the legislation and reconsider the institutional framework is being put in place under component 4 of this project. The final activity of this project will be for the Project Manager to prepare a lesson-learned study on multiple aspects for buildings and S&L for appliances. Develop policy briefings, reviews e.g. a new case study on analyzing the process of developing, and implementing a new building code and policy implications, lessons learned study to control import of inefficient appliances and how to apply them for other appliances.

**Outcome 4: Additional investment mobilized in energy-efficiency as a result of the dissemination and replication activities.**

**Output 4.1 Elaboration of case study guides and disseminated among relevant audience**

#### **Activity 4.1.1: Develop energy efficiency case study guides and best practice user guides**

The activity involves the development of user guides and case study guides based on technical research and learning from the activities listed in the document. The activity will result in producing a best practice handbook and guidelines on energy efficient building design and technologies, and circulate to building professionals and upload on a public domain for raising awareness and encourage replication of energy efficient technologies. Review and assessment of traditional building practices or techniques and construction materials conducted in Activity 1.1 could result in an assessment report to disseminate knowledge about use traditional methods and their benefits among design consultants and building stakeholders.

- Activity output:
- Prepare case study guides, energy efficiency user guide reports, and assessment report for traditional building practices and materials.

**Output 4.2 Public awareness raising campaign on standards and labels**

**Activity 4.2.1: Develop awareness-raising campaign for end users, retailers and distributors on S&L program for imported appliances (websites, media outreach, educational initiatives with schools etc.)**

After the successful implementation of the S&L program, major steps will be required to generate public awareness on the benefits of purchasing energy efficient appliances and associated returns. A training program and awareness raising workshops will be developed targeted towards the role of importers, retailers, consumers, and enforcement agency.

**Activity output**

- Prepare awareness raising campaign report

**Output 4.3 Training of key stakeholders on energy efficiency in buildings**

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#### Activity 4.3.1: Conducting training courses and workshops for key building stakeholders for energy efficiency building design, building life cycle and facility management

The activity involves conducting trainings and workshops across the country and target diverse professions within the building industry to ensure uniform awareness among all the associated sectors. This should also include design and implementation of certification schemes for building auditors, code compliance professionals etc. This activity would also provide targeted training programs or workshops for facilities management companies to raise awareness about building life cycle aspects and occupancy behaviour.

#### Activity 4.3.2: Capacity development and support to LEC (Civil Engineering Lab)

This activity will build capacity and enhance technical expertise of LEC for testing the thermal properties of building materials such as thermal conductivity, specific heat and density. This will result in producing a complied technical data for buildings materials with their thermal properties. Additional equipment (guarded hot-box) for testing U-values of wall and roof materials will be added. The activity will also provide technical support in conducting various types of tests, and training in the use of equipments for conducting these tests. Thus, support to LEC lab will be conducive in producing a comprehensive data for thermal properties of the materials, which will guide design consultants, and building professional for procurement of energy efficient materials.

#### Activity 4.3.3: Develop vocational training programs and develop energy efficiency best practices modules for university curriculum

The activity involves the development of a university curriculum and degree courses to educate the young generation with the concept of energy efficiency and bioclimatic architecture and promote further research

Output 4.4: A thorough monitoring of the impacts of the new energy efficiency requirement is performed

h in Cabo Verde universities.

#### Activity 4.4.1: A monitoring plan to assess the demonstration projects and system for tracking and monitoring of labels for EE appliances

The activity will define the procedures to check the compliance and performance of the adopted energy efficiency measures after the pilot becomes operational. The process should be comprehensive to include all the measurement, reporting, and verification requirement to illustrate the performance in detail and suggest recommendations, if necessary. The outcome of the pilot programs will apply on mass level to maximize the GHG abatement. The project activity should focus on developing a tracking system for labelled appliances and monitor the impact and performance of S&L program.

Output 4.5: Regular update of the legislation in order to tighten energy efficiency is introduced to

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Activity 4.5.1: Developed standards to increase the stringency level for energy efficient appliances and for buildings (REACH standard)

The activity involves development of a reach standard projecting the growth in future and expected energy efficiency potential with future technological advancement. The reach standard factors such parameters and prescribes stringent energy efficiency levels in future to be set for new baseline in the future.

Output 4.6: Lessons Learned study prepared and disseminated

Activity 4.6.1: Develop and publish energy efficiency best practice user manuals

The activity could review existing good practices of the country in terms of bioclimatic architecture to showcase the best practice measures and scope for improvements, A study or a review on existing financial mechanism or policy implications on energy efficiency in buildings could also be conducted etc.

## 2.4 PROJECT Indicators, Risks and Assumptions

### *Project Indicators*

Key indicators of the project success (impact indicators) include:

- Introduce new law with energy efficiency building code and corresponding amendments to policies, regulatory and institutional framework is established. The project resulting in % improvement of building energy intensity in the buildings by EOP (EE building code of practice)
- Mandatory S&L program launched for appliances.
- Direct impacts of demonstration buildings, in terms of area of new public buildings, amount of energy savings (as compared with conventional buildings) and corresponding reduced CO<sub>2</sub>emission. The project results framework outlined in section III provides a detailed list of project progress indicators for the various outcomes and outputs of the project.

*Table 17: Project Indicators*

Indicator	Time Frame	Target
Reduction in energy consumption in buildings sector and demonstration projects through energy and water efficiency	EOP	4634 MWh <sup>53</sup>
Increase in EEBC code compliant buildings, % increase	EOP	30%
Direct CO <sub>2</sub> emissions reductions from all energy efficiency and water efficiency in buildings and demonstration projects	EOP	25.4ktCO <sub>2</sub> e
Increase in the sales of S&L imported domestic appliances	EOP	60%
Energy saving from energy efficient domestic appliances and resultant CO <sub>2</sub> emissions reductions	EOP	111,184MWh 272.4ktCO <sub>2</sub> e
% Increase in the investment mobilized in energy efficient public sector buildings as a result of dissemination and replication activities	EOP	15%
% Increase in the investment mobilized in energy efficient private sector buildings	EOP	15%

### *Risks*

To ensure the effective design and implementation of the project activities, address some risks to ensure project success. Efforts should be made to mitigate existing risks that might prevent the project objectives from being achieved. To address these risks, the project needs to establish effective means to monitor and mitigate these risks. Mitigation measures include active and continuous involvement in project activities and decisions of the groups of people that might pose a risk to the project implementation and sustainability. The project can be considered to face two categories of risks: external (policy-related) and internal (risks inherent to project implementation itself).

The external risks include:

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<sup>53</sup> It is expected that a new law on buildings and energy efficiency building code is developed and implemented from 2016 (after one year of project implementation). Thus direct emissions reduction is calculated for nearly 30% of new buildings built thereafter along with estimated reductions from demonstration projects.

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The external risks include:

- The greatest risk to the success of the project is a lack of continued political will towards energy efficiency and a stable economic growth of the country. Possible effects of this could be slow implementation of the project resulting in delayed outcomes.
- Co-financing does not materialize from key partners and for demonstration projects.
- Slow or limited market transformation for new buildings related to real estate market stagnation and economic-financial crisis as a risk in limited new construction or challenges for public institutions to secure funding for their investment projects
- Legislation does not pass in a law on building codes and for appliances or resistance of Ministry of Finance to adopt some fiscal incentives, or Custom Department to implement some regulations due to the increased costs
- Economic and market risks stems from increased cost of energy efficiency measures for new design and construction practices. There is a risk that building owners and builders will reject this additional cost.

The internal project implementation risks are:

- Failure to trigger positive response from consumers and stakeholders (architects, design professionals, building material suppliers, builders, contractors, developers, and building managers) – possible effects of this could be ineffective capacity building efforts and a resultant slower rate of market transformation.
- Failure of demonstration projects showing good performance of new energy efficiency technologies, no achievement of projected energy savings and increased investment or maintenance costs for EE.
- Failure to have appropriate coordination within project activities of each component.
- Failure to trigger improved financing for energy efficient buildings. This will result in very slow uptake of energy efficient buildings in the market. This also includes suggestions for mitigation measures to deal with outlined risks to warrant successful implementation of this GEF project.



• Table 18 : Project Risks and Adaptation

Risk	Level of Risk	Mitigating Actions
Lack of political support for energy efficiency	Medium	Involve and commitment of Government of Cabo Verde and key decision makers in the project implementation from the beginning
Lack of confirmed co financing from key partners	Medium	Involve key stakeholders in the project implementation from the project inception stage and find alternative partners
No confirmed co- financing for demonstration project	Medium	Involve key partners for demonstration selection and implementation. Select alternative demonstration projects if 6 months after the completion of the feasibility studies, co-financing is not forthcoming.
Legislation does not pass into a law on energy efficiency buildings and appliances	Medium	Government ministries should be involved from the project inception stage and should be regularly updated about the project progress
Lack of positive response from building industry	Low	Targeted capacity building efforts to initiate a positive response from the industry Involve all the stakeholders in all stages of the project
Poor energy performance of demonstrated technologies, non achievement of projects energy savings selected demonstration projects	Low	Targeted training programs for key professionals involved in the demonstration projects (other activities leading to removal of barrier to effective implementation of demonstration projects)
Lack of coordination within project components and activities	Medium	Project director should be well informed about the project development and ensure coordination mechanisms' effectiveness. Project Manager should manage the activities and coordination between components.
Increased cost of energy efficiency measures	Medium	Financial and fiscal incentives should be introduced as early as possible to motive investment in energy efficiency measures Awareness raising and training should be done from the beginning of the project, to make informed cost benefit decisions
Improved energy efficiency financing for buildings does not happen	High	Banking sector should be involved as one of the stakeholder from the project beginning

## Assumptions

The assumptions for this project will centre on the continued commitment from both the government and the private sector. Stakeholders and other participants clearly understand the roadmap and implementation plan prepared by the Government. Experiences from the demonstration projects are communicated well to raise awareness about energy efficiency

Key project assumptions:

- The government's commitment, private sector participation to implement new energy efficiency building code and other energy efficiency programmes in buildings sector and concerned authorities are willing to cooperate on imported appliance labelling and other import regulations.

- The programme implementation is effective and achieves its objectives
- It is assumed that mechanism or systems are developed to bridge the gaps available for collecting and generating data
- Stakeholders are willing to Co-finance for the demonstration project
- Building industry is keen on improvements in BAU scenario of building construction industry
- Financial institutions show a positive response to energy efficiency measures and are convinced of expected benefits
- EE measures and technologies will be incorporated efficiently and leading to marginal increase in cost from BAU
- Project management unit (PMU) will work efficiently to deliver project successfully
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## 2. 5 INCREMENTAL REASONING: EXPECTED Global, National and Local Benefits

The proposed GEF project is aimed at targeting barriers, which are currently impeding the realization of significant energy savings in the buildings and domestic appliances sector in Cabo Verde. Through this project, the GEF will contribute to lifting institutional, policy, regulatory, and other strategic barriers to energy efficiency in building and appliances.

### Global Environment Benefits

The global environment benefits associated with this project are going to be significant. The project will facilitate and influence actions that will result in the reduction of GHG emissions from the country's buildings sector by project end as compared to GHG emissions in a BAU scenario. Initial estimates suggest possible savings of up to 1,158,180 MWh resulting from improved energy efficiency in Cabo Verde over a 10-year period averaging out to approximately 115,818 MWh per year. With a grid factor of 0.492tCO<sub>2</sub>/MWh, this suggests potential CO<sub>2</sub> savings of some 703.9 ktCO<sub>2</sub>e over a 10-year lifetime or approximately 70.3ktCO<sub>2</sub> per year (top down approach).

Table 19 : Global Environment Benefits<sup>54</sup>

Global Benefits	
Energy Savings	
2015-2019 (Project)	463,272 MWh
2019 – 2025(Post-Project)	694,908 MWh
CO <sub>2</sub> Emission Reductions	
2015- 2019 (Project)	297.8ktCO <sub>2</sub> e
2015 – 2019 (Post-Project)	29,7 ktCO <sub>2</sub> e
2019 – 2025 (Post Project)	703.9ktCO <sub>2</sub> e

<sup>54</sup> Refer annexure C for more detailed explanations on GHG calculations.

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## National and Local Benefits:

Among the key national benefits that the project will bring are:

- Legislative and regulatory frameworks will be improved to promote energy efficiency in buildings
- Significant savings in electricity in buildings sector, and corresponding CO<sub>2</sub> emissions reduction in the long term.
- Access to comprehensive information on national energy balance, detailed consumption statistics and related GHG's emissions in building by major end-use (through inventory and well established DBMS)
- Monitoring of energy efficiency in buildings sector will enable better evaluation and development of new policies and strategies by the government
- Significant capacity will be built and will increase pool of professionals to design energy efficient buildings on a large scale
- The improved access to financing for energy efficiency in buildings
- Significant awareness will be generated amongst professionals, decision makers, and the general public,
- A number of design tools will be developed, including guidebooks, user manual and software tools
- A large number of demonstration buildings will be constructed demonstrating energy efficiency best practices
- Households increase their purchasing capacity through reduced burden of electricity bills
- Control demand growth and therefore limited government investment, fiscal deficit, and public debt (considering most of the investment in power plants has been completed through credit and public endowment).
- New jobs and business opportunities on energy audits, trainers, design professionals, testing officials etc.

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## 2.6 Cost-effectiveness

The project would contribute to both global environmental benefits and to national benefits, as synthesized below. The direct project reduction of CO<sub>2</sub> emissions targeted by the efficient energy use in buildings and appliances is about 297.80 ktCO<sub>2</sub>e. Considering the US\$ 1,991,000 from the GEF (\$72,600 + \$ 1,918,400 Grant) as support for this project and the direct CO<sub>2</sub> emission reductions from the actual energy efficiency building demonstrations that will be implemented, the unit abatement cost is about US\$ 6.4 per ton of CO<sub>2</sub> reduced. On the other hand, the cost-effectiveness would be around US\$ 2.7/ton CO<sub>2</sub> if the conservatively estimated indirect CO<sub>2</sub> emission reductions were also considered. After all, most of the CO<sub>2</sub> emission reductions will actually be realized indirectly with the compliance to the energy efficiency building code and energy efficient appliance S&L program. The project will help develop, approve, and enforce as well as influence that the project would generate among the building sector stakeholders in incorporating energy efficiency measures in the buildings that they design, construct, operate and manage/administer.

## 2.7 Sustainability and Replicability

The innovativeness of this project is that it will be targeting a sector, which has not been targeted before by other donor-supported programs in Cabo Verde in any significant manner: Energy efficiency in buildings and standards and labels for household appliances. Much of the attention related to reducing greenhouse gas emissions in Cabo Verde has focused on renewable energy and in particular wind energy and solar PV.

In the lack of Demand Side Management policies and policy development in the area of energy efficiency, large investments to satisfy the demand will be required. Investments in renewable energies needs to be coupled with a clear energy efficiency policy to ensure the country will achieve its ambitious 100% renewable target in a cost-efficient manner.

### *Replicability:*

The proposed GEF project is designed to have a balanced mix of capacity building and dissemination enabling environment activities made to country's specific conditions, markets and regulatory environment. Such balanced mix of activities is expected to promote the application of building energy efficiency technologies. Replication is an integral component of the project design as the expected energy savings from the application of energy efficiency technologies in Cabo Verde buildings (and the corresponding GHG emissions reduction from the reduced electricity demand) rely on the replication of the relevant project activities. This is an important part of the project strategy and is a reason for the emphasis put on information and capacity building related activities.

## Sustainability

Ensure sustainability of the project through the different outputs of the project components, e.g. the new laws and regulations related to energy efficiency and a new national standards and labels program for energy efficient appliances will transform the market by both encouraging and requiring greater levels of investment and attention to energy efficiency measures. Both buildings sector and appliances sector in Cabo Verde are expected to be transformed by the results of this project. The combination of new laws and regulations, a national S&L programme, and several targeted demonstration projects should help in catalyzing new and additional investment in more energy savings projects. By the end of the project implementation, it will create a significant impact to the energy performance of the Cabo Verdean buildings sector.

### SECTION III: STRATEGIC RESULTS FRAMEWORK AND GEF INCREMENT

**This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD:** Institutions reinforce environmental governance and integrate principles of environmental sustainability, climate change and disaster relief reduction; public and private institutions adopt a holistic approach to conservation and protection of critical habitats and biodiversity.

**Country Programme Outcome Indicators:** % of public resources allocated to environment; Number of key sector strategies integrating environmental dimension.

**Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one):** 1. Mainstreaming environment and energy OR 2. Catalyzing environmental finance OR 3. Promote climate change adaptation OR 4. Expanding access to environmental and energy services for the poor.

