PROGRAMME DESIGN DOCUMENT FORM FOR CDM PROGRAMMES OF ACTIVITIES (F-CDM-PoA-DD)
Version 02.0

PROGRAMME OF ACTIVITIES DESIGN DOCUMENT (PoA-DD)

PART I. Programme of activities (PoA)

SECTION A. General description of PoA

A.1. Title of the PoA

Standard Bank Renewable Energy Programme

Current version number of the PoA-DD: 3.0

Date the PoA-DD was completed: 27/09/2012

A.2. Purpose and general description of the PoA

General operating and implementing framework of the proposed PoA

The Standard Bank Renewable Energy Programme (hereafter referred to as "the PoA") aims to promote and to support the implementation of grid-connected electricity generation plants/units from renewable energy sources in Ghana, Kenya and Mauritius.

To assist project developers to invest in and to implement grid-connected renewable electricity generation plant(s)/unit(s), Standard Bank Plc has developed the PoA under which individual projects could join as CDM Programme Activities (CPA). The PoA mainly provides a platform for overcoming institutional, financial and structural hurdles for the development of renewable energy projects including solar, wind and hydro.

Standard Bank Plc will act as the Coordinating / Managing entity (CME) for this PoA.Standard Bank Plc or any of its affiliate will act as the Programme Manager and will assess project activities before submission to the DOE for CPA inclusion.

In quality of programme manager, it will be the responsibility of the CME to:

- design the overall program,
- develop and manage an appropriate operational structure for the proposed PoA,
- provide support and guidance to all stakeholders,
- enforce compliance of the technology and the CPA(s) of potential independent implementers with PoA requirements,
- act as a liaison with Ghana, Kenya and Mauritius Designated National Authorities, Designated Operational Entities, and the CDM Executive Board,
- be responsible for data collection, management and monitoring activities,
- monetize the carbon credits generated by the PoA,
- oversee all institutional communication regarding this PoA.

Standard Bank Plc will enter into a contractual agreement with each CPA implementer, giving Standard Bank Plc the legal rights to deal with the carbon credits that will be generated from these projects and monitor the project implementation and all necessary parameters that are required for the calculation of emission reductions from each CPA. The conditions for participation shall be in line with the eligibility criteria of the projects for inclusion in the PoA and shall be elaborated in the agreements between Standard Bank Plc and the project developers or other entities.

Policy/measure or stated goal of the PoA

The stated goal of the PoA is the significant expansion of renewable energy (solar, wind and hydro) in the energy balance in Ghana, Kenya and Mauritius, in order to reduce the dependency on fossil fuels, contribute to improved energy security and access, and finally contribute to form of a future low-carbon energy system.

Ghana

According to Energy Commission of Ghana (Energy Commisision of Ghana, 2010), Ghana experienced an important increase of its electrical consumption over the last decade. Indeed, as shown in Table below, electricity consumption for any sectors (e.g. residential, non-residential, industrial), rose up by 50% from 4,552 GWh in 2003 to 6,860 GWh in 2010.

The development of renewable energy is an essential component of a global approach to meeting the energy needs of industry, transport, buildings and households without adversely affecting the climate.

Table 1: *Electricity Consumption by Sector (GWh)*[1]

SECTOR	2003	2004	2005	2006	2007	2008	2009	2010
Residential	1,727	1,84	1,956	2,13	2,094	2,269	2,42	2,738
Non-residential	620	661	676	789	802	927	884	966
Industrial	2,206	2,029	2,542	3,593	2,687	2,963	2,92	3,156
Total	**4,552**	**4,53**	**5,174**	**6,512**	**5,583**	**6,159**	**6,223**	**6,860**

According to International Energy Agency (IEA), newly commissioned and operated power plants in Ghana are mainly conventional fossil-fuelled power plants as showed on Figure 1.As shown in Table 2,CO_2 emissions generated due to conventional fossil-fuelled power plants increased sharply in Ghana (+233 % change for the period 1990-2009). (International Energy Agency Statistics, 2011).

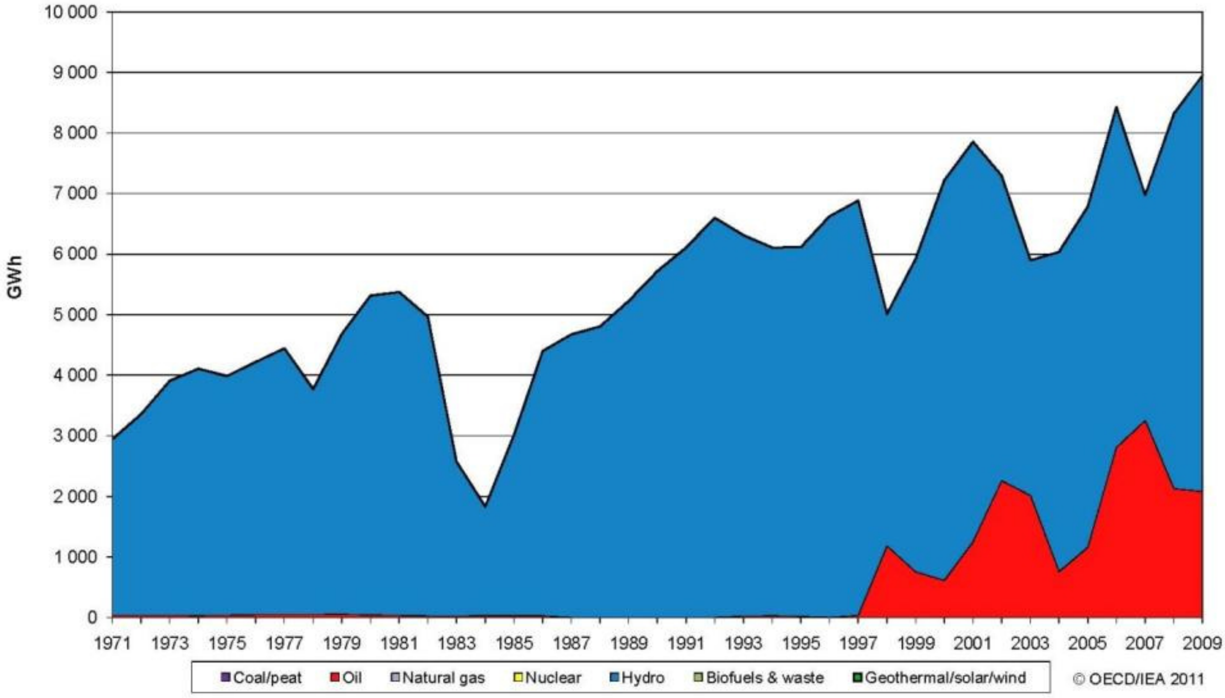

Figure 1: *Electricity generation by fuel (Source: IEA)*

[1]Does not include transmission and distribution losses

Table 2: *CO_2 emissions - Sectoral Approach*[2] *(*Million tonnes of CO_2)

Non-OCDE	1971	1975	1980	1985	1990	1995	2000	2005	2007	2008	2009	% change 1990-2009
Ghana	1.9	2.3	2.3	2.2	2.7	3.3	5.1	6.4	8.2	7.3	9.0	**233.0%**

The proposed PoA seeks to increase the proportion of renewable energy, particularly solar, wind, and hydro in the national energy supply mix and contribute through the use of alternative sources of energy to mitigate climate change. In this way, the proposed PoA will promote the development of renewable energy and facilitate the mitigation of greenhouse gas (GHG) emissions through displacement of fossil-fuel-based electricity.

The proposed PoA to promote renewable energy projects is fully in line with the Government's strategy for the sector. Since 1997, the government of Ghana has initiated reforms in the energy sector that led to the development of the Strategic National Energy Plan (SNEP); the plan outlines policy for the period 2006 to 2020 and sets a target of 10% of renewable energy in the country's energy mix.

However this ambitious blueprint has translated into little action. Indeed, the study conducted by Climate Strategies[3] in 2009 has identified barriers to deployment for renewable energy activities in Ghana (Climate Strategies, 2009). *"It emerged from the study that in Ghana many barriers relate to the implementation and the roll-out stages. Implementation phase barriers in RE [...] sectors were identified inter alia, as lack of clear policy, capacity to innovate, regulate, adapt and adopt. The other barriers relate to lack of finance, inability to operate and maintain RE […] equipment after installation. Lack of appropriate technical standards and stakeholder's awareness, and absence of information were also identified as some of the barriers that have affected the scale of utilization of RE […] technologies in Ghana. […]. Human capacity building for government agencies and other stakeholders has therefore been identified as key to 'unlocking' the domestic environment.[…].The results of the study suggest that in order to increase the penetration of RE technologies in Ghana, a combination of appropriate market mandated policies (i.e. portfolio standards, a quota system, and feed-in tariff regime, etc.), use of the Clean Development Mechanism (CDM), as well as the incorporation of other policy options. These policy options include, among others, use of international support to enhance the regulatory framework, develop an all-inclusive energy policy, build domestic technical capacity, bridge the gap between policy makers and academics, leverage the domestic financial environment and develop innovative business models which ensure RE […] project are technically and financially sustainable."*

More recently, in 2011, ECN's report highlights that *"renewable energy is a […] area where private sector participation and investments are important for large scale implementation. However, despite a number of initiatives in this area, electricity market regulation and energy subsidies, which keep the cost of energy for consumers low, are cited as one of the reasons for the slow uptake of renewable energy technologies in the country"*. (Energy research Centre of the Netherlands, 2011).

Ghana is fortunate in having a huge renewable energy potential to meet growing energy needs. An overview of renewable energy resources of the country is given hereafter.

Solar energy

According to the Ministry of Energy, Ghana receives an average solar radiation of about 4 – 6 $kWh/m^2/day$ and sunshine duration of 1,800 hours to 3,000 hours per annum (Ministry of Energy, 2010).

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[2] Sectoral Approach contains total CO_2 emissions from fuel combustion as calculated using the IPCC Tier 1 Sectoral Approach and corresponds to IPCC Source/Sink Category 1 A. Emissions calculated using a Sectoral Approach include emissions only when the fuel is actually combusted.

[3]Climate Strategies is a not-for-profit organisation that provides world-class, independent policy and economic research input to European and international climate and energy policy. Climate Strategies is supported by range of national governments, businesses and foundations, and provides unrivalled analysis for international decision-makers that bridge the gap between research and policy.

Solar radiation in Ghana shows strong geographical variations with the highest level of solar radiation found in the northern regions of the country (Figure 2). Diffuse radiation is between 41 percent and 53 percent, with the lowest occurring in the northern parts of the country and the highest across the western part of the country. Generally, solar radiation levels are good enough to be exploited for electricity generation and direct thermal applications.

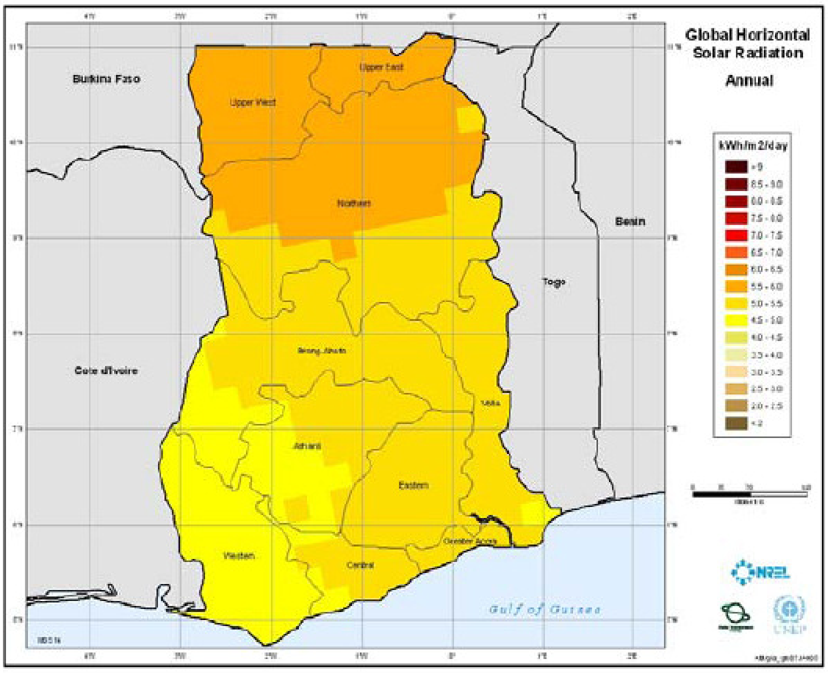

Figure 2: *Global Horizontal Radiation Annual (National Renewable Energy Laboratory, 2005)*

Wind energy

Preliminary wind resource assessments results in selected sites along the coasts and high elevations showed moderate to excellent wind potentials as shown in Figure 3. Especially, sites with good wind regimes are those along the east coastlines. As shown in Table 3 the gross wind electric potential is 5,640 MW. Infrastructure such as road, grid network and load centres coincide with most areas where these wind potentials exist. (Ministry of Energy, 2010).

Table 3: *Gross wind resource potential of Ghana*

Wind Resource Utility Scale	Wind Class	Wind Power at 50 m (W/m^2)	Wind Speed at 50 m (m/s)	Total Area (km^2)	Percent Windy Land	Total Capacity Installed (MW)
Moderate	3	300 – 400	6.4 – 7.0	715	0.3	3,575
Good	4	400 – 500	7.0 – 7.5	268	0.1	1,340
Excellent	5	500 – 600	7.5 – 8.0	82	<0.1	410
Excellent	6	600 – 800	8.0 – 8.8	63	<0.1	315
			Total	**1,128**	**0.5**	**5,640**

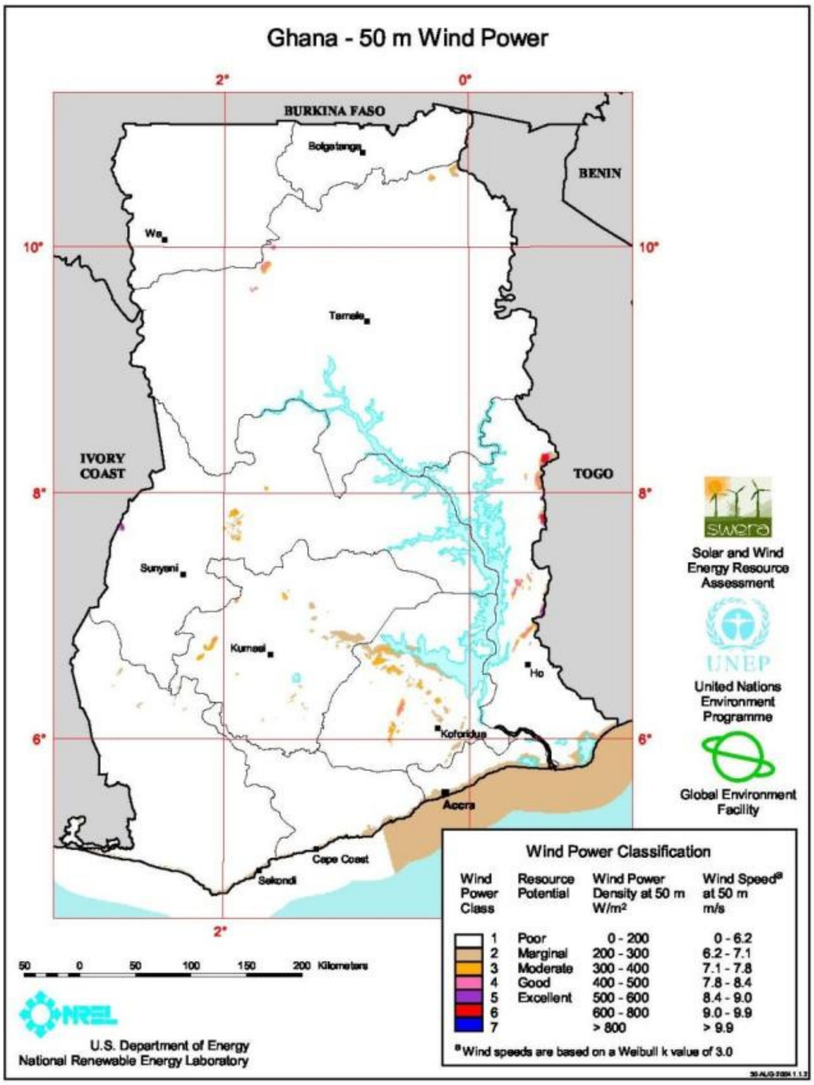

Figure 3: *Wind Energy Resource Map of Ghana* (National Renewable Energy Laboratory, 2004)

Hydropower

The potential exploitable hydro resource for Ghana is about 2,500 MW. Already, 1,180 MW of this potential have been developed and operational at Akosombo and Kpong. An additional 400 MW is under construction, bringing the total exploited capacity to 1,580 MW. The remaining 840 MW capacity is located at about 21 sites as shown in Figure 4 with capacities ranging from medium (95MW) to small (17 MW) hydropower potentials.(Ministry of Energy, 2010).

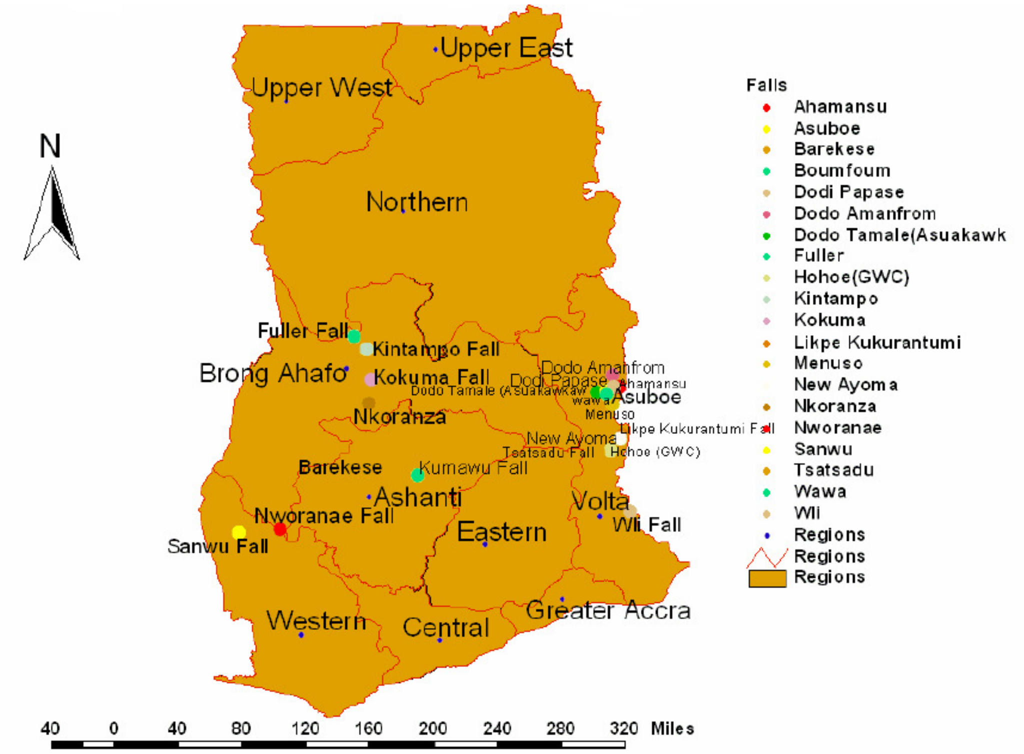

Figure 4: *Exploitable hydro sites in Ghana.* (REEP and Energy Commission of Ghana, 2009)

Kenya

Kenya experienced an important increase of the demand over the last years (Climate Investment Fund, 2011). As shown in Table 4 the global electricity consumption rose up by 26% from 4,200 GWh in 2004/2005 to 5,318 GWh in 2009/2010.

