CLEAN DEVELOPMENT MECHANISM
PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM-PoA-DD) Version 01

CONTENTS

Annexes

NOTE:

This form is for the submission of a CDM PoA whose CPAs apply a large scale approved methodology.

At the time of requesting registration this form must be accompanied by a CDM-CPA-DD form that has been specified for the proposed PoA, as well as by one completed CDM-CPA-DD (using a real case).

SECTION A. General description of programme of activities (PoA)

A.1 Title of the programme of activities:

Programme for Grid Connected Renewable Energy in the Mediterranean Region
Version of PoA-DD: 4
Date: 12/09/2012

A.2. Description of the programme of activities:

1. General operating and implementing framework of the proposed PoA

The Programme for Grid Connected Renewable Energy in the Mediterranean Region (in the following also "the PoA") is a programme to promote renewable energy in North African and Middle Eastern countries. The idea of the PoA coordinated and managed by Renewable Energy for the Mediterranean (R.E.M.) is to facilitate the development of greenfield energy projects connected to the national grids as CPAs, implemented by CPA implementers and deploying the following technologies: wind power, solar photovoltaic (PV), including concentrated photovoltaic (CPV) and concentrated solar power (CSP). This is a regional PoA currently covering 4 countries of the Middle East and North Africa (MENA) region, namely: Egypt, Lebanon, Morocco and Tunisia.

The PoA aims to harness carbon finance for CPA implementers applying renewable energy in the region, and to contribute to reaching national renewable energy targets. It will supplement policies and strategies summarised in the following table.

Table 1: Selected targets and policies to promote renewable energies in the host countries of the PoA

Country	Targets (on electricity generation)	Name of Policy	Status	Year
Egypt	• 14% of primary energy from renewables by 2020 • 20% of electricity generation from renewables by 2020: 12% from wind (equivalent to more than 7,200 MW installed), 6% from hydro and 2% from other renewables	New National Renewable Energy Strategy	In force	2007
Morocco	• 8% of primary energy and 10% of final energy from renewables by 2012 • 20% of electricity generation from renewables by 2012 and 42% by 2020 • 400 MW of small hydro capacity by 2015 • 2,000 MW of solar capacity by 2020 • 1,440 MW of wind capacity by 2015, increased to 2,000 MW by	National Agency for the Development of Renewable Energy and Energy Efficiency	In force	2010
		National Integrated Project for Solar Electricity Production and National Agency for Solar Energy	In force	2010
		Renewable Energy Development Law 13.09	In force	2009

	2020			
Tunisia	• 4% of electricity generation from renewables by 2011 • 11% of electricity generation from renewables by 2016 • 25% of electricity generation from renewables by 2030 • 330 MW of wind capacity, 15 MW of solar photovoltaic capacity by 2011 • 1,000 MW of renewable capacity by 2016 • 4,700 MW of renewable capacity by 2030	Decree 2009/362 on Renewable Energy and Energy Efficiency Premiums	In force	2009
		Law 2009-7 on Energy Efficiency: Renewable Energy Provisions	In force	2009
		Tunisian Solar Plan (PST) 2010-2016	In force	2009
		National Energy Efficiency Program 2008-2011: Renewable Energy Provisions	In force	2008
		Law and Decree on Energy Conservation and Renewable Energy	In force	2005

Source: IEA/IRENA Global Renewable Energy Policies and Measures Database[1], IRENA Renewable Energy Country Profiles[2]

On the other hand, most countries in the region have still a high dependency on fossil fuels, and some even depend on imports. Fossil fuels are the dominating primary energy source, but the region is also endowed with unique renewable energy resources, especially with solar energy.