**Applicable GEF Strategic Objective and Program: Climate Change Mitigation Objective 2:** Promote market transformation for energy efficiency in industry and the building sector

**Applicable GEF Expected Outcomes:**

- Appropriate policy, legal and regulatory frameworks adopted and enforced
- Sustainable financing and delivery mechanisms established and operational
- GHG emissions avoided

**Applicable GEF Outcome Indicators:**

- Extent to which EE policies and regulations are adopted and enforced (score of 0 to 4)
- Volume of investment mobilized
- Tonnes of CO<sub>2</sub> equivalent

Objective/Outcome or Output	Indicator	Baseline	Targets End of Project	Source of verification	Risks and Assumptions
<b>Project Objective</b> The objective of the project is to reduce energy consumption and related GHG emissions in buildings and household appliances in Cabo Verde through introducing a range of legislative and regulatory measures and resulting in an estimated indirect CO <sub>2</sub> savings of some 703.99 ktCO <sub>2</sub> over the 10-year project lifetime.	Cumulative GHG emissions reduced from building sector and through domestic appliances by end-of project (EOP), ktCO <sub>2</sub> e	0	297.8	M&E reports of the pilot/model projects. Reports and documents available on code compliance,, GHG national inventory (energy sector) and national Energy balance.	<b>Risk:</b> Energy performance reports may not be made available unless mandated and they may not be accurate <b>Assumptions:</b> Government of Cabo Verde commitment to energy efficiency remains firm All energy performance reports are made available

	Annual Reduction of energy consumption in the buildings and appliances, MWh	0	115,818	Project implementation reports Building sector energy database GHG national inventory (energy sector) and national Energy balance and utilities report to DGE.	
<b>Outcome 1<sup>55</sup>: Policy, Institutional and Legislative Framework for energy efficient buildings are enabled</b>					
<b>Indicator :</b>					
<b>a. Direct energy savings in the buildings sector projects by EOP, MWh/yr. ( energy and water efficiency) Baseline – 0 Target Value -4634</b>					
Output 1.1. New building code focused on energy savings in Cabo Verde (includes minimum energy performance standards and energy passports) and which promotes climate resiliency and adaptation' and includes water usage considerations	New building space compliant with new energy efficiency code by EOP, million m <sup>2</sup>	to be determined		EE code compliance reports/documents	Risks: Lack of political will to introduce a new law on energy savings which includes new energy efficiency building codes Assumptions: Government of Cabo Verde commitment to energy efficiency remains firm No change in stakeholder commitments for co-financing and other co-operation to facilitate the output 1.1
	Direct energy savings in the projects by EOP, MWh/yr. ( energy and water efficiency)	0	4634	Energy monitoring reports of demonstration buildings	
	No of trained professionals and government officials by EOP to conduct code compliance	0	50	Workshop proceedings and evaluation reports Completion reports for training and capacity building	

<sup>55</sup>All outcomes monitored annually in the APR/PIR. It is highly recommended not to have more than 4 outcomes.

				workshops.	
Output1.2 Inventory and database management system for national energy balance, detailed consumption statistics and related GHG's emissions in the building by major end-use (air conditioning, lighting, water heating, appliances.).	No. of professionals trained to conduct energy audits	Limited professional skill for energy audit	50	Completion reports of trainings and capacity building workshops	Risk: Insufficient data collection. Too many variations in energy Consumption/ savings. Poor quality of energy audits and no flow of information to database Assumptions: Reporting of building energy performance is consistent and well understood by key stakeholders
	No. of buildings energy performance in the database	0	100	Inventory and database management reports  Energy management system developed  Project implementation reports	
	No. of energy audits carried out annually	Limited energy audit reports	15	Reports generated from database	
Output 1. 3 MRV Protocol to measure energy savings, water usage, and emission reductions in public buildings	No. of professionals trained in the building sector for MRV	0	25	Documentation on the training courses; training reports MRV approach report	Risk: Limited qualified professionals to develop MRV protocol
	No. of buildings adopted MRV protocol	0	30	Building MRV reports	

Output1.4 Amendments to construction permit regulations to include mandatory requirements for minimum energy performance standards and including robust enforcement mechanism	No. of municipalities carrying out mandatory enforcement of the new energy efficiency code compliance	Municipalities are currently responsible to oversee the new construction	5	Official notifications issued by municipal bodies	Risk: Lack of continued commitment of the key public authorities and government entities to develop and implement effective energy efficiency building policies and practices Non availability of qualified staff to promote the new energy efficiency code and energy efficiency programs Assumption: Key public authorities are aware of the need to learn on energy efficiency code compliance need. A continued support to promote energy efficiency code and other programs.
	No. of building permits approvals processed according to new EE code compliance mechanism	Lack of inspecting and monitoring mechanisms of new construction			
	No of professionals and govt. staff trained to conduct energy efficiency code compliance	Limited capacity for compliance enforcement	60	Capacity building program reports	



	No. of verified energy efficiency code compliant buildings each year project implementation EOP	Technical code of buildings (2012) and contains few provisions on energy efficiency	25	Documentation of revised building permits	
	No. of accredited local authorities (at municipal level) to validate and verify mandatory energy efficiency code compliance by EOP	0	5	Accredited local authorities list available with DGE	

## Outcome 2: Energy-Efficiency improvements through Standards & Labelling for appliances

### Indicator

- a) Direct energy savings in the appliances stock by EOP MWh/yr baseline – 0 , target value - 111,184
- b) % Increase in sales of energy efficient appliances as a result of energy efficiency finance baseline – 0 , target value - 20%

Output 2.1 Labelling programme for appliances imported into Cabo Verde in line with ECOWAS labelling programme	No. of verification and enforcement procedures developed in line with ECOWAS labelling program	ECOWAS concept note on S&L programs available No energy efficiency policy for refrigerators / freezers, Air-conditioners etc.	1	New energy efficiency policy draft for appliances	Risk: No motivation from the market for energy efficient appliances Assumption: Manufacturers are willing to commit staff time for appliance S&L training and financial resources to improve their products.
	No of manufacturers, retailers and consumers attend educational workshop on	No awareness on energy efficiency	50	Education workshops reports	

	energy efficiency labels on appliances	labelling of appliances  Some awareness campaigns implemented on incandescent bulbs targeting households			
	% Increase in sales of energy efficient appliances with labelling and certification	0	30%	Sales data analysis report	
Output 2.2 Regulations including import regulations for energy-efficiency standards for a first selection of appliances	% Increase in import of energy efficient appliances due to developed new law and regulatory changes	0	60%	Import data from customs	Risk: Lack of collaboration on Customs officials to implement new regulations. Lack of continued Ministry of Finance commitment to introduce fiscal and financial incentives.
	No of trained energy efficiency standard compliance and enforcement officials	0	60	Workshop reports and outcomes	
Output 2.3 Testing mechanism for selected appliances to be developed and established	% Increase in testing of appliances as per new testing mechanism developed	0	60%	Appliance testing reports	Risk: Limited capacity to establish a national testing mechanism for new appliances and a framework for labelling and certification of appliances
	No. of officials trained to conduct and adopt periodic testing and reporting of selected appliances (as per international testing procedures)	0	25	Project implementation reports Documentation on the training courses; training reports	

Output 2.4 National certification procedures to promote energy efficiency	% Increase in energy efficient appliance sales through certification procedures.	0	50%	Annual sales report	Risk: : Limited consumer trust on the certification procedure and label system. Assumption: appliances sales will continue to increase
Output 2.5 Public awareness programme and diffusion strategy, which includes training seminars on the new regulations for importers, appliances distributor's retail chains, and the general public.	No of officials (manufactures, retailers, customs officials) trained to comply with new energy efficient appliance law/regulation	Absence of awareness raising campaign for energy efficient appliances	25	Training program reports Documentation on the training courses	Risk: Limited adherence of importers and commerce to the awareness raising initiatives Assumption:
	% Increase in consumers and retailers understanding of trade-off between higher purchase cost and lower running cost of energy efficient appliances	Limited awareness of energy efficient appliances benefits	40%	Surveys reports of consumes and retailer understanding and perceptions of energy efficient appliance.  INE thematic surveys or ADECO reports.	
	% Increase in local retailers and distributors to market more efficient appliances	Market for energy efficient appliances is non existential	40%	Customs reports on volume of energy efficient appliances import	
Output 2.5 Demand Side Management program, run by the national utility, built around a "turn-in or exchange" mechanism/modality	No. of professionals and state officials trained on DSM programs by EOP	Lack of information on DSM programs	25		Risk: Limited adherence of utilities, financing institutions and retailers to the program  Assumption: Retailers and/or importers are interested in turn-in mechanism to increase their sales
	No. of energy audits carried out annually	Few energy audit reports available	15		
	No of pilot DSM programs launched	No mechanism for phasing out of inefficient appliance with some initiatives to replace	2	Pilot program case study documentation	

		incandescent			
	No. of satisfied users of building DSM program	0	25		
Output 2.6 The most relevant financial incentive is identified & introduced in a pilot programme for the scale up of energy efficient refrigerators, air conditioners and water heater.	No. of applicable project financing schemes on energy efficient appliances identified, designed and launched during project implementation	No data available on energy efficiency finance. No energy efficient appliance finance scheme	2	Documentation of the designed financing scheme, including implementation mechanisms, and rules and regulations EE finance scheme launched	Risk: Limited awareness and sensibility of financial institutions and commerce sector on the advantages of supporting this type of schemes.  Assumptions: Banks/FIs are willing to finance building energy efficiency projects
	% Increase in sales of energy efficient appliances as a result of energy efficiency finance	Absence of energy efficiency finance schemes	20%	Sales data reports  Facility/mechanism management agency report	
Outcome 3 Energy efficiency solutions in a selection of public buildings through selected pilot demonstration projects					
Indicator : Demonstration projects completed and energy efficiency best practices disseminated					

database management system	No of professionals certified as accredited professional	No accredited professional program	25	Launch of Accredited program in the first year of project	
Output 3.3 Monitoring and Reporting System of energy performance / water usage for the demonstration projects	No. of energy and water audits conducted in pilot projects	0	8	Audit Reports	
	No. of M&V reports published from pilot projects	0	2	M&V reports	

Outcome 4: Additional investment mobilized in energy-efficiency as a result of the dissemination and replication activities.

Indicator :

a) % Increase in sales of energy efficient appliances during the project implementation baseline- 0 , target value 30%

b) % increase in number of energy efficiency buildings during and after project implementation baseline – 0 , target value 30%

Output 4.1 Elaboration of case study guides and disseminated among relevant audience	No of published comprehensive energy efficiency buildings user manuals and case study guides	User manual available on sustainable architecture	5	Project implementation reports	Risk: Failure to trigger positive response from key stakeholders and certified practitioners  Assumption: Experts to deliver trainings are available and willingness of the targeted stakeholders to benefit from the training. Accredited authorities willing to cooperate on energy efficiency in buildings
	No. of set of guidelines prepared on energy efficient buildings for developed and investors by EOP		5	User manual reports Published guidelines for energy efficient buildings	
Output 4.2 Public awareness raising campaign on standards and labels	No of awareness raising campaigns (websites, newsletters, media outreach activities)	0	15	Consumer awareness campaign reports	
	% Increase in sales of energy efficient appliances during the project implementation	0	30 %	Sales data reports	
Output 4.3 Training of Key Building Stakeholders (senior policy makers, introduction of energy	No. of training courses conducted for key stakeholders each year	Limited trainings for energy efficiency techniques	4	Documentation on the training courses; training reports	

efficiency technique and practices in Vocational Training Schools across the country) on energy efficient buildings	No. of vocational training /vocational training schools or courses/units/modules within university programs	0	5	Vocational training modules	
Output 4.4 A thorough monitoring of the impacts of the new energy efficient requirement is performed.	% Reduction in energy consumption due to new energy efficiency requirements	0	30 %	Documented monitoring plan and audit reports	
Output 4.6 Lessons learned study prepared and disseminated	No. of sets of knowledge sharing products developed by EOP	0	4	Launched knowledge products	

## SECTION IV: TOTAL BUDGET AND WORK PLAN

Award ID:				75997		Project ID(s):		87601			
Award Title:				Energy Efficiency							
Business Unit:				CPV10							
Project Title:				Removing Barriers to energy efficiency in the Cabo Verdean built environment and for appliances							
PIMS no.				PIMS 4996							
Implementing Partner (Executing Agency)				Directorate General for Environment (DGA), Directorate General of Energy							
GEF Outcome/Atlas Activity	Responsible Party/Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Annual Expenses (USD)				TOTAL(USD)	Notes
						Year 1	Year 2	Year 3	Year 4		
OUTCOME 1:	Policy , Institutional and Legislative Framework for energy efficient buildings are enabled	62000	GEF	71200	International Consultants	75,000	75,000	30,000	20,000	200,000	1
Policy , Institutional and Legislative Framework for energy efficient buildings are enabled				71300	Local Consultants	25,000	25,000	25,000	25,000	100,000	2
				72100	Contractual services	30,000	30,000	20,000	20,000	100,000	3
				72200	Equipments & Furniture	12,500	12,500	5000	5000	35,000	4
				74200	Audio Visual & Printing Prod	12,500	12,500	2000	2000	29,000	5
				71600	Travel	6,000	6,000	2,000	2,000	16,000	6
				72500	Supplies	2,500	2,500	2,500	2,500	10,000	
				74500	Miscellaneous	2,500	2,500	2,500	2,500	10,000	7
				sub-total GEF		166,000	166,000	89,000	79,000	500,000	
OUTCOME 2:	Energy-Efficiency improvements through Standards and Labelling for appliances are enabled	62000	GEF	71200	International Consultants	30,000	30,000	30,000	30,000	120,000	8
Energy-Efficiency improvements through Standards and Labelling for appliances are enabled				71300	Local Consultants	20,000	20,000	20,000	20,000	80,000	9
				72100	Contractual services	30,000	30,000	20,000	25,000	100,000	10
				71600	Travel	2,000	2,000	2,000	2,000	8,000	11
				72200	Equipments & Furniture	13,000	13,000	3,000	3,000	32,000	12
				74200	Audio Visual & Printing Prod	12,500	12,500	7.500	7.500	40,000	13
				72500	Supplies	3,000	3,000	3,000	3,000	12,000	
				74500	Miscellaneous	2,000	2,000	2,000	2,000	8,000	7
				Sub -Total GEF		112,500	112,500	87,500	87,500	400,000	
OUTCOME 3	EE solutions in a selection	62000	GEF	71200	International Consultants	0	20,000	20,000	20,000	60,000	1
EE solutions in a selection				71300	Local Consultants	0	13,333	13,333	13,334	40,000	2
				72100	Contractual services	100,000	100,000	75,000	75,000	350,000	14

of public buildings through selected pilot demonstration projects				71600	Travel	0	5,000	5,000	5,000	15,000	15	
				72200	Equipments & Furniture	50,00	10,000	15,000	15,000	45,000	12	
				74200	Audio Visual & Printing Prod	5,000	15,000	25,000	30,000	75,000	16	
				72500	Supplies	0	5000	0	0	5,000		
				74500	Miscellaneous	0	0	5,000	5,000	10,000	7	
				Sub- Total GEF		110,000	168,333	158,333	163,334	600,000		
OUTCOME 4:	DGE	62000	GEF	71200	International Consultants	25,000	25,000	25,000	25,000	1,00,000	1	
71300				Local Consultants	12,500	12,500	12,500	12,500	50,000	2		
72100				Contractual services	15,000	15,000	15,000	15,000	60,000	3		
71600				Travel	5,000	5,000	2,500	2,500	15,000	17		
72200				Equipments & Furniture	5,000	5,000	10,000	10,000	30,000	18		
74200				Audio Visual & Printing Prod	15,000	20,000	20,000	20,000	75,000	19		
72500				Supplies	1,000	1,000	1,500	1,500	5,000			
74500				Miscellaneous	0	0	2,500	2,500	5,000	7		
Sub- Total GEF				80,000	85,000	87,500	87,500	340,000				
Additional investment mobilized in energy-efficiency as a result of the dissemination and replication activities.	DGE	62000	GEF	71300	Local Consultants	13,600	13,600	13,600	13,600	54,400	2	
				71600	Travel	5,000	5,000	5,000	5,000	20,000	15	
				72200	Equipment & Furniture	1,000	1,000	1,000	1,000	4,000	4	
				Sub-Total GEF		19,600	19,600	19,600	19,600	78,400		
			4000	UNDP	71300	Local Consultants	20,000	20,000	20,000	20,000	80,000	2
					71600	Travel	5,000	5,000	5,000	5,000	20,000	15
					72200	Equipments & Furniture	10,000	10,000	9,080	10,000	39,080	4
					74200	Audio Visual & Printing Prod ( communications)	10,000	10,000	15,000	10,000	45,000	19
					72500	Supplies	1,000	1,000	1,920	2,000	5,920	
		74500			Miscellaneous			2,500	2,500	5,000	7	
		Sub- Total UNDP CO		50,000	50,000	50,000	45,000	195,000				
			MTIE	71300	Local Consultants	50,000	50,000	50,000	50,000	200,000	2	
				71600	Travel	15,000	10,000	10,000	6604	41,604	15	
				72500	Supplies	5,000	5,000	5,000	0	15,000		
				74500	Miscellaneous	0	10,000	5,000	0	15,000	7	
				Sub – Total MTIE		75,000	70,000	70,000	56,604	271,604		



	Total Project Management	144,600	139,600	138,680	121,204	544,084	
	TOTAL GEF	488,100	551,443	441,933	436,934	1,918,400	
	TOTAL UNDP( Co-finance , In Cash)	50,000	50,000	50,000	45,000	195,000	
	Total M & E Budget ( UNDP Co-finance, In Cash)	36,000		30,000	39,000	105, 000	
	TOTAL MTIE( Co-finance -In -Kind)	75,000	70,000	70,000	56,604	271,604	
<b>PROJECT TOTAL</b>		<b>649,100</b>	<b>671,433</b>	<b>591,933</b>	<b>577,538</b>	<b>2,490,0044</b>	

#### Budget Notes 2490004

- Hire consulting agency (joint venture/consortium) with building energy efficiency experts. The team of consultants will support the outcome of the proposed components 1, 3, and 4 as per the criteria's met in the RFP (annex B). (International Consultants are budgeted for \$ 2000/week)
- The association should have local experts as part of the consortium and to work full time for project outcome. (National consultants are budgeted for \$ 1000/week)
- Local firms will be hired to perform contractual services(additional assessment and review of traditional building practices and materials)
- Equipment includes testing equipment, computer hardware and software for certification and enforcement, auditing equipments, metering and monitoring equipments, office machinery, furniture etc.
- Printing and reproduction of legal and technical documentation, communications and other equipment necessary to establish the building code, publications, promotional material etc.
- The travel costs include the DSA and in-country travels of the project staff and experts, travels of international and local consultants. Travel and DSA related to sponsor participation of stakeholders from other islands to meetings and workshop is covered as well.
- Miscellaneous ( insurance, warranty expense, bank charges, storage, staff welfare etc)
- Hire consulting agency (joint venture/consortium) with expertise in standards and labelling program for appliances as consultants. The team of consultants will support the outcome of the proposed components 2 and 4 as per the criteria's met in the RFP (annex B).
- Local consultants will be hired to support the development of standards and labeling program (budgeted at \$ 1000/wk)
- Contractual services to provide support in regional and national test facilities and implementation of DSM program
- The travel costs include the DSA and travels of international and local consultants and budget for workshops and training programs ( no. of workshops is given in results framework)
- Equipment includes computer hardware and software, stationery, premises , testing materials
- Communication and audio-visual equipment, used during the training, workshop and other dissemination activities of this outcome
- Contractual services to incorporate EE measures in buildings ( design consultants, EE material procurements, Efficient lighting and HVAC systems, building commissioning , M& V ), to develop and launch accreditation program,
- The travel costs include the DSA and travels of international and local consultants
- Communication and audio-visual equipment, used during the training, workshop and other dissemination activities of this outcome
- The travel costs include the DSA and travels of international and local consultants
- Testing equipment for LEC labs etc.
- Communication and audio-visual equipment, used during the training ( capacity building for LEC), workshop and other dissemination activities of this outcome, launch of study guides, best practice guidelines , budget for websites, user manuals, posters, documentation and videos, implementation of EMS system.