Table 4: *Evolution of electrical consumption in Kenya (Republic of Kenya, 2011)*

Sector	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010
Domestic	956	1,028	1,113	1,255	1,254	1,290
Small Commercial	522	522	558	590	823	823
Commercial (Medium) and Industrial (Medium)	885	901	985	996	n/a	n/a
Commercial and Industrial (large)	1,776	1,877	2,054	2,108	n/a	n/a
Commercial and Industrial (medium + large)	n/a	n/a	n/a	n/a	3,020	3,153
Off-peak	53	54	50	74	43	36
Street lighting	8	9	11	13	15	16
TOTAL	**4,200**	**4,391**	**4,771**	**5,036**	**5,155**	**5,318**

Kenya's electricity mix is dominated by hydro generation (over 50% of the installed capacity), however due to climate change effects in the country, hydro component of base load supply has become unreliable and has decreased. Thus in the last years most of new capacity additions consisted of fossil-fuelled power plants which were supposed to replace hydro power plant as base load. Therefore Kenyan energy sector's GHG emissions are rising quickly and it estimated that they increased by around 50% over the last decade. (Climate Investment Fund, 2011)

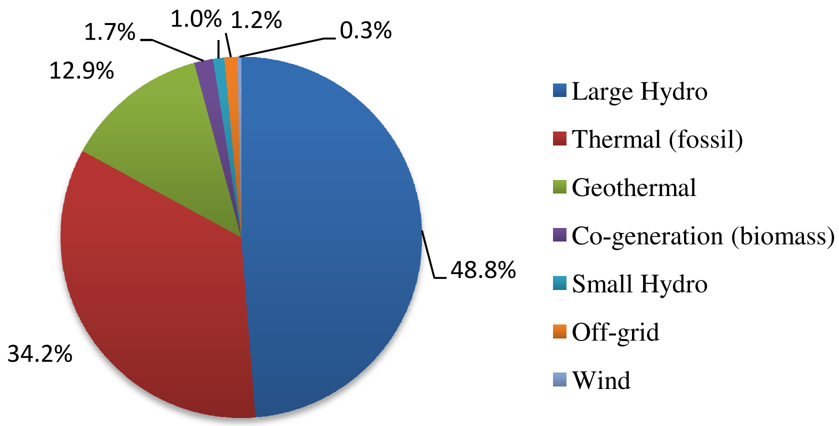

Figure 5: *Kenya's electricity mix (expressed in % of capacity installed - 2010) (Climate Investment Fund, 2011).*

Table 5: *Kenya's electricity Power plants and commissioning date*

Name		Year of commissioning	Type	Owner	Electricity generation (MWh) 2008/2009
1	Orpower 4	2009	Geothermal	IPP	203,832
2	Sondu Miriu	2008	Hydro	KenGen	330,649
3	Aggreko (Embakasi)	2006	Thermal	IPP	738,501
4	Aggreko (Eldoret)	2006	Thermal	IPP	174,040
5	Mumias	2005	Cogeneration	IPP	4,782
6	Olkaria II	2003	Geothermal	KenGen	529,948
7	Tsavo Diesel	2001	Thermal	IPP	564,916
8	Orpower 4 – 13 MW	2000	Geothermal	IPP	75,709
9	Gitaru	1999	Hydro	KenGen	651,335
10	Kipevu Diesel	1999	Thermal	KenGen	376,059
11	Kipevu GT2	1999	Thermal	KenGen	87,927
12	Iberafrica	1997	Thermal	IPP	345,677
13	Turkwel	1991	Hydro	KenGen	519,388
14	Kiambere	1988	Hydro	KenGen	615,493
15	Kipevu GT1	1987	Thermal	KenGen	99,348
16	Olkaria I	1985	Geothermal	KenGen	366,807
17	Masinga	1981	Hydro	KenGen	128,523
18	Kamburu	1976	Hydro	KenGen	327,046
19	Nairobi South Fiat	1973	Thermal	KenGen	9,219
20	Kindaruma	1968	Hydro	KenGen	157,011
21	Gogo	1958	Hydro	KenGen	5,956
22	Sagana	1955	Hydro	KenGen	6,259
23	Sosiani	1955	Hydro	KenGen	1,644
24	Tana	1955	Hydro	KenGen	44,461
25	Wanji	1954	Hydro	KenGen	31,903
26	Mesco	1933	Hydro	KenGen	2,581
27	Ndula	1925	Hydro	KenGen	4,563

Table 6: *Planned Generation Capacity expansion in Kenya 2012-2016 (Kenya Electricity Generating Company, 2011) (Kenya Power, 2012)*

Developer	Project	Type	Capacity	Est. Commissioning date
KenGen	Sang'oro	Hydro	21	Feb-2012
	Muhoroni	Thermal	80	Oct-2012
	Ngong 1 ph2 and Ngong 2 wind	Wind	6.8	Apr-2013
	Olkaria IV	Geothermal	140	Dec-2013
	Olaria 1- Life Extension	Geothermal	140	Dec-2013
	Kindaruma 3rd unit and Upgrading Unit 1&2	Hydro	32	Unit 3 to be commissioning in June 2012 Unit 2 to be Commissioning in December 2012 Unit 1 to be Commissioning in June 2013
	Isiolo Wind	Wind	50	Jul-2013
	Olkaria 1 Unit 6 & Olakria IV Unit 3	Geothermal	140	Jun-2016
	Olkaria IV Unit 4 and 5	Geothermal	170	Jun-2016
	Kilifi Coal	Thermal	600	Jul-2016
Subtotal			**1,379**	
IPP	Thika 1 MSD Plant	Thermal	87	Dec-2012
	Athi River 1 MSD Plant (Triumph)	Thermal	80	Dec-2012
	Athi River 2 MSD Plant (Gulf)	Thermal	83	Dec-2012
	Garissa	Thermal	10	Dec-2012
	Aeolus - Kinangop	Wind	60	Nov-2013
	Lake Turkana	Wind	300	Dec-2014
	Orpower 4	Geothermal	52	2014 (36) 2019 (16)
	AGIL	Geothermal	140	Jul-2015
	Gura	Hydro	3	Jul-2015
	Genpro	Hydro	3	Jul-2015
	ARM Coal (Mombassa)	Coal	20	Jul-2014
	Small Hydros	Hydro	25	2011-2015
Import	Ethiopia	Hydro	200	Jul-2015
Subtotal			**1,791**	

Over the next decade, Kenya's electricity demand is expected to rise by 247% from 9,084 GWh in 2012 to 36,652 GWh in 2022. In this particular context of a sharp growth of electricity demand, the proposed PoA seeks to increase or at least maintain the share of renewable energies, particularly solar, wind and hydro in the Kenyan power generation mix by alleviating the barriers faced by the various renewable energy sources. Thus this PoA will promote the development of renewable energy and help mitigate the greenhouse gas (GHG) emissions generated by the electricity generation sector.

Solar energy

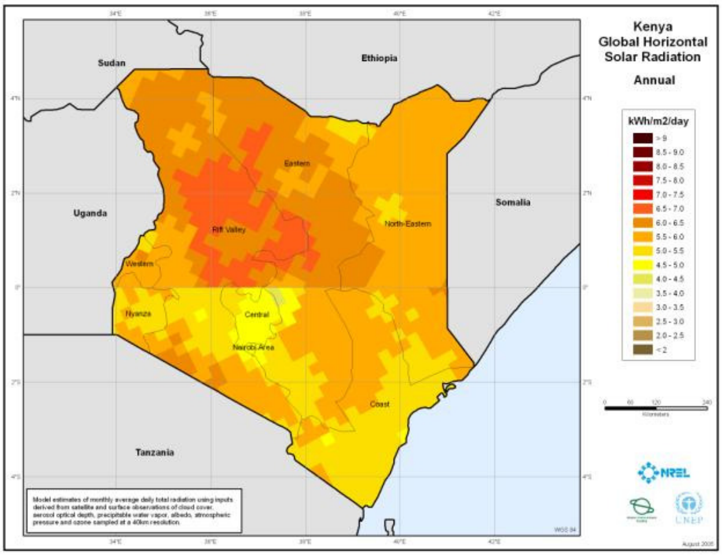

Figure 6: *Kenya's solar PV potential* (UNEP/RISOE, 2008)

Given its location near the equator, Kenya has great potential for the use of solar energy throughout the year with 4-7 kWh/m^2/day levels of insolation. However due to high initial capital costs, low awareness of the potential benefits of solar technologies and a lack of adherence to system standards the share of solar-generated grid electricity is currently negligible.

Wind energy

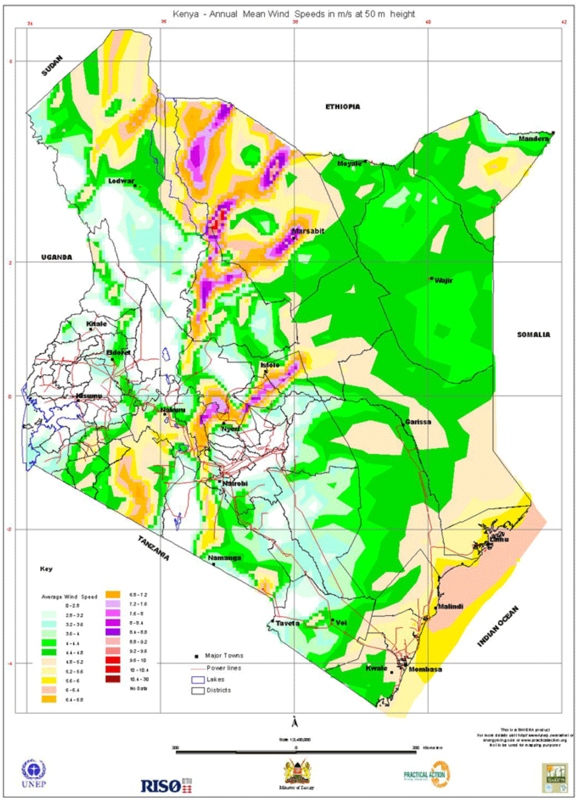

Figure 7: *Kenya's wind potential (source: UNEP/RISOE)*

As for today Kenya's wind installed capacity is 5.1 MW at the Ngong site operated by KenGen. Given the strong potential of Kenya (90,000 km^2 of surface with wind over 6 m/s) and the measured exploitation of this energy the government decided to develop the Feed-in Tariffs policy in order to provide an strong incentive in favour of wind farms projects. However high capital cost and lack of sufficient wind regime data are still strong barriers that affect wind energy in Kenya. Besides given that auspicious areas for wind energy are often far away from the main transmission grid or load centres, an important investment in transmission lines is often needed.

Hydropower

Hydro power already represents an important share of the power generated in Kenya (around 32.5%). As for today 750 MW out of a potential of 3,000-6,000 MW of hydro resource is exploited and it does represent 50% of the installed capacity in Kenya (Republic of Kenya, 2011). However hydro power plants consist mainly of large-scale dams which were built before the 1990s and of small scale power plants that predate the independence of Kenya. Given the economic risk of hydro project, their capital intensive nature, the vulnerability to large variation in rainfall, strong challenges exist today for the continuing development of this energy.

Mauritius

According to the Digest of Energy and Water statistics (Ministry of Finance and Economic Development, 2010), Mauritius experienced an important increase of its electrical consumption over the last decade. Indeed, as shown in Table below, global electricity consumption rose up by 48% from 1,467 GWh in 2001 to 2,174 GWh in 2010.

Table 7: *Sales of electricity by tariff group, 2001 - 2010*

GWh sold	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Domestic	522.8	532.5	564.6	575	607.5	617.9	643	652.2	680.1	710.7
Commercial	415.5	424.9	479.3	516.2	556.4	581.8	617.9	672.7	704.2	748
Industrial	505	527.9	552	577.9	578.1	641.6	673	688.7	646.1	677.6
Other	23.3	24.4	31	34.8	35.4	38.5	41.4	40	38.8	37.6
Total	**1,466.7**	**1,509.8**	**1,626.9**	**1,703.9**	**1,777.4**	**1,975.3**	**1,879.8**	**2,053.7**	**2,069.2**	**2,173.9**

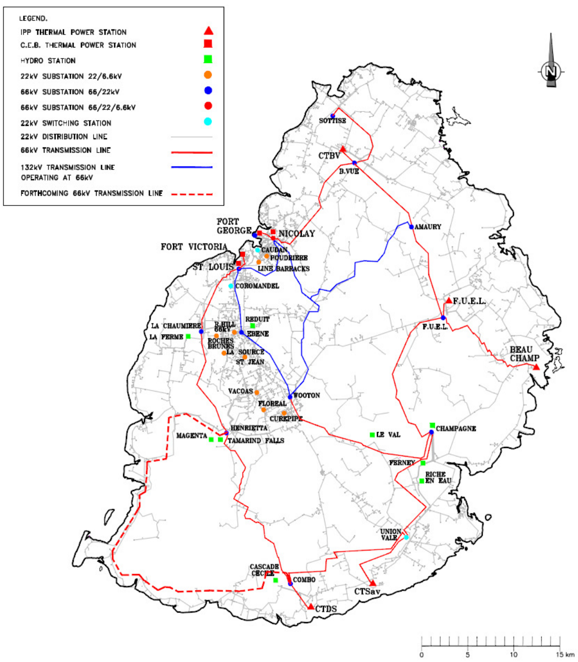

Figure 8: *Mauritius electrical grid (source: CEB)*

The current Mauritian electricity generation mix is dominated by thermal power plant which have a "long history and good track record of high availability and reliability in island-based systems" like Mauritius (Central Electricity Board, 2003). Combustion of fossil fuel (coal, Heavy Fuel Oil, diesel and kerosene) represented 75.8% of the total power generation of the country in 2010. The remaining share is based on bagasse (20.5%) and hydropower (3.7%). CEB forecasted that the electricity demand will rise by 4.1% annually until 2012.

The trend for power generation remains mostly fossil-fuel based, as proven by the most recent capacity additions: 6x15MW HFO-fired plants at Fort Victoria between 2010 and 2012 and 350kW hydropower station at La Nicoliere in 2010.

The proposed PoA to promote renewable energy projects is fully in line with the Government's Long-Term Energy Strategy 2009-2025 (Ministry of Renewable Energy & Public Utilities, 2009), a blue print for the development of the energy sector up to year 2025. This plan aimed at achieving about of 35% self sufficiency in terms of electricity supply through use of renewable sources of energy by 2025 and develop a Master Plan for Renewable Energy by end 2010 (delayed).

To facilitate small-scale grid electricity generation and in order to "democratize" the electricity sector to enable the participation of Small-scale Independent Power Producers, the Government has prepared, with the collaboration of UNDP and the Central Electricity Board, a Grid Code aimed at simplifying regulations governing grid-connected distributed generation. The Grid Code allows for the integration of renewable energy generating technologies (limited to Hydro, PV and Wind) on the low voltage grid (230/410V). The Grid Code and feed-in tariff for Small Independent Power Producers (SIPP) generating up to 50 kW is now being implemented (Central Electricity Board, 2010).

Hydropower

Most of the hydropower potential of Mauritius is already fully tapped with nine hydro power plants and it is anyway limited given the very competitive uses of existing water resources in such a small insular country (Ministry of Renewable Energy & Public Utilities, 2009). Only small hydro projects can now be considered, such as the mini hydropower plant under implementation at Midlands Dam and the feasibility study undergoing for another mini hydropower station at Bagatelle. (Government Information Service, 2010)

Solar energy

Despite the progressive reduction in the cost of the technology in the last decade, large scale photovoltaic or thermal solar initiatives are still unheard of in the country, contrary to small solar water-heating systems that have penetrated the household market, because large amounts of land are required for solar electricity generation, which are not easily available in Mauritius (Palanichamy, Sundar Babu, & Nadarajan, 2002).

A number of small PV projects of capacity less than 50kW are already being implemented, under the Small Scale Distributed Generators (SSDG) programme launched by the CEB, although limited to a total installed capacity of 3 MW (Central Electricity Board, 2010). The developers benefited from a feed in tariff which has been developed for that purpose. As for other projects that do not fall under the SSDG programme, these are considered by the CEB at its marginal cost of production of energy.

Lastly, a Request for Proposal for Solar Photovoltaic (PV) Farms of Capacity between 1-2 MW is opening to bidders, for a total capacity of 10 MW (Central Electricity Board, 2012).

Wind energy

In 1998, the Ministry of Public Utilities launched a new pre-qualification notice for the setting up of wind energy farms in the range of 10–30 MW on a BOO basis. During recent years, the interest in wind energy is gaining momentum in Mauritius, and wind turbine manufacturers from India are also keen to invest. The inland wind power technical potential is estimated to be 60–140 MW and a total technical potential, including offshore, of 250 MW by 2025 producing 550 GWh annually (National Economic and Social Council, 2009). A pioneer 18 MW grid connected wind farm project at Plaine des Roches was registered under the CDM in December 2011 but has still not started construction due to delayed negotiations between the promoters and the CEB (Patrick Hilbert, 2012).

Previous marginal attempts of implementation were prevented or failed due to prevailing practice issues, or removed following operation failures or cyclonic damages. Former pilot projects (such as Grand Bassin 100kW) were abandoned due to spare parts problems or tilting inability (S.K.Thannoo, 2006).

To date, the only wind power capacities in Mauritius are installed on Rodrigues independent grid (dependency located 550km North-East of Mauritius main island): four small wind turbines of 275kW each at Grenade farm and three older 60 kW turbines at Trefles farm are operating satisfactorily. (Vergnet Wind Turbine, 2012)

Confirmation that the proposed PoA is a voluntary action by the coordinating/managing entity

The proposed PoA is a voluntary action undertaken by the CME to encourage investments and development of grid-connected renewable electricity generation plant(s)/unit(s). There are no mandatory requirements neither in the Republic of Ghana nor in the Republic of Kenya nor in the Republic of Mauritius regarding implementation of grid-connected renewable electricity generation plant(s)/unit(s), but only stated national energy objectives that this voluntary action will contribute to achieve.

The PoA will contribute towards sustainable development objectives of both Ghana, Kenya, and Mauritius by leveraging on the three dimensions of sustainable development:

- *Environmental Dimension:*

By supporting the use of renewable energy, the PoA will contribute towards sustainable reduction of the amount of GHG produced by the power generation sector at the national grid level. Furthermore the reduction of fossil fuel consumption will also mitigate the emission of other pollutants such as sulphur dioxide and dust. Therefore the PoA will ultimately contribute to mitigate the adverse environmental impact of the power generation sector, on particular regarding the emission of atmospheric and water pollution and the degradation of landscapes due to coal mining

- *Social Dimension:*

The prevailing practice for energy production in most African countries is the combustion of biomass (firewood or charcoal) for daily household energy needs related to cooking or heating. For instance biomass does represent 70% of the energy consumed in Kenya while it is 65% in Ghana. There are several serious social, environmental and public health related drawbacks to these practices such as respiratory illness and deforestation. The activities that would be implemented under this PoA will assist in mitigating the above-mentioned negative impacts by enabling the grid-connection of many households living mainly in rural areas and that are not currently connected to the electricity grid due to a lack of available power. Besides, the programme will improve energy self-sufficiency of the countries which are currently heavily reliant on imported fossil fuels, particularly in the case of Mauritius.

- *Economic Dimension:*

During construction phases of the hydro, wind and solar projects that would be implemented under the proposed PoA, engineering and construction will employ several hundreds of people (between 500 and

800 depending on the project size). Employment opportunities will also exist during the operational phase.

In 2008, Greenpeace and the European Union provided the following statistics associated with the operations and management of PV centres in Europe (Greenpeace & European Photovoltaic Industry Association, 2008):

- 10 jobs are created per MW during production;
- 33 jobs are created per MW during the process of installation;
- 3-4 jobs per MW for wholesaling of the system and indirect supply;
- 1-2 jobs per MW created in research.

Similar figures can therefore reasonably be inferred for Africa.

Above all the job opportunities created by the activities under the PoA, training will also be provided for technical positions. Thus it will lead progressively to the transfer and development of specific skills and expertise leading to an effective transfer of technology.

A.3. CMEs and participants of PoA

Coordinating or managing entity of the PoA as the entity which communicates with the Board

The entity that manages and oversees communication with the Designated Operational Entities, the UNFCCC secretariat and the Executive Board is Standard Bank Plc

Standard Bank Plc is a bank authorised and regulated by United Kingdom Financial Services Authority providing a range of banking and related financial services. It is a member of the London Stock Exchange, the London Bullion Market Association, the London Metal Exchange, the London Platinum and Palladium Market and is Chairman of the London Platinum and Palladium Fixing and has two seats on the New York Mercantile Exchange (COMEX Division). The franchise of Standard Bank Plc and its subsidiaries focuses on emerging markets - primarily debt, interest rate, equity and currency products and natural resources.

Project participants being registered in relation to the PoA

Standard Bank Plc is the only project participant being registered in relation to the PoA.