According to the World Bank[3], the carbon intensity of power generation in many MENA countries is higher than in industrialized countries, and the potential for renewable energy is under-explored. Additionally, the region is slow in implementing reforms in the electricity sector. As a result private investment in the power sector is low.[4] There are considerable differences in the situation of the energy sector in the MENA region from one country to another; however, there are a number of common issues (World Bank, 2011)[5]:

- In most countries where oil and gas resources are large, price distortions are considerable and cost recovery for electricity is low. In many countries this has led to inefficient supply, high energy intensity, low awareness of end users and increasing environmental problems, and a rapidly increasing burden on government finances;

[1] http://www.iea.org/textbase/pm/index.html, accessed 25 January 2012

[2] http://www.irena.org/REmaps/africamap.aspx, accessed 25 January 2012

[3] Middle East and North Africa - *Energy in MENA - World Bank*, accessed 22 December 2011

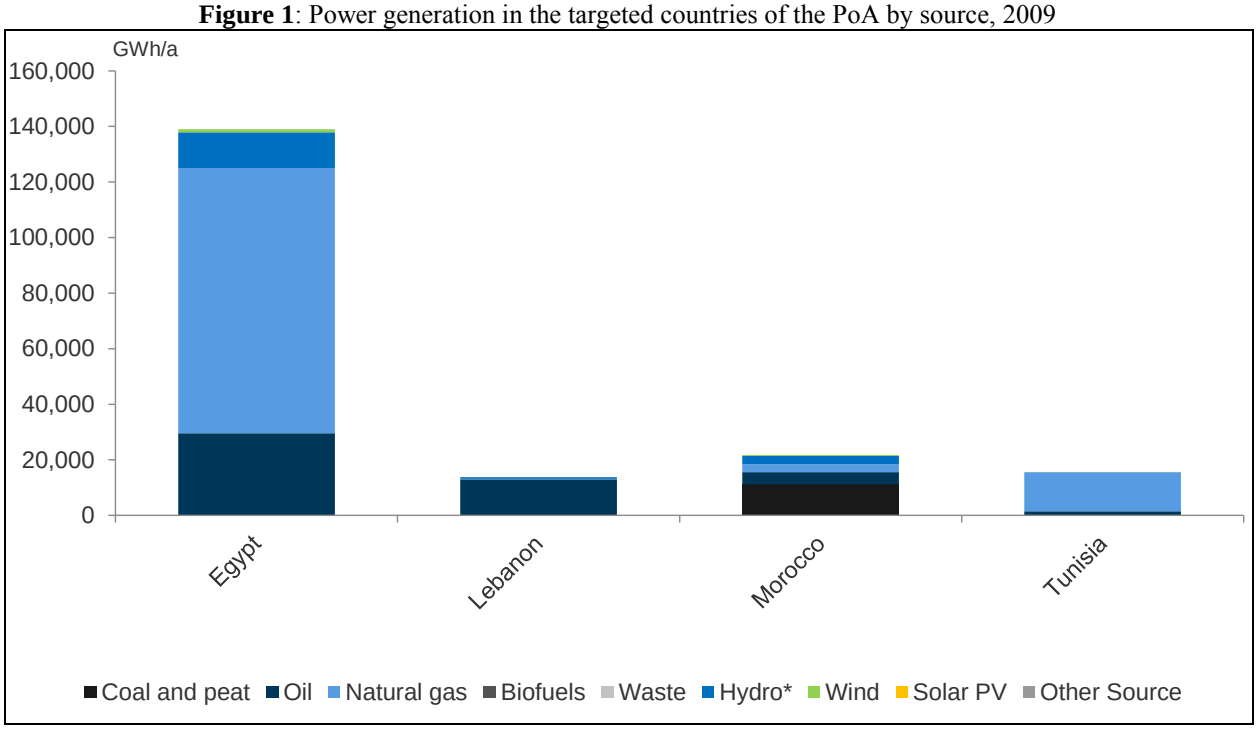
[4] Nadejda Komendantova, Anthony Patt, Lucile Barras, Antonella Battaglini, '*Perception of risks in renewable energy projects: The case of concentrated solar power in North Africa*', in Energy Policy, Volume 40, January 2012, Pages 103–109, Available online 31 December 2009, , DOI: 10.1016/j.enpol.2009.12.008. and Columbia Program on International Investment: '*World investment prospects to 2011 - Foreign direct investment and the challenge of political risk'*, 2007 The Economist Intelligence, London

[5] Middle East and North Africa - *Energy in MENA - World Bank*, accessed 22 December 2011

- In countries which are net importers of fossil fuels, price distortions are generally less and cost recovery in the electricity sector has been somewhat better. However, the challenges remain on how these countries cope with high fuel prices while financing the rapidly growing demand for energy in general, and electricity in particular;

- The MENA region is highly exposed to the risk of climate change impact due to water scarcity, concentration of economic activities in coastal areas and reliance on climate-sensitive agriculture. Despite relatively low total greenhouse gas (GHG) emission as compared to other regions, the MENA region has the third largest growth rate of CO_2 emissions of all regions, compounding the risk of climate change. The CO_2 emissions are predominantly from oil-producing countries.