Table 20: Budget per Component

Category	USD	Components				
		1	2	3	4	5 ( GEF+UNDP+MTIE+ M&E)
International Experts	480,000	200,000	120,000	60,000	100,000	-
National consultants	604,400	100,000	80,000	40,000	50,000	334,400
Contractual Services	610,000	100,000	100,000	350,000	60,000	-
Travel	135,604	16,000	8,000	15,000	15,000	81,604
Equipments & Furniture	185,080	35,000	32,000	45,000	30,000	43,080
Audio Visual & Printing Prod (communications)	264, 000	29, 000	40,000	75,000	75,000	45,000
Supplies	52,920	10,000	12,000	5,000	5,000	20,920
Miscellaneous	53, 000	10,000	8,000	10,000	5,000	20, 000
M& E	105,000	36,000		30,000	39,000	
Total	2,490,004	500,000	400,000	600,000	340,000	544,084

Project Component	GEF	UNDP	MTIE	ECREEE	APP	UNICV	Total (USD)
	USD (\$)						
Component 1: Enabling policy, institutional, and legislative framework for energy efficiency in buildings	500,000		2,000,000.04	1,000,000	50,000		3,550,000.04
Component 2: Enabling energy efficiency improvements through S&L for appliances	400,000		530,865.1	1,050,000	450,000		2,430,865.1
Component 3: Energy efficiency solutions in a selection of public buildings through selected pilot demonstration projects	600,000		191,737.2	1,400,000	62,316	313,346	2,567,399.2
Component 4: Replication and Dissemination	340,000		1,917,130	450,000	50,000		2,757,130
Project Management	78,400 (includes DPC of \$24,276)	195,000	271,604				544,084
M & E Budget		105,000					105,920
TOTAL	1,918,400	300,000	4,911,336.30	3,900,000	612,316	313,346	11,955,398.3

Table 21 : Summary of Funds

Table 22 : Work Plan

Component 1: Enable Policy , Institutional and Legislative Framework for EE buildings		Year 1				Year 2				Year 3				Year 4			
Expected Outputs	Activities	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
<b>1.1 New building code</b> focused on energy savings in Cape Verde ( includes minimum energy performance standards and energy passports) and which promotes climate resiliency and adaptation* and includes water usage considerations	Data collection for baseline formulation																
	Code Structure and scope																
	Code Stringency																
	Compliance forms and users manuals																
<b>1.2 Inventory &amp; database management system</b> for national energy balance, detailed consumption statistics & related GHG's emissions in the building by major end-use (air conditioning, lighting, water heating, appliances.).	Identification and classification of buildings																
	Energy , GHG and water end use mapping for buildings in the country																
	Policy mechanism for periodic update and reporting of data for existing buildings																
<b>1.3 MRV Protocol</b> to measure energy savings, water usage, and emission reductions in public	Technical requirements for MRV for each building type																
<b>1.4 Amendments</b> to construction permit regulations to include mandatory requirements for minimum energy performance standards and	Incorporation of energy code in the construction plan approval process																
	Inspection and reporting mechanism for new building construction																
Component 2: Energy-Efficiency improvements through Standards & Labeling for appliances		Year 1				Year 2				Year 3				Year 4			
Expected Outputs	Activities	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
<b>2.1 Labeling programme</b> for appliances imported into Cape Verde in line with ECOWAS labeling programme	Design of informative labels for appliances																
	Selection of appropriate testing procedure for each appliance																
	Setting labeling threshold and range for each labeled appliance																
<b>2.2 regulations</b> including import regulations for energy-efficiency standards for a first selection of appliances	Developing an implementation plan for mandatory S& L Program																
	Incorporating labeling requirements in import and sales regulations																
	Requirement for MRV of sales and actual performance																
<b>2.3 Testing mechanism</b> for selected appliances to be developed and established	Engagement of national and regional test facilities for testing labeled appliances																
	Periodic testing and reporting of labeled appliances																
<b>2.4 National certification procedures</b> to promote energy efficiency	Design of a national certification program for selected appliances																
<b>2.5 Public awareness programme &amp; diffusion strategy</b> , which includes training seminars on the new regulations for importers, appliances distributors retail chains, and the general public.	Design of comprehensive awareness program for key stakeholders - importers , retailers, consumers, enforcement agencies																
<b>2.6 Demand Side Management program</b> , run by the national utility, built around a “turn-in or exchange” mechanism/modality	Developing an incentive mechanism for exiting inefficient appliances through DSM program phasing out																
	Implementing DSM for selected appliances with the most saving potential																
<b>2.7 The most relevant financial incentive</b> is identified &introduced in a pilot programme for the scale up of EE refrigerators, air conditioners & water heater.	Fiscal incentive program for import of super-efficient appliances and for large scale replacement program																

**Component 3 : Energy efficiency solutions in a selection of public buildings through selected pilot demonstration projects**

		Year 1				Year 2				Year 3				Year 4			
Expected Outputs	Activities	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
3.1, Selection of at least 4 public buildings & 2 social housing programmes for pilot demonstration projects in EE investment	Identification of pilots based on national survey and inventory , through a competitive selection process ( New and Existing buildings)																
	Implementing EE measures																
3.2 Building Stakeholders (architects, engineers, designers, developers, financial institutions)trained to monitor energy performance / water usage at the selected buildings in accordance with database management system	Developing a training and certification program for EE design , Audit and skilled tradesmen																
3.3 Monitoring and Reporting System of energy performance / water usage for the demonstration projects	Documenting demo programs - published case study , documentary etc.																
	Annual reporting of results and accessible on public domain																

**Component 4: Replication & Dissemination**

		Year 1				Year 2				Year 3				Year 4			
Expected Outputs	Activities	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
4.1 Elaboration of case study guides and disseminated among relevant audience.	Develop EE case study guides and EE best practice user guides																
4.2 Public awareness raising campaign on standards and labels	Develop awareness raising campaign for end users , retailers and distributors on S& L program for imported appliances ( websites, media outreach etc)																
4.3 Training of Key Building Stakeholders (senior policy makers, introduction of EE technique & practices in Vocational Training Schools across the country) on EE buildings	Conducting training courses and workshops for key building stakeholders for EE building design																
	Develop vocational training programs and develop EE best practices modules for university curriculum																
4.4 A thorough monitoring of the impacts of the new energy efficiency requirement is performed.	Develop a monitoring plan to assess the demonstration projects and evaluate the pilot performances																
4.5 Regular update of the legislation in order to tighten energy efficiency is introduced to transform further the appliance market & building practices.	Develop standards to increase the stringency level for EE appliances and for buildings (REACH standard)																
4.6 Lessons Learned study prepared and disseminated	Develop and publish EE best practice user manuals																

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## SECTION V: MANAGEMENT ARRANGEMENTS

### 5.1 Project Organization Structure

The project will be nationally implemented (according to the UNDP NIM implementation modality) by the DGE and will be responsible for the achievement of the project results as the implementing partner (national implementing partner). Both UNDP and DGE will together form a project management board which will meet once a year to oversee the project implementation, and approve the annual budget. Other stakeholders who will participate on the Project Management Board will include (OAC, National Land Management Institute(INGT), Ministry of Finance and Planning, DG Customs, DG Environment, OE (Ordem dos Engenheiros), Chambers of Commerce, DG Industry and Commerce, Quality Management & Intellectual Property Institute( ; National Municipality Association ( ANMCV), Association of the Building sector companies; ECREEE; LEC). UNDP national team and regional technical advisors will provide overall management and guidance from its Cabo Verde country office and will be responsible for monitoring and evaluation of the project as per GEF and UNDP requirements.

Establish a project management unit (PMU) to implement the project, which will be housed under the DGE. The structure of the PMU is provided in Figure 27. The PMU will report to a senior government official as the national project director (NPD), designated by the DGE. The NPD will be responsible for overall strategic guidance to the project management, including approval to the annual work plan and achievement of planned results as outlined in the ProDoc, use of UNDP transferred funds through effective management and well established project review and oversight mechanisms. The NPD will also ensure coordination with various ministries and agencies provide guidance to the project team to coordinate with UNDP, and to look after the administrative arrangements required under the Cabo Verde government and the UNDP.

The project will appoint a full time national project manager (NPM) to coordinate all the activities undertaken by the project management unit, and coordinate the timely implementation of the project components. The NPM will primarily be responsible for the day-to-day management of the project operations covering the administrative, financial and operational aspects of the project component implementation. A full-time Project Assistant will support the national project manager (NPM). Service provider agencies (firm, joint venture or consortium) each for building and appliances will be selected for providing technical assistance in activities that will be carried out in all relevant project components. The consulting agency will comprise of international and national experts and will implement the project area component. Efforts shall be made to mobilize NPM and the consulting agency for the full project tenure as GEF –funded full- time employment to ensure availability until the end of the project. As needed, adequate numbers of contractual services in different disciplines will be associated on long-term or short-term time basis depending on the requirements. The job description and ToRs for the PMU positions are enclosed in Annex C.

Two project technical committees –i) Energy efficiency building codes and for ii) energy efficient appliances shall be constituted, and will meet once every three months to consider the quarterly work plans. These technical committees will be responsible for making management decisions for the project component in particular when guidance is required by the project manager. The Project Steering Committee (PSC) will play a critical role in project monitoring and evaluation by quality assurance, using evaluations for performance improvement, accountability and learning, and ensuring that required resources are committed and providing overall direction to the project team. The PSCs will consider and approve the quarterly plans and any deviations from the original plan. The PSCs will consist of heads of relevant stakeholders. The team members will include distinguished stakeholders who will advise the project team on technical issues, and issues related to each component output. The project steering committee will be established and chaired by the DGE to provide support and advice to the PMU and other committees as and when needed. The committee members will include heads of all other relevant government departments.

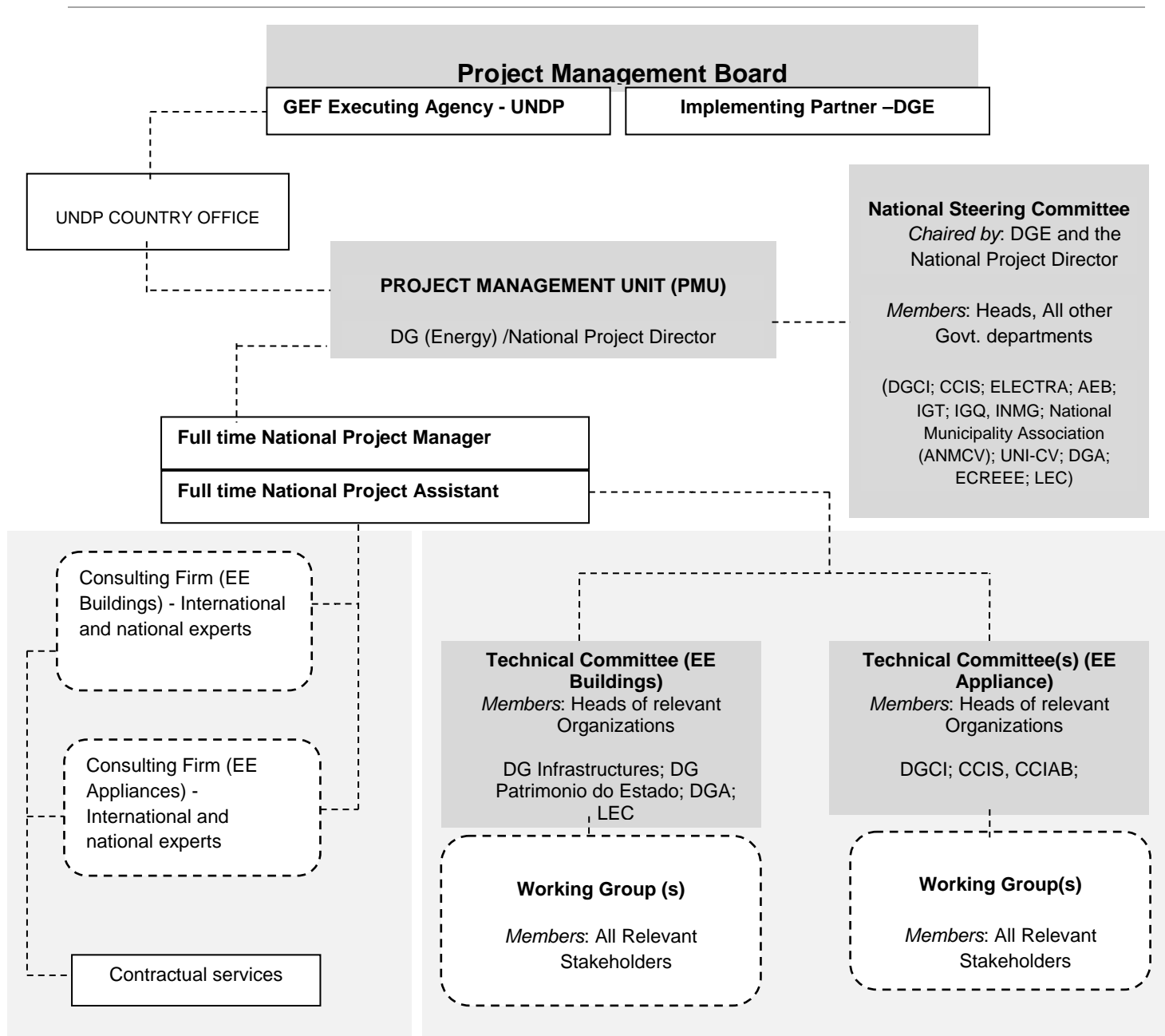


FIGURE 28: Project Organizational Structure

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## SECTION VI: MONITORING FRAMEWORK AND EVALUATION

The project will follow all standard UNDP activities for monitoring and reporting including project inception workshop, annual PIR report, mid-term evaluation, and final evaluation..

Project start:

A Project inception workshop will be held within the first 2 months, and after the hiring of the national project manager and with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders. The inception workshop is crucial to building ownership for the project results, review and confirm the SMART of the indicators chosen and to plan the first year annual work plan. The inception workshop should address a number of key issues including:

Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of project team and UNDP CO. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The terms of reference (TOR) for project staff will be discussed again as needed.

Based on the project results framework and the relevant GEF climate change tracking tool if appropriate, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks. Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The M &E work plan and budget should be agreed and scheduled. Discuss financial reporting procedures and obligations, and arrangements for annual audit.

Plan and schedule project board meetings. Roles and responsibilities of all project organization structures should be clarified and meetings planned. The first project board meeting should be held within the first 12 months following the inception workshop.

An inception workshop report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

Quarterly Review:

Progress made shall be monitored in the UNDP enhanced results based management platform. Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high. Note that for UNDP GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, s are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).

Project Manager is responsible to report on progress on UNDP's country office progress report. This information will be recorded on the Atlas platform. Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the executive snapshot. Other ATLAS logs can be used to monitor issues, lessons learned etc. The use of these functions is a key indicator in the UNDP executive balanced scorecard.

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#### Annual Review:

Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements. The APR/PIR includes, but is not limited to, reporting on the following:

- Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
- Project outputs delivered per project outcome (annual).
- Lesson learned/good practice.
- AWP and other expenditure reports
- Risk and adaptive management
- ATLAS QPR
- Rating and comments on progress (Development objectives) and Implementation Progress by Project Manager, UNDP CO, UNDP Regional Technical Advisor , GEF Operation Focal Point, National Implementing agency lead and Key partner.
- Portfolio level indicators (i.e. GEF focal area tracking tools) are used by most focal areas on an annual basis as well.

#### Periodic monitoring through site visits:

UNDP CO jointly with Project Management Unit and the UNDP Regional Coordinating Unit (RCU) will conduct visits to project sites based on the agreed schedule in the project's inception report/AWP to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and Project Board members.

#### Mid-term of project cycle:

The project will undergo an independent mid-term evaluation at the mid-point of project implementation, which means approximately two years after the project has started. The mid-term review will determine progress being made toward the achievement of outcomes and will identify adaptive management, as required. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Incorporate findings of this review as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance from the RCU and UNDP-GEF. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Centre (ERC). The relevant GEF Focal Area Tracking Tools will also be completed during the mid-term evaluation cycle.

#### End of Project:



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An independent final evaluation will take place three months prior to the end of the project and will be undertaken in accordance with UNDP and GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The TOR for this evaluation will be prepared by the UNDP CO based on guidance from the RCU and UNDP-GEF.

The final evaluation should also provide recommendations for follow-up activities and requires a management response, which should be uploaded to PIMS and to the UNDP ERC. The relevant GEF Focal Area Tracking Tools will also be completed during the final evaluation.

During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also make recommendations for any further steps that may need to be taken to ensure sustainability and Replicability of the project's results.

#### Learning and knowledge sharing:

Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks, communities of practice and forums.