A.4. Party(ies)

Table 8 : *Project participants being registered in relation to the PoA*

Name of Party involved (host) indicates a host Party	Private and/or public entity(ies) project participants(as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Republic of Ghana (host)	Standard Bank Plc (Private entity)	No
Republic of Kenya (host)	Standard Bank Plc (Private entity)	No
Republic of Mauritius (host)	Standard Bank Plc (Private entity)	No

A.5. Physical/ Geographical boundary of the PoA

The boundary of a PoA is defined as the geographical area within which all the CPAs included in the PoA will be implemented. The geographical boundary of the PoA will cover the ten regions of Ghana, the eight provinces of Kenya and the whole Republic of Mauritius.

Figure 9: *Map of Ghana (Source: United Nations Cartographic Section).*

Figure 10: *Map of Kenya (Source: United Nations Cartographic Section)*

Figure 11: *Map of Mauritius (Source: Foreign Ministry Geographic Division)*

The boundary of the programme may be amended post-registration to include additional other countries. As per EB60/Annex 26, in expanding the PoA to other countries the following three conditions will be met:

- The existing registered PoA design document (POA-DD) will be revised to reflect the changes, in particular, the eligibility criteria for inclusion of CPAs;
- A designated operation entity (DOE) will confirm that the baseline established in the POA- DD is applicable to the extended programme boundary; and
- The DNA of the new Host Party issues a letter of approval for the programme and a letter of authorization for the co-ordinating and managing entity.

A.6. Technologies/measures

The technology or measures to be employed by each CPA falls into Sectoral Scope 1: Energy Industries (renewable - / non-renewable sources) as it concerns the implementation of grid-connected renewable electricity generation projects in Ghana, Kenya and Mauritius.

A typical CPA may be one of the following:

(a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant);

(b) involve a capacity addition;

(c) involve a retrofit of (an) existing plant(s);

(d) involve a replacement of (an) existing plant(s).

A typical CPA is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types:

- hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir)

  Energy in water can be harnessed and used. Since water is about 800 times denser than air, even a slow flowing stream of water, or moderate sea swell, can yield considerable amounts of energy.

There are different forms of water energy: run-of-river systems derive kinetic energy from rivers and oceans without using a dam, while accumulation systems consist in hydroelectric dams (e.g. Akosombo Dam in Ghana or Kamburu Hydro Power Plant in Kenya).

- wind power plant/unit

  Airflows can be used to run wind turbines. Modern wind turbines range from around a few hundred kW to several MW of rated power; the power output of a turbine being a function of the cube of the wind speed, so as wind speed increases, power output increases dramatically.

- solar power plant/unit.

  Solar energy is the energy derived from the sun through the form of solar radiation. Solar powered electrical generation relies on photovoltaic and heat engines.

A typical CPA under this proposed PoA may be a single grid-connected renewable electricity generation plant/unit

Detailed technical description will be provided within each CPAdue to the nature of projects under this proposed PoA.

A.7. Public funding of PoA

The PoA does not expect to involve any public funding according to the OECD definitions for Official Development Assistance (ODA).

SECTION B. Demonstration of additionality and development of eligibility criteria
B.1. Demonstration of additionality for PoA

According to the *Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities* (EB 65, Annex 3, Version 01.0):

- *Additionality shall be demonstrated by establishing that in the absence of CDM, none of the implemented CPAs would occur.*

  As per paragraph 10 of "Tool for the demonstration and assessment of additionality" (Annex 20, Version 06.1.0, EB69), approach to demonstrate and assess additionality is given as follows:

  (a) Identification of alternatives to the project activity;

  (b) Investment analysis to determine that the proposed project activity is either: 1) not the most economically or financially attractive, or 2) not economically or financially feasible;

  (c) Barriers analysis; and

  (d) Common practice analysis.

  ➔ Depending on project-specific circumstances, identification of alternatives is to be performed at CPA level as well as investment or barriers analysis and common practice analysis if applicable. However at PoA level, a selection of relevant barriers faced is outlined at the end of this section.

- *PoAs that consist of one or more microscale projects as CPAs shall include eligibility criteria derived from all the relevant requirements of the "Guidelines for demonstrating additionality of microscale project activities".*

  As per paragraph 2 of "*Guidelines for demonstrating additionality of microscale project activities" (Annex 26, Version 04.0, EB68),* Project activities up to five megawatts that employ renewable energy technology are additional if the condition below is satisfied:

  (a) *The geographic location of the project activity is in one of the least developed countries or the small island developing States (LDCs/SIDS) or in a special underdeveloped zone (SUZ) of the host country;*

  According to UNFCCC, Ghana is not a least developed country, but underdeveloped zones have been identified by the government of Ghana. This area includes the Northern, Upper East and Upper West

Regions of Ghana, and the districts that lie to the north of Brong-Ahafo and north of Volta Regions (Government of Ghana, 2011). Indeed, there is an increasing development gap between the Northern Savannah Ecological belt and the rest of the country. By all indications the North lags behind the South and the gap seems to be increasing. The 17th September, 2010, the parliament of the Republic of Ghana has established the Savannah Accelerated Development Authority (SADA) to provide a framework for the comprehensive and long-term development of the Northern Savannah Ecological Zone. According to a recent study conducting conducted by the World Bank, the poverty rate in Northern Ghana (defined as the sum of the administrative regions Northern, Upper East and Upper West Regions) which cover 40 percent of Ghana's land area was estimated to 58.3% in 2006.[4] (World Bank, 2011).

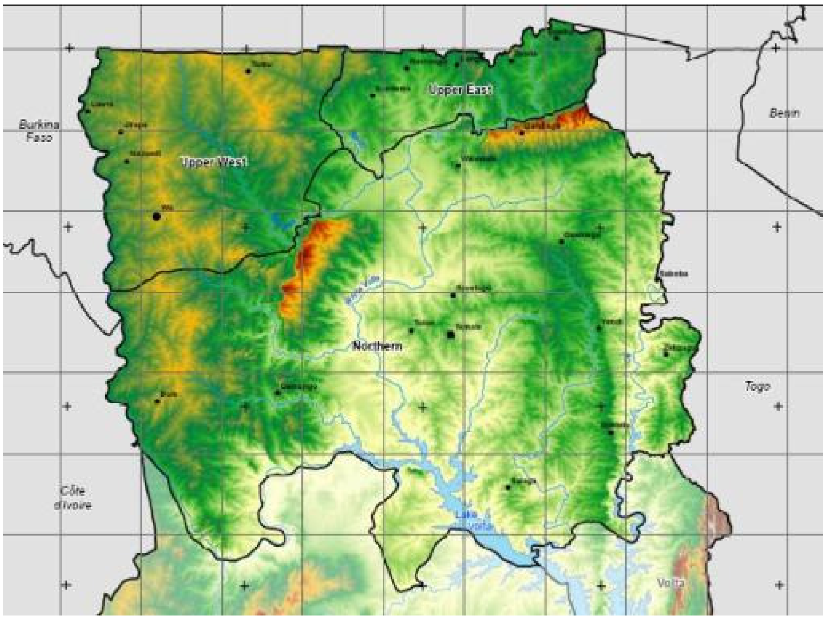

Figure 12: *Map of Northern Ghana.*

According to UNFCCC, Kenya is not a least developed country, but the North Eastern Province and the Coast Province have been identified by the government of Kenya as underdeveloped zones. According to the UNDP, the proportion of the people whose income is less than one dollar PPP a day in 2005/2006 is higher than 70% in the Coast Province and the North Eastern Province (UNDP, 2009). The Ministry of State for Development of Northern Kenya[5] and other Arid Lands was established by the Presidential Circular No. 1/2008 under the Office of the Prime Minister with the objectives:

- accelerating economic development in the region
- enhance equity and poverty reduction
- improve the quality of governance increase mutual understanding between the citizens of Northern Kenya and those in the rest of the country

According to UNFCCC, Mauritius is not a least developed country, but it is part of the Small Island Developing States.

All CPAs up to five megawatts and implemented in these areas are automatically considered to be additional.

[4] Measured with an international poverty line of PPP $1.25 a day. Data 2006 (most recent available data)

[5] www.northernkenya.go.ke

- *The CME shall demonstrate that compliance with the additionality-related eligibility criteria set in the PoA design document will ensure that all the relevant additionality-related guidelines, tools or any requirements embedded in the methodologies are met.*
  - ➔ As required in eligibility criteria (f) of the below section, any compliant CPA will necessarily meet the relevant additionality-related guidelines, tools or methodological requirements, namely:
    - o the *Tool for the demonstration and assessment of additionality*[6]
    - o *Guidelines for demonstrating additionality of microscale project activities* (when applicable) for CPAs up to five megawatts.

Barriers faced by the proposed PoA

For Ghana, a *Technology needs assessment report* published by the Ministry of Environment & Science of Ghana has highlighted institutional, financial and structural hurdles for the development of renewable energy projects including solar, wind and hydro (Ministry of Environment & Science of Ghana, 2003).

Table 9: *Barriers faced by the proposed PoA in Ghana*

RE Technology	Barriers
All RE Technologies	▪ High initial capital costs. ▪ Comparatively low tariff for grid electricity without similar incentives for renewable energy electricity. ▪ Low output or energy intensity hence making the cost of energy high. ▪ Monopolistic utility model where the utilities are vertically integrated and no one has choice of supplier. ▪ Local production of system components attract higher taxes such that it is cheaper to import PV systems than to assemble or produce locally. ▪ No legal and regulatory mechanisms for Independent Power Producers (IPPs) and lack of access codes to guarantee open access to the grid network for energy providers.
Solar PV for grid integration	▪ Lack of skilled labour ▪ High initial cost ▪ Depreciation value of the cedi since almost all components are imported ▪ Lack of interconnection standards ▪ Limited understanding of issues of integrating renewables into the grid within utility companies.
Wind	▪ Lack of dependable country-wide data. ▪ Weakening and unstable local currency does not favour importing the systems in the country ▪ Lack of standardisation ▪ There are no regulations and code of installation and practice. ▪ Lack of expertise in wind energy technology ▪ High initial capital investment ▪ Uneconomic tariffs for grid electricity without similar incentives for renewable energy electricity

[6] Project activities that apply this tool in context of approved consolidated methodology ACM0002, only need to identify that there is at least one credible and feasible alternative that would be more attractive than the proposed project activity.

Small and Mini Hydro	▪ Limited capacity and know-how. ▪ Lack of policy to implement the development of mini hydropower. ▪ High investment cost and long pay-back period. ▪ Uneconomic electricity tariffs. ▪ Lack of sufficient incentives to attract private capital for renewable energy projects. ▪ Ineffective coordination in implementing government projects

According to the study conducted by Climate Strategies in 2009, technological barriers to deployment for renewable energy activities in Ghana are described as follows:

a) Human capacity in civil, electrical, mechanical, and engineering for the design, construction, installation, operation, and maintenance of power plants is limited.
b) Lack of appropriate technical standards and stakeholder's awareness,
c) Absence of information of utilization of renewable energy technologies in Ghana (Climate Strategies, 2009)

For Kenya, the Scaling-up Renewable Energy Program (SERP) Investment Plan has also identified several barriers, constraints and structural hurdles for the development of renewable energy projects including solar, wind and hydro (Climate Investment Fund, 2011).

Table 10: *Barriers faced by the proposed PoA in Kenya*

1. **Barriers/constraints**	2. **Resources affected**
High capital cost	Wind, Solar, Small Hydro, Geothermal
Insufficient./Inadequate data	Wind, Small Hydro
Renewable energy resource distribution relative to existing grid/load centers	Wind
Challenges in reaching financial closure	Wind, Solar
Lack of appropriate and affordable credit and financing mechanisms	Solar
Low awareness of the potential opportunities and economic benefits	Wind, Solar
Lack of adherence to system standards by suppliers and poor after-sale service	Solar
High cost of resource assessment and feasibility studies	Small Hydro, Wind
Climate change impact	Small Hydro
Limited capacity for equipment and human resource	Solar, Small Hydro

For Mauritius, a Renewable energy investment opportunities review (Palanichamy, Sundar Babu, & Nadarajan, 2002) analysed the energy scenario, the renewable energy technologies in practice, the technological barrier for further expansion, and it also identified the suitable renewable energy technology.

Table 11: *Barriers faced by the proposed PoA in Mauritius*

RE Technology	**Barriers**
Solar	▪ As per current practice experience in Mauritius, solar power is more expensive than other methods of producing electricity. The unit generation cost of solar systems approaches 30 cents/kWh even in the sunniest locations of Mauritius.

	Solar is far behind in competing with conventional power generation costs of 3–5 cents/kWh. ▪ Solar electricity costs depend on the location and the cost of finance available to the owner of the solar installation. The unit installation cost in Rodriguez is more expensive than on the main island. ▪ Current technology requires large amounts of land for small amounts of energy generation. Mauritius being a small country cannot provide vast land for such practices. ▪ In Mauritius, small plants are in practice and, hence, they are found to be inefficient. ▪ With solar power, along with some batteries for backup, one is also paying for the extra reliability with their increased resistance to the simple line failures of standard utility electricity. ▪ Inadequate hardware and training in photovoltaic solar energy systems (installation, maintenance, trouble-shooting and repair).
Wind	▪ Damage due to cyclones ▪ Inadequate maintenance ▪ Insufficient data availability for planning and installation ▪ Transition in technology maturity ▪ No further Government support, and ▪ No public interest

Although several barriers have favourably evolved since 2002 (capacity building at CEB for wind power, outsourcing to private/foreign experts, wind mapping at 10 m publicly available, Maurice Ile Durable – Mauritius Sustainable Island vision and Long Term Energy Strategy 2009-2025 enunciation by the Government, etc.) and growing interest expressed among national investors and partners in developing grid-connected PV [and wind] as a business opportunity, prospects for this investment to materialize in full and at agreed time-frames remain low as long as measures to reduce the administrative burdens on the county's limited regulatory capacities and to approve the required feed-in tariff and incentive schemes are not undertaken (United Nations Development Programme, 2011).

Besides, Mauritius island specificity of an isolated grid with no interconnection facilities further hampers CEB to ensure reliability of supply from renewable sources of energy like wind and solar sources of energy which are intermittent.

<u>Investment barrier</u>

As highlighted by the above extracts, renewable energy power plants require an intensive capital investment and a long-term financing, proportional to the risks associated with this kind of investment. Specific technical difficulties for construction and operation at the site of the project, and lack of significant experience and feedback in renewable energies make it difficult to obtain local financing.

Published renewable energy technology cost review also evidences the higher investment price tag (The World Bank, 2011) of the proposed PoA technologies (solar, wind and hydro power) in comparison with Gas Combined Cycle power or other fossil-fuelled power plants available in Ghana, Kenya and Mauritius – as shown in below.

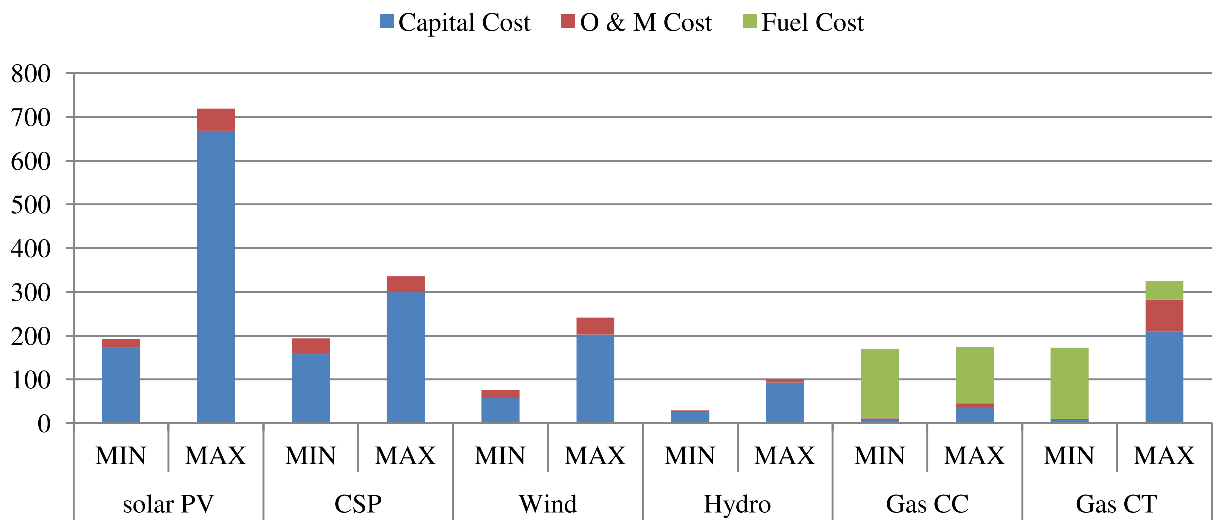

Figure 13: *Levelized cost of electricity generation by technology (2008US$/MWh)*

Barrier due to prevailing practice

The information presented in section A.2 shows that fossil fuel use in the electricity generation sector has increased over the past decades in Kenya, Ghana and Mauritius. This pattern suggests that technological know-how and expertise have been mostly oriented towards non-renewable fossil fuel plants.

Ghana

The Ghanaian country chapter of a study entitled Renewable Energies in West Africa (GTZ, 2009) has observed the following:

(a) Although solar technology applications are increasingly spreading among households and communities, they remain generally confronted with (i) opportunity cost for deploying solar energy as an alternative energy source and (ii) the far distances of the locations from the national electricity grid in Ghana where solar energy is applied (off grid locations). To date, the share of solar power in the national grid electricity balance is nil.

(b) There is general perception that wind speeds in Ghana are too low to generate energy, but the coastal belt and the Volta and Central Regions in particular have wind speeds of 3–5 meters per second which is enough to drive turbines to generate wind energy. The technology, however, has been virtually untapped by the private and public sectors.

(c) Apart from the main grid-connected public hydroelectric plants of Akosombo and Kpong and the Bui dam under construction by the Government, none of the thirteen other river sites that have been earmarked for mini hydro projects requiring public private partnerships have been implemented.

Mauritius

The first attempt to install a wind farm in Mauritius was a 300 kW wind farm, located in the Rodrigues island independent grid, which was abandoned due operation failures and cyclonic damages. Additional pilot projects (such as the 100 kW Grand Bassin project) were abandoned due to lack of spare parts and tilting inability. (Dr Sanju Deenapanray, 2006).

As a stepping stone the Government of Mauritius and the Central Electricity Board, with the help of the UNDP, established a Grid Code in May 2009. However the Grid Code is restricted to generating plant up to a maximum capacity of 50 kilowatts and the total installed capacity is limited to a maximum of 200 installations or a total installed capacity of 2 MW island-wide. (Republic of Mauritius, 2010)

Kenya

The current installed capacity of which more than half is from hydro is facing energy crisis due to lack of rainfall. Government has initiated measures to meet the shortfall by "encouraging the operation of thermal power plants". According to the government "the increase in the use of thermal power plants will alleviate the current situation." (J.Wafula, 2009) . As detailed in Table 6 power plants that are expected to be commissioned in 2012 represent 282.4 MW, most of them are of thermal sources (262MW) with only 20.4 MW from Wind energy source (a project supported by foreign aid in the form of concessional loan from the Spanish government) (Charlie Beall, 2010). Latest news announced the commissioning of new power plant of 88 MW capacity from diesel source (MAN Diesel & Turbo, 2012).

The existence of this barrier is confirmed by the fact that solar and wind technologies are marginal in Ghana, Kenya and Mauritius.

➔ Nonetheless, it can be outlined that such voluntary coordinated action would not easily be implemented in the absence of the PoA except in another PoA or a stand-alone CDM project, given the barriers highlighted above which are also likely to be faced at CPA level.