Figure 1: Power generation in the targeted countries of the PoA by source, 2009



* Includes production from pumped storage plants. Source: IEA Statistics & Balances, electricity production from source, January 2012

In 2009, about 93% of the region's electricity generation was based on natural gas (59%) and fuel oil (34%) fired power plants. Coal (4%) and hydro power (3%) played a minor role for the power generation. Renewable energy technologies like wind and solar power contributed only 0.2%. This dependency on fossil fuels, mainly petroleum products and natural gas, results in significant greenhouse gas emissions. The PoA will hence help to decrease the dependency on fossil fuels by promoting renewable energy technologies (wind and solar) in the region.

2. Policy/measure or stated goal of the PoA

Several countries in the MENA region are engaged in ambitious renewable energy investment programmes over the period of 2012-2020 (see targets above). Some of this work is promoted under the Mediterranean Solar Plan (MSP)[6]. However, the high investment cost and electricity generation costs per MWh in renewable energy sources compared to conventional sources remains a major obstacle for the development of renewable energy in the region. Despite the financial support provided by multinational institutions and bilateral agreements, the available financing mechanisms are not enough to benefit all projects. Renewable Energy for the Mediterranean (R.E.M.) with this PoA is attempting to actively support national investment efforts in renewable energy through an additional income stream to project developers based on CER revenues, with the following side benefits:

1. Reduced dependency on fossil fuels,
2. Reduced electricity bills in the long run;
3. Increased job opportunities.
4. Reduced local pollution

All Component project activities (CPAs) within the PoA will consist of one or more greenfield renewable energy facilities implemented by CPA implementers. The electricity generated from the renewable sources will be fed into the national grid of the host countries either directly or through local municipalities or private parties. By replacing electricity generated from fossil fuel based power plants, the CPAs under the PoA will directly contribute to reducing GHG emissions.

The proposed PoA will therefore promote sustainable development and improve energy security in the targeted countries by avoiding the use of fossil fuels and thus reducing pollutant and GHG emissions.

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

The proposed PoA is a voluntary action by the coordinating/managing entity CME, Renewable Energy for the Mediterranean (R.E.M.), a 100% subsidiary of CDC Climat Asset Management, France. R.E.M. has not been established due to any existing policy or regulation, but was founded for the sole purpose of coordinating, managing and implementing the PoA and acting as the CME. The initiative and programme would not be developed if there were no potential for revenues from CER sales. CPAs will be implemented voluntarily by independent CPA implementers.

A.3. Coordinating/managing entity and participants of POA:

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

CME: Renewable Energy for the Mediterranean (R.E.M.)
(hereafter referred to as R.E.M. or "CME"),
47 Rue de la Victoire, Paris 75009, France

[6] The Mediterranean Solar Plan (MSP) was announced on 13 July 2008 at the Paris Summit for the Mediterranean region. The MSP is a result of collaboration on renewable energy between the EU and its Southern and Southeast Mediterranean neighbours, involving support to the production of solar energy in North Africa. Furthermore, the MSP promotes Energy Efficiency to support significant energy savings in the region. The objective is to reach 20 GW of new renewable energy capacities by 2020 in the region, out of which 3-4 GW would be covered by solar PV, 5-6 GW by wind and 10-12 GW by CSP. (see Mediterranean Solar Plan Strategy Paper for further information)

2. Project participants being registered in relation to the PoA. Project participants may or may not be involved in one of the CPAs related to the PoA.

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants(*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
France	Coordinating and managing entity (CME) of the PoA: Renewable Energy for the Mediterranean (R.E.M.)	No
France	CDC Climat Asset Management	No
Egypt (host)	Renewable Energy for the Mediterranean (R.E.M.)	No
Lebanon (host)	Renewable Energy for the Mediterranean (R.E.M.)	No
Morocco (host)	Renewable Energy for the Mediterranean (R.E.M.)	No
Tunisia (host)	Renewable Energy for the Mediterranean (R.E.M.)	No
(*) In accordance with the CDM modalities and procedures, at the time of making the PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.		