The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation through lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects. Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

TABLE 23 : M&E work plan and budget

Type of M&E activity	Responsible Parties	Budget US\$ Excluding project team staff time	Time frame
Inception Workshop and Report	Project Manager Project Assistant UNDP CO, UNDPGEF	Indicative cost: \$10,000	Within first two months of hiring of national project manager
Measurement of Means and Verification of project results.	UNDPGEFRTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members.	Indicative cost: \$ 20,000  (To be finalized in Inception Phase and Workshop)	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on output and implementation	Oversight by Project Manager Project team	Indicative cost: \$6,000 (To be determined as part of the Annual Work Plan's preparation)	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	Project manager and team UNDP CO UNDPRTA UNDP EEG	Already included in the PMU cost	Annually
Periodic status/ progress reports	Project manager and team	Already included in the PMU cost	Quarterly
Mid-term Review	Project manager and team UNDP CO UNDP RCU External Consultants (i.e. evaluation team)	Indicative cost: \$30,000	At the mid-point of project implementation.
Final Evaluation	Project manager and team, UNDP CO UNDP RCU External Consultants (i.e. evaluation team)	Indicative cost: \$36,000	At least three months before the end of project implementation
Project Terminal Report	Project manager and team UNDP CO Local consultant	None	At least three months before the end of the project
Audit	UNDP CO Project manager and team	Indicative cost: \$ 3,000	Yearly
Visits to field sites	UNDP CO UNDP RCU (as appropriate) Government representatives	For GEF supported projects, paid from IA fees and operational budget	Yearly
TOTAL indicative COST Excluding project team staff time and UNDP staff and travel expenses (comes from UNDP contribution)		US\$ 105,000 (+/- 5% of total budget)	

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## SECTION VII: LEGAL CONTEXT

This document together with the CPAP signed by the Government and UNDP, which is incorporated by reference, constitute together a Project Document as referred to in the SBAA [or other appropriate governing agreement] and all CPAP provisions apply to this document.

Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

The implementing partner shall:

- put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
- Assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism. The recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via <http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm>. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

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## **ANNEXURES**

### **Annex A: List of stakeholders consulted**

- Directorate General for Energy (DGE)
- Ministry of Tourism, Industry, and Energy (MTIE)
- The General Directorate for Industry and Commerce (DGIC)
- The General Directorate of Tourism (DGT)
- General Directorate of Environment (DGA)
- Ministry of Environment, Housing and Land Management
- Institute of Meteorology and Geophysics (INMG)
- DG Customs- Ministry of Finance
- National Municipality Association (ANMCV)
- ELECTRA
- Economic Regulatory Agency (ARE)
- Regional Centre for Renewable Energy and EE (ECREEE)
- Directorate General of Infrastructure & General Inspection
- (DGI). Ministry of Infrastructure and Maritime Economy
- National Land Management Institute (INGT)
- OAC- Chamber of Architects
- OECV- Chamber of Engineers
- National Institute of Quality Management and Intellectual property
- Uni-Cv: Public University
- Luxembourg Development Agency -(LUXDEV)
- The European Union (EU) –
- IFH (Housing Development Institute)
- Chamber of Commerce Industries and Services Sotavento (CCISS)
- Engineering Laboratory Cabo Verde (LEC)
- Private Sector Partner/(s)

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## **Annex B: Terms of Reference for Key Project Personnel**

Terms of Reference: National Project Director

A national project director (NPD) will appoint the DGE to oversee the project implementation and progress. The person will be a government's representative and is holding a senior position in the government's hierarchy.

### **Duties and Responsibilities**

The National Project Director shall be tasked for:

- To provide overall guidance to the national project manager (NPM) and the Project Management Unit (PMU)
- Mobilizing national institutional mechanisms for smooth progress of the project
- Providing direction and guidance on project-related issues and providing guidance to the project team
- Ensuring result-oriented planning and implementation
- Review project budget revisions, annual progress reports, quarterly progress reports, annual work plan, facilitate audit and other administrative arrangements as required by DGE and UNDP
- Facilitate, mid-term review and, terminal evaluation facilitate implementation of recommendations, , support dissemination of lessons learned and capture policy implications
- Ensure timely progress of activities and project implementation as per the project document
- Reporting the project progress to the national steering committee and seek approval for any modifications/revisions to the project document as recommended
- Managing the project finances in line with GEF -UNDP guidelines and approve expenditure as provided for in the project budget and according to national procedures ( Treasury and Finance; and Ministry level Directorate General of Budget, management and planning ( DGPOG)
- Approving annual project reports and knowledge products for submission to NSC and UNDP
- Approving payments according to the agreed deliverables
- Being responsible for the preparation and submission of the Annual Progress Report (based on AWP); Project Implementation Report (PIR), Quarterly Operational Reports for submission to the Executing Agency and UNDP

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## **Terms of Reference: National Project Manager**

Under the direct supervision of the UNDP country office and established project management unit, national project manager (NPM) will be responsible for the day-to-day management and implementation of the UNDP-GEF project, including all project administrative matters. The manager's work will be carried out in line with the country program action plan and in full compliance with the UNDP rules and regulations. The management and coordination process will be pursued through undertaking appropriate actions in program formulation, implementation and evaluation.

### **Scope of work**

- Manage the project implementation in accordance with objectives, schedule and planned budget.
- Manage all project activities, staff, consultants etc., for timely implementation of requirements on monitoring and evaluation.
- Review and approve Terms of reference for technical assistances call for tenders, request for proposals and procurement process
- Ensure transparent and effective procurement process and proposals reviews
- Ensure timely preparation of annual project reports, working plans and other relevant project documents.
- Coordinate and manage inception workshop and preparation of inception report. Technically prepare steering and technical committees meetings and secretariat the meetings' chair..
- Oversee day-to-day planning, implementation and monitoring of project activities.
- Disbursement of funds, maintenance of accounts as per requirements of UNDP and provide inputs to internal and external audits.
- Liaise with counterparts and main stakeholders for ensuring their roles are appropriately integrated in the project as envisaged.
- Provide team leadership and guidance to the energy efficiency building code development/ S&L appliances consulting firms.
- Liaise with institutions at central, state and municipal level to ensure proper dissemination of the new project outcomes.
- Coordinate the project component activities and manage project deliverables.
- Coordinate demonstration project component and ensure effective implementation.
- Prepare and approve terms of reference for subcontracts and for equipment procurement

### **Qualifications**

- Advanced university degree /advances management degree (MBA)and at least 7 years of professional experience in energy management/ environmental policy and/or energy efficiency, including extensive knowledge of the international context.
- Experience in managing projects of similar complexity and nature, including demonstrated capacity to actively explore new, innovative implementation and financing mechanisms to achieve the project objective.
- Extensive experience in project management with adequate exposure to buildings and appliances.
- Demonstrated experience and success in the engagement of, and working with private sector and NGOs, creating partnerships and leveraging financing for activities of common interest.
- Strong analytical and problem-solving skills and experience with adaptive management with prompt action on the conclusion and recommendations coming out from the project's regular monitoring and self-assessment activities as well as from periodical external evaluations.

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- Ability and demonstrated success to work in a team, to effectively organize work, motivate members and other project counterparts to effectively work towards the project's objective and expected outcomes.
  - Good communication skills and competences in handling the project's external relations at all levels.
  - Good knowledge and fluency of English and Portuguese languages.
  - Strong information technology skills and experience with using Microsoft Office is essential.

Terms of Reference: National Project Assistant

### **Scope of work**

- Provide assistance to project manager in accordance with objectives, schedule and planned budget
- Coordinate and assist inception workshop and preparation of inception report
- Provide all administrative support to the project manager.
- Coordinate the project component activities and manage project deliverables.
- Coordinate and assist the project manager in demonstration project component.

Terms of Reference: National Technical Committee

One project board and two-project working group committee each for buildings and appliances will be constituted during the project implementation. The Project working group committee will be responsible for making – by consensus – technical decisions for the project when guidance is required by the NPM, including recommendation for UNDP/Implementing Partner approval of project plans and revisions. In order to ensure UNDP's ultimate accountability, project working group decisions should be made in accordance with standards that ensure management for development results, best value for money, fairness, integrity, transparency and effective international competition.. In addition, the project-working group plays a critical role in UNDP-commissioned project evaluations by quality assuring the evaluation process and products, and using evaluations for performance improvement, accountability and learning.

Project reviews by the working group committee are made at designated decision points during the running of the project, or as necessary when raised by the PMU. This group is consulted by the PMU for decisions when PMU's tolerances (normally in terms of time and budget) have been exceeded (flexibility). Based on the approved annual work plan, the working group may review and approve project quarterly plans when required and authorizes any major deviation from these agreed quarterly plans. It is the authority that signs off the completion of each quarterly plan as well as authorizes the start of the next quarterly plan. It ensures that required resources are committed and arbitrates on any conflicts within the project or negotiates a solution to any problems between the projects and external bodies. In addition, it approves the appointment and responsibilities of the PMU and any delegation of its project assurance responsibilities.

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## Request for Proposal (RFP) – Buildings

Appointment of an agency for removing barriers for energy efficiency in Cabo Verde building sector

### Detailed Scope of Work

Energy efficiency policies, legislation and secondary regulations are adopted and are put in place and strengthened regulatory framework results

- Develop a new building code focused on energy savings in Cabo Verde (including minimum energy performance standards and energy passports), promoting climate resiliency and adaptation' and including water usage standards (efficiency, recycling and reuse).
- Develop inventory and information system for national energy balance, detailed consumption statistics and related GHG emissions by building category and major end-use (air conditioning, lighting, water heating, water pumping, and lighting appliances).
- Propose MRV protocol to measure energy savings, water usage, and emission reduction in public buildings.
- Develop implementation strategy for amendments to construction permit regulations; include mandatory requirements for minimum energy and water performance standards and develop robust enforcement mechanism.

Energy efficiency solutions in selection of public buildings through selected pilot demonstration projects

- Provide assistance in selection of demonstration projects for energy efficiency investment
- Develop training and certification programs for building stakeholders
- Provide training to monitor energy performance, water usage at the selected buildings in accordance with information systems
- Develop monitoring and reporting system of energy performance/water usage for the demonstration projects

Replication and Dissemination

- Prepare case study guides and strategies to disseminate among relevant audience
- Conduct training programs for key stakeholders on energy efficient buildings
- Perform monitoring of the impacts of the new energy efficiency requirement
- Develop framework to regularly update the legislation in order to tighten energy efficiency to transform further the building practices.

### Deliverables

- Energy efficiency building code: Baseline data collection, baseline analysis report, code structure and scope, code stringency analysis, code compliance mechanism, user manuals and training programs, stakeholder consultations, draft code for energy efficiency in buildings



- Technical Assistance Pilot demonstration projects: Pilot selection criteria and feasibility, training and certification program, pilot project demonstration on energy efficiency measures
- Replication and dissemination: Case study guides and energy efficiency user guide, awareness raising programs, develop and publish energy efficiency best practice user manuals

### Eligibility Criteria

- The service provider should have completed assignments of minimum cumulative total of USD five hundred thousand (\$ 170,000 in energy efficiency/ conservation/Audits/Project management services/training programs in total over last three financial years)
- The service provider should have minimum 7 years of experience in energy efficiency programs, projects or policy level and/or technical assistance for energy efficiency in buildings, energy conservation/ audits/project management services
- Familiarity with energy efficiency issues ,policy measures in small islands developing states (SIDS) , and/or Africa and in particular West Africa
- Significant experience in developing and conducting training programs for energy efficiency measures, energy auditing, MRV etc.
- Key experts should have post graduate qualification in relevant field e.g. Energy management /energy policy/ environmental policy/ or equivalent qualifications, with minimum 7 year post qualification experience in energy efficiency
- Other team members should be engineering graduate and/or post graduate in energy related field with 3 years of experience in energy efficiency buildings

Table 24 : Key Evaluation Criteria

Technical Criteria		Weight (70%)
1.	Expertise of the service provider(or joint venture/consortium) in building energy efficiency, building code development and policies, energy audits, monitoring & verification, and conducting trainings	20%
2.	Methodology, its appropriateness to the condition and timeliness of the Implementation Plan	20%
3.	Management Structure and Qualification of Key Personnel (CVs of key experts: building energy efficiency expert, energy auditor expert, M& V expert, training expert in training and local team expertise(maximum 6 team members)	30%
Financial Criteria		30%
4	To be computed as a ratio of the proposal's offer to the lowest price among the proposals received by UNDP.	

### Documents required for Proposal

#### Technical Proposal

- Qualifications of the service provide

- Proposed Methodology for the completion of required services
- Qualifications of key personnel

### **Financial Proposal**

- Cost breakdown per deliverables
- Cost breakdown per cost component
- 

#### **Qualification of the service provider**

The Service provider must describe and explain how and why they are the best entity that can deliver the requirements of UNDP by indicating the following:

- a) Profile – describing the nature of business, field of expertise, licenses, certifications, accreditations;
- b) Business Licenses – Registration Papers, Tax Payment Certification, etc.
- c) Latest Audited Financial Statement – income statement and balance sheet to indicate its financial stability, liquidity, credit standing, and market reputation, etc. ;
- d) Track Record – list of clients for similar services, indicating description of contract scope, contract duration, contract value, contact references;
- e) Certificates and Accreditation – including Quality Certificates, Patent Registrations, Environmental Sustainability Certificates, etc.
- f) Written Self-Declaration that the company (or joint venture) is not in the UN Security Council 1267/1989 List, UN Procurement Division List or Other UN Ineligibility List.

#### **Proposed Methodology for the Completion of Services**

The Service Provider must describe how it will address/deliver the demands of the RFP; providing a detailed description of the essential performance characteristics, reporting conditions and quality assurance mechanisms that will be put in place, while demonstrating that the proposed methodology will be appropriate to the local conditions and context of the work .

#### **Qualifications of Key Personnel**

The Service Provider must provide:

- a) Names and qualifications of the key personnel that will perform the services indicating who is Team Leader, who are supporting, etc.;
- b) CVs demonstrating qualifications must be submitted and
- c) Written confirmation from each personnel that they are available for the entire duration of the contract

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## **Request for Proposal (RFP) – Appliances**

Appointment of an agency for removing barriers for energy efficiency in Cabo Verde domestic appliances sector

### **Detailed Scope of Work**

Certification, labelling and enforcement mechanism to promote energy efficient end-uses and national testing, certification, labelling and enforcement mechanisms adopted for appliances

- Develop labelling programme for appliances imported in Cabo Verde in line with ECOWAS labelling programme
- Develop regulatory framework including import regulations for energy efficiency standards for a first selection of appliances
- Develop a testing mechanism for selected appliances to be developed and established
- Develop national certification procedures to promote energy efficient appliances
- Develop and launch demand side management program, run by national utility, built around a “turn in or exchange” mechanism /modality
- Develop and propose financial incentive and is introduced in a pilot programme for the scale up of energy efficient appliances

Replication and dissemination

- Develop awareness-raising campaign for end users, retailers and distributors on S&L program for imported appliances (websites, media outreach etc.)
- Conduct public awareness programme and diffusion strategy – training seminars etc.

### **Deliverables:**

- Standards and Labelling for appliances: appliance labelling programme, design of informative labels, appropriate testing procedures, labelling threshold and programme implementation methodology, pilot launch of S&L programme, customs and sales regulations framework, MRV methodology
- Appliance testing mechanism: methodology for testing and labelling of appliances.
- National Certification program: comprehensive certification program of standardized products
- Training and awareness program: The proposed activity will produce awareness raising programmes and target audience, appropriate training programs and various marketing products
- DSM program report: Implementation strategy to phase out inefficient appliances
- EE financing report: the proposed activity will provide feasibility analysis of various financing schemes which could facilitate the market for selected energy efficient products

- Developed standards: to increase the stringency level for energy efficient appliances and buildings (REACH standard)

### Eligibility Criteria

- The service provider (joint venture / consortium) consulting firm should have minimum 7 years of experience in energy efficiency programs, standards and labelling of appliances, projects or policy level and/or technical assistance for energy efficiency measures, training and outreach
- Significant experience in the field of standards and labelling of appliance, policies and programs for energy efficiency in awareness
- Significant experience in developing and conducting training programs for energy efficient appliances
- Proposed team leader should have post graduate degree in energy management /energy policy/ environmental policy/ or equivalent qualifications
- Project team leader should have minimum 7 years of energy efficiency /policy related assignments
- Team members should have engineering graduate and/or post graduate in energy related field with 3 years of experience in energy efficiency
- Presence of a strong in-house team of trainers (minimum 3) and outreach campaigns experts

*Table 25 : Key Evaluation Criteria*

Technical Criteria		Weight (70%)
1.	Expertise of the service provider (or joint venture/consortium) in building energy efficiency, standards and labelling of appliances, energy efficiency finance, demand side management, training and certification	20%
2.	Methodology, its appropriateness to the condition and timeliness of the Implementation Plan	20%
3	Management Structure and Qualification of Key Personnel (CVs of key experts: international energy efficiency expert (S&L appliances), M&V expert, training expert in training and local team expertise (maximum 7 team members	30%
Financial Criteria		30%
4	To be computed as a ratio of the proposal's offer to the lowest price among the proposals received by UNDP.	

### Documents required for Proposal

#### Technical Proposal

- Qualifications of the service provide (max. 15 pages)
- Proposed Methodology for the completion of required services
- Qualifications of key personnel

#### Financial Proposal

- Cost breakdown per deliverables

- Cost breakdown per cost component

**Qualification of the service provider**

The Service provider must describe and explain how and why they are the best entity that can deliver the requirements of UNDP by indicating the following:

- a) Profile – describing the nature of business, field of expertise, licenses, certifications, accreditations;
- b) Business Licenses – Registration Papers, Tax Payment Certification, etc.
- c) Latest Audited Financial Statement – income statement and balance sheet to indicate its financial stability, liquidity, credit standing, and market reputation, etc. ;
- d) Track Record – list of clients for similar services, indicating description of contract scope, contract duration, contract value, contact references;
- e) Certificates and Accreditation – including Quality Certificates, Patent Registrations, Environmental Sustainability Certificates, etc.
- f) Written Self-Declaration that the company (or joint venture) is not in the UN Security Council 1267/1989 List, UN Procurement Division List or Other UN Ineligibility List.

**Proposed Methodology for the Completion of Services**

The Service Provider must describe how it will address/deliver the demands of the RFP; providing a detailed description of the essential performance characteristics, reporting conditions and quality assurance mechanisms that will be put in place, while demonstrating that the proposed methodology will be appropriate to the local conditions and context of the work .