Assessment of applicable laws and regulations

Ghana

Table 12: *Applicable Laws and Regulations in Ghana.*

Laws, policies and incentives applicable to renewable energy	Relevant extracts	Interpretation with regards to the proposed PoA
Renewable Energy Bill, 2011	**Object of this Bill** "Its clauses cover the provision of a framework to support the development and utilisation of renewable energy sources and the creation of an enabling environment to attract investment in renewable energy sources. The promotion for the use of renewable energy, the diversification of supplies to safeguard energy security, and improved access to electricity through the use of renewable energy sources. In addition, the building of indigenous capacity in technology for renewable energy sources, public education of renewable energy production and consumption and the regulation of the production and supply of wood fuel and biofuel represent components of the object. (Ministry of Energy, 2011)	The Renewable Energy Bill sets up a facilitating environment for renewable energies development, but does not include any quantitative objective. Moreover, it still pursues the rehabilitation, expansion, completion and addition of thermal power plants.
National Energy Policy, 2010	**4.0 Renewable Energy Sub-Sector:** "The challenge is to increase renewable energy in the national energy mix in a sustainable manner" **4.5 Solar and wind** "The policy focus is to: (d) Improve the cost-effectiveness of solar and wind technologies. (e) Create favourable regulatory and fiscal regimes; (f) Support indigenous research and	The National Energy Policy barely outlined general directions to overcome what they recognize as a renewable energy challenge.

	development to reduce the cost of solar and wind energy technologies; and (g) Support the use of decentralised off-grid alternative technologies (such as solar PV and wind) where they are competitive with conventional electricity supply" **4.6 Mini Hydro** "The policy actions are: (h) Create appropriate fiscal and regulatory framework; and (i) Provide pricing incentives for mini hydropower projects." (Ministry of Energy, 2010)	

Kenya

Table 13: *Applicable Laws and Regulations in Kenya.*

Laws, policies and incentives applicable to renewable energy	Relevant extracts	Interpretation with regards to the proposed PoA
SREP Investment Plan	Renewable Energy Sector Context, paragraph 10. The Government is committed to expedite the uptake of renewable energy resources, and has introduced a number of policy measures to promote them, including: (i) a feed-in-tariff policy; (ii) a study aimed at developing feasible renewable electricity generation options, regulatory instruments and guidelines needed for their integration; (iii) setting up of a Green Energy Facility to pool donor contribution to help finance renewable energy projects; and (iv) incorporation of renewable energy integration into Least Cost Power Development Plan (LCPDP) process. (Climate Investment Fund, 2011)	The Government of Kenya recognizes the role of the private sector in renewable energy development. This programme identifies among others; increased energy access and security, employment creation, income generation etc. as benefits of exploitation of renewable energy.
Kenya Vision 2030	The government is committed to institutional reforms in the energy sector, including a strong regulatory framework, encouraging more private generators of power, and separating generation from distribution. New sources will be found through exploitation of geothermal power, coal, renewable energy sources, and connecting Kenya to energy-surplus countries in the region. (Kenya Vision 2030, 2012)	This PoA promotes renewable energy generation which is identified as one of the efforts to benefit from proposed energy sector reforms.
Feed-in Tariff policy on Wind, Biomass, Small Hydro, Geothermal, Biogas and Solar resource generated electricity	1. The government of Kenya recognises that renewable energy sources (RES) including wind, biomass, small hydros, geothermal, biogas and solar and municipal waste energy have potential for income and employment generation, over and above contributing to the supply and diversification of electricity	The Feed-in Tariff policy sets up a more attractive environment for renewable energy in Kenya. However it does not set any quantitative objective to be attain and

	generation sources. The national energy policy as enunciated in Sessional Paper No.4 of 2004 and operationalized by the Energy Act No. 12 of 2006 encourages implementation of these indigenous renewable energy sources to enhance the country's electricity supply capacity. The Sessional Paper incorporates strategies to promote the contributions of the renewable energy sources in the generation of electricity. 2. In tandem with these documents, the Ministry of Energy established a Feed-in Tariff policy (FiT) in 2008 covering wind, small hydro and biomass sources, for plants with capacities not exceeding 50MW, 10MW, and 40MW respectively. (Ministry of Energy, 2010)	it is only applicable to relatively small scale projects(under 50, 40 or 10 MW depending on the resource), leaving large scale projects without any incentive measure.
The Energy Act, 2006	103.(1) The Minister shall promote the development and use of renewable energy technologies, including but not limited to biomass, biodiesel, bio ethanol, charcoal, fuel wood, solar, wind, tidal waves, hydropower, biogas and municipal waste. (2) The Minister may perform such functions and exercise such powers as may be necessary under this Act to promote the development and use of renewable energy, including but not limited to (a) formulating a national strategy for coordinating research in renewable energy; (b) providing an enabling framework for the efficient and sustainable production, distribution and marketing of biomass, solar, wind, small hydros, municipal waste, geothermal and charcoal; (c) promoting the use of fast maturing trees for energy production including biofuels and the establishment of commercial woodlots including peri-urban plantations; (d) promoting the use of municipal waste for energy (e) promoting the development of appropriate local capacity for the manufacture, installation, maintenance and operation of basic renewable technologies such as bio digesters, solar systems and hydro turbines; (f) promoting international co-operation on programmes focusing on renewable energy sources; (g) harnessing opportunities offered under	The Energy Act sets up an objective of promoting the development of renewable energy. It does also give means of promoting the use of renewable energy without specifying quantitative goals or target to attain.

	clean development mechanism and other mechanisms including, but not limited to, carbon credit trading to promote the development and exploitation of renewable energy sources; (h) promoting the utilization of renewable energy sources for either power generation or transportation; (i) promoting co-generation of electric power by sugar millers and sale of such electric power through the national grid directly to the consumers; (j) promoting the production and use of gasohol and biodiesel. (Energy Regulatory Commission, 2006)	

Mauritius

Table 14: *Applicable Laws and Regulations in Mauritius.*

Laws, policies and incentives applicable to renewable energy	Relevant extracts	Interpretation with regards to the proposed PoA
Grid Code, 2010	The Grid Code describes the technical criteria and requirements for interconnection of Small Scale Distributed Generators (SSDG) with CEB's low voltage network systems. It caters for the production of electricity from the following renewable technologies: 1. Solar Photovoltaic 2. Wind Turbine 3. Hydro The total installed capacity of SSDGs is limited to 3 MW - which has been attained and the CEB will no longer accept any new application from potential producers[7] (CEB, 2010).	There is yet no Grid Code formulated for capacities higher than 50 kW or for connection to the Medium Voltage grid (6.6 kV and 22 kV) and High Voltage grid (66 kV); however, Power Purchase Agreements (PPA) can be signed with private power producers on a case by case basis.
Electricity Bill, 2005	The Act deals with the supply of electricity to public and private bodies. Section 4 of the Act provides for the application of permits for the supply of electricity in bulk to the CEB. Section 5, 6, 7, 8, 9, deal with the issue of permits and objections by those who are affected (Minister of Public Utilities, 2005).	Today, the CEB is in practise the single purchaser of electricity in Mauritius, but is allowed to purchase electricity from bulk supply licensees.
Environment Protection Act (EPA), 2002	The Act (amended in 2008) deals with the protection of environment in Mauritius. It outlines the processes for Environment Impact Assessment (EIA) and Preliminary Environment Report (PER) where and when necessary (Environment Protection Act, 2002).	An EIA will be required for any "Power Generating Plant", to be conducted in line with the EPA requirements

[7] Source : http://ceb.intnet.mu/grid_code/project.asp

As reviewed through existing laws and regulations, renewable energy power generation is not mandatory, thus the proposed PoA is a voluntary coordinated action from the CME to promote the implementation of solar, wind and hydro power plants/units in Ghana, Kenya and Mauritius.

B.2. Eligibility criteria for inclusion of a CPA in the PoA

According to the *Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities* (EB 65, Annex 3, Version 01.0), the eligibility criteria for inclusion of a CPA in the PoA is specified in Table 15.

Table 15: *Eligibility criteria of the proposed PoA*

§	Eligibility criteria of the Standard	Eligibility criteria of the proposed PoA
(a)	The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA.	The proposed CPA is developed within the borders of Ghana, Kenya or Mauritius and is connected to the national grid.
(b)	Conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo).	The CPA implementer complies with the procedure established by the CME as specified in PoA-DD Section C Part I to avoid double accounting.
(c)	The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications.	The proposed CPA is one of the following: ☐ install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); ☐ involve a capacity addition; ☐ involve a retrofit of (an) existing plant(s); ☐ involve a replacement of (an) existing plant(s). In the case of capacity additions, retrofits or replacements (for hydro projects), the proposed CPA consist of an: ▪ existing plant that started commercial operation prior to the start of a minimum historical reference period of five years; and ▪ no capacity expansion or retrofit of the plant will have been undertaken between the start of this minimum historical reference period and the implementation of the project activity. If the proposed CPA is a grid-connected hydropower plant: ▪ the CPA will be implemented in an existing single or multiple reservoir, with no change in the volume of any of the reservoir; or ▪ the CPA will be implemented in an existing single or multiple reservoir,

§	Eligibility criteria of the Standard	Eligibility criteria of the proposed PoA
		where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, will be greater than 4 W/m^2 after the implementation of the CPA; or ▪ the CPA will result in new single or multiple reservoirs and the power density of each reservoir, as per definitions given in the Project Emissions section, will be greater than 4 W/m^2 after the implementation of the CPA.
(d)	Conditions to check start date of the CPA through documentary evidence.	In accordance with the CDM Glossary, the starting date of the proposed CPA is the date on which CPA implementer commits to expenditures related to the implementation or the construction of the grid-connected renewable electricity generation project. The CME has verified that no significant financial commitment for project implementation or construction has been done yet at the time of validation.
(e)	Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs.	The proposed CPA-DD complies and applies the baseline and monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (Version 12.3.0).
(f)	Conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality as specified in Section B.1 part 1 above	The proposed CPA-DD meets the relevant requirements pertaining to the demonstration of additionality: ☐ *Guidelines for demonstrating additionality of microscale project activities* (when applicable) for CPAs up to five megawatts; or ☐ *Tool for the demonstration and assessment of additionality*; or/and ☐ *Combined tool to identify the baseline scenario and demonstrate additionality* in case of retrofit or replacement of existing grid-connected renewable power plant/unit(s)
(g)	PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis.	Local stakeholder consultation has been conducted prior to the inclusion of the proposed CPA-DD. And, The proposed CPA-DD complies with the Ghanaian Environmental Assessment Regulations 1999 or the Kenyan Environmental (Impact Assessment and Audit) Regulations or the Mauritian Environmental Protection Act (EPA 2002) in terms of environmental impact

§	Eligibility criteria of the Standard	Eligibility criteria of the proposed PoA
		analysis as specified in Section E.1. Part II.
(h)	Conditions to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance.	Confirmation that the proposed CPA does not involve any public funding from Annex I Parties or that in case public funding is used, it does not result in diversion of Official Development Assistance (ODA)
(i)	Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation).	Not applicable for the Proposed PoA
(j)	Where applicable, the conditions related to sampling requirements for a PoA in accordance with the approved guidelines/standard from the Board pertaining to sampling and surveys.	Not applicable for the Proposed PoA
(k)	Where applicable, the conditions that ensure that every CPA in aggregate meets the small-scale or microscale threshold criteria and remains within those thresholds throughout the crediting period of the CPA.	As per requirements pertaining to the demonstration of additionality as specified in Section B.1. Part I., some CPA may fall under the microscale threshold criteria as following: ☐ CPA total installed capacity is below or equal to 5MW AND ☐ The proposed CPA is undertaken in: • in one of the least developed countries, or • in one of the small island developing States (LDCs/SIDS), or • a special underdeveloped zone (SUZ). identified by the Government in official notifications for development assistance including for planning, management, and investment satisfying any one of the following conditions using most recent available data: o The proportion of population with income less than USD 2 per day (PPP)[8] in the region is greater than 50%; o The GNI per capita in the country is less than USD 3000[9] and the population of the region is among the poorest 20% in the poverty ranking of the host

[8] Purchasing power parity.
[9] PPP or the World Bank atlas method or another comparable method

§	Eligibility criteria of the Standard	Eligibility criteria of the proposed PoA
		country as per the applicable national policies and procedures[10]. CPA implementer has demonstrated that the CPA-DD remains within this threshold throughout the corresponding crediting period.
(l)	Where applicable, the requirements for the debundling check, in case CPAs belong to microscale project categories.	If the proposed CPA is microscale project activities, CPA implementer has demonstrated that the CPA is not a debundled component of a small scale activity as described in the "Guidelines for demonstrating additionality of microscale project activities".
(m)	Legal conditions pertaining to the ownership and transfer of Emission Reductions.	The proposed CPA is implemented by an entity who has signed a binding agreement with the CME which ensures that they are aware and agree that their activity is subscribed to a PoA and that their carbon rights have to be relinquished to the CME.
(n)	Formal procedure of review prior to submission for inclusion.	The proposed CPA-DD has been reviewed by the CME and submitted to a DOE for inclusion into the PoA.

B.3. Application of methodologies

As detailed in A.6., a typical CPA will consist to implement grid-connected renewable electricity generation project that is eligible under methodology ACM0002.

The approved baseline and monitoring methodology ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources (Version 12.3.0) is applied to each CPA included in the PoA.

No sampling plan is applicable since the CPAs to be included in the PoA are expected to be large industrial facilities uniquely designed and operated, thus individually monitored.

SECTION C. Management system

a) Definition of roles and responsibilities of personnel involved in the process of inclusion of CPAs, including a review of their competencies

Standard Bank Plc is the programme manager, the Coordinating and Managing Entity (CME). As stated in paragraph A.2., it is responsible for:

- recruiting CPA implementers,
- ensuring that the proposed CPA are in compliance with PoA eligibility criteria,
- writing the present PoA-DD and CPA-DD through service agreements with CDM consultants,
- collecting documents and supporting evidence required for PoA-DD and CPA-DD validation,
- communicating with the Host country DNAs and the CDM Executive Board,
- hiring DOE to conduct validation and verification,
- finding CERs buyers and distributing CERs revenues to CPA implementers,
- implementing a monitoring database,
- training of personnel,

[10] Information on per capita income or other economic indicators used for the ranking purposes shall be provided in USD.

- collecting monitoring data periodically,
- preparing the monitoring reports.

Note: The CPAs will be implemented by project developers, building on the Standard Bank Plc's relationship with individual project developers. Standard Bank Plc will enter into a contractual agreement with each CPA implementer, giving Standard Bank Plc the legal rights to deal with the carbon credits that will be generated from these projects and monitor the project implementation and all necessary parameters that are required for the calculation of emission reductions from each CPA. The conditions for participation shall be in line with the eligibility criteria of the projects for inclusion in the PoA and shall be elaborated in the agreements between Standard Bank Plc and the project developers.

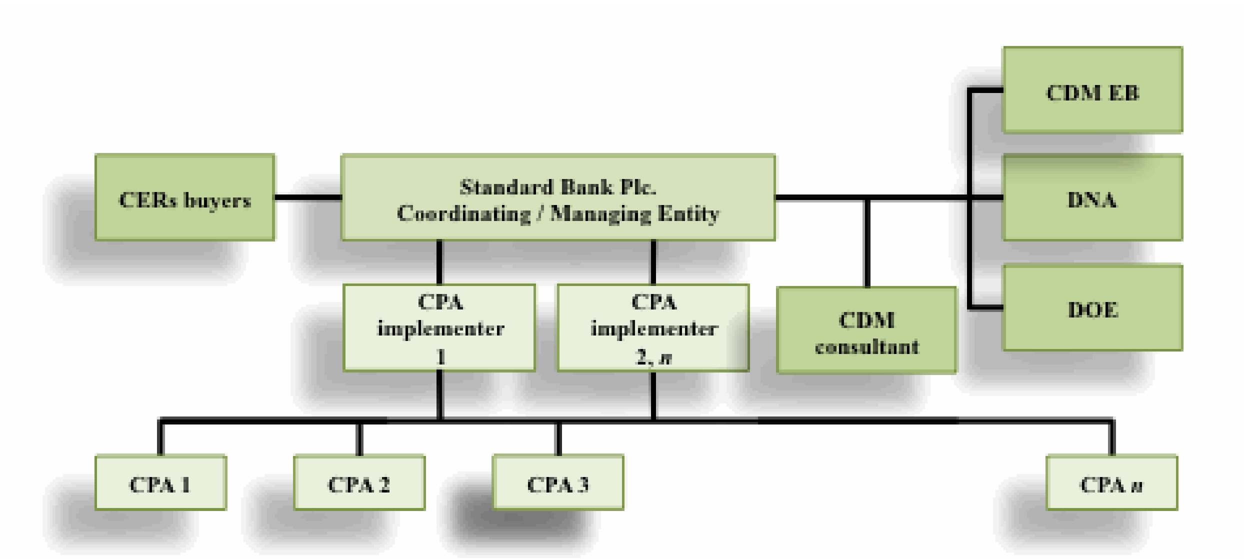

Figure 14: *Operational and management diagram.*

CPA implementer is responsible for:

- Construction, installation, operation and maintenance of grid-connected renewable electricity plant (s)/unit(s), or retrofit/capacity addition/replacement of an existing plant,
- Data monitoring and checking,
- Facilitate the CME and DOE required documents and access to sites as needed.

In addition, the CME shall set up the following operational elements to ensure management and oversight of the proposed PoA.

b) Records of arrangements for training and capacity development for personnel

In order to ensure that the competencies of the members of the compliance team remain current, training and capacity development records in which all instruction sessions and workshops related to CDM procedures and project management shall be established. The training and capacity development records shall be part of the CPA Inclusion Procedure.

c) Procedures for technical review of inclusion of CPAs

All new CPAs proposed for inclusion in the PoA and monitoring reports proposed for verification will be reviewed by the CME using a technically competent, independent reviewer to ensure that the new CPA or monitoring report fully complies with the registered design requirements and the CDM. This process can also be used by the intermediaries or CPA owners on new CPAs and monitoring reports before they are sent to the CME for approval. The review can be completed by either a fully competent individual reviewer or by a team of reviewers formed to include all necessary competencies.

The following Technical Review procedure is observed for CPA inclusion:

1. Verify that all eligibility criteria for inclusion in the PoA are met.
2. Check the procedure to avoid double counting.
3. Check if EIA has been undertaken (if required).
4. Check if stakeholder consultation has been undertaken (if required).
5. Check if all supporting documentation quoted in PoA-DD are in accordance with CPA details.
6. Complete all the sections of the CPA-DD.
7. Reviewer shall check emission reduction calculation.
8. The person responsible shall seek CME and PoA manager approval for the draft CPA-DD.
9. Delivery of approval and contact agreement for CPA inclusion.
10. A DOE is contracted.
11. CPA-DD is submitted to the DOE.
12. CARs & CLRs closed.
13. The inclusion of the CPA in the PoA is confirmed.

d) A system/procedure to avoid double accounting (e.g. to avoid the case of including a new CPA that has been already registered either as a CDM project activity or as a CPA of another PoA)

The database described above will be used to perform a double accounting check. Every new CPA will be compared to the already existing database and the list of project activities that are under validation or registered at the UNFCCC.

Moreover, as shown in Table below, the CPA implementers will be made aware of the double accounting principle and will guarantee to the CME that the proposed CPA is not registered under the Clean Development Mechanism of the UNFCCC or any voluntary scheme. Should such a case occur, the CME will not proceed with inclusion of the corresponding CPA in the proposed PoA.

Table 16: *Procedure to avoid double-counting*

Criteria	?	Source	Result
1. No similar CPA already submitted as CPA under another PoA or CDM project a. Research on UNFCCC's database b. Inquiry with the Host country DNA	True/False	a. Programme of Activities and CDM projects registries (UNFCCC) b. DNA projects/PoA portfolio	If "False", the proposed CPA is not eligible to the PoA
2. The CPA implementer's participation to the PoA is voluntary and the proposed CPA is not registered or under validation under the Clean Development Mechanism of the UNFCCC or any voluntary scheme as a single project activity or as a component activity under another program.	True/False	Confirmation by CME review (project assessment and/or interviews)	If "False", the proposed CPA is not eligible to the PoA
3. The proposed CPA is uniquely identified and defined in an unambiguous manner by amongst other aspects providing geographic information (GPS coordinates).	True/False	Confirmation by CME review (project assessment)	

The provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA

In order to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA, a contractual agreement shall be established between the CPA implementer and the CME, confirming the following provisions:
- The CPA implementer agrees and confirms his voluntary participation to the present PoA.
- The CPA implementer cedes its rights to claim and own emission reductions under the Clean Development Mechanism of the UNFCCC to Standard Bank Plc

e) Record keeping system for each CPA under the PoA

The CME will establish and maintain a database for each CPA. The CME will record CPA information detail delivered by CPA implementer, as follows:
- Name of the CPA,
- Name of CPA implementer,
- Contact details of CPA implementer,
- Renewable energy source: solar or wind or hydro,
- Installed capacity and other relevant technical specifications of each CPA,
- GPS coordinates of each CPA,
- Verification status (number of verification and associated monitoring period),
- Emission reductions monitored and issued each monitoring period.