A.4. Technical description of the programme of activities:

A.4.1. Location of the programme of activities:

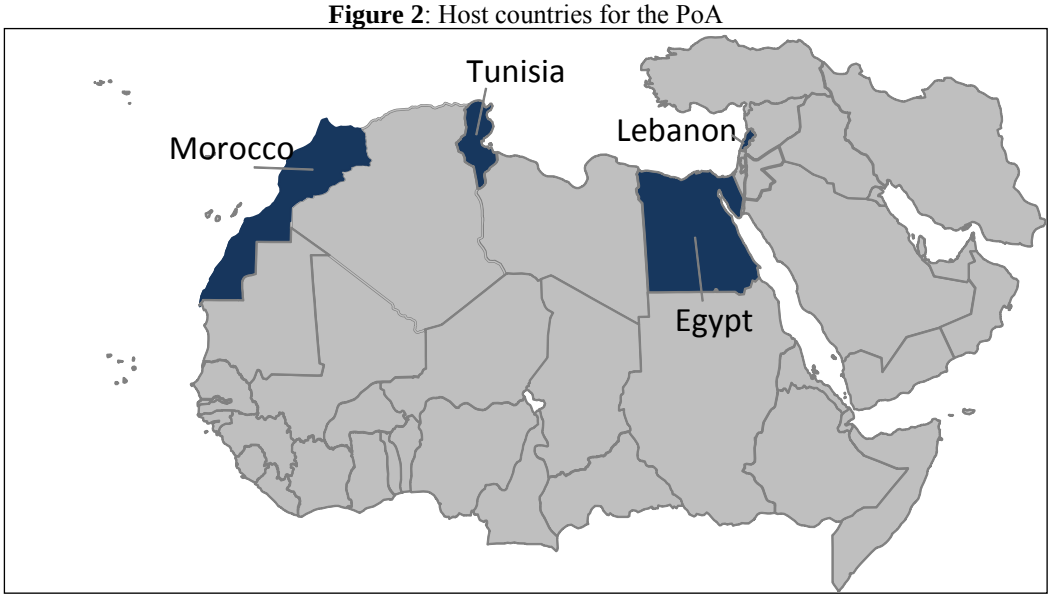
A.4.1.1. Host Party(ies):

Egypt, Lebanon, Morocco and Tunisia

A.4.1.2. Physical/ Geographical boundary:

All CDM programme activities (CPAs) included in the PoA will be implemented within the territorial area of the host parties: Egypt, Lebanon, Morocco and Tunisia. Other countries might be included in the PoA post-registration.[7]

Figure 2: Host countries for the PoA



A.4.2. Description of a typical CDM programme activity (CPA):

A.4.2.1. Technology or measures to be employed by the CPA:

A typical CPA under this PoA will be one or more greenfield renewable energy project(s) employing wind, photovoltaic (PV), including concentrated photovoltaic (CPV), or concentrated solar power (CSP) technologies. Each CPA will be connected to the national/sub-national grid of the corresponding host country.

Even though the detailed technical characteristics might differ per CPA, the following general conditions will apply to all CPAs:

- CPAs are grid-connected renewable energy projects in the Mediterranean region. Each CPA will convert renewable energy sources (wind power and solar radiation) with the help of either large