**Qualifications of Key Personnel**

The Service Provider must provide:

- a) Names and qualifications of the key personnel that will perform the services indicating who is Team Leader, who are supporting, etc.;
- b) CVs demonstrating qualifications must be submitted and
- c) Written confirmation from each personnel that they are available for the entire duration of the contract

## Annex C: Emission reduction calculations

Using the best available data, expert opinion from the consultant team and nation team, as well as reasonable hypothesis, it was possible to build an energy efficiency buildings scenario and energy efficient appliances scenario, resulting from the project. Estimates for impact on GHG emissions reduction and subsequent energy savings resulting from project implementation were calculated. The principal sources of statistical data on energy consumption and GHG emissions from appliances and buildings used were:

### Appliances Data:

- DG customs provided extensive list of the products imported into the country in terms of value of imports and the total weight for last decade(2003- 2013).
- National team provided details of key information needed to calculate energy consumption of the shortlisted appliances (refrigerators, air conditioners, televisions, water heaters and bulbs) - unit weight, no of units imported, average power consumption of each appliance, annual usage, and popular brand of import. This data was compiled and extracted from DG Energy sources ( Utilities annual report submitted to DG Energy) , National Statistics Institute ( INE) Energy sector and household survey and 2010 census data, as well as from survey to major importers and retailers on appliances at major urban centres in the country ( distributed by e-mail and/or applied in-situ).
- The statistical data was developed and used for calculating energy consumption of appliance in last decade with corresponding GHG emission.

Table 26: Appliances: Energy Consumptions and GHG Emissions (2004-13)

Refrigerators and freezers	CVE (DG Customs)	Weight (Kgs) - DG Customs	No of freezer units imported( avg weight 35kg/unit) *	Avg Power consumption (watts)*	Usage per day (in hours)	Days of usage per year	Usage by single unit per annum (KWh)	Usage of freezers imported (kwh)	Usage of freezers imported (Mwh)	Grid Emission Factor tCO <sub>2</sub> e / kWh	t co <sub>2</sub>
2013	313353427	798307	22,809	200	24	365	1752	39960968	39,961	0.000490	19593
2012	349385343	793234	22,664	200	24	365	1752	39707028	39,707	0.000490	19469
2011	375089941	927435	26,498	200	24	365	1752	46424746	46,425	0.000490	22762
2010	444714318	1917967	54,799	200	24	365	1752	96007948	96,008	0.000490	47073
2009	396078395	823238	23,521	200	24	365	1752	41208942	41,209	0.000490	20205
2008	470736548	1272065	36,345	200	24	365	1752	63675939	63,676	0.000490	31221
2007	9082115	20288	580	200	24	365	1752	1015559	1,016	0.000490	498
2006	344433449	773747	22,107	200	24	365	1752	38731564	38,732	0.000490	18990
2005	303785265	793508	22,672	200	24	365	1752	39720743	39,721	0.000490	19475
2004	224449790	574872	16,425	200	24	365	1752	28776450	28,776	0.000490	14109

Televisions	CVE (DG Customs)	Weight (Kgs) - DG Customs	No. of TV imported ( 30Kg /unit)	Power consumption (watts)	Usage per day (in hours)	Days of usage per year	Usage by single unit per annum (KWh)	Usage of televisions imported (kwh)	Usage of televisions imported (Mwh)	Grid Emission Factor tCO <sub>2</sub> e / kWh	t co <sub>2</sub>
2013	240624825	247229	8,241	120	6	365	262.8	2165726.04	2165.7	0.000490	1062
2012	240161582	270975	9,033	120	6	365	262.8	2373741	2373.7	0.000490	1164
2011	315772039	452794	15,093	120	6	365	262.8	3966475.44	3966.5	0.000490	1945
2010	319690328	419119	13,971	120	6	365	262.8	3671482.44	3671.5	0.000490	1800
2009	216647118	430368	14,346	120	6	365	262.8	3770023.68	3770.0	0.000490	1848
2008	248758347	448889	14,963	120	6	365	262.8	3932267.64	3932.3	0.000490	1928
2007	230557163	415975	13,866	120	6	365	262.8	3643941	3643.9	0.000490	1787
2006	392551595	511440	17,048	120	6	365	262.8	4480214.4	4480.2	0.000490	2197
2005	201729737	385144	12,838	120	6	365	262.8	3373861.44	3373.9	0.000490	1654
2004	231671989	365405	12,180	120	6	365	262.8	3200947.8	3200.9	0.000490	1569

Air Conditioner	CVE(DG Customs)	Weight (Kgs) - DG Customs	No. of AC imported ( 45Kg /unit)	Avg Power consumption (watts)	Usage per day (in hours)	Days of usage per year	Usage by single unit per annum (KWh)	Usage of AC imported (kwh)	Usage of AC imported (Mwh)	Grid Emission Factor tCO <sub>2</sub> e / kWh	t co <sub>2</sub>
2013	213803713	273645	6,081	3,000	4	365	4380	26634780	26634.8	0.000490	13059.1
2012	235284528	275343	6,119	3,000	4	365	4380	26800052	26800.1	0.000490	13140.2
2011	147785139	238135	5,292	3,000	4	365	4380	23178473.3	23178.5	0.000490	11364.5
2010	214745393	387810	8,618	3,000	4	365	4380	37746840	37746.8	0.000490	18507.4
2009	179211405	227872	5,064	3,000	4	365	4380	22179541.3	22179.5	0.000490	10874.7
2008	135025647	215009	4,778	3,000	4	365	4380	20927542.7	20927.5	0.000490	10260.9
2007	132242432	305950	6,799	3,000	4	365	4380	29779133.3	29779.1	0.000490	14600.8
2006	196902290	262755	5,839	3,000	4	365	4380	25574820	25574.8	0.000490	12539.4
2005	94066309	183513	4,078	3,000	4	365	4380	17861932	17861.9	0.000490	8757.8
2004	106701020	168020	3,734	3,000	4	365	4380	16353946.7	16353.9	0.000490304	8018.4

Electric water heaters	CVE	Weight (Kgs)	No. of aquecedores de água imported ( 20Kg /unit)	Avg Power consumption (watts)	Usage per day (in hours)	Days of usage per year	Usage by single unit per annum (KWh)	Usage of aquecedores de água imported (kwh)	Usage of aquecedores de água imported (Mwh)	Grid Emission Factor tCO <sub>2</sub> e / kWh	t co <sub>2</sub>
2013	83807118	192798	9639.9	1500	1	365	547.5	5277845.25	5277.85	0.000490	2587.75
2012	102421944	232983	11649.15	1500	1	365	547.5	6377909.63	6377.91	0.000490	3127.11
2011	131527632	265486	13274.3	1500	1	365	547.5	7267679.25	7267.68	0.000490	3563.37
2010	120763543	297368	14868.4	1500	1	365	547.5	8140449	8140.45	0.000490	3991.29
2009	118228524	281069	14053.45	1500	1	365	547.5	7694263.88	7694.26	0.000490	3772.53
2008	146130838	342372	17118.6	1500	1	365	547.5	9372433.5	9372.43	0.000490	4595.34
2007	125540403	268788	13439.4	1500	1	365	547.5	7358071.5	7358.07	0.000490	3607.69
2006	101234383	185777	9288.85	1500	1	365	547.5	5085645.38	5085.65	0.000490	2493.51
2005	83388469	167423	8371.15	1500	1	365	547.5	4583204.63	4583.20	0.000490	2247.16
2004	65298368	124320	6216	1500	1	365	547.5	3403260	3403.26	0.000490	1668.63

bulbs	CVE	Weight (Kgs)	No. of bulbs imported ( 0,3Kg /unit)	Avg Power consumption (watts)	Usage per day (in hours)	Days of usage per year	Usage by single unit per annum (KWh)	Usage of bulbs imported (kwh)	Usage of bulbs imported (Mwh)	Grid Emission Factor tCO <sub>2</sub> e / kWh	t co <sub>2</sub>
2013	79690209	115384	384613.33	60	4	365	87.6	33692128	33692.1	0.000490	16519.4
2012	72895736	115152	383840.00	60	4	365	87.6	33624384	33624.4	0.000490	16486.2
2011	90545628	131876	439586.67	60	4	365	87.6	38507792	38507.8	0.000490	18880.5
2010	61492468	104128	347093.33	60	4	365	87.6	30405376	30405.4	0.000490	14907.9
2009	111840887	135721	452403.33	60	4	365	87.6	39630532	39630.5	0.000490	19431.0
2008	82883148	144279	480930.00	60	4	365	87.6	42129468	42129.5	0.000490	20656.2
2007	62320879	113761	379203.33	60	4	365	87.6	33218212	33218.2	0.000490	16287.0
2006	72200176	97031	323436.67	60	4	365	87.6	28333052	28333.1	0.000490	13891.8
2005	37059339	69268	230893.33	60	4	365	87.6	20226256	20226.3	0.000490	9917.0
2004	41747746	49350	164500	60	4	365	87.6	14410200	14410.2	0.000490	7065.4

Table 27 : Business as Usual Scenario for Appliances

Energy Consumed (MWh)	Business as Usual																		
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
	BAU	BAU	BAU	BAU	BAU	BAU	BAU	BAU	BAU	BAU									
Air conditioners	20866	22181	23578	25063	26642	28321	30105	32002	34018	36161	38439	40861	43435	46172	49080				
Cumulative energy consumption(MWh)	89,576	93842	98652	103985	109830	116185	123053	130444	138374	146860	155927	165603	175917	186905	198605				
Refrigerators & Freezers	41519	43139	44821	46569	48385	50272	52233	54270	56387	58586	60871	63244	65711	68274	70936				
Cumulative(MWh)	207323	208997	210679	215113	216929	223815	225776	234891	237007	248192	259424	261798	275149	288393	291056				
Electric water heaters	5568	5874	6197	6538	6898	7277	7678	8100	8545	9015	9511	10034	10586	11168	11783				
Cumulative (MWh)	29283	29301	29624	30237	30597	31755	32155	33824	34269	36431	38656	39179	41929	44712	45326				
Televisions	2220	2275	2332	2391	2450	2512	2574	2639	2705	2772	2842	2913	2985	3060	3137				
Cumulative(MWh)	13585	13143	13200	12951	13010	12920	12983	13025	13091	13245	13438	13509	13792	14094	14171				
Bulbs	34130	34574	35023	35479	35940	36407	36880	37360	37845	38337	38836	39341	39852	40370	40895				
Cumulative(MWh)	154785	158402	158852	162560	163021	166824	167297	171198	171683	175683.97	176182	180287	180798	185008.57	185533				
Total Appliance (Energy consumption)	1,04,304	1,08,043	1,11,952	1,16,040	1,20,316	1,24,789	1,29,470	1,34,370	1,39,500	1,44,872	1,50,498	1,56,393	1,62,570	1,69,044	1,75,831				
Cumulative (energy consumption)	4,94,552	503684.7	5,11,006	524845.1	5,33,387	551499.2	5,61,264	583381.7	5,94,424	620411.3	6,43,627	660374	6,87,586	719112.8	7,34,690				

Energy Consumed (MWh)	ALTERNATIVE SCENARIO																		
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028				
	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS				
Air conditioners	17736.20581	18853.5868	20041.36274	21303.969	22646.11862	24072.82409	25589.41201	27201.54497	28915.2423	30736.90256	32673.32743	34731.74705	36919.8471	39245.79749	41718.28273				
Cumulative energy consumption(MWh)	86446.48699	88010.7764	90449.98384	93663.956	97577.28316	102134.6506	107297.1325	113039.251	119346.6431	126214.217	133644.701	141647.5079	150237.853	159436.0802	169267.1469				
Refrigerators & Freezers	35291.52849	36667.8981	38097.94612	39583.766	41127.5329	42731.50668	44398.03544	46129.55882	47928.61162	49797.82747	51739.94274	53757.80051	55854.3547	58032.67456	60295.94887				
Cumulative(MWh)	201094.8696	197543.794	196132.9811	196490.15	198319.6536	201387.2296	205507.8191	210535.8141	216357.2629	222883.6378	230046.853	237795.2829	246090.581	254905.1394	264220.0604				
Electric water heaters	5289.720402	5580.65502	5887.59105	6211.4086	6553.036029	6913.45301	7293.692926	7694.846037	8118.062569	8564.55601	9035.606591	9532.564953	10056.856	10609.98311	11193.53218				
Cumulative (MWh)	29004.32076	28784.1116	28914.88036	29343.313	30027.6863	30935.60205	32042.17457	33328.58659	34780.93112	36389.30091	38147.04732	40050.20281	42097.0183	44287.59772	46623.61036				
Televisions	1664.901893	1706.52444	1749.187552	1792.9172	1837.740171	1883.683676	1930.775768	1979.045162	2028.521291	2079.234323	2131.215181	2184.495561	2239.10795	2295.085648	2352.46279				
Cumulative(MWh)	13029.90956	12130.4521	11453.54922	10955.757	10602.34547	10365.56005	10223.22381	10157.62421	10154.62066	10202.93085	10293.55986	10419.34345	10574.5827	10754.75182	10956.26424				
Bulbs	8532.531416	8643.45432	8755.819231	8869.6449	8984.950264	9101.754618	9220.077428	9339.938434	9461.357634	9584.355283	9708.951902	9835.168276	9963.02546	10092.54479	10223.74788				
Cumulative(MWh)	129187.858	111993.741	98350.81178	87550.294	79025.18571	72321.90318	67077.59997	63002.01841	59862.97236	57474.73317	55688.73844	54386.15903	53471.9527	52870.10694	52519.83343				
Total Appliance (Energy consumption)	68514.88801	71452.1187	74531.9067	77761.705	81149.37798	84703.22207	88431.99357	92344.93342	96451.79541	100762.8756	105289.0438	110041.7764	115033.191	120276.0856	125783.9744				
Cumulative (energy consumption)	458763.4449	438462.875	425302.2063	418003.47	415552.1543	417144.9455	422147.95	430063.2934	440502.4301	453164.8197	467820.8996	484298.4961	502471.988	522253.6761	543586.9153				



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**Assumptions:**

- Growth rate of appliances from 2014-28 is assumed to be same as growth rate from 2004-13.
- It is assumed that all the appliances imported into the country are sold in the market thus sales volume and import volume are considered same both in base case and projected scenarios
- Each appliance unit weight, energy usage, and average power consumption is considered same in base case and projected scenarios.
- It is assumed that 20% of appliances are replaced every year from the stock
- Product policy analysis tool (PPAT) (analytical tool developed to support policy decisions for energy efficiency potential in appliances) was used to develop scenarios with minimum energy performance standards (MEPS) and labels for BAU and alternative scenario analysis
- Assumed that the S&L program will be launched after one year of the launch of the project

**Table 28: Survey Data for Appliances (Collected During the PPG Phase)**

Appliances	Total Impor(2009-2013) Volume	Wiegth (Kg)(Total(2009-2013)	Wigth Unit(Kg)	Total Impor(2009-2013) Quantity	Annual sales volume (2009-13) -quantity	Posse de bens por agregados familiares(2010)	Expected Annual sales growth rate(%) / (2015-20)	Average power consumption per unit (watts)	Average daily usage (in hours)	No. of days used each year (avg)	Brands of imported appliance	Average Capacity / size
Air conditioners	990830178	1402805	45	31173	31173	2.4		15-20w/m2	4	269	Westpoint OLG Norm Fairline Orima	12.000 BTU
water heaters	556748761	1269704	20	63485	63485.2	7		12-14w/L	1	365	Tropicool Ariston	20 L
computers	3927506490	863437	20	43172	43172			250	6	365	Tsunami DELL	
electric ovens	57049061	51129	20	2556	2556	20.4		2000	2	365		
Electrothermal hair dryers	20568945	33810	2	16905	16905			1000	6	365		
electrothermal toasters	14677351	35351	2	17675.5	17675.5			930	0.5	365	Clatronic Elekom Julin Kinderbo Bomann Flama Sinbo Tanras Tristar Nikai	2 sanduiches
electric iron	42882644	86239	2	43119.5	43119.5			1900	0.5	365	Clatronic EST-europa style Utilidad Rowenta CROWN FLAMA Leidy Amrtica Tarrington Ttouse Nova Promax	1900 W
Refrigerators and freezers	1878621424	5260181	35	150290.8857	150290.8857	58.3		200	24	365	Westpoint Tropicool OLG Luso Holtpoint Indesit whirlpool Radiso Jocel Samsung Sonic Xper Fairline Bomann DAKO CROWN Tensai	290 L
lamps	416464928	602261	0.3	2007537	2007537			500	4	365		
washing machines	955034962	485184	30	16172.8	16172.8	16		2000	0.5	365	OLG Wilson Tropicool Westpoint Orima Apell Induit CROWN Radiso	8 KG
support sound and picture reord	697186818	249969	5	49993.8	49993.8	51.8		200	2	365		
Televisions	1332895892	1820485	30	60683	60683	73.9		120	6	365	CROWN Samsung OLG Sharp Grundig	34 polegadas

\*Agregados familiares: 117.289

Note: as marcas assinaladas com cor verde são as que mais vendem

## Direct emissions reductions

Based on the tables above, direct emissions reduction will result from the most relevant financial incentive and introduced in a pilot programme for the scale up of energy efficient refrigerators, air conditioners and water heater. This results in energy savings of 111,184 MWh (average energy savings from year 2016 -19, during the project implementation period). Direct emission reductions, thus calculated from GEF methodology is 272.4 **ktCO<sub>2</sub>** of emission savings. Out of this, approximately 10% (27,200 ktCO<sub>2</sub> ) is estimated to be post project direct GHG emission reduction from the financial mechanisms which will be put in place by the end of the project. This estimate will need to be refined once more details are known about the financial mechanism.