The CME will be responsible for the management of records and data associated with each CPA. All data collected as part of monitoring should be archived electronically and be kept at least for 2 years after the end of the last crediting period. The database will be updated using the data supplied by the CPA implementer. It will form the basis for the verification of CPA and be available for inspection by the DOE at any point in time.

Four categories of documents with specific procedures for collection, approval processes, document identification, storage, are:
1. documents which directly support implementation of the system;
2. documents from external parties that are required to develop and manage the inclusion of CPAs;
3. documents from external parties to be collected during, and/or immediately post-, project implementation; and
4. Documents from external parties to be collected on an ongoing basis for the crediting period of the CPA.

Documents are controlled by making sure they are clearly identified, complete and up to date, properly approved, and that they are available where they need to be used.

Records are the evidence of what was done to operate the PoA in accordance with the requirements of the registered project design and the CDM requirements. A document master list will be constantly filled in order to centralize all records of documents regarding the PoA.

Conformity of proposed CPA-DD with Generic CPA-DD will be checked by the compliance team. All evidences related to baseline identification, additionality and stakeholder consultation (if applicable) will be collected from the CPA implementer in electronic format and checked during technical review of the proposed CPA.

These documents, evidences and all other records related to documentation control process shall be kept for the duration of the PoA under the supervision and responsibility of the compliance supervisor. Those documents will be made available for the DOE during the formal inclusion of the CPA into the PoA or afterwards if required.

f) Measures for continuous improvements of the PoA management

Tracking what happens in the PoA is critical to being able to effectively improve and provide consistent performance. This section describes a general commitment or guidance to continual improvement.

- **Internal audit**

The internal audit processes are used to measure and improve the performance of management and personnel. Internal audits are a structured review by observation and interview of a critical activity. The internal audit process is managed by planning the audit of critical activities:
- at a frequency based on risk (the higher the potential for error and the higher the impact on the integrity of the PoA, the more frequent the audit),
- using competent auditors independent of the area being audited,
- by providing timely and comprehensive audit reports, and
- by ensuring that any corrective action that result from the audit is effective and actually implemented.

- **Measures for continuous improvement**

Periodic meetings will be held under the supervision of the compliance supervisor in which will be discussed:
- A review of the previous period and the latest developments,
- Recurring issues related to the inclusion process,
- Comments provided by the members of the compliance team and CME,
- Feedback from the CPA implementers,
- Potential improvements to be implemented for the next period.

Furthermore in case a CPA is internally approved for inclusion and yet finds itself rejected by DOE, an extraordinary meeting shall be convened by the compliance supervisor in which the reasons of such outcome shall be analysed and provisions for improvements of the technical review process shall be proposed to the CME.

SECTION D. Duration of PoA

D.1. Start date of PoA

The PoA start date is set at 01/01/2013 (expected date of commissioning of the first CPA) or on the date of inclusion of the first CPA in the PoA, whichever is later.

D.2. Length of the PoA

The expected length of the PoA is 28 years.

SECTION E. Environmental impacts

E.1. Level at which environmental analysis is undertaken

1. Environmental Analysis is done at PoA level ☐
2. Environmental Analysis is done at CPA level √

Environmental Analysis will be performed at CPA level given the singularity of each CPA to be included in the PoA and its presumably unique environmental impacts related to specific project context.

E.2. Analysis of the environmental impacts

A summary of the analysis of the environmental impacts, including transboundary impacts and references to all related documentation will be provided at the CPA level.

E.3. Environmental impact assessment

If an environmental impact assessment is required, conclusions and references to all related documentation will be provided at the CPA level.

SECTION F. Local stakeholder comments

F.1. Solicitation of comments from local stakeholders

1. Local stakeholder consultation is done at PoA level ☐
2. Local stakeholder consultation is done at CPA level √

Stakeholder consultation will be performed at the CPA level to ensure that a wider group of stakeholders is reached since each CPA affects different geographical positions and different groups of stakeholders.

A description of the process by which comments from local stakeholders were invited and compiled will be provided at CPA level.

F.2. Summary of comments received

Identification of stakeholders and summary of comments will be provided at the CPA level.

F.3. Report on consideration of comments received

Information demonstrating that all comments received have been considered will be provided at the CPA level.

SECTION G. Approval and authorization

The letter of approval from the Party which wishes to be involved in the PoA is not available at the time of submitting the PoA-DD to the validating DOE.

PART II. Generic component project activity (CPA)

SECTION A. General description of a generic CPA

A.1. Purpose and general description of generic CPAs

The proposed CPA to be implemented under the PoA framework consists in a grid-connected electricity generation plant/unit from renewable energy according to the following matrix scenario:

	Type of implementation scenario		
Type of renewable energy	Greenfield	Retrofit or replacement of an existing plant	Capacity addition to an existing plant
Hydropower			
Wind power			
Solar power			*[tick as appropriate]*

[Case 1: **Greenfield renewable energy power plant**

The purpose of proposed CPA is to implement and operate a *[hydropower, wind, solar]* power plant. The CPA's installed capacity is *[rated capacity]* MW. The net annual electricity generation is estimated at *[forecasted production]* MWh. The power output is exported to the national grid of *[Ghana, Kenya, Mauritius]*.

Or

Case 2: **Retrofit or replacement of an existing renewable energy power plant**

The purpose of proposed CPA is the *[retrofitting and/or replacement]* of *[site name]* grid-connected *[hydropower, wind, solar]* power plant with new-technology generation capacity.
The CPA's installed capacity is *[rated capacity]* MW. The net annual electricity generation is estimated at *[forecasted production]* MWh. The power output is exported to the national grid of *[Ghana, Kenya, Mauritius]*.

Or

Case 3: **Capacity addition to an existing renewable energy power plant**

The purpose of proposed CPA is capacity addition to *[site name]* grid-connected *[hydropower, wind, solar]* power *[plant or unit].*

The CPA's installed capacity is *[rated capacity]* MW. The net annual electricity generation is estimated at *[forecasted production]* MWh. The power output is exported to the national grid of *[Ghana, Kenya, Mauritius]*

[*Name of entity*] acts as a CPA implementer for the proposed CPA.

SECTION B. Application of a baseline and monitoring methodology

B.1. Reference of the approved baseline and monitoring methodology(ies) selected

The approved baseline and monitoring methodology selected for to the proposed CPA is: ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources (Version 12.3.0).

This methodology also refers to the latest approved versions of the following tools:

- "Tool for the demonstration and assessment of additionality" (Version 06.1.0);
- "Combined tool to identify the baseline scenario and demonstrate additionality" (Version 04.0.0);
- "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (Version 02);
- "Tool to calculate the emission factor for an electricity system" (Version 02.2.1).

["Guidelines for demonstrating additionality of microscale project activities" (Version 04.0) are also applied.]

["Guidelines on the assessment of Investment Analysis (Version 05) are also applied.]

B.2. Application of methodology(ies)

The choice of the ACM0002 methodology is accurate since the proposed CPA respects all the applicability conditions required.

Table 17: Compliance *of the CPA project activity regarding ACM0002 applicability conditions*

§	Applicability conditions of the methodology	CPA specifications
1	This methodology is applicable to grid-connected renewable power generation project activities that: (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing	The CPA will consist of a grid-connected renewable electricity generation project falling under *[one of options (a) – (d). Justification]*.

§	Applicability conditions of the methodology	CPA specifications
	plant(s).	
2	The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: ▪ hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), ▪ wind power plant/unit, ▪ solar power plant/unit.	The CPA will consist of a renewable power plant/unit project falling under *[one of the three types listed. Justification]*.
3	In the case of capacity additions, retrofits or replacements (except for capacity addition projects for which the electricity generation of the existing power plant(s) or unit(s) is not affected): ▪ the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and ▪ no capacity addition or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity	*[In the case of capacity additions, retrofits or replacements,* the CPA will verify both following conditions: ▪ the existing plant that started commercial operation prior to the start of a minimum historical reference period of five years; and ▪ no capacity expansion or retrofit of the plant will have been undertaken between the start of this minimum historical reference period and the implementation of the project activity. *In the case of Greenfield projects,* Not applicable to the proposed CPA*].*
4	In case of hydro power plants, one of the following conditions must apply: ▪ The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or ▪ The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m^2 after the implementation of the project activity; or ▪ The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m^2 after the implementation of the project activity.	*[In the case of hydropower plant,* the CPA will *either*: ▪ be implemented in an existing single or multiple reservoir, with no change in the volume of any of the reservoir; or ▪ be implemented in an existing single or multiple reservoir, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, will be greater than 4 W/m^2 after the implementation of the CPA; or ▪ result in new single or multiple reservoirs and the power density of each reservoir, as per definitions given in the Project Emissions section, will be greater than 4 W/m^2 after the implementation of the CPA. *In the case of solar or wind power projects,* Not applicable to the proposed CPA*].*
5	The methodology is not applicable to the following: ▪ Project activities that involve switching	The CPA does not consist in (i) switching from fossil fuels to renewable energy sources at the site of the project activity, neither (ii) biomass

§	Applicability conditions of the methodology	CPA specifications
	from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; ▪ Biomass fired power plants; ▪ A hydro power plant that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the reservoir is less than 4 W/m^2.	fired power plants, nor (iii) a hydro power plant that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the reservoir is less than 4 W/m^2.
6	In the case of retrofits, replacements, or capacity additions, this methodology is only applicable if: ▪ the most plausible baseline scenario, as a result of the identification of baseline scenario, is the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance.	*[In the case of project activity consisting in a retrofit, replacement or capacity addition,* the CPA will verify the condition that: ▪ the most plausible baseline scenario, as a result of the identification of baseline scenario, is the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance. *In the case of Greenfield projects,* Not applicable to the proposed CPA*].*

B.3. Sources and GHGs

The main emission sources and type of GHGs in the project boundary are listed in the table below.

Table 18: *Emissions sources and greenhouse gases included in each CPA boundary*

Source		Gas	Included?	Justification/Explanation
Baseline	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO_2	Yes	Main emission source
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source
Project Activity	CO_2 emissions from combustion of fossil fuels for electricity generation in solar thermal power plants	CO_2	*[Yes/No]*	*Main emission source (Only for CSP)*
		CH_4	No	Minor emission source (Only for CSP)
		N_2O	No	Minor emission source
	For hydro power plants, emissions of CH_4 from the reservoir	CO_2	No	Minor emission source
		CH4	*[Yes/No]*	*Main emission source (Only for specific hydro)*
		N_2O	No	Minor emission source

According to ACM0002 methodology, the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system[11] that the CDM project power plant is connected to.

The project boundary is therefore determined as:

- The CPA site, where the electricity is being produced,

[11]Refer to the "*Tool to calculate the emission factor for an electricity system*" for definition of an electricity system.

- The *[Ghanaian, Kenyan, Mauritian]* grid with all the power plants connected to.

B.4. Description of baseline scenario

Assessment and demonstration of additionality will follow the "Tool for the demonstration and assessment of additionality" (Version 06.1.0) for Greenfield and Capacity Addition projects and the "Combined tool to identify the baseline scenario and demonstrate additionality" (Version 04.0.0) for CPAs involving a Retrofit or Replacement of existing grid-connected renewable power plant/unit(s) at the CPA project site.

However for projects with an installed capacity up to 5 MW, "Guidelines for demonstrating additionality of microscale project activities" (Version 04.0) can also be applied as detailed in eligibility criteria (f) and (k).

"Guidelines on additionality of first-of-its-kind project activities" version 02.0 may be applied to demonstrate additionality.

[*Case 1*: The proposed CPA consists in the installation of a new grid-connected renewable power plant/unit (Greenfield), therefore the baseline scenario shall be the following:

Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

Baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as described in section B.6.1. equation (9).

Step 1. Identification of alternatives to the project activity consistent with current laws and regulations

Define realistic and credible alternatives to the project activity(s) through the following Sub-steps:

Sub-step 1a: Define alternatives to the project activity:

For Greenfield project, realistic and credible alternatives available to the project participants or similar project developers that provide outputs or services comparable with the proposed CDM project activity are:

1) The proposed project activity undertaken without being registered as a CDM project activity;
2) The continuation of the current situation (no project activity or other alternatives undertaken).

Sub-step 1b: Consistency with mandatory laws and regulations:

	Regulatory analysis	*Consistency with laws & regulations?*
1	The proposed project activity undertaken without being registered as a CDM project activity; [*Please provide a brief justification*]	
2	The continuation of the current situation (no project activity or other alternatives undertaken). [*Please provide a brief justification*]	

The alternative scenarios 1) and 2) are consistent with mandatory laws and regulations.

"Proceed to Step 2 (Investment analysis) or Step 3 (Barrier analysis). (Project participants may also select to complete both Steps 2 and 3.)"

Step 2: Investment analysis

Determine whether the proposed project activity is not:

(a) The most economically or financially attractive; or
(b) Economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs).

To conduct the investment analysis, use the following Sub-steps:

Sub-step 2a: Determine appropriate analysis method

As proposed project activity generates financial and economic benefits other than CDM related income, the simple cost analysis cannot be applied. Benchmark analysis should preferably be used to demonstrate additionality (Option III). Otherwise, the investment comparison analysis (Option II) may be used if justified.

Sub-step 2b. Apply Benchmark analysis

The investment analysis should preferably be performed by using project IRR as the financial/economic indicator most suitable for the project type and decision-making context.

IRR for scenario 1 will be compared with the relevant pre or post tax financial benchmark[12], namely the usual rate of return available to an investor in the host country and for this specific project type. This rate represents the minimum rate of return that would justify the financial viability of the project and therefore the implementation of Scenario 1.

Power plant projects are financed using variable proportion of equity and fixed income funding, thus as the appropriate benchmark rate should enable the variable characteristics of the different source of funding, the Weighted Average Cost of Capital (WACC) is chosen. The WACC is the rate of return that a company should expect to pay on average to all its creditors (stock holders, bond holders, banks and other providers of capital). It is the minimum rate of return that a company should earn in order to represent a viable investment[13].

In general the WACC is calculated using the following formula:

$$WACC = \frac{\sum_i r_i MV_i}{MV_i}$$

With:

r_i the required rate of return for security or provider of capital *i*

MV_i the market value of all outstanding securities *i* or the remaining balance of loan *i*

[12] Calculated in nominal terms
[13] If all data needed to calculate the WACC are not available equity IRR may be used in conjunction with other benchmark such as the expected rate of return on equity.

In the usual case where the sources of capital narrow themselves to standard equity, fixed income securities and bank loans, WACC may be calculated by using the following formulas:

$WACC_{at} = \frac{MV_d}{MV_d + MV_e} \cdot r_d (1 - t) + \frac{MV_e}{MV_d + MV_e} \cdot r_e$ for after-tax comparison

$WACC_{bt} = \frac{MV_d}{MV_d + MV_e} \cdot r_d + \frac{MV_e}{MV_d + MV_e} \cdot r_e$ for pre-tax comparison

With:

r_d the required rate of return of all debt financing

r_e the required rate of return of all equity financing

t the applicable corporate tax rate in the host country

The required rate of return of equity financing may be estimated by using one of the following three methods:

1. The Capital Asset Pricing Model (CAPM):

$$r_e = r_f + \beta_e \cdot r_p$$

r_f the applicable risk-free rate in the host country. If no investment may be deemed as risk-free in the considered country, a risk-free rate shall be estimated by starting with a risk-free rate based on the 10-year U.S. government bond yield and then by adding projected difference over time between U.S. and local inflation to develop a nominal risk-free rate in local currency. As per the Guidelines on the Assessment of Investment Analysis (Version 05), a default value of 3.0% may be used.

r_p the applicable equity risk premium, namely the excess rate of return of equity investments over the risk-free rate[14]. As per the Guidelines on the Assessment of Investment Analysis (Version 05), a default value of 6.5% may be applied.

β_e the sensitivity of project returns to the variation of market returns.
β_e is affected by the systematic component of business risk and financial risk. Therefore it is project specific and depends on the proportion of equity to debt financing. For each project it may be determined using the following formula: $\beta_e = \beta_u \cdot \left[1 + (1 - t)\frac{MV_d}{MV_e}\right]$, with β_u being a measure of the business risk applicable to a specific industry.

2. The Build-up Approach:

$$r_e = r_f + r_p + r_c$$

r_c the host country risk premium, which is estimated as the yield on the host country market bonds (denominated in the currency of the host country market) minus the yield on long-term US government bonds.

[14] Calculation of the equity risk premium should be consistent with the determination of the risk-free rate. If the risk-free rate is chosen as a local rate then the equity risk premium should be calculated using local equity rate of return. If the risk-free rate is based on the 10-year U.S. government bond yield then the equity risk premium should be calculated as the excess return of major US equity index over the 10-year U.S. government bond yield.

3. The default approach:
   Expected return on equity is estimated using default values stated for various countries in the Appendix of the Guidelines on the Assessment of Investment Analysis (Version 05). As the PoA only covers renewable energy projects which fall under the sectoral scope 1. Energy Industries, each CPA using the default approach will use the value defined for Group 1. (Ghana: 13.25%, Kenya: 13.25%, Mauritius: 11.5%)

Table 19: *Parameters for benchmark calculation*

Parameters	Description	Source and explanation
r_f	Risk-free rate in a developed country	The risk-free rate should be determined using reputable sources of financial information such as Reuters, Morningstar of Bloomberg databases
r_d	Cost of debt	The cost of debt is determined as the usual commercial lending rate in the host country for power plant projects or the yield of a 10 year bond issued by the government of the host country with the addition of a relevant yield spread based on company rating.
r_p	Equity risk premium	The equity risk premium should be determined using reputable sources of financial information such as Reuters, Morningstar of Bloomberg databases or data from academic research[15]. If data is not available from those sources of info, experts' opinions may be used as a replacement.
β_u	Unlevered beta (electricity utility sector)	The unlevered beta should be determined using reputable sources of financial information such as Reuters, Morningstar of Bloomberg databases or data from academic research[16] If data is not available from those sources of info, experts' opinions may be used as a replacement.
r_c	Country risk premium	The country risk premium should be determined using reputable sources of financial information such as Reuters, Morningstar of Bloomberg databases or data from academic research[17]. If data is not available from those sources of info, experts' opinions may be used as a replacement.
MV_d	Percentage of financing from debt	As per the Guidelines on the Assessment of Investment Analysis (Version 05), paragraph 17 and 18
MV_e	Percentage of financing from equity	
t	Applicable corporate tax rate	Official documentation

For the assessment of the additionality of each CPA, all parameters should be determined by using the latest info available.

Sub-step 2c. Calculation and comparison of financial indicators

Project IRR shall be calculated as the discount rate that makes the present value of the future after-tax cash flows equal the investment outlay.

$$\sum_i \frac{CF_i}{(1+IRR)^i} = Investment\ Outlay$$

[15] E.g.: http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/implpr.html
[16] E.g.: http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/Betas.html
[17] E.g.: http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html

With:

*CF*i — the annual pre or after-tax[18] operating[19] cash flow expected from the proposed project activity in the year *i*

Investment Outlay — *this includes all costs required to set the power plant operational): land cost, project development costs (e.g. consultancy fees, license fees, engineering costs), equipment cost, construction costs, etc.*

Table 20: *Parameters for IRR calculation*

Parameter	Unit	Sources
Investment decision date		Board decision notes, loan agreement, feasibility study
First spending year		
First operation year		
Project lifetime	year	
Annual power generation	MWh	As per guidelines for the reporting and validation of plant load factors
Other revenues	Local Currency/year	Feasibility study (if applicable)
Electricity tariff	Local Currency/kWh	Legislation at the date of investment, Power Purchase Agreement
Expected increase in electricity tariff	%/year	
Inflation	%/year	Forecasts from official governmental statistics, international reputable sources (IMF, WB) or academic research
Exchange rate	Local Currency/USD	If applicable
Investment outlay	Local Currency	Board decision notes, loan agreement, feasibility study
Other Capex	Local Currency	Board decision notes, loan agreement, feasibility study (if applicable)
Operation & Maintenance Cost	Local Currency/year	Feasibility study
Other operating expenditure	Local Currency/year	
Salvage value of assets	Local Currency	
Insurance	% of Capex	If applicable

All relevant data used for the calculation of the IRR shall be expressed in Local Currency. Thus all financial information denominated in Foreign Currency shall be converted in Local Currency using the 12-month trailing average exchange rate at the date of investment decision for investment outlay and other capital expenditures. For future revenues and costs the exchange rate is forecasted for each year by using the long-term average real exchange rate and the inflation forecasts in Local Currency and Foreign Currency.