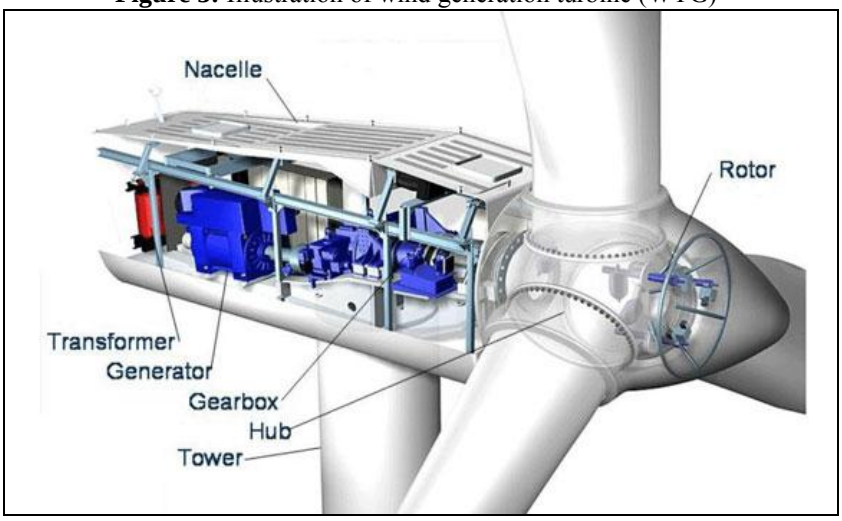
[7] According to the CDM Project Standard (version 1), EB65, Annex 5, §234, the coordinating/managing entity may request changes to the boundary of a registered CDM PoA to include an additional host Party, in accordance with the Project cycle procedure. In such cases, the coordinating/managing entity shall: (a) Revise the registered PoA-DD and reflect the changes, in particular, the eligibility criteria for inclusion of CPAs; (b) Obtain from the DNA of the new host Party a letter of approval for the PoA and a letter of authorization for the coordinating/managing entity; (c) Submit the revised registered PoA-DD and the letters of approval and authorization to a DOE for validation.

wind turbine generators (WTG), PV generators or CSP power plants into electricity, which is supplied to the national/sub-national grid.

- The PoA will be open to all technology providers and project implementers that meet the eligibility criteria for inclusion into this PoA (mentioned below).
- A CPA under this PoA may be a single unit/plant or a cluster of such units/plants employing the same technology undertaken by the same project developer or project community.

Wind power generation with grid connection:
Each wind power project (CPA) will consist of one or more either wind turbine generators (WTG) that produce electricity and are connected to the specific national grid. The vast majority of commercial turbines nowadays operate on a horizontal axis with three evenly spaced blades. These are attached to a rotor from which power is transferred through a gearbox to a generator. The gearbox and generator are contained within a housing called a nacelle. Some turbine designs avoid a gearbox by using direct drive. The electricity is then transmitted down the tower to a transformer and eventually into the grid network.[8]

Figure 3: Illustration of wind generation turbine (WTG)[9]



The detailed technical specifications of the WTGs and wind parks can differ, but will have no effect on the principal functionality and emission reduction of the CPAs. There are no emissions from fossil fuel combustion.

Wind power plants under a CPA can comprise the following generic characteristics:

- Wind turbines generators
  - Rotor (diameter, tilt, pitch system, max tip speed, hub)
  - Gearbox
  - Transformer
  - Towers (type, hub height)
  - Generator (power output, converter, voltage, frequency)
- Electrical distribution cabling between the WTGs;

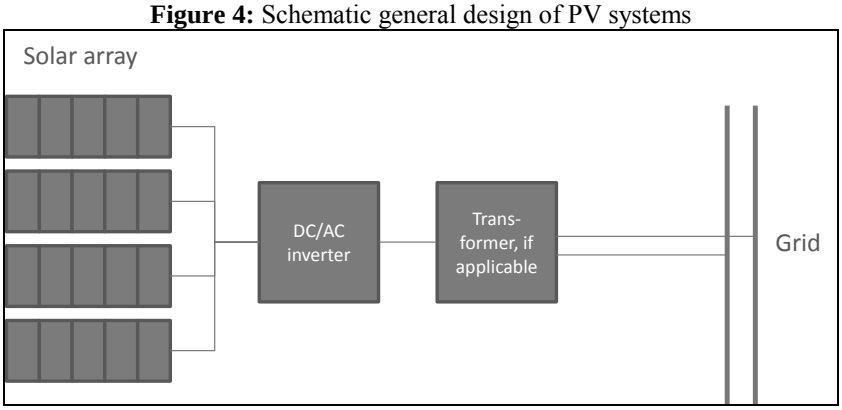
[8] Compare GWEC: http://www.gwec.net/index.php?id=31

[9] Source: Clean Green Renewable Energy, http://cleangreenenergyzone.com/wind-turbine-working-principle/

- Substations/transformers on the site in an appropriate position to inject generated power
- Power lines and operating facilities
- Electricity meters and optionally equipment for off-site control and monitoring