TABLE 29: APPLIANCES ENERGY SAVINGS (2015- 28)

	Energy savings(MWh)	tCO <sub>2</sub>
2014		-
2015	-	-
2016	85,704	41,995
2017	106,842	52,352
2018	117,835	57,739
2019	134,354	65,834
2020	139,116	68,167
2021	153,318	75,126
2022	153,922	75,422
2023	167,246	81,951
2024	175,806	86,145
2025	176,076	86,277
2026	185,114	90,706
2027	196,859	96,461
2028	191,103	93,641
Total	1,672,916	819,729

## Indirect Emissions reductions

It is assumed that the project implementation and development of S&L program will lead to indirect energy savings and emission reductions from the project. With replication factor of 3, thus replicating the direct emissions reduction three times for **indirect bottom up emissions** resulting in **817.2 ktCO<sub>2</sub>**emissions reductions.

**Indirect top down emissions** with causality factor of 80% will result in indirect emission savings of **655.7 Kt CO<sub>2</sub>** from appliances alone (for 10 years).

Table 30 : Co2 Emissions (Appliances)

Appliances (Standards and labelling programme)	
Direct Emissions Reductions	272.4ktCO <sub>2</sub>
Indirect Bottom up Reductions	817.2ktCO <sub>2</sub>
Indirect Top down reductions	655.7 ktCO <sub>2</sub>

## Buildings Data

The objective of the project is development of a new modern energy efficient building code for the country. The new law on energy savings is expected to introduce concepts such as energy audits; MEPS for buildings, the project will support pilot action on public buildings and mobilize additional investments for energy efficiency.

### Baseline data

- It was difficult to gather baseline data of energy use in buildings sector, UNDP national team conducted extensive surveys and interviews to formulate baseline.
- Simulations on energy consumption on buildings using sample energy audit to public and/or office building data & compilation of electricity consumption and space use data from public buildings' managers were conducted.
- ELECTRA is responsible for 90% of electricity supply in the country, thus it was assumed that electricity sales and production data from the ELECTRA annual reports could be considered reasonable to form baseline of energy consumption for public sector, residential and institutions etc.

Table 31 : Annual Sales - Electra (2005-12)

Consumers	2005	2006	2007	2008	2009	2010	2011	2012
Public Buildings	16,548	16,677	18,245	18,548	20,508	22,929	22,893	23,321
Domestic sector	80,977	82,331	81,297	85,234	90,754	95,857	98,761	96,945
Institutions/Social Organizations	2,779	2,896	3,075	3,255	3,793	4,434	5,110	4,643
<b>Total Buildings</b>	<b>100,304</b>	<b>101,905</b>	<b>102,619</b>	<b>107,037</b>	<b>115,056</b>	<b>122,584</b>	<b>126,765</b>	<b>124,911</b>
Others	61,371	62,868	65,852	69,315	70,052	80,871	79,778	79,770
<b>Total</b>	<b>161,675</b>	<b>164,774</b>	<b>168,471</b>	<b>176,352</b>	<b>185,109</b>	<b>203,456</b>	<b>206,544</b>	<b>204,682</b>

- Growth rate for both public and residential sector buildings is considered same from base case year 2005-12, using the similar growth rates for 2013- 2028. No studies on real estate sector projections and construction growth rates for the next year have been conducted or are commissioned to be completed by any public agency, private corporation or research centre.
- In BAU projections for buildings it is assumed that in absence of the project, market penetration of energy efficient buildings will be relatively low. A baseline shift is developed with assumption of only 10% building to be energy efficient without the project implementation until 2019.
- In alternate scenario, it is assumed that new energy efficiency building code will be developed and implemented after year one of the project start, thus assuming 30% of building stock will be built as per energy efficiency building standards till 2019.

- Therefore, direct emission reduction will not only result from demonstration projects but also from newly developed code compliant buildings.
- Assuming that after the project implementation, from 2019 all buildings will be built as per the new energy efficiency code.

#### Direct emissions reduction

- Energy savings of 1150 MWh ( average saving from year 2016-19) are expected from the project during its implementation phase, contributed from demonstration projects and other new buildings which are built with energy efficiency standards(nearly 30% of new build stock).
- Emissions reduction of 16.91ktCO<sub>2</sub> is expected.

Table 32 : Energy Savings and Emissions Abatement (2016-28)

Year	Energy savings(MWh)	Cumulative Energy Savings(MWh)	t co2 abatement
2015	0	0	0
2016	211	211	103
2017	434	645	213
2018	1,449	2,095	710
2019	2,508	4,602	1,229
2020	3,389	7,992	1,661
2021	4,312	12,304	2,113
2022	5,278	17,582	2,586
2023	6,289	23,871	3,081
2024	6,951	30,822	3,406
2025	7,640	38,462	3,744
2026	8,358	46,820	4,096
2027	9,106	55,926	4,462
2028	10,098	66,024	4,948
Total Savings	66,024	307,356	32,352

#### Indirect Emissions Reduction

- After project implementation, it is expected that all new buildings will comply with new energy efficiency building code (100% of the new build stock).
- Bottom up reductions: 50.72ktCO<sub>2</sub> of emissions reduction (replication factor 3 – of direct emission reductions)
- To down reductions: 31.3ktCO<sub>2</sub> of reductions (causality factor 100%)

Table 33: Buildings Baseline and Alternative Scenario

Consumers	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	BASELINE (assumptions)																	
	EE Uptake Stock		Yr 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
			0	0.1	0.1	0.1	0.1	0.3	0.3	0.3	0.3	0.6	0.6	0.6	0.6	0.8	0.8	0.8
Public Sector	24162.0	25031.9	25933.00706	26852.6	27804.8	28790.7	29811.7	30836.6	31896.7	32993.4	34127.7	35245.7	36400.3	37592.8	38824.4	40054.3	41323.2	42632.4
Residential	99659.9	102450.4	105318.9682	108179.4	111117.6	114135.5	117235.5	120222.6	123285.9	126427.2	129648.6	132625.3	135670.4	138785.4	141971.9	144993.1	148078.5	151561.3
Institutions/ Social	4829.5	5022.6	5223.553454	5429.361	5643.278	5865.623	6089.690	6322.316	6563.829	6814.567	7074.884	7332.409	7599.309	7875.924	8162.608	8449.931	8747.369	9055.276
Total Energy consumption (MWh)	128651.3774	132504.8658	136475.5287	140461.3843	144565.647	148791.9038	153136.8116	157381.522	161746.469	166235.1419	170851.1355	175203.4151	179670.04	184254.1231	188958.86	193497.3012	198149.1116	203248.9456

Consumers	ALTERNATIVE Scenario																	
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	EE UPTAKE		Yr 0	30%	30%	100%	100%	100%										
Public Sector	24162	25032	25933	26825	27747	28596	29471	30373	31302	32260	33247	34264	35313	36394	37507	38655	39838	41057
Residential	99660	102450	105319	108002	110754	112925	115139	117395	119696	122042	124434	126873	129360	131895	134480	137116	139804	142544
Institutions/ Social	4829	5023	5224	5423	5630	5822	6020	6224	6436	6655	6881	7115	7357	7607	7866	8133	8410	8696
Total Energy consumption (MWh)	128651	132505	136476	140250	144131	147343	150629	153992	157434	160957	164562	168253	172030	175896	179853	183904	188051	192296

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## Annex D: Identified Potential Demonstration Project

The pilot demonstration projects will aim to support UNDP GEF in removing barriers to energy efficiency in Cabo Verdean built environment and for appliances. Demonstration projects are visible as vehicles to highlight the concept of energy efficiency building design measures through applicable, cost effective technologies and design strategies. Summarized are the objectives;

- Demonstration and promotion of energy efficiency technologies, design strategies, materials, construction and operational practices that can be instrumental in developing best practices energy efficiency measures
- Creation of public awareness about energy efficient buildings and their benefits and encourage stakeholders to design and build buildings in compliance with EEBC code developed during the project implementation
- Identification of market and policy barriers in achieving energy efficient buildings
- Identification and development of technical tools, practices and skills that would accelerate the growth energy efficient buildings
- Building stakeholders (architects, engineers, designers, developers, financial institutions) trained to monitor energy performance/water usage
- Develop a monitoring and reporting system of energy performance / water usage of pilot projects

### Key selection Criteria

- a) **Energy Saving Potential:** The key criteria for project selection will be based on the significant energy saving and water saving potential. Large energy savings can best validate the higher capital cost and additional technical inputs required for energy efficient pilot project and make the most convincing case for promoting energy efficiency and water efficiency in buildings.
- b) **Potential for market transition:** Results and lessons from the pilot studies should be applicable across a broad spectrum of buildings thereby increasing the chance to make a major impact in reducing energy consumption in the building sector.
- Selected projects should cover diversity of building type to demonstrate the link between technological interventions with different usage, activities and related energy usage.
  - Project size should be representative of a diverse range of scales in terms of physical footprint that will better establish the applicability of energy efficient buildings concept irrespective of their size. This will enable understanding of the integration of technologies inside the building, between multiple buildings and between building and site.
  - Economic, social, and technical feasibility of the site location and topology should be for energy efficient building development should be primary.

c) **Technology Diffusion and replication**

UNDP GEF pilot demonstration project should encourage the integration of energy efficient technologies and concepts in buildings for enhanced building performance.. To support this objective, the selected projects should be able to display easily replicable energy efficiency technology, product or measure for other projects to emulate its

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example. Alternatively, availability of traditional skill set to design and manufacture efficient versions of established technology can also qualify for this criterion.

#### Financial Resources and Funding

Energy efficiency projects may require larger capital investment due to high first cost of energy efficient technologies and products, trial & testing of nascent technologies, specialized consultants etc. To achieve this it is imperative that the project owner/developer has access to the required funding (through GEF or other co-financing) to make the extra capital investment during the construction, and operation stage. Additional budget required for M&V of the pilots and the incremental cost incurred should not exceed 30% of the total cost. The selection of pilot should be based on the best value of money.

#### **d) Implementation Timeline**

Launch of the selected project(s) should be ready and preferably complete within the expected period of UNDP project timeline. Selected pilot projects would require inputs and advice from the national and international consultants appointed for component 1 and 3. Technical expertise can thus be ensured from conception to completion, and the continuity of the intent and methods with which the projects are initiated.

#### **e) Replication and dissemination potential**

Pilot project program is being initiated to share and transfer the information, knowledge, and expertise gained from the project. The project should desirably have mass awareness potential so the advantages of energy efficient building are highlighted to the largest possible audience. This would facilitate capacity building in terms of technical expertise and skills. It is essential that the project owner/team is enthusiastic to make the project serve as a vehicle for Measurement and Verification (M&V) studies and energy efficiency education and outreach activities/ program. Project owner/ management should be willing to share data and their experiences from the project. Public buildings open to visitors; housing institutions/clients that are engaged in promoting sustainability as a primary business activity, educational institutions imparting education on sustainable development have large awareness potential.

### **List of Potential demonstration project during UNDP –GEF project implementation**

#### **1. New Headquarter building of ECREEE:**

ECREEE is co- financing the UNDP GEF project and contributing in removing barriers for energy efficiency. ECREEE is in the preparatory phase for building a Green Office Building in Praia incorporating energy efficiency measures and renewable energy technologies. The new building will be used as a demonstration project for regional initiative on energy efficiency for buildings.

The proposed project is a potential demonstration pilot for UNDP GEF project and will be further evaluated on the key selection criteria.

#### **2. New Buildings for General Directorate of Environment (DGA) and Science Museum facilities**

A new public building is proposed for DG Environment in Praia, Santiago Island. The total built up area of building is 73,576m<sup>2</sup>. The six storey public building will house natural history museum, environmental laboratory, offices of different departments of the institution. The proposed project with energy efficiency building design measures and efficient appliances will reduce overall demand of the building by nearly 30%. Thus the project will meet the key selection criteria for the pilot demonstration under the UNDP –GEF project and will showcase measures for replication.

#### **3. Social Housing Program: Kasa para todos & Reabilitar**



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The Cabo Verde and Portuguese Government has signed a Line of Credit of EUR 200 million for the development of Housing Social interest, to be executed in five years (2010-14). Under the terms defined in the agreement, companies of Cape Verdean and Portuguese consortium (Joint venture) perform financing the projects of government initiative with close coordination of municipalities. The Fund for Social Housing (FHIS) aims to centralize and manage resources for structured programs under the National Housing System Social Interest (SNHIS) intended to implement housing policies directed to households in disadvantaged economic and / or populations with specific support needs (e.g. Youths Lower Middle Class, women-headed mono-parental households). The social housing fund is agreed to use materials and construction techniques, which are environmentally friendly or locally available materials; the social housing program aims to build 8250 units of housing with existing quantitative deficit of 42,334.

The Kasa Para Todos social housing program phases not implemented yet could be evaluated in the light of pilot selection criteria and assess the demonstration potential of few housing units. The current status and scope of the project should be evaluated to include under UNDP GEF project implementation.

#### **4. Potential demonstration of new eco-lodges, youth-hostels or resorts ( Ministry of Tourism, Industry and Energy; Ministry of Youth and Employment )**

As tourism sector is growing at a fast rate, for new hotels and resorts are being planned. Efforts could be made to identify a pilot project and evaluated as per the key selection criteria. A feasible pilot in tourism industry will be able to display energy efficiency measures leading to wider awareness in the society with high potential for replication of new technologies in other existing hotels and resorts.

#### **5. Uni-CV Campus Palmajero (Public University)**

The Campus University of Cape Verde (UNI-CV) of Palmajero is located in the greater island of Cabo Verde, Santiago. The University plans to install photovoltaic solar energy system and generate solar power from the rooftop. The design of photovoltaic solar energy system consists of series of photovoltaic modules, environmental monitoring devices, direct current combiner box, inverter network, data storage systems and other components. The monthly electricity consumption at the University of Cabo Verde (CV-UNI) is 15,017 KWh; average daily electricity consumption is about 500 KWh. Thus the university has a huge potential to reduce the energy demand from the building by first incorporating energy efficiency measures and then off-setting the remaining demand through solar energy, therefore reducing the dependence on the grid. The university could be highlighted as the zero energy grids connect building in Cabo Verde.

Thus, public university could be evaluated as per the key selection criteria to showcase and implement energy conservation measures and reduce the overall energy demand of the building. The pilot demonstration project will display energy efficiency measures in existing buildings unlike other new buildings for pilot demonstration.

The Uni-CV being a platform for generating ideas and for the dissemination of general education, the new energy efficiency measures will have positive effects on school students and will lead to widespread dissemination of knowledge of the new concepts.

#### **6. New Campus of Uni -CV(public University )**

The Pubic University of Cabo Verde, Uni-Cv in accordance with Decree-Law No. 53/2006, is conceived as an institution of higher education whose mission is to empower the Cabo Verdean nation, in order to overcome the great challenges of modernization and development of the country. The construction of the new campus

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university aims to integrate concepts of sustainable building design, which aims to meet requirements for energy efficiency and environmental impacts with emphasis on natural lighting, ventilation, air cooling with minimum power consumption and water efficiency in toilets. Uptake of surface water and wastewater treatment.

The new campus must be evaluated for pilot potential to display energy efficiency measures in new building for further replication in institutions.

## **7. ANAS (National Water and Sanitation Agency) HQ and laboratories**

The recently created National Agency on water and sanitation will establish its new headquarters. Office space and water labs are planned on the new Head Quarters that will be installed on an abandon structure that will be rehabilitated.

This building will be further evaluated as a demonstration project with the potential to showcase EE measures that can be incorporated on rehabilitation programs.

## Annex E: AGREEMENTS



ÁGUAS DE PONTA PRETA

Urbanização de Ponta Preta  
Caixa Postal nº 124  
Santa Maria – Ilha do Sal  
CABO VERDE  
Tel.: (00238) 242 17 12  
Fax: (00238) 242 17 05  
info@aguaspp.com

**Mrs. Ulrika Richardson**  
Resident Coordinator  
United Funds and Programmes in Cabo Verde  
Resident Representative  
United Nations Development Program, Cabo Verde  
Av. OUA, PO Box 62  
Praia, Cabo Verde

C/C:

Ref.ª APP/110/2014

Sal Island, 18-July-2014

**Subject: Projects to complement to GEF-funded Project on “Removing Barriers to Energy-Efficiency in the Cape Verdean Built Environment and for Appliances”**

Dear Mrs. Ulrika Richardson-Golinski,

This letter is to inform that ÁGUAS DE PONTA PRETA, Lda. is developing the following projects that could complement to the UNDP GEF ( Global Environmental Facility) funded Project on “Removing Barriers to Energy-Efficiency in the Cape Verdean Built Environment and for Appliances”.

There are five (5) developed by ÁGUAS DE PONTA PRETA, Lda. geared towards achieving energy efficiency in our desalination units and industrial and office facilities which could contribute and are relevant to the objectives and outcomes of the UNDP/GEF project. These include:

Company	ITEM	Description	Amount (\$US)
Águas de Ponta Preta	LED Bulbs	Replacement of the APP buildings' fluorescent tube bulbs with LED bulbs	14,600
	LED Floodlights	Replacement of sodium and metal iodide vapor bulb floodlights with LED floodlights	12,643
	Condenser batteries	Install condenser batteries in the motors of sea water collection wells for the production of potable water	11,656
	Solar panels	Install 100 KW of photovoltaic potential in APP	308,348
Águas de Porto Novo	LED Bulbs	Replacement of the APP buildings' fluorescent tube bulbs with LED bulbs	4,625
	LED Floodlights	Replacement of sodium and metal iodide vapor bulb floodlights with LED floodlights	263



	Electrical cables	Increase of the section for sea water collection wells for the production of potable water.	2,174
	Solar panels	Install 30 KW of photovoltaic potential in APN	104,838
NETSAL	LED bulbs	Replacement of fluorescent tube bulbs with LED bulbs or LED floodlights	6,031
	Transparent roofing tiles	Substitution of some of the existing roofing tiles with ones that allow for the penetration of natural light	8,367
	Solar panels	Install 30 KW of photovoltaic potential in the laundry facility	104,838
	Natural ventilation	Installation of equipment to facilitate the natural entry and exit of air without the need for electrical energy	9,065
	Solar water heater	Solar water heating system to work alongside the steam boiler	14,801
CLINITUR	LED bulbs	Replacement of fluorescent tube bulbs with LED bulbs	4,113
	Condenser battery	Install condenser battery for Power Factor compensation	3,454
CABOCAN	LED bulbs	Replacement of fluorescent tube bulbs with LED bulbs	1,500
<b>TOTAL AMOUNT (US\$)</b>			<b>612,316</b>

Through the above projects, ÁGUAS DE PONTA PRETA, Lda. is contributing a total of 612,316 \$US as parallel co-financing to the GEF-funded project.