The parameters listed in the table shall be obtained from the most recent sources, if there is any substantial gap between the date of investment decision and the date at which the corresponding sources was produced, the value of the relevant parameter shall corrected appropriately by using the host country price index.

[18] The definition of CF_i shall be consistent with the definition of WACC

[19] The cash inflow for the last year of project life shall include the expected profit realisable from the sale of project assets as per the Guidelines on the Assessment of Investment Analysis (Version 05), paragraph 4

Sub-step 2d. Sensitivity analysis

After the determination of the base case IRR, a sensitivity analysis shall be done by modifying monetary parameters that constitute more than 20% of either total project costs or total project revenues (such as investment outlay or O&M cost amongst others) by +/- 10%. The full array of the derived IRR will be reported in the CPA-DD. If the IRR of one the scenarios considered for the sensitivity analysis exceeds the benchmark, CPA implementer shall demonstrate that that the probability of such a scenario is negligible. If no sufficient evidence is provided the CPA shall be deemed as not additional.

Outcome of Step 2: *If after the sensitivity analysis it is concluded that: (1) the proposed CDM project activity is unlikely to be the most financially/economically attractive or is unlikely to be financially/economically attractive, then proceed to Step 4 (Common practice analysis).*

Step 3.Barrier analysis

The "Guidelines for objective demonstration and assessment of barriers", Version 1 shall be taken into account when applying this step.

Determine whether the proposed project activity faces barriers that:

a) Prevent the implementation of this type of proposed project activity; and
b) Do not prevent the implementation of at least one of the alternatives, if the project is not "first of its kind" according to the definition provided in paragraph 40(c)(i) of the tool.

For barriers other than barriers due to project being "first of its kind" as defined in paragraph 40(c)(i), the identified barriers are only sufficient grounds for demonstration of additionality if they would prevent potential project proponents from carrying out the proposed project activity undertaken without being registered as a CDM project activity.

Use the following Sub-steps:

Sub-step 3a: Identify barriers that would prevent the implementation of the proposed CDM project activity:

Establish that there are realistic and credible barriers that would prevent the implementation of the proposed project activity from being carried out if the project activity was not registered as a CDM activity. Such realistic and credible barriers may include, among others:

1) Investment barriers, other than the economic/financial barriers in Step 2 above, inter alia:

    (a) For alternatives undertaken and operated by private entities: Similar activities have only been implemented with grants or other non-commercial finance terms. Similar activities are defined as activities that rely on a broadly similar technology or practices, are of a similar scale, take place in a comparable environment with respect to regulatory framework and are undertaken in the relevant country/region;
    (b) No private capital is available from domestic or international capital markets due to real or perceived risks associated with investment in the country where the proposed CDM project activity is to be implemented, as demonstrated by the credit rating of the country or other country investments reports of reputed origin.

2) Technological barriers, inter alia:

    (a) Skilled and/or properly trained labour to operate and maintain the technology is not available in the relevant country/region, which leads to an unacceptably high risk of equipment disrepair and malfunctioning or other underperformance;

(b) Lack of infrastructure for implementation and logistics for maintenance of the technology (e.g. natural gas cannot be used because of the lack of a gas transmission and distribution network);
(c) Risk of technological failure: the process/technology failure risk in the local circumstances is significantly greater than for other technologies that provide services or outputs comparable to those of the proposed CDM project activity, as demonstrated by relevant scientific literature or technology manufacturer information;
(d) The particular technology used in the proposed project activity is not available in the relevant region.

3) Barriers due to prevailing practice, inter alia:
The project activity is the "first of its kind".
(a) For the measures identified under paragraph 6, a proposed project activity is the First-of-its-kind in the applicable geographical area if :
    i. The project is the first in the applicable geographical area that applies a technology that is different from any other technologies able to deliver the same output and that have started commercial operation in the applicable geographical area before the start date of the project; and
    ii. Project participants selected a crediting period for the project activity that is a maximum of 10 years with no option of renewal;
(b) For the measures identified under paragraph 6, a proposed project activity that was identified as the First-of-its-kind project activity is additional and Sub-step 3 b does not apply.
(c) For other measures, the project proponents shall propose approach for demonstrating that a project is a "first-of-its-kind" and Sub-step 3 b applies.

Sub-step 3b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity):

If the identified barriers also affect other alternatives, explain how they are affected less strongly than they affect the proposed CDM project activity. In other words, demonstrate that the identified barriers do not prevent the implementation of at least one of the alternatives. Any alternative that would be prevented by the barriers identified in Sub-step 3a is not a viable alternative, and shall be eliminated from consideration.

In applying Sub-steps 3a and 3b, provide transparent and documented evidence, and offer conservative interpretations of this documented evidence, as to how it demonstrates the existence and significance of the identified barriers and whether alternatives are prevented by these barriers.

Anecdotal evidence can be included, but alone is not sufficient proof of barriers. The type of evidence to be provided should include at least one of the following:
(a) Relevant legislation, regulatory information or industry norms;
(b) Relevant (sectoral) studies or surveys (e.g. market surveys, technology studies, etc) undertaken by universities, research institutions, industry associations, companies, bilateral/multilateral institutions, etc;
(c) Relevant statistical data from national or international statistics;
(d) Documentation of relevant market data (e.g. market prices, tariffs, rules);
(e) Written documentation of independent expert judgments from industry, educational institutions (e.g. universities, technical schools, training centres), industry associations and others.

If both Sub-steps 3a and 3b are satisfied, proceed to Step 4 (Common practice analysis).
If one of the Sub-steps 3a and 3b is not satisfied, the project activity is not additional"

Step 4. Common practice analysis

Sub-step 4a: Analyze other activities similar to the proposed project activity

Provide an analysis of any other activities that are operational and that are similar to the proposed project activity. Projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc.

Other CDM project activities (registered project activities and project activities which have been published on the UNFCCC website for global stakeholder consultation as part of the validation process) are not to be included in this analysis. Provide documented evidence and, where relevant, quantitative information. On the basis of that analysis, describe whether and to which extent similar activities have already diffused in the relevant region.

For the purpose of this analysis, "similar activities" will be defined as similar technologies: solar, wind and hydro.

Sub-step 4b: Discuss any similar Options that are occurring

According to the Tool for the demonstration and assessment of additionality, essential distinctions may include a serious change in circumstances under which the proposed CDM project activity will be implemented when compared to circumstances under which similar projects were carried out.

The following step shall be applied:

Step 1: Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity.

Step 2: In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project[20]. Note their number N_{all}. Registered CDM project activities and projects activities undergoing validation shall not be included in this step;

Step 3: Within plants identified in Step 2, identify those that apply technologies different that the technology applied in the proposed project activity. Note their number N_{diff}.

Step 4: Calculate factor $F=1-N_{diff}/N_{all}$ representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity.

The proposed project activity is a common practice within a sector in the applicable geographical area if both the following conditions are fulfilled:

a) the factor F is greater than 0.2, and
b) $N_{al}l-N_{diff}$ is greater than 3.

Outcome of Step 4: The proposed project activity is not regarded as "common practice", then the proposed project activity is additional.

or

[20] While identifying similar projects, project participants may also use publically available information, for example from government departments, industry associations, international associations, on the market penetration of different technologies, etc.

Case 2: The CPA consists in the retrofit or replacement of existing grid-connected renewable power plant/unit(s) at the CPA project site. Therefore the following step-wise procedure to identify the baseline scenario shall be applied:

Step 1: Identify realistic and credible alternative baseline scenarios for power generation

Apply Step 1 of the "Combined tool to identify the baseline scenario and demonstrate additionality". The options considered should include:

P1: The project activity not implemented as a CDM project;

P2: The continuation of the current situation, i.e. to use all power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance. The additional power generated under the project would be generated in existing and new grid-connected power plants in the electricity system; and

P3: All other plausible and credible alternatives to the project activity that provide an increase in the power generated at the site, which are technically feasible to implement. This includes, inter alia, different levels of replacement and/or retrofit at the power plant/unit(s). Only alternatives available to project participants should be taken into account.

Step 2: Barrier analysis

Step 2 of the "Combined tool to identify the baseline scenario and demonstrate additionality" is applied. Guidelines for objective demonstration and assessment of barriers", Version 1 shall be taken into account when applying this step.

Step 2a: Identify barriers that would prevent the implementation of alternative scenarios

Establish a complete list of realistic and credible barriers that may prevent alternative scenarios to occur. Examples of barriers are provided in the combined Tool.

Outcome of Step 2a: List of barriers that may prevent one or more alternative scenarios to occur.

Step 2b: Eliminate alternative scenarios which are prevented by the identified barriers

Identify which alternative scenarios are prevented by at least one of the barriers listed in Step 2a, and eliminate those alternative scenarios from further consideration.

Outcome of Step 2b: List of alternative scenarios to the project activity that are not prevented by any barrier

In applying Steps 2a and 2b, provide transparent and documented evidence, and offer conservative interpretations of this evidence (example are provided in the combined tool), as to how it demonstrates the existence and significance of the identified barriers and whether alternative scenarios are prevented by these barriers. Outcome of step 2: indicate if the barriers analysis is sufficient to identify the baseline scenario or if an investment analysis (and/or a common practice analysis) is required by the combined tool.

Step 3: Investment analysis (if applicable)

- If the remaining alternatives include scenarios P1 and P3, an investment comparison analysis is applied as per Step 3 of the "Combined tool to identify the baseline scenario and demonstrate additionality".

- If the remaining alternatives include scenarios P1 and P2, therefore a benchmark analysis is applied as per Step 2b of the "Tool for the demonstration and assessment of additionality".

Outcome of Step 3: Ranking of the short list of alternative scenarios according to the most suitable financial indicator, taking into account the results of the sensitivity analysis.

If the sensitivity analysis is not conclusive, then the alternative scenario to the project activity with least emissions among the alternative scenarios is considered as baseline scenario. If the sensitivity analysis confirms the result of the investment comparison analysis, then the most economically or financially attractive alternative scenario is considered as baseline scenario.

If the alternative considered as baseline scenario is the proposed project activity undertaken without being registered as a CDM project activity, then the project activity is not additional. Otherwise, proceed to Step 4.

Step 4: Common practice analysis

Step 4 of the "Combined tool to identify the baseline scenario and demonstrate additionality" is applied. Guidelines on common practice, (Version 02.0) shall be taken into account when applying this step.

Outcome of Step 4: The proposed project activity is not regarded as "common practice", then the proposed project activity is additional.

or

Case 3: The CPA consists in capacity addition to an existing renewable energy power plant/unit. Therefore, the baseline scenario is the following:

In the absence of the CDM project activity, the existing facility would continue to supply electricity to the grid at historical levels, until the time at which the generation facility would likely be replaced or retrofitted ($DATE_{BaselineRetrofit}$). From that point of time onwards, the baseline scenario is assumed to correspond to the CPA project activity, and no emission reductions are assumed to occur.

The step-wise procedure described for Case 1 (Greenfield projects) is applied. However only the supplemental revenues and costs incurred by the capacity addition project activity shall be taken into account in the investment analysis]

B.5. Demonstration of eligibility for a generic CPA

To be included in the PoA, the CPA proposed should verify all applicability assessments below.

Eligibility criteria §	Description	Tick when met	Mean of proof/ Evidence / Document
(a)	The proposed CPA is developed within the borders of *[Ghana, Kenya or Mauritius]* and is connected to the national grid.	☐	- GPS coordinates, or - Detailed project report, or - Electricity generation licence, or - Environmental Impact Assessment, or - Preliminary grid feed-in approval.
(b)	The CPA implementer complies with the procedure established by the CME as specified in PoA-DD Section C Part I to avoid double accounting.	☐	- Review of UNFCCC and DNA registries/portfolios to detect similar activities, and - CME review (project assessment and/or interviews) confirming that: ○ the proposed CPA is not registered or under validation under the Clean Development Mechanism of the UNFCCC or any voluntary scheme as a single project activity or as a component activity under another program, and ○ the proposed CPA is uniquely identified and defined in an unambiguous manner by amongst other aspects providing geographic information (GPS coordinates).
(c)	The proposed CPA is one of the following: install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); involve a capacity addition; involve a retrofit of (an) existing plant(s); involve a replacement of (an) existing plant(s).	☐ or ☐ or ☐ or ☐	- GPS coordinates, or - Detailed project report, or - Land Documents, or - Environmental Impact Assessment

<table>
<tr><th colspan="2">Eligibility criteria</th><th rowspan="2">Tick when met</th><th rowspan="2">Mean of proof/ Evidence / Document</th></tr>
<tr><th>§</th><th>Description</th></tr>
<tr><td></td><td>In the case of capacity additions, retrofits or replacements (for hydro projects), the proposed CPA consist of an:
▪ existing plant that started commercial operation prior to the start of a minimum historical reference period of five years; and
▪ no capacity expansion or retrofit of the plant will have been undertaken between the start of this minimum historical reference period and the implementation of the project activity.

If the proposed CPA is a grid-connected hydropower plant:
▪ the CPA will be implemented in an existing single or multiple reservoir, with no change in the volume of any of the reservoir; or
▪ the CPA will be implemented in an existing single or multiple reservoir, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, will be greater than 4 W/m^2 after the implementation of the CPA; or
▪ the CPA will result in new single or multiple reservoirs and the power density of each reservoir, as per definitions given in the Project Emissions section, will be greater than4 W/m^2 after the implementation of the CPA.</td><td>☐
and
☐

☐
and
☐
and
☐</td><td></td></tr>
<tr><td>(d)</td><td>In accordance with the CDM Glossary, the starting date of</td><td></td><td>- Purchase orders related to the implementation or the construction of</td></tr>
</table>

<table>
<tr><th colspan="2">Eligibility criteria</th><th rowspan="2">Tick when met</th><th rowspan="2">Mean of proof/ Evidence / Document</th></tr>
<tr><th>§</th><th>Description</th></tr>
<tr><td></td><td>the proposed CPA is the date on which CPA implementer commit to expenditures related to the implementation or the construction of the grid-connected renewable electricity generation project.

The CME has verified that no significant financial commitment for project implementation or construction has been done yet at the time of validation.</td><td>☐

☐</td><td>the grid-connected renewable electricity generation project.

- Check by CME at the time of inclusion of the proposed CPA-DD into the PoA</td></tr>
<tr><td>(e)</td><td>The proposed CPA-DD complies and applies the baseline and monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (Version 12.3.0)</td><td>☐</td><td>- CPA-DD demonstrates that the proposed CPA meets the criteria of ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (Version 12.3.0) as specified in Section B.2 part II.</td></tr>
<tr><td>(f)</td><td>The proposed CPA-DD meets the relevant requirements pertaining to the demonstration of additionality:
- Guidelines for demonstrating additionality of microscale project activities (when applicable) for CPAs up to five megawatts; or
- Tool for the demonstration and assessment of additionality; or/and
- Combined tool to identify the baseline scenario and demonstrate additionality in case of retrofit or replacement of existing grid-connected renewable power plant/unit(s)</td><td>☐
or
☐
or/and
☐</td><td>The CPA is smaller than five megawatts and takes place in [the Northern, Upper East and/or Upper Regions of Ghana, and/or the districts that lie to the north of Brong-Ahafo and/or north of Volta Region; the district covered by the Ministry of State for the Development of Northern Kenya and other Arid Lands; Mauritius (SIDS)], therefore microscale additionality demonstration is used as per paragraph 2 of “Guidelines for demonstrating additionality of microscale project activities” (Annex 26, Version 04, EB68): the CPA is automatically considered to be additional.
Or
Project-specific additionality assessment and demonstration in accordance with section B part 1:
(a) Identification of alternatives to the project activity;
(b) Investment analysis to determine that the proposed project activity is either: 1) not the most economically or financially attractive, or 2) not economically or financially feasible;
(c) Barriers analysis; and
(d) Common practice analysis.</td></tr>
</table>

Eligibility criteria		Tick when met	Mean of proof/ Evidence / Document
§	Description		
(g)	Local stakeholder consultation has been conducted prior to the inclusion of the proposed CPA-DD. And The proposed CPA-DD complies with the [*Ghanaian Environmental Assessment Regulations 1999 or the Kenyan Environmental (Impact Assessment and Audit) Regulations or the Mauritian Environmental Protection Act (EPA 2002)*] in terms of environmental impact analysis as specified in Section E.1. Part II.	☐ And ☐	- Minutes of the meeting, summary of concerns raised and clarification provided thereof, attendance sheet, photographs and or video, etc. - Confirmation from local Authorities or - Environmental Impact Assessment, or - Letter of exemption of EIA if applicable or - Environmental permit if applicable
(h)	Confirmation that the proposed CPA does not involve any public funding from Annex I Parties or that in case public funding is used, it does not result in diversion of Official Development Assistance (ODA)	☐	- Statement in CPA-DD section A.11 "Public funding of the CPA"
(k)	As per requirements pertaining to the demonstration of additionality as specified in Section B.1. Part I., some CPA may fall under the microscale threshold criteria as following: CPA total installed capacity is below or equal to 5MW AND The geographic location of the project activity is • In one of the least developed countries (LDCs) or • In one of the small island developing States	☐ and ☐	- The proposed CPA-DD demonstrates the CPA total installed capacity is below or equal to 5 MW. AND - CPA-DD demonstrates the proposed CPA is undertaken: ○ *[in one of the least developed countries, or* ○ *in one of the small island developing States (LDCs/SIDS), or* ○ *in a special underdeveloped zone (SUZ). identified by the Government in official notifications for development assistance including for planning, management, and investment satisfying any one of the following conditions using most recent available data:*

<table>
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<tr><th>§</th><th>Description</th></tr>
<tr><td></td><td>(SIDS) or:
• In a special underdeveloped zone (SUZ). identified by the Government in official notifications for development assistance including for planning, management, and investment satisfying any one of the following conditions using most recent available data:
o The proportion of population with income less than USD 2 per day (PPP) in the region is greater than 50%;
o The GNI per capita in the country is less than USD 3000 and the population of the region is among the poorest 20% in the poverty ranking of the host country as per the applicable national policies and procedures.
CPA implementer has demonstrated that the CPA-DD remains within this threshold throughout the corresponding crediting period.</td><td>☐</td><td>▪ The proportion of population with income less than USD 2 per day (PPP)[21] in the region is greater than 50%;
▪ The GNI per capita in the country is less than USD 3000[22] and the population of the region is among the poorest 20% in the poverty ranking of the host country as per the applicable national policies and procedures[23].]
CPA implementer has demonstrated that the CPA-DD remains within this threshold throughout the corresponding crediting period.</td></tr>
<tr><td>(l)</td><td>If the proposed CPA is microscale project activities, CPA implementer has demonstrated that the CPA is not a debundled component of a large activity as described in the “Guidelines for demonstrating additionality of microscale project activities”.</td><td>☐</td><td>- CPA-DD demonstrates that the proposed CPA is not a debundled component of a large activity as described in the “Guidelines for demonstrating additionality of microscale project activities”.</td></tr>
</table>

[21] Purchasing power parity.
[22] PPP or the World Bank atlas method or another comparable method
[23] Information on per capita income or other economic indicators used for the ranking purposes shall be provided in USD.

Eligibility criteria		Tick when met	Mean of proof/ Evidence / Document
§	Description		
(m)	The proposed CPA is implemented by an entity who has signed a binding agreement with the CME which ensures that they are aware and agree that their activity is subscribed to a PoA and that their carbon rights have to be relinquished to the CME.	☐	- Proof of the contractual link (including a description of the PoA and carbon rights transfer provisions) between the CME and the CPA implementer.
(n)	The proposed CPA-DD has been reviewed by the CME and submitted to a DOE for inclusion into the PoA.	☐	- Letter from the CME to the DOE (cc/ CPA implementer) submitting the proposed CPA-DD for inclusion into the PoA.