Grid connected solar PV systems:
Solar photovoltaics (PV) is a method of generating electrical power by converting solar radiation (direct and global) into direct current (DC) electricity making use of semiconductors (e.g. silicon) that exhibit the photovoltaic effect. Photovoltaic power generation employs solar panels composed of a number of solar cells containing a photovoltaic material. Materials presently used for photovoltaics include monocrystalline silicon, polycrystalline silicon, amorphous silicon, cadmium telluride, and copper indium gallium selenide/sulfide. Solar PV systems are defined as any technology that converts sun irradiation into electric power directly with the help of photovoltaic modules. PV systems can be mounted on rooftops (building adapted PV systems), can be integrated into the roof or building facade (building integrated PV systems) or mounted on frames on the ground (free field PV systems). There are no emissions from fossil fuel combustion related to the operation of these systems.

Figure 4: Schematic general design of PV systems



The detailed technical specification of photovoltaic systems with grid connection can differ, but will have no effect on the principal functionality and emission reduction of the CPA. Solar PV systems can contain the following components:

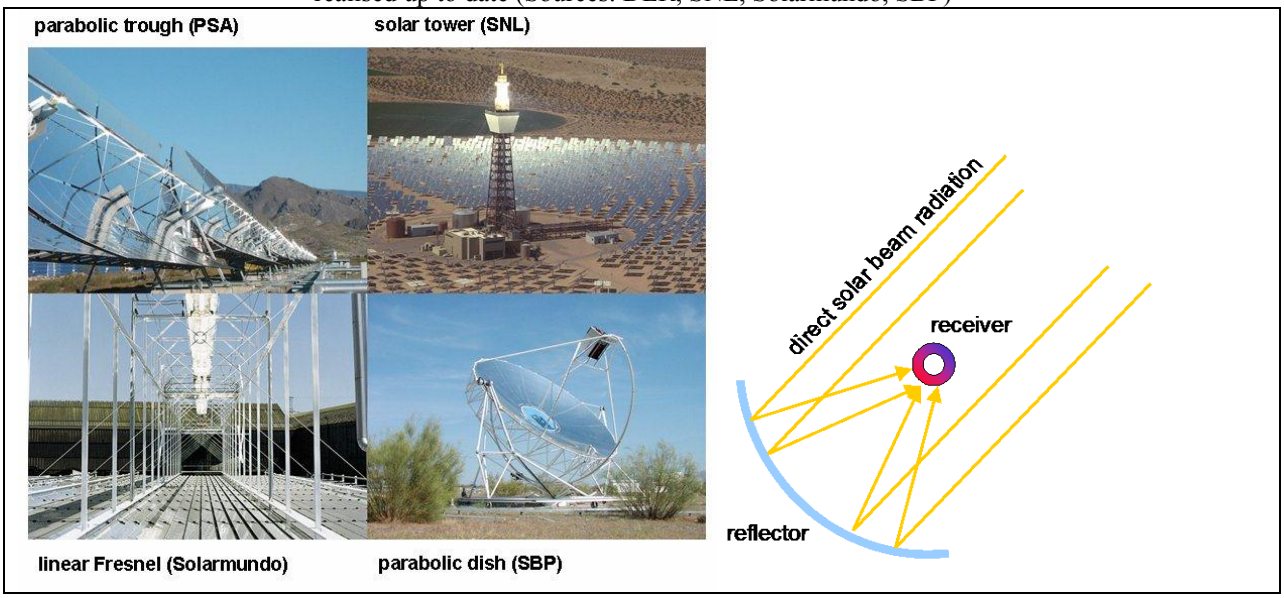
- Solar modules (the connected field of solar panels is called solar generator or solar array)
- Electrical infrastructure: internal cabling, inverters DC/AC, transformers;
- Mounting systems: frames, racks or tracking systems
- Electricity meters and optionally equipment for off-site control and monitoring (data loggers)

It generally makes no difference for the PoA if the PV technology is crystalline, multi-crystalline, thinfilm, concentrated PV or if a plant utilizes future PV technologies like concentrating lenses or panels with organic substances. Utilization of different PV technologies within the same CPA is not an obstacle and will not influence the baseline of the project or cause any additional project emissions.

Concentrated Solar Power (CSP)
Concentrating solar thermal power technologies (CSP) are based on the concept of concentrating solar radiation to be used for electricity generation within conventional power cycles using steam turbines, gas turbines or Stirling engines. For concentration, most systems use glass mirrors