Best regards

  
**ÁGUAS DE PONTA PRETA, LDA**  
 C.P. 124 - Sta Maria - Sal  
 Damià Pujol  
 -MANAGER-

# ECREEE

Address: Achada Santo António,  
Electra Building, 2nd Floor C.P  
288, Praia, Cape Verde



# CEREEC

Tel.: 260 4630 Fax: 262 4614  
e-mail: info@ecreee.org  
www.ecreee.org

UN FUNDS & PROGRAMMES		
DATE 05-08-2014	REF ORC 130/2	
N.V.	ACTION	INFO
Representative		
Programme Coordinator		
Deputy Representative		
Operations Manager/Deputy Representative		
Security Advisor		
UN coordinator Specialist		
Executive Associate		

*António Queiroz*  
**Mrs. Ulrika Richardson**  
Resident Coordinator  
United Funds and Programmes in Cabo Verde  
Resident Representative  
United Nations Development Program, Cabo Verde  
Av. OUA, PO Box 62  
Praia, Cabo Verde

C/C:

Ref. No. ECR/REL/05/04-08/MK/2014

Praia, 4th August 2014

**Subject: Projects to complement GEF-funded Project on "Removing Barriers to Energy-Efficiency in the Cape Verdean Built Environment and for Appliances"**

Dear Mrs. Ulrika Richardson

This letter is to inform that the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) is financing the following projects that could complement the UNDP GEF (Global Environmental Facility) funded Project on "Removing Barriers to Energy-Efficiency in the Cape Verdean Built Environment and for Appliances".

There are two Projects funded by ECOWAS Commission under the ECOWAS Centre for Renewable Energy and Energy Efficiency, geared towards achieving energy efficiency in our head quarter in Praia and in elimination of incandescent lamps in all Cape Verde which could contribute and are relevant to the objectives and outcomes of the UNDP/GEF project. These include:

Name of Projects	Description	Amounts (\$US)
New Head Quarter of ECREEE	ECREEE is on the preparatory phase for building a Green Office Building in Praia, incorporating energy efficiency measures and renewable energy technologies. The new building will be used as a demonstration project for our regional initiative on Energy Efficiency for Buildings	2.700.000
National Campaign for replacement of incandescent lamps for efficient lamps	Develop a tri-annual campaign in all Cabo Verde for replacement and eliminate incandescent lamps, including revision of the actual legal and regulatory framework to incentive the use of efficient lamps in Cabo Verde	1.200.000
Total Amount		3.900.000





Ministério do Turismo, Indústria e Energia  
Rua Cidade do Funchal, n.º2,  
Achada de Stº António C.P.15  
Praia, Ilha de Santiago  
República de Cabo Verde  
Tel.: 00 238 260.48.36  
[www.mtiegov.cv](http://www.mtiegov.cv)

GABINETE  
DO MINISTRO

UN FUNDS & PROGRAMMES		
DATE	REF	INFO
01-08-2014	ORG 130/1-	
N.º	ACTION	INFO
Representative		
Programme Coordinator	✓	
Deputy Representative		
Operations Manager/Deputy Representative		
Security Advisor		
UN coordinator Specialist		
Executive Associate		
Message:		

Mrs. Ulrika Richardson  
Resident Coordinator  
United Funds and Programmes  
in Cabo Verde  
Resident Representative  
United Nations Development  
Program, Cabo Verde  
Av. OUA, PO Box 62 – Praia –  
Cabo Verde

Praia, 31, July 2014

**Subject:** *Projects to complement to GEF-funded Project on "Removing Barriers to Energy-Efficiency in the Cape Verdean Built Environment and for Appliances"*

Dear Mrs. Ulrika Richardson-Golinski,

This letter is to inform that Ministry of Tourism Industry and Energy is financing the following projects that could complement to the UNDP GEF (Global Environmental Facility) funded Project on "Removing Barriers to Energy-Efficiency in the Cape Verdean Built Environment and for Appliances".


There are 10 Projects funded by this Ministry geared towards achieving energy efficiency in Cabo Verde, which could contribute and are relevant to the objectives and outcomes of the UNDP/GEF project. These include:

Ministério do Turismo, Indústria e Energia  
Rua Cidade do Funchal, nº2,  
Achada de Stº António C.P.15  
Praia, Ilha de Santiago  
República de Cabo Verde  
Tel.: 00 238 260.48.36  
[www.mtiegov.cv](http://www.mtiegov.cv)

Name of Projects	Activities	Year 1	Year 2	Year 3	Year 4
Monitoring of energy sector	Support the implementation of monitoring system and sectoral information and statistical data collection.	37,037.04	37,037.04	37,037.04	37,037.04
Energy Audits Program	Auditing public building and promoting the appropriate mitigation actions	37,037.04	37,037.04	37,037.04	37,037.04
Action plan of RE and EE	Promoting the penetration rate of RE and EE in the Country	370,370.37	370,370.37	370,370.37	370,370.37
Commercial loss reduction program	Campaign to inform the costumers and prevent energy fraud and increase safety	32,502.20	32,502.20	32,502.20	32,502.20
Costs of DG (E) and staff	General direction of energy staff cost	108,912.12	108,912.12	108,912.12	108,912.12
Cost of ECREEE installation	Contribution of the GovCV to host the ECOWAS Regional Center on Renewable Energy and Energy Efficiency (ECREEE)	18,518.52	18,518.52	18,518.52	18,518.52
Certification program of Electrical installations	Implementation of service to certify the electric installation in order the energy security.	185,185.19	185,185.19	185,185.19	185,185.19
SIDS DOCK program in renewable energy	Distributing solar energy for social facilities	987,654.32	-	-	-
Rural electrification of Vale da Costa locality	Improving energy efficiency and decrease energy consumption in rural area	6,172.84	6,172.84	6,172.84	6,172.84
Reform and modernization of the legal framework of the energy sector	Approval of new laws and regulation for RE and EE	185,185.19	185,185.19	185,185.19	185,185.19
<b>Total Year</b>		1,968,574.81	980,920.49	980,920.49	980,920.49
<b>Grand TOTAL</b>		4,911,336.30			

Through the above projects, the Ministry of Tourism Industry and Energy is contributing a total of 4,911,336.30 US\$ as parallel co-financing to the GEF-funded project.

Best regards and,

  
Humberto Santos de Brito  
Minister of Tourism, Industry and Energy



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Nações Unidas  
CABO VERDE  
*Juntos na acção*



Praia, 1<sup>st</sup> September 2014

PRODOC Removing barriers to energy efficiency in the Cabo Verdean built environment and for appliances

Ms Adriana Dinu,  
UNDP GEF Executive Coordinator


**Subject:** UNDP Co-financing for the "Removing barriers to energy efficiency in the Cabo Verdean built environment and for appliances" project in Cabo Verde

The Joint Office of UNDP, UNICEF and UNFPA in Cabo Verde is providing assistance to the Government in the framework of the 2012-2016 UNDAF. Supporting climate change mitigation initiatives is a priority within the larger objective of achieving a Low Carbon Emissions and Climate resilient sustainable development.

The objectives of the project "Removing barriers to energy efficiency in the Cabo Verdean built environment and for appliances" are in line with the Cabo Verde UNDAF. The project will work to reduce greenhouse gases' emissions in the Cabo Verdean building sector, by supporting the enabling policy, legal and institutional framework; and through the demonstration of mitigation measures in buildings and appliances.

I am pleased to confirm that, in order to contribute to its successful implementation, the UNDP Cabo Verde office is committing to a total of US \$ 300,000 from UNDP funds as direct in cash co-financing for the medium-size project implementation phase. We are confident this project will be implemented in close coordination and collaboration with other national initiatives to achieve the overall goal of energy efficiency, low carbon economy and sustainable development.

Yours sincerely,



Ms. Ulrika Richardson  
Resident Representative





**GABINETE DO ADMINISTRADOR GERAL**

Mrs. Ulrika Richardson  
Resident Coordinator  
United Funds and Programmes in Cabo Verde  
Resident Representative  
United Nations Development Program, Cabo Verde  
Av. OUA, PO Box 62  
Praia, Cabo Verde

N/Ref.: 142/Gab. AG/2014

Praia, 22 de Setembro de 2014

**Subject: Projects to complement to GEF-funded Project on “Removing Barriers to Energy-Efficiency in the Cape Verdean Built Environment and for Appliances”**

Dear Mrs. Ulrika Richardson

This letter is to inform that University of Cabo Verde the following projects, ongoing or in pipeline that could complement the UNDP/GEF (Global Environmental Facility) funded Project on “Removing Barriers to Energy-Efficiency in the Cape Verdean Built Environment and for Appliances”.

There are (NUMBER OF PROJECT) implemented by Uni-CV geared towards achieving energy efficiency and contributing to build national capacities on the Energy sectors. University of Cabo Verde as a public university is a center of creation, dissemination and promotion of culture, science and technology by articulating the study and research, in order to promote human development as a strategic factor in sustainable development. We believe these projects could contribute and are relevant to the objectives and outcomes of the UNDP/GEF project. These include:

Reitoria da Universidade de Cabo Verde – Praça António Lemos – C.P.379- C  
Tel. (00238) 261.99.04/261.98.94 Fax. (00238) 261.26.60  
E-mail: [administracao@adm.unicv.edu.cv](mailto:administracao@adm.unicv.edu.cv) Site: [www.unicv.edu.cv](http://www.unicv.edu.cv)

Title of project	Description	Amount (In CVE) planned for next 4 years.
New Uni-CV Campus: The new campus of the University of Cape Verde, will have a total construction area of 28,000 m2, in order to meet basic needs and functions of the Uni-CV.	Administration Building; Faculties and Schools; Scientific and Pedagogic Boards; Departments and Institutes; Research Centres; Classrooms; laboratories; Central Library; Auditorium / Conference Room; Stadium with lanes; Residence for teachers and students.	1.540.000.000\$00
Rehabilitation for improved energy efficiency in the campus		11.730.689\$35
Training, Curriculum development on the area of Energy efficiency, sustainable construction/architecture and sustainable energy environment	Implementation project in Uni-CV new program curriculum revision in energy efficiency, sustainable energy environment for undergraduate courses and vocational courses in higher specialization.	5 000.000\$00
Research on Energy efficiency, and sustainable energy environment.	Laboratory equipment for research and study center energy efficiency.	10 000.000\$00

Through the above projects, the UNI-CV is contributing a total of 20% as parallel co-financing to the GEF-funded project.

Best regards,

  
 Administrador Geral  
 Prof. Mano José Carvalho de Lima  
 Universidade de Cabo Verde

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## **ANNEX F: Communications and visibility requirements:**

Full compliance is required with UNDP's Branding guidelines. These can be accessed at <http://intra.undp.org/coa/branding.shtml>, and specific guidelines on UNDP logo use can be accessed at: <http://intra.undp.org/branding/useOfLogo.html>. Amongst other things, these guidelines describe when and how the UNDP logo needs to be used, as well as how the logos of donors to UNDP projects needs to be used. For the avoidance of any doubt, when logo use is required, the UNDP logo needs to be used alongside the GEF logo. The GEF logo can be accessed at: [http://www.thegef.org/gef/GEF\\_logo](http://www.thegef.org/gef/GEF_logo). The UNDP logo can be accessed at <http://intra.undp.org/coa/branding.shtml>.

Full compliance is also required with the GEF's Communication and Visibility Guidelines (the "GEF Guidelines"). The GEF Guidelines can be accessed at: [http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08\\_Branding\\_the\\_GEF%20final\\_0.pdf](http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08_Branding_the_GEF%20final_0.pdf).

Amongst other things, the GEF Guidelines describe when and how the GEF logo needs to be used in project publications, vehicles, supplies and other project equipment. The GEF Guidelines also describe other GEF promotional requirements regarding press releases, press conferences, press visits, visits by Government officials, productions and other promotional items.

Where other agencies and project partners have provided support through co-financing, their branding policies and requirements should be similarly applied.

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## **ANNEX G: Direct Project Costs for projects financed from GEF-managed vertical funds and the Adaptation Fund**

Dear Mr. Antonio Baptista

1. Reference is made to consultations between officials of the Government of *Cabo Verde* (hereinafter referred to as “the Government”) and officials of UNDP with respect to the provision of support services by the UNDP country office for the project “Removing barriers to energy efficiency in the Cabo Verdean built environment and for appliances” implemented by General Directorate of Energy of Cabo Verde. UNDP and the Government hereby agree that the UNDP country office may provide such support services at the request of the Directorate General detailed in the respective project document, as described below.
2. The UNDP country office may provide support services for assistance with reporting requirements and direct payment. In providing such support services, the UNDP country office shall ensure that the capacity of the Directorate General is strengthened to enable it to carry out such activities directly. The costs incurred by the UNDP country office in providing such support services shall be recovered from the project budget in accordance with UN Universal Price List.
3. The UNDP country office may provide, at the request of the designated institution, the following support services for the activities of the project, details are specified in the Attachment:
  - (a) Payments, disbursements and other financial transactions;
  - (b) Recruitment of consultants;
  - (c) Procurement of services and goods
  - (d) Organization of training activities, conferences and workshops
  - (e) Travel authorization, visa requests, ticketing, and travel arrangements;
4. The procurement of goods and services and by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures. Support services described in paragraph 3 above shall be detailed in an annex to the project document, in the form provided in the Attachment hereto. If the requirements for support services by the country office change during the life of the project, the annex to the programme support document or project document is revised with the mutual agreement of the UNDP resident representative and the Ministry.
5. The relevant provisions of the UNDP Standard Basic Assistance Agreement with the Government of Cabo Verde (the “SBAA”), including the provisions on liability and privileges and immunities, shall apply to the provision of such support services. The Ministry shall retain overall responsibility for the nationally managed project. The responsibility of the UNDP country office for the provision of the support services described herein shall be limited to the provision of such support services detailed in the annex to the project document.
6. Any claim or dispute arising under or in connection with the provision of support services by the UNDP country office in accordance with this letter shall be handled pursuant to the relevant provisions of the SBAA.
7. The manner and method of cost-recovery by the UNDP country office in providing the support services described in paragraph 3 above shall be specified in the annex to the project document.
8. The UNDP country office shall submit progress reports on the support services provided and shall report on the costs reimbursed in providing such services, as may be required.
9. Any modification of the present arrangements shall be effected by mutual written agreement of the parties hereto.

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10. If you are in agreement with the provisions set forth above, please sign and return to this office two signed copies of this letter. Upon your signature, this letter shall constitute an agreement between your Government and UNDP on the terms and conditions for the provision of support services by the UNDP country office for the project.

Yours sincerely,

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Signed on behalf of UNDP

Ulrika Richardson

Resident Representative

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For the Government of Cabo Verde

Antonio Baptista

Directorate General of Energy

Date:

---

Attachment

**DESCRIPTION OF UNDP COUNTRY OFFICE SUPPORT SERVICES**

1. Reference is made to consultations between the Directorate General of Energy (the DGE), the institution designated by the Government of Cabo Verde and officials of UNDP with respect to the provision of support services by the UNDP country office for the nationally managed project "Removing barriers to energy efficiency in the Cabo Verdean built environment and for appliances" ( PIMS no:4996), (the Project)".

2. In accordance with the provisions of the signed letter of agreement and the project document, the UNDP country office shall provide support services for the Project as described below.

3. Support services to be provided:

Support services (insert description)	Schedule for the provision of the support services	Amount and method of reimbursement of UNDP (where appropriate)	Estimated Chargeable Amount
1. Payments, disbursements and other financial transactions	2015-2018	Cost-recovery for ISS based on UNDP Universal Price List	\$ 17,415 USD
2. Recruitment of consultants	2015-2018	Cost-recovery for ISS based on UNDP Universal Price List	\$ 1,008 USD
3. Procurement of services and goods	2015-2018	Cost-recovery for ISS based on UNDP Universal Price List	\$ 1,205 USD
4. Organization of training activities, conferences and workshops,	2015-2018	Cost-recovery for ISS based on UNDP Universal Price List	\$ 4,000 USD
5. Travel authorization, visa requests, ticketing, and travel arrangements	2015-2018	Cost-recovery for ISS based on UNDP Universal Price List	\$ 649 USD
<b>Total</b>			<b>\$ 24,276 USD</b>

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#### **4. Description of functions and responsibilities of the parties involved:**

UNDP will provide support services to the DGE as described in the paragraph 3 above in accordance with UNDP rules and procedures; it retains ultimate accountability for the effective implementation of the project;

The UNDP will provide support to the National Project Director (appointed by Minister of Tourism, Industry and Energy) in order to maximize the programme's impact as well as the quality of its products. It will be responsible for administering resources in accordance with the specific objectives defined in the Project Document, and in keeping with the key principles of transparency, competitiveness, efficiency and economy. The financial management and accountability for the resources allocated, as well as other activities related to the execution of programme activities will be undertaken under the direct supervision of the UNDP Country Office.

The DGE through its National Project Director (NPD) designated from its staff or through duly authorized person, will approve annual work plans, authorize direct payment requests and submit them to UNDP country office in a timely manner;

The DGE through its NPD or other duly authorized person will monitor and assure that the project funds are spent in accordance with Annual Work Plan (AWP) by authorizing and signing direct payment requests and Combined Delivery Reports (CDRs).