Following the requirements stated in the *Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for Programme of Activities* (EB 65, Annex 3, Version 01.0) prior to the start of the inclusion process for a new CPA under the PoA, the proposed CPA-DD will be reviewed by an independent compliance team appointed by CME.

This compliance team, which shall be composed a personnel with adequate competencies shall check if the CPA-DD is drafted following the lines of the generic CPA as below. The compliance team shall also check that the proposed CPA-DD is neither registered or being registered under another PoA, nor registered or being registered as a standalone CDM Project Activity.

For each proposed CPA-DD the findings of the compliance team will be summarized in a short report and submitted to CME management for final approval. In case the conclusion of the compliance team are not positive, the CPA implementer will have to carry out the requested changes in its proposed CPA before submitting again the project document for inclusion.

A CPA Inclusion Procedure that encompasses all provisions and procedures related to pre-inclusion due diligence shall be used as the foundation of compliance team activities.

B.6. Estimation of emission reductions of a generic CPA
B.6.1. Explanation of methodological choices

According to the approved methodology ACM0002, emission reductions are calculated as follows:

$$\mathbf{ER_y = BE_y - PE_y}$$

Where:

ER_y = Emission reductions in year y (t CO_2e)

BE_y = Baseline emissions in year y (t CO_2)

PE_y = Project emissions in year y (t CO_2e)

Project emissions

For most renewable power generation project activities, PE_y = 0. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for, by using the following equation:

$$\mathbf{PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}} \quad \textbf{(1)}$$

Where:

PE_y = Project emissions in year y (tCO_2e)

$PE_{FF,y}$ = Project emissions from fossil fuel consumption in year y (tCO_2)

$PE_{GP,y}$ = Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year y (tCO_2e)

$PE_{HP,y}$ = Project emissions from reservoirs of hydro power plants in year y (tCO_2e)

The proposed CPA doesn't comprise geothermal power plants CPA, $PE_{GP,y}$ = 0, thus equation (1) is written as follows:

$$\mathbf{PE_y = PE_{FF,y} + PE_{HP,y}} \quad \textbf{(1')}$$

The procedure to calculate the project emissions from each of these sources is presented next.

<u>*Fossil Fuel Combustion ($PE_{FF,y}$)*</u>

For solar thermal projects, which also use fossil fuels for electricity generation, CO_2 emissions from the combustion of fossil fuels shall be accounted for as project emissions ($PE_{FF,y}$).

$PE_{FF,y}$ shall be calculated as per the latest version of the "*Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion*" (Version 02, EB41), where CO_2 emissions from fossil fuel combustion in process *j* are calculated based on the quantity of fuels combusted and the CO_2 emission coefficient of those fuels, as follows:

$$\mathbf{PE_{FF,y} = \sum_i FC_{i,j,y} * COEF_{i,y}} \quad \textbf{(2)}$$

Where:

$PE_{FF,y}$ = Are the CO_2 emissions from fossil fuel combustion in process *j* during the year *y* (tCO_2/yr);

$FC_{i,j,y}$ = Is the quantity of fuel type *i* combusted in process *j* during the year *y* (mass or volume unit/yr);

$COEF_{i,y}$ = Is the CO_2 emission coefficient of fuel type *i* in year *y* (tCO_2/mass or volume unit)
i = Are the fuel types combusted in process *j* during the year *y*

The CO_2 emission coefficient $COEF_{i,y}$ is calculated using Option B, given the unavailability of data on the chemical composition of fossil fuel required for Option A, as follows:

Option B: The CO_2 emission coefficient $COEF_{i,y}$ is calculated based on net calorific value and CO_2 emission factor of the fuel type *i*, as follows:

$$COEF_{i,y} = NCV_{i,y} * EF_{CO_2,i,y} \quad (5)$$

Where:

$COEF_{i,y}$ = Is the CO_2 emission coefficient of fuel type *i* in year *y* (tCO_2/mass or volume unit)
$NCV_{i,y}$ = Is the weighted average net calorific value of the fuel type *i* in year *y* (GJ/mass or volume unit)
$EF_{CO_2,i,y}$ = Is the weighted average CO_2 emission factor of fuel type *i* in year *y* (tCO_2/GJ)
i = Are the fuel types combusted in process *j* during the year *y*

[*Case 1:* No fossil fuel consumption is expected in the CPA (e.g. wind or hydro power generation without back-up generators).Therefore, $PE_{FF,y}$=0.

or

Case 2: On-site fossil fuel consumption is expected in the CPA (e.g. solar thermal project). Therefore, $PE_{FF,y}$ is calculated according to the equation previously described.]

Emissions from water reservoirs of hydro power plants ($PE_{HP,y}$)

For hydro power project activities that result in new single or multiple reservoirs and hydro power project activities that result in the increase of single or multiple existing reservoirs, project proponents shall account for CH_4 and CO_2 emissions from the reservoirs, estimated as follows:

(a) <u>If the power density of the single or multiple reservoirs (PD) is greater than 4 W/m^2 and less than or equal to 10 W/m^2:</u>

$$PE_{HP,y} = \frac{EF_{Res} * TEG_y}{1000} \quad (6)$$

Where:

$PE_{HP,y}$ = Project emissions from reservoirs of hydro power plants in year y (tCO_2e)

EF_{Res} = Default emission factor for emissions from reservoirs of hydro power plants ($kgCO_2e$/MWh)

TEG_y = Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y (MWh)

(b) <u>If the power density of the project activity (*PD*) is greater than 10 W/m^2:</u>

$$PE_{HP,y} = 0 \quad (7)$$

The power density of the project activity (PD) is calculated as follows:

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}} \quad (8)$$

Where:

PD = Power density of the project activity (W/m^2)

Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W)

Cap_{BL} = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero

A_{PJ} = Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m^2)

A_{BL} = Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m^2). For new reservoirs, this value is zero

[*Case 1:* The CPA does not consist in hydro power (e.g. wind or hydro power projects).Therefore, $PE_{HP,y}$=0.

or

Case 2: The CPA consists in hydro power project activity that result in new single or multiple reservoirs or the increase of single or multiple existing reservoirs.

Sub-case 2.1: As the power density of the single or multiple reservoirs (PD) is greater than 4 W/m^2 and less than or equal to 10 W/m^2, $PE_{HP,y}$ is calculated according to the equation (6) previously described.

Sub-case 2.2: As the power density of the single or multiple reservoirs (PD) is greater than 10 W/m^2, $PE_{HP,y}$ is calculated according to the equation (7) previously described.]

Baseline emissions

Baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$$\mathbf{BE_y = EG_{PJ,y} * EF_{grid,CM,y}} \quad \textbf{(9)}$$

Where:

BE_y = Baseline emissions in year y (tCO_2)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the "Tool to calculate the emission factor for an electricity system" (tCO_2/MWh)

Calculation of $EG_{PJ,y}$

The calculation of $EG_{PJ,y}$ is different for (a) Greenfield plants, (b) retrofits and replacements, and (c) capacity additions. These cases are described next:

(a) Greenfield renewable energy power plants

If the project activity is the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity, then:

$$\mathbf{EG_{PJ,y} = EG_{facility,y}} \quad \textbf{(10)}$$

Where:

$EG_{PJ,y}$	= Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)
$EG_{facility,y}$	= Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)

<u>(b) Retrofit or replacement of an existing renewable energy power plant</u>

If the project activity is the retrofit or replacement of an existing grid-connected renewable power plant, the baseline scenario is the continuation of the operation of the existing plant. For hydro power plants, if the replacement involves the installation of a hydro power plant in a new reservoir, then the applicability conditions on multiple reservoirs must be satisfied by the project activity.

The methodology uses historical electricity generation data to determine the electricity generation by the existing plant in the baseline scenario, assuming that the historical situation observed prior to the implementation of the project activity would continue.

The power generation of renewable energy projects can vary significantly from year to year, due to natural variations in the availability of the renewable source (e.g. varying rainfall, wind speed or solar radiation). The use of few historical years to establish the baseline electricity generation can therefore involve a significant uncertainty. The methodology addresses this uncertainty by adjusting the historical electricity generation by its standard deviation. This ensures that the baseline electricity generation is established in a conservative manner and that the calculated emission reductions are attributable to the project activity. Without this adjustment, the calculated emission reductions could mainly depend on the natural variability observed during the historical period rather than the effects of the project activity[24].

$EG_{PJ,y}$ is calculated as follows:

$$\mathbf{EG_{PJ,y}=EG_{facility,y} - (EG_{historical} + \sigma_{historical});\ until\ DATE_{BaselineRetrofit}} \qquad \textbf{(11)}$$

and

$$\mathbf{EG_{PJ,y} = 0;\ on/after\ DATE_{BaselineRetrofit}} \qquad \textbf{(12)}$$

Where:

$EG_{PJ,y}$	= Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)
$EG_{facility,y}$	= Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)
$EG_{historical}$	= Annual average historical net electricity generation delivered to the grid by the existing renewable energy plant that was operated at the CPA project site prior to the implementation of the project activity (MWh)
$\sigma_{historical}$	= Standard deviation of the annual average historical net electricity generation delivered to the grid by the existing renewable energy plant that was operated at the CPA project site prior to the implementation of the project activity (MWh)
$DATE_{BaselineRetrofit}$	= Point in time when the existing equipment would need to be replaced in the absence of the project activity (date)

[24]As an alternative approach for hydropower plants, the baseline electricity generation could be established as a function of the water availability. In this case, the baseline electricity generation would be established ex-post based on the water availability monitored during the crediting period. Project participants are encouraged to consider such approaches and submit the related request for a revision to this methodology.

$EG_{historical}$ is the annual average of historical net electricity generation, delivered to the grid by the existing renewable energy plant that was operated at the CPA project site prior to the implementation of the project activity. To determine $EG_{historical}$, project participants may choose between two historical periods. This allows some flexibility: the use of the longer time period may result in a lower standard deviation and the use of the shorter period may allow a better reflection of the (technical) circumstances observed during the more recent years.

Project participants may choose among the following two time spans of historical data to determine $EG_{historical}$:

(a) The five last calendar years prior to the implementation of the project activity; or

(b) The time period from the calendar year following $DATE_{hist}$, up to the last calendar year prior to the implementation of the project, as long as this time span includes at least five calendar years, where $DATE_{hist}$, is latest point in time between:

(i) The commercial commissioning of the plant/unit;

(ii) If applicable: the last capacity addition to the plant/unit; or

(iii) If applicable: the last retrofit of the plant/unit.

<u>(c) Capacity addition to an existing renewable energy power plant</u>

The addition of a new power plant or unit may in some cases affect the electricity generated by the existing plant(s) or unit(s). This applies, for example, in the following situation:[25]

- A new hydro turbine installed at an existing hydro dam may affect the power generation by the existing turbines;

In other situations, the power plant of the existing plant(s) or unit(s) may not be affected. This applies, for example, in the following situation:

- A new solar power plant installed next to an existing solar power plant may not affect the radiation received by the existing power plant and would therefore not affect the power generation of the existing solar power plant;

In the case where the addition of new capacity could affect the electricity generated by existing plant(s) or unit(s).

The project participants shall use the approach applied to retrofits and replacements above set out in section (b). $EG_{facility,y}$ corresponds to the total electricity generation of the existing plant(s) or unit(s)and the added plant(s) or unit(s). A separate metering of electricity fed into the grid by the added plant(s) or unit(s) is not necessary under this option.

In the case where the addition of new capacity does not affect the electricity generated by existing plant(s) or unit(s), the following approach can be used provided that the electricity fed into the grid by the added power plant(s) or unit(s) addition is separately metered:

$$\mathbf{EG_{PJ,y} = EG_{PJ\_Add,y}} \quad \mathbf{(13)}$$

Where:

$EG_{PJ,y}$	= Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CPA project activity in year y (MWh)
$EG_{PJ\_Add,y}$	= Quantity of net electricity generation supplied to the grid in year y by the project plant/unit that has been added under the project activity (MWh)

[25] In case of wind power plant capacity additions, some shadow effects can occur but need not be accounted under this methodology.

[*Case 1:* The CPA consists in a Greenfield renewable energy power unit(s)/plant(s).Therefore,$EG_{PJ,y}$ = $EG_{facility,y}$ as per equation (10) above.

or

Case 2: The CPA consists in the retrofit or replacement of an existing renewable energy power plant. Therefore $EG_{PJ,y}$ is calculated as per equations (11) and (12) above, and $DATE_{BaselineRetrofit}$ is determined as follows:

Calculation of $DATE_{BaselineRetrofit}$

In order to estimate the point in time when the existing equipment would need to be replaced/retrofitted in the absence of the project activity ($DATE_{BaselineRetrofit}$*), project participants may take the following approaches into account:*

(a) *The typical average technical lifetime of the type equipment may be determined and documented, taking into account common practices in the sector and country, e.g. based on industry surveys, statistics, technical literature, etc.;*

(b) *The common practices of the responsible company regarding replacement/retrofitting schedules may be evaluated and documented, e.g. based on historical replacement/retrofitting records for similar equipment.*

The point in time when the existing equipment would need to be replaced/retrofitted in the absence of the project activity should be chosen in a conservative manner, i.e. if a range is identified, the earliest date should be chosen.

or

Case 3: The CPA consists in capacity addition to an existing renewable energy power plant. Therefore, $EG_{PJ,y} = EG_{PJ_Add,y}$as per equation (13) above]

Calculation of $EF_{grid,CM,y}$

The grid emission factor ($EF_{grid,CM,y}$) is calculated ex-anteas per the "*Tool to calculate the emission factor for an electricity-system*" (Version 02.2.1). The emission factor is not monitored during the crediting period of each CPA but shall be updated at the renewal of the crediting period of the CPA.

This methodological tool determines the CO_2 emission factor for the displacement of electricity generated by power plants in an electricity system, by calculating the "combined margin" emission factor (CM) of the electricity system. The CM is the result of a weighted average of two emission factors pertaining to the electricity system: the "operating margin" (OM) and the "build margin" (BM). The operating margin is the emission factor that refers to the group of existing power plants whose current electricity generation would be affected by the CPA. The build margin is the emission factor that refers to the group of prospective power plants whose construction and future operation would be affected by the CPA.

This tool provides procedures to determine the following parameters:

Parameter	SI Unit	Description
$EF_{grid,CM,y}$	tCO_2/MWh	Combined margin CO_2 emission factor for the project electricity system in year *y*
$EF_{grid,BM,y}$	tCO_2/MWh	Build margin CO_2 emission factor for the project electricity system in year *y*
$EF_{grid,OM,y}$	tCO_2/MWh	Operating margin CO_2 emission factor for the project electricity system in year *y*

The tool indicates six steps for the calculation of the combined margin (CM) emission factor:

STEP 1. Identify the relevant electricity systems.

[Apply STEP 1 in accordance with the Tool.]

STEP 2. Choose whether to include off-grid power plants in the project electricity system (optional).

[Apply STEP 2 in accordance with the Tool.]

STEP 3. Select a method to determine the operating margin (OM).

[Apply STEP 3 in accordance with the Tool.]

STEP 4. Calculate the operating margin emission factor according to the selected method.

[Apply STEP 4 in accordance with the Tool.]

STEP 5. Calculate the build margin (BM) emission factor.

[Apply STEP 5 in accordance with the Tool.]

STEP 6. Calculate the combined margin (CM) emission factor.

The calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) is based on the following method:

(a) Weighted average CM;

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM}$$

Where:

$EF_{grid,BM,y}$	= Build margin CO_2 emission factor in year y (tCO_2/MWh)
$EF_{grid,OM,y}$	= Operating margin CO_2 emission factor in year y (tCO_2/MWh)
w_{OM}	= Weighting of operating margin emissions factor (%)
w_{BM}	= Weighting of build margin emissions factor (%)

According to the tool, default values for wind and solar power generation CPAs are: $w_{OM} = 0.75$ and $w_{BM} = 0.25$ (owning their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods.
According to the tool, default values for other CPAs are: $w_{OM} = 0.5$ and $w_{BM} = 0.5$.

Based on [*years*], the combined margin (CM) emission factor $EF_{grid,CM,y}$ is given as follows:

$EF_{grid,CM,y}$	[*value*] tCO_2/MWh	For wind and solar projects
$EF_{grid,CM,y}$	[*value*] tCO_2/MWh	For other projects

Leakage

No leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport).These emissions sources are neglected.

Emission reductions

Emission reductions are calculated as follows:

$$\mathbf{ER_y = BE_y - PE_y} \quad \textbf{(14)}$$

Where:

ER_y = Emission reductions in year y (t CO_2e)

BE_y = Baseline emissions in year y (t CO_2)

PE_y = Project emissions in year y (t CO_2e)

Estimation of emissions reductions prior to validation

Project participants should prepare as part of the CPA-DD an estimate of likely emission reductions for the proposed crediting period. This estimate should, in principle, employ the same methodology as selected above. Where the grid emission factor ($EF_{grid,CM,y}$) is determined ex post during monitoring, project participants may use models or other tools to estimate the emission reductions prior to validation.

Changes required for methodology implementation in 2nd and 3rd crediting periods

At the start of the second and third crediting period project proponents have to address two issues:

- Assess the continued validity of the baseline; and
- Update the baseline.

In assessing the continued validity of the baseline, a change in the relevant national and/or sectoral regulations between two crediting periods has to be examined at the start of the new crediting period. If at the start of the project activity, the project activity was not mandated by regulations, but at the start of the second or third crediting period regulations are in place that enforce the practice or norms or technologies that are used by the project activity, the new regulation (formulated after the registration of the project activity) has to be examined to determine if it applies to existing plants. If the new regulation applies to existing CDM project activities, the baseline has to be reviewed and, if the regulation is binding, the baseline for the project activity should take this into account. This assessment will be undertaken by the verifying DOE.

For updating the baseline at the start of the second and third crediting period, new data available will be used to revise the baseline scenario and emissions. Project participants shall assess and incorporate the impact of new regulations on baseline emissions.

B.6.2. Data and parameters that are to be reported ex-ante

All fixed parametric values, including the ex-ante grid emission factor, will be revised at each point of the renewal of the crediting period of the CPAs. CPAs that are included or that renew their crediting period shall always apply the fixed parameters of the latest version of the PoA-DD. Following parameters are fixed for all CPAs included during the first 7 years of the PoA crediting period and for the respective first 7 year crediting period of these CPAs.

Project emissions:

Emissions from water reservoirs of hydro power plants: if the power density of the single or multiple reservoirs (PD) is greater than $4W/m^2$ and less than or equal to $10W/m^2$.

Data / Parameter	EF_{Res}
Unit	$kgCO_2e/MWh$
Description	Default emission factor for emissions from reservoirs of hydro power plants
Source of data	Decision by EB23
Value(s) applied	90 $kgCO_2e/MWh$
Choice of data or Measurement methods and procedures	Thresholds and criteria for the eligibility of hydroelectric power plants with reservoirs as CDM project activities (EB 23, Annex 5, paragraph ii.): "Hydroelectric power plants with power densities greater than 4 W/m^2 but less than or equal to 10 W/m^2 can use the currently approved methodologies, with an emission factor of 90 gCO_2eq/kWh for project reservoir emissions".
Purpose of data	Calculation of project emissions
Additional comment	-

Emissions from water reservoirs of hydro power plants: if the power density of the single or multiple reservoirs (PD) is greater than 4W/m^2 and less than or equal to 10W/m^2.

Data / Parameter	CAP_{BL}
Unit	W
Description	Installed capacity of the hydro power plant before the implementation of the project activity. For new hydro power plants, this value is zero
Source of data	CPA implementer records at the CPA project site
Value(s) applied	*[To be provided at CPA level, using CPA implementer records]*
Choice of data or Measurement methods and procedures	Determine the installed capacity based on recognized standards
Purpose of data	Calculation of project emissions
Additional comment	-

Data / Parameter	A_{BL}
Unit	m^2
Description	Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full. For new reservoirs, this value is zero
Source of data	CPA implementer records at the CPA project site
Value(s) applied	*[To be provided at CPA level, using CPA implementer records]*
Choice of data or Measurement methods and procedures	Measured from topographical surveys, maps, or satellite pictures, etc.
Purpose of data	Calculation of project emissions
Additional comment	-

Baseline emissions:

Data / Parameter	$FC_{i,m,y}$
Unit	Mass or volume unit
Description	Amount of fossil fuel type *i* consumed by power plant / unit *m* in year *y*
Source of data	Government records / official sources
Value(s) applied	*[To be provided at CPA level]*
Choice of data or Measurement methods and procedures	• Simple OM: once for each crediting period using the most recent three historical years for which data is available at the time of submission of the PoA-DD to the DOE for validation (*ex ante* option); • BM: For the first crediting period, either once *ex ante* or annually *ex post*, following the guidance included in Step 5. For the second and third crediting period, only once *ex ante* at the start of the second crediting period
Purpose of data	Calculation of baseline emissions
Additional comment	Data vintage available at validation (or inclusion): *[To be provided at CPA level]*

Data / Parameter	$NCV_{i,y}$
Unit	GJ/mass or volume unit
Description	Net calorific value (energy content) of fossil fuel type *i* in year *y*
Source of data	Government records / official sources or IPCC default values *[To be provided at CPA level]*
Value(s) applied	*[To be provided at CPA level]*
Choice of data or Measurement methods and procedures	• Simple OM: once for each crediting period using the most recent three historical years for which data is available at the time of submission of the PoA-DD to the DOE for validation (*ex ante* option); • BM: For the first crediting period, either once *ex ante* or annually *ex post*, following the guidance included in Step 5. For the second and third crediting period, only once *ex ante* at the start of the second crediting period
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	$EF_{CO2,i,y}$
Unit	tCO_2/GJ
Description	CO_2 emission factor of fossil fuel type *i* in year *y*
Source of data	Government records / official sources or IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in Table 2.2 of Chapter 2 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories, as neither local nor national values are available.
Value(s) applied	*[To be provided at CPA level]*
Choice of data or Measurement methods and procedures	• Simple OM: once for each crediting period using the most recent three historical years for which data is available at the time of submission of the PoA-DD to the DOE for validation (*ex ante* option); • BM: For the first crediting period, either once *ex ante* or annually *ex post*, following the guidance included in Step 5. For the second and third crediting period, only once *ex ante* at the start of the second crediting period
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	$EG_{m,y}$
Unit	MWh
Description	Net electricity generated by power plant/unit *m* in year *y*
Source of data	Government records / official sources *[To be provided at CPA level]*
Value(s) applied	*[To be provided at CPA level]*
Choice of data or Measurement methods and procedures	• Simple OM: once for each crediting period using the most recent three historical years for which data is available at the time of submission of the PoA-DD to the DOE for validation (*ex ante* option); • BM: For the first crediting period, either once *ex ante* or annually *ex post*, following the guidance included in Step 5. For the second and third crediting period, only once *ex ante* at the start of the second crediting period
Purpose of data	Calculation of baseline emissions
Additional comment	Data vintage available at validation (or inclusion): – *[To be provided at CPA level]*

Data / Parameter	$EF_{grid,CM,y}$
Unit	tCO_2/MWh
Description	Combined margin CO_2 emission factor for the project electricity system in year *y*
Source of data	As per "*Tool to calculate the emission factor for an electricity system*" (Version 02.2.1)
Value(s) applied	*[To be determined at CPA level]*
Choice of data or Measurement methods and procedures	Calculated from the above parameters as per step-by-step calculations detailed in B.6.1.
Purpose of data	Calculation of baseline emissions
Additional comment	Ex-ante option is chosen: the emission factor is not monitored during the crediting period of each CPA but shall be updated at the renewal of the crediting period of the CPA.

Retrofit or replacement of an existing renewable energy power plant:

Data / Parameter	$EG_{historical}$
Unit	MWh
Description	Annual average historical net electricity generation delivered to the grid by the existing renewable energy plant that was operated at the CPA project site prior to the implementation of the project activity
Source of data	CPA implementer records at the CPA project site
Value(s) applied	*[To be provided at CPA level, using CPA implementer records]*
Choice of data or Measurement methods and procedures	Electricity meters Project participants may choose among the following two time spans of historical data to determine $EG_{historical}$: (a) The five last calendar years prior to the implementation of the project activity; or (b) The time period from the calendar year following $DATE_{hist}$, up to the last calendar year prior to the implementation of the project, as long as this time span includes at least five calendar years, where $DATE_{hist}$, is latest point in time between: (i) The commercial commissioning of the plant/unit; (ii) If applicable: the last capacity addition to the plant/unit; or (iii) If applicable: the last retrofit of the plant/unit.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	$\sigma_{historical}$
Unit	MWh
Description	Standard deviation of the annual average historical net electricity generation delivered to the grid by the existing renewable energy plant that was operated at the CPA project site prior to the implementation of the project activity
Source of data	Calculated from data used to establish $EG_{historical}$
Value(s) applied	Calculated
Choice of data or Measurement methods and procedures	Parameter to be calculated as the standard deviation of the annual generation data used to calculate $EG_{historical}$ for retrofit or replacement CPA project activities.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	$DATE_{BaselineRetrofit}$
Unit	date
Description	Point in time when the existing equipment would need to be replaced in the absence of the project activity
Source of data	CPA implementer records at the CPA project site
Value(s) applied	*[To be provided at CPA level, using CPA implementer records]*
Choice of data or Measurement methods and procedures	In order to estimate the point in time when the existing equipment would need to be replaced/retrofitted in the absence of the project activity ($DATE_{BaselineRetrofit}$), project participants may take the following approaches into account: (a) The typical average technical lifetime of the type equipment may be determined and documented, taking into account common practices in the sector and country, e.g. based on industry surveys, statistics, technical literature, etc.; (b) The common practices of the responsible company regarding replacement/retrofitting schedules may be evaluated and documented, e.g. based on historical replacement/retrofitting records for similar equipment.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	$DATE_{hist}$
Unit	date
Description	Point in time from which the time span of historical data for retrofit or replacement project activities may start
Source of data	CPA implementer records at the CPA project site
Value(s) applied	*[To be provided at CPA level, using CPA implementer records]*
Choice of data or Measurement methods and procedures	$DATE_{hist}$, is latest point in time between: (i) The commercial commissioning of the plant/unit; (ii) If applicable: the last capacity addition to the plant/unit; or (iii) If applicable: the last retrofit of the plant/unit.
Purpose of data	Calculation of baseline emissions
Additional comment	-

B.6.3. Ex-ante calculations of emission reductions

Ex-ante calculations of emission reductions for a typical CPA can be summarized as follows:

[*Case 1:* If the CPA consists in a Greenfield renewable energy power unit(s)/plant(s).]	Value/Result	Source/reference
Total installed capacity	*[ ]*MW	A.1. - General Description
Load factor	*[ ]*hours per annum (i.e. *[ ]*% at nominal capacity)	
Net electricity delivered to the grid ($EG_{PJ,y}$)	*[ ]*MWh	A.1. [$EG_{PJ,y} = EG_{facility,y}$]
Baseline emission factor of grid ($EF_{grid,CM,y}$)	*[ ]*tCO_2/MWh	B.6.1. [$EF_{grid,CM,y} = w_{OM} \cdot EF_{OM,y} + w_{BM} \cdot EF_{BM,y}$]
Baseline emissions (BE_y)	*[ ]*tCO_2/y	$BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y}$
Project emissions (PE_y)	*[ ]*tCO_2/y	B.6.1.
Emission reduction (ER_y)	*[ ]*tCO_2e/year	$ER_y = BE_y - PE_y$

or

[*Case 2:* If the CPA consists in the retrofit or replacement of an existing renewable energy power plant]	Value/Result	Source/reference
Total retrofitted/replaced capacity	*[ ]*MW	A.1. - General Description
Load factor	*[ ]*hours per annum (i.e. *[ ]*% at nominal capacity)	
Net electricity generation supplied by the project plant/unit ($EG_{facility,y}$)	*[ ]*MWh	
Annual average historical net electricity generation ($EG_{historical}$)	*[ ]*MWh	
Standard deviation of the annual average historical net electricity generation ($\sigma_{histoical}$)	*[ ]*MWh	
Point in time when the existing equipment would need to be replaced ($DATE_{BaselineRetrofit}$)	*[dd/mm/yyyy]*	

Net electricity delivered to the grid ($EG_{PJ,y}$)	*[ ]*MWh	A.1. [$EG_{PJ,y}$ = = $EG_{facility,y}$ − ($EG_{historical}$ + σhistorical; until DATEBaselineRetrofit and $EG_{PJ,y}$ =0; on/after $DATE_{BaselineRetrofit}$]
Baseline emission factor of grid ($EF_{grid,CM,y}$)	*[ ]*tCO_2/MWh	B.6.1. [$EF_{grid,CM,y} = w_{OM} \cdot EF_{OM,y} + w_{BM} \cdot EF_{BM,y}$]
Baseline emissions (BE_y)	*[ ]*tCO_2/y	$BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y}$
Project emissions (PE_y)	*[ ]*tCO_2/y	B.6.1.
Emission reduction (ER_y)	*[ ]*tCO_2e/year	$ER_y = BE_y – PE_y$

or

[*Case 3:* If the CPA consists in capacity addition to an existing renewable energy power plant]	**Value/Result**	**Source/reference**
Total added capacity	*[ ]*MW	A.1. - General Description
Load factor	*[ ]*hours per annum (i.e. *[ ]*% at nominal capacity)	
Net electricity delivered to the grid ($EG_{PJ,y}$)	*[ ]*MWh	A.1. [$EG_{PJ,y} = EG_{PJ\_Add,y}$]
Baseline emission factor of grid ($EF_{grid,CM,y}$)	*[ ]*tCO_2/MWh	B.6.1. [$EF_{grid,CM,y}$ = $w_{OM} \cdot EF_{OM,y} + w_{BM} \cdot EF_{BM,y}$]
Baseline emissions (BE_y)	*[ ]*tCO_2/y	$BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y}$
Project emissions (PE_y)	*[ ]*tCO_2/y	B.6.1.
Emission reduction (ER_y)	*[ ]*tCO_2e/year	$ER_y = BE_y – PE_y$

Ex-ante calculations of emission reductions will be established at CPA level due to the nature of projects under this proposed PoA.

B.7. Application of the monitoring methodology and description of the monitoring plan
B.7.1. Data and parameters to be monitored by each generic CPA

Project emissions:

Emissions from fossil fuel combustion:

Data / Parameter	$FC_{i,j,y}$
Unit	Mass or volume unit per year (e.g. ton/yr or m^3/yr)
Description	Quantity of fuel type i combusted in process j during the year
Source of data	Onsite measurements
Value(s) applied	*[To be provided at CPA level]*
Measurement methods and procedures	• Use either mass or volume meters. In cases where fuel is supplied from small daily tanks, rulers can be used to determine mass or volume of the fuel consumed, with the following conditions: The ruler gauge must be part of the daily tank and calibrated at least once a year and have a book of control for recording the measurements (on a daily basis or per shift); • Accessories such as transducers, sonar and piezoelectronic devices are accepted if they are properly calibrated with the ruler gauge and receiving a reasonable maintenance; • In case of daily tanks with pre-heaters for heavy oil, the calibration will be made with the system at typical operational conditions.
Monitoring frequency	Continuously
QA/QC procedures	The consistency of metered fuel consumption quantities should be cross-checked by an annual energy balance that is based on purchased quantities and stock changes. Where the purchased fuel invoices can be identified specifically for the CDM project, the metered fuel consumption quantities should also be cross-checked with available purchase invoices from the financial records.
Purpose of data	Calculation of project emissions
Additional comments	-

Data / Parameter	$NCV_{i,y}$
Unit	GJ/mass or volume unit (e.g. GJ/m³, GJ/ton)
Description	Weighted average net calorific value of fuel type i in year y
Source of data	The following data sources may be used if the relevant conditions apply:

Data source	Conditions for using the data source
a) Values provided by the fuel supplier in invoices	This is the preferred source if the carbon fraction of the fuel is not provided (Option A)
b) Measurements by the project participants	If a) is not available
c) Regional or national default values	If a) is not available These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances).
d) IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter	If a) is not available

	1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Value(s) applied	*[To be provided at CPA level]*
Measurement methods and procedures	For a) and b): Measurements should be undertaken in line with national or international fuel standards
Monitoring frequency	For a) and b): The NCV should be obtained for each fuel delivery, from which weighted average annual values should be calculated For c): Review appropriateness of the values annually For d): Any future revision of the IPCC Guidelines should be taken into account
QA/QC procedures	Verify if the values under a), b) and c) are within the uncertainty range of the IPCC default values as provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines. If the values fall below this range collect additional information from the testing laboratory to justify the outcome or conduct additional measurements. The laboratories in a), b) or c) should have ISO17025 accreditation or justify that they can comply with similar quality standards.
Purpose of data	Calculation of project emissions
Additional comments	Applicable where Option B is used

Data / Parameter	$EF_{CO2,i,y}$
Unit	tCO_2/GJ
Description	Weighted average CO_2 emission factor of fuel type i in year y
Source of data	The following data sources may be used if the relevant conditions apply:

Data source	Conditions for using the data source
a) Values provided by the fuel supplier in invoices	This is the preferred source
b) Measurements by the project participants	If a) is not available
c) Regional or national default values	If a) is not available These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances).
d) IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories	If a) is not available

Value(s) applied	*[To be provided at CPA level]*
Measurement methods and procedures	For a) and b): Measurements should be undertaken in line with national or international fuel standards
Monitoring frequency	For a) and b): The CO_2 emission factor should be obtained for each fuel delivery, from which weighted average annual values should be calculated For c): Review appropriateness of the values annually For d): Any future revision of the IPCC Guidelines should be taken into

	account
QA/QC procedures	-
Purpose of data	Calculation of project emissions
Additional comments	Applicable where option B is used. For a): If the fuel supplier does provide the NCV value and the CO_2 emission factor on the invoice and these two values are based on measurements for this specific fuel, this CO_2 factor should be used. If another source for the CO_2 emission factor is used or no CO_2 emission factor is provided, Options b), c) or d) should be used.

Emissions from water reservoirs of hydro power plants: if the power density of the single or multiple reservoirs (PD) is greater than 4W/m^2 and less than or equal to 10W/m^2.

Data / Parameter	TEG_y
Unit	MWh
Description	Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y
Source of data	Measured directly with electricity meters at CPA project site.
Value(s) applied	*[To be determined at CPA level]*
Measurement methods and procedures	Electricity outputs will be electronically stored and reading recorded on a record sheet.
Monitoring frequency	Continuous measurement and at least monthly recording
QA/QC procedures	Cross check measurement results with records for sold electricity
Purpose of data	Calculation of project emissions
Additional comments	Applicable to hydro power project activities with a power density of the project activity (PD) greater than 4 W/m^2 and less than or equal to 10 W/m^2

Emissions from water reservoirs of hydro power plants: if the power density of the project activity (PD) is greater than 10 W/m^2:

Data / Parameter	Cap_{PJ}
Unit	W
Description	Installed capacity of the hydro power plant after the implementation of the project activity
Source of data	CPA implementer records at the CPA project site
Value(s) applied	*[To be determined at CPA level]*
Measurement methods and procedures	Determine the installed capacity based on recognized standards
Monitoring frequency	Yearly
QA/QC procedures	-
Purpose of data	Calculation of project emissions
Additional comments	-

Data / Parameter	A_{PJ}
Unit	m^2
Description	Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full
Source of data	CPA implementer records at the CPA project site
Value(s) applied	*[To be determined at CPA level]*
Measurement methods and procedures	Measured from topographical surveys, maps, satellite pictures, etc.
Monitoring frequency	Yearly
QA/QC procedures	-
Purpose of data	Calculation of project emissions
Additional comments	-

Baseline emissions:

Greenfield renewable energy power plants

Data / Parameter	$EG_{facility,y}$
Unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y*
Source of data	Measured directly with electricity meters at CPA project site.
Value(s) applied	*[To be determined at CPA level]*
Measurement methods and procedures	Electricity outputs will be electronically stored and reading recorded on a record sheet.
Monitoring frequency	Continuous measurement and at least monthly recording
QA/QC procedures	Cross check measurement results with records for sold electricity
Purpose of data	Calculation of baseline emissions
Additional comments	-

Capacity addition to an existing renewable energy power plant

Data / Parameter	$EG_{PJ\_Add,y}$
Unit	MWh
Description	Quantity of net electricity generation supplied to the grid in year y by the project plant/unit that has been added under the project activity
Source of data	Measured directly with electricity meters at CPA project site.
Value(s) applied	*[To be determined at CPA level]*
Measurement methods and procedures	Electricity outputs will be electronically stored and reading recorded on a record sheet.
Monitoring frequency	Continuous measurement and at least monthly recording
QA/QC procedures	Cross check measurement results with records for sold electricity
Purpose of data	Calculation of baseline emissions
Additional comments	Applicable to wind and solar power plant(s)/unit(s), provided that option 2 in the baseline methodology is applied

B.7.2. Description of the monitoring plan for a generic CPA

Details of the monitoring plan will be described within each CPA due to the size, location and nature-specific characteristics of projects under this proposed PoA.

Each CPA monitoring plan will comply with the methodology ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources (Version 12.3.0), whereby it is stated that:

"All data collected as part of monitoring should be archived electronically and be kept at least for 2years after the end of the last crediting period. 100% of the data should be monitored if not indicated otherwise in the tables [B.7.1.]. All measurements should be conducted with calibrated measurement equipment according to relevant industry standards".

The quantity of net electricity generation delivered to the grid by the renewable electricity generation plant(s)/unit(s) will be reliably monitored through calibrated electricity meters and cross-checked with sales records as follows.

Monitoring organization

The CME will establish and maintain a database for each CPA. The CME will record CPA information detail delivered by CPA implementer, as follows:

- Name of the CPA,
- Name of CPA implementer,
- Contact details of CPA implementer,
- Renewable energy source : solar, wind or hydro,
- Installed capacity and other relevant technical specifications of each CPA,
- GPS coordinates of each CPA,
- Verification status (number of verification and associated monitoring period),
- Emission reductions monitored and issued each monitoring period.

The CME will be responsible for the management of records and data associated with each CPA. All data collected as part of monitoring should be archived electronically and be kept at least for 2years after the end of the last crediting period.The database will be updated using the data supplied by the CPA implementer. It will form the basis for the verification of CPA and be available for inspection by the DOE at any point in time.

For each CPA, all parameters included in section B.7.1 Part II will be monitored by the CPA implementer, recorded electronically, and provided to the CME.

Data quality

CPA implementer will have to implement a QA/QC procedure to ensure that data provided meet the requirements of the monitoring plan.

The data and reports provided by each CPA implementer to the CME will be checked internally to ensure the accuracy and completeness of data. In case of mistakes, corrective action will be applied to avoid future similar mistakes. If applicable, the CPA implementer will have to deliver equipment calibration certificates to the CME.

The CME will crosscheck, reconcile or consolidate data with multiple sources whenever possible. At minimum, data obtained from the electricity meters is to be crosschecked with the electricity sales receipts. This kind of reconciliation activity will be recorded properly as DOE may request for such information during the verification.

Monitoring team and training

Data collection, consolidation and results analysis will be undertaken by a dedicated team adequately trained, well aware of CDM requirements and supervised by the CME. This team will not have any hierarchical relationships or dependence links with all entities involved to measure net electricity supplied to the grid and to assure the correct operation and maintenance of the measuring equipment either within the CME and/or CPA implementers. This independence shall guarantee the integrity of the work that will be done.

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Appendix 1: Contact information on entity/individual responsible for the PoA

Organization	Standard Bank Plc
Street/P.O. Box	20 Gresham Street
Building	-
City	London
State/Region	-
Postcode	EC2V 7JE
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Salutation	Mr.
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Middle name	-
First name	Geoff
Department	Energy Trading and Marketing
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CDM consultant

ecosur afrique

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Aurélie Lepage (COO)
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ecosur afrique is not a project participant.

Appendix 2: Affirmation regarding public funding

The PoA does not expect to involve any public funding according to the OECD definitions for Official Development Assistance (ODA).

Appendix 3: Application of methodology(ies)

No further background information on the applicability of the selected methodology(ies).

Appendix 4: Further background information on ex ante calculation of emission reductions

Not applicable.

Appendix 5: Further background information on the monitoring plan

Not applicable.

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History of the document

Version	Date	Nature of revision(s)
02.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the programme design document form for CDM programmes of activities" (EB 66, Annex 12).
01	EB33, Annex41 27 July 2007	Initial adoption.
Decision Class: Regulatory **Document Type:** Form **Business Function:** Registration		