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**Annex H: UNDP-GEF Environmental and Social Screening Procedure (ESSP)**

**QUESTION 1:**



**Has a combined environmental and social assessment/review that covers the proposed project already been completed by implementing partners or donor(s)?**

Select answer below and follow instructions:

**X NO → Continue to Question 2 (do not fill out Table 1.1)**

☐ **YES** → No further environmental and social review is required if the existing documentation meets UNDP's quality assurance standards, and environmental and social management recommendations are integrated into the project. Therefore, you should undertake the following steps to complete the screening process:

1. Use Table 1.1 below to assess existing documentation. (It is recommended that this assessment be undertaken jointly by the Project Developer and other relevant Focal Points in the office or Bureau).
2. Ensure that the Project Document incorporates the recommendations made in the implementing partner's environmental and social review.
3. Summarize the relevant information contained in the implementing partner's environmental and social review in Annex A.2 of this Screening Template, selecting Category 1.
4. Submit Annex A to the PAC, along with other relevant documentation.

**Note: Further guidance on the use of national systems for environmental and social assessment can be found in Annex B.**

<b>TABLE 1.1: CHECKLIST FOR APPRAISING QUALITY ASSURANCE OF EXISTING ENVIRONMENTAL AND SOCIAL ASSESSMENT</b>	<b>Yes/No</b>
1. Does the assessment/review meet its terms of reference, both procedurally and substantively?	<b>n/a</b>
2. Does the assessment/review provide a satisfactory assessment of the proposed project?	<b>n/a</b>
3. Does the assessment/review contain the information required for decision-making?	<b>n/a</b>

4. Does the assessment/review describe specific environmental and social management measures (e.g. mitigation, monitoring, advocacy, and capacity development measures)?	n/a
5. Does the assessment/review identify capacity needs of the institutions responsible for implementing environmental and social management issues?	n/a
6. Was the assessment/review developed through a consultative process with strong stakeholder engagement, including the view of men and women?	n/a
7. Does the assessment/review assess the adequacy of the cost of and financing arrangements for environmental and social management issues?	n/a
<b>Table 1.1 (continued) For any “no” answers, describe below how the issue has been or will be resolved (e.g. amendments made or supplemental review conducted).</b>	
n/a	

## QUESTION 2:

Do **all** outputs and activities described in the Project Document fall within the following categories?

- ☐ Procurement (in which case UNDP's [Procurement Ethics](#) and [Environmental Procurement Guide](#) need to be complied with)
- ☐ Report preparation
- ☐ Training
- ☐ Event/workshop/meeting/conference (refer to [Green Meeting Guide](#))
- ☐ Communication and dissemination of results

Select answer below and follow instructions:

**NO** → Continue to Question 3

**X YES** → No further environmental and social review required. Complete Annex VII-2, selecting Category 1, and submit the completed template (Annex A) to the PAC.

## QUESTION 3:

Does the proposed project include activities and outputs that support *upstream* planning processes that potentially pose environmental and social impacts or are vulnerable to

environmental and social change (refer to Table 3.1 for examples)? (Note that *upstream* planning processes can occur at global, regional, national, local and sectoral levels)

Select the appropriate answer and follow instructions:

☐ **NO** → Continue to Question 4.

**X YES** → **Conduct the following steps to complete the screening process:**

1. Adjust the project design as needed to incorporate UNDP support to the country(ies), to ensure that environmental and social issues are appropriately considered during the upstream planning process. Refer to Section 7 of this Guidance for elaboration of environmental and social mainstreaming services, tools, guidance and approaches that may be used.
2. Summarize environmental and social mainstreaming support in Annex A.2, Section C of the Screening Template and select "Category 2".
3. If the proposed project **ONLY** includes upstream planning processes then screening is complete, and you should submit the completed Environmental and Social Screening Template (Annex A) to the PAC. If downstream implementation activities are also included in the project then continue to Question 4.

<b>TABLE 3.1</b> <b>EXAMPLES OF UPSTREAM PLANNING PROCESSES WITH POTENTIAL DOWNSTREAM ENVIRONMENTAL AND SOCIAL IMPACTS</b>	<b>Answer</b> Yes/No/N.A
1. Support for the elaboration or revision of <b>global- level</b> strategies, policies, plans, and programmes.  <i>For example, capacity development and support related to international negotiations and agreements. Other examples might include a global water governance project or a global MDG project.</i>	No
2. Support for the elaboration or revision of <b>regional-level</b> strategies, policies and plans, and programmes.  <i>For example, capacity development and support related to trans boundary programmes and planning (river basin management, migration, international waters, energy development and access, climate change adaptation etc.).</i>	Yes
3. Support for the elaboration or revision of <b>national-level</b> strategies, policies, plans and programmes.  <i>For example, capacity development and support related to national development</i>	Yes

<b>TABLE 3.1</b>	<b>EXAMPLES OF UPSTREAM PLANNING PROCESSES WITH POTENTIAL DOWNSTREAM ENVIRONMENTAL AND SOCIAL IMPACTS</b>	<b>Answer Yes/No/N.A</b>
	<i>policies, plans, strategies and budgets, MDG-based plans and strategies (e.g. PRS/PRSPs, NAMAs), sector plans.</i>	
4.	Support for the elaboration or revision of <b>sub-national/local-level</b> strategies, policies, plans and programmes.  <i>For example, capacity development and support for district and local level development plans and regulatory frameworks, urban plans, land use development plans, sector plans, provincial development plans provision of services, investment funds, technical guidelines and methods, stakeholder engagement.</i>	Yes

## QUESTION 4:

**Does the proposed project include the implementation of *downstream* activities that potentially pose environmental and social impacts or are vulnerable to environmental and social change?**

To answer this question, you should first complete Table 4.1 by selecting appropriate answers. If you answer “No” or “Not Applicable” to all questions in Table 4.1 then the answer to Question 4 is “NO.” If you answer “Yes” to any questions in Table 4.1 (even one “Yes” can indicated a significant issue that needs to be addressed through further review and management) then the answer to Question 4 is “YES”:

☐ **NO → No further environmental and social review and management required for downstream activities. Complete Annex VII-B by selecting “Category 1”, and submit the Environmental and Social Screening Template to the PAC**

**X YES →** Conduct the following steps to complete the screening process:

1. Consult Section 8 of this Guidance, to determine the extent of further environmental and social review and management that might be required for the project.
2. Revise the Project Document to incorporate environmental and social management measures. Where further environmental and social review and management activity cannot be undertaken prior to the PAC, a plan for undertaking such review and management activity within an acceptable period of time, post-PAC approval (e.g. as the first phase of the project) should be outlined in Annex A.2.
3. Select “Category 3” in Annex A.2, and submit the completed Environmental and Social Screening Template (Annex A) and relevant documentation to the PAC.

**TABLE 4.1: ADDITIONAL SCREENING QUESTIONS TO DETERMINE THE NEED AND POSSIBLE EXTENT OF FURTHER ENVIRONMENTAL AND SOCIAL REVIEW AND MANAGEMENT**

1. Biodiversity and <a href="#">Natural</a> Resources	Answer (Yes/No/ Not Applicable)
1.1 Would the proposed project result in the conversion or degradation of <a href="#">modified habitat</a> , <a href="#">natural habitat</a> or <a href="#">critical habitat</a> ?	No
1.2 Are any development activities proposed within a legally protected area (e.g. natural reserve, national park) for the protection or conservation of biodiversity?	No
1.3 Would the proposed project pose a risk of introducing invasive alien species?	No
1.4 Does the project involve natural forest harvesting or plantation development without an independent forest certification system for sustainable forest management (e.g. <i>PEFC, the Forest Stewardship Council certification systems, or processes established or accepted by the relevant National Environmental Authority</i> )?	No
1.5 Does the project involve the production and harvesting of fish populations or other aquatic species without an accepted system of independent certification to ensure sustainability (e.g. <i>the Marine Stewardship Council certification system, or certifications, standards, or processes established or accepted by the relevant National Environmental Authority</i> )?	No
1.6 Does the project involve significant extraction, diversion or containment of surface or ground water?  <i>For example, construction of dams, reservoirs, river basin developments, groundwater extraction.</i>	No
1.7 Does the project pose a risk of degrading soils?	No
2. Pollution	
2.1 Would the proposed project result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and trans boundary impacts?	No
2.2 Would the proposed project result in the generation of waste that cannot be recovered, reused, or disposed of in an environmentally and socially	No

<b>TABLE 4.1: ADDITIONAL SCREENING QUESTIONS TO DETERMINE THE NEED AND POSSIBLE EXTENT OF FURTHER ENVIRONMENTAL AND SOCIAL REVIEW AND MANAGEMENT</b>	
sound manner?	
<b>2.3</b> Will the propose project involve the manufacture, trade, release, and/or use of chemicals and hazardous materials subject to international action bans or phase-outs?  <i>For example, DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Convention on Persistent Organic Pollutants, or the Montreal Protocol.</i>	No
<b>2.4</b> Is there a potential for the release, in the environment, of hazardous materials resulting from their production, transportation, handling, storage and use for project activities?	No
<b>2.5</b> Will the proposed project involve the application of pesticides that have a known negative effect on the environment or human health?	No
<b>3. Climate Change</b>	
<b>3.1</b> Will the proposed project result in significant <sup>56</sup> greenhouse gas emissions?  <i>Annex E provides additional guidance for answering this question.</i>	No
<b>3.2</b> Is the proposed project likely to directly or indirectly increase environmental and social vulnerability to climate change now or in the future (also known as maladaptive practices)? You can refer to the additional guidance in Annex C to help you answer this question.  <i>For example, a project that would involve indirectly removing mangroves from coastal zones or encouraging land use plans that would suggest building houses on floodplains could increase the surrounding population's vulnerability to climate change, specifically flooding.</i>	No
<b>4. Social Equity and Equality</b>	
<b>4.1</b> Would the proposed project have environmental and social impacts that could affect indigenous people or other vulnerable groups?	No
<b>4.2</b> Is the project likely to significantly impact gender equality and women's empowerment <sup>57</sup> ?	No

<sup>56</sup> Significant corresponds to CO<sub>2</sub> emissions greater than 100,000 tons per year (from both direct and indirect sources). Annex E provides additional guidance on calculating potential amounts of CO<sub>2</sub> emissions.

<b>TABLE 4.1: ADDITIONAL SCREENING QUESTIONS TO DETERMINE THE NEED AND POSSIBLE EXTENT OF FURTHER ENVIRONMENTAL AND SOCIAL REVIEW AND MANAGEMENT</b>	
<b>4.3</b> Is the proposed project likely to directly or indirectly increase social inequalities now or in the future?	No
<b>4.4</b> Will the proposed project have variable impacts on women and men, different ethnic groups, social classes?	No
<b>4.5</b> Have there been challenges in engaging women and other certain key groups of stakeholders in the project design process?	No
<b>4.6</b> Will the project have specific human rights implications for vulnerable groups?	No
<b>5. Demographics</b>	
<b>5.1</b> Is the project likely to result in a substantial influx of people into the affected community(ies)?	Yes
<b>5.2</b> Would the proposed project result in substantial voluntary or involuntary resettlement of populations?  <i>For example, projects with environmental and social benefits (e.g. protected areas, climate change adaptation) that impact human settlements, and certain disadvantaged groups within these settlements in particular.</i>	No
<b>5.3</b> Would the proposed project lead to significant population density increase which could affect the environmental and social sustainability of the project?  <i>For example, a project aiming at financing tourism infrastructure in a specific area (e.g. coastal zone, mountain) could lead to significant population density increase which could have serious environmental and social impacts (e.g. destruction of the area's ecology, noise pollution, waste management problems, greater work burden on women).</i>	No
<b>6. Culture</b>	
<b>6.1</b> Is the project likely to significantly affect the cultural traditions of affected	No

<sup>57</sup>Women are often more vulnerable than men to environmental degradation and resource scarcity. They typically have weaker and insecure rights to the resources they manage (especially land), and spend longer hours on collection of water, firewood, etc. (OECD, 2006). Women are also more often excluded from other social, economic, and political development processes.

<b>TABLE 4.1: ADDITIONAL SCREENING QUESTIONS TO DETERMINE THE NEED AND POSSIBLE EXTENT OF FURTHER ENVIRONMENTAL AND SOCIAL REVIEW AND MANAGEMENT</b>	
communities, including gender-based roles?	
<b>6.2</b> Will the proposed project result in physical interventions (during construction or implementation) that would affect areas that have known physical or cultural significance to indigenous groups and other communities with settled recognized cultural claims?	No
<b>6.3</b> Would the proposed project produce a physical “splintering” of a community?  <i>For example, through the construction of a road, power line, or dam that divides a community.</i>	No
<b>7. Health and Safety</b>	
<b>7.1</b> Would the proposed project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, and erosion, flooding or extreme climatic conditions?  <i>For example, development projects located within a floodplain or landslide prone area.</i>	No
<b>7.2</b> Will the project result in increased health risks as a result of a change in living and working conditions? In particular, will it have the potential to lead to an increase in HIV/AIDS infection?	No
<b>7.3</b> Will the proposed project require additional health services including testing?	No
<b>8. Socio-Economics</b>	
<b>8.1</b> Is the proposed project likely to have impacts that could affect women’s and men’s ability to use, develop and protect natural resources and other natural capital assets?  <i>For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their development, livelihoods, and well-being?</i>	No
<b>8.2</b> Is the proposed project likely to significantly affect land tenure arrangements and/or traditional cultural ownership patterns?	No
<b>8.3</b> Is the proposed project likely to negatively affect the income levels or employment opportunities of vulnerable groups?	No
<b>9. Cumulative and/or Secondary Impacts</b>	



**TABLE 4.1:****ADDITIONAL SCREENING QUESTIONS TO DETERMINE THE NEED AND POSSIBLE EXTENT OF FURTHER ENVIRONMENTAL AND SOCIAL REVIEW AND MANAGEMENT**

<p><b>9.1</b> Is the proposed project location subject to currently approved land use plans (e.g. roads, settlements) which could affect the environmental and social sustainability of the project?</p> <p><i>For example, future plans for urban growth, industrial development, transportation infrastructure, etc.</i></p>	No
<p><b>9.2</b> Would the proposed project result in secondary or consequential development which could lead to environmental and social effects, or would it have potential to generate cumulative impacts with other known existing or planned activities in the area?</p> <p><i>For example, a new road through forested land will generate direct environmental and social impacts through the cutting of forest and earthworks associated with construction and potential relocation of inhabitants. These are direct impacts. In addition, however, the new road would likely also bring new commercial and domestic development (houses, shops, businesses). In turn, these will generate indirect impacts. (Sometimes these are termed “secondary” or “consequential” impacts). Or if there are similar developments planned in the same forested area then cumulative impacts need to be considered.</i></p>	No

**ANNEX VII-B: ENVIRONMENTAL AND SOCIAL SCREENING SUMMARY****(To be filled in after Annex VII-A has been completed)**

**Name of Proposed Project:** “Removing barriers to energy efficiency in Cabo Verdian built environment and for appliances”

**A. Environmental and Social Screening Outcome**

Select from the following:

- ☐ **Category 1.** No further action is needed
- ☐ **Category 2.** Further review and management is needed. There are possible environmental and social benefits, impacts, and/or risks associated with the project (or specific project component), but these are predominantly indirect or very long-term and so extremely difficult or impossible to directly identify and assess.
- ☒ **Category 3.** Further review and management is needed, and it is possible to identify these with a reasonable degree of certainty. If Category 3, select one or more of the following sub-categories:
- ☒ **Category 3a:** Impacts and risks are limited in scale and can be identified with a reasonable degree of certainty and can often be handled through application of standard best practice, but require some minimal or targeted

further review and assessment to identify and evaluate whether there is a need for a full environmental and social assessment (in which case the project would move to Category 3b).

- ☐ Category 3b: Impacts and risks may well be significant, and so full environmental and social assessment is required. In these cases, a scoping exercise will need to be conducted to identify the level and approach of assessment that is most appropriate.

**B. Environmental and Social Issues**(for projects requiring further environmental and social review and management)

*Environmental Issues:* While there are few adverse environmental impacts resulting from Project activities, there are a number of positive environmental impacts expected from the Project including: a) a reduction in energy demand from the buildings sector and from appliances; b) significant reduction in carbon emission resulting from reduced demand of energy from buildings and appliances c) The project results in reduce demand for water use from the buildings due to new water efficiency standards .

**C. Next Steps**(for projects requiring further environmental and social review and management):

**D. Sign Off**

Project Manager

Date

PAC

Date

Programme Manager

Date

:

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SIGNATURE PAGE

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Country:

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**UNDAF Outcome (s)/Indicator (s):** Institutions reinforce environmental governance and integrate principles of environmental sustainability, climate change and disaster relief reduction; public and private institutions adopt a holistic approach to conservation and protection of critical habitats and biodiversity.

**CPAP Outcome (s)/Indicator (s):** Growth and development are inclusive and sustainable, incorporating productive capacities that create employment and livelihoods for the poor and excluded

**CPAP Output (s)/Indicator (s):** Integration of climate change and disaster risk reduction into territorial plans; national institutions and CSO strained and strengthened in environmental management.

**Executing Entity/Implementing Partner:** Directorate General of Energy (Ministry of Tourism, Industry and Energy) and Directorate General for Environment (DGA),

Implementing entity/Responsible Partner

Programme Period:	48 Months
Atlas Award ID:	00075997
Project ID:	00087601
PIMS #	4996
Start date:	12/2014
End Date	12/2018
Management Arrangements:	National
Implementation	
PAC Meeting Date	__TBD__

Total resources required	\$11,955,398
Total allocated resources:	\$ 11,955,398
• Regular	
o GEF	\$ 1,918,400
o UNDP CO	\$ 300,000
• Other:	
o Government (MTIE)	\$ 4,911,336
o ECREEE	\$3,900,000
o APP	\$ 612,316
o UNICV	\$ 313,346

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Agreed by (Government):

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NAME	SIGNATURE	Date/Month/Year
Agreed by (Executing Entity/Implementing Partner): Directorate General of Energy (Ministry of Tourism, Industry and Energy) and Directorate General for Environment (DGA),		

NAME	SIGNATURE	Date/Month/Year
Agreed by (UNDP):		

NAME	SIGNATURE	Date/Month/Year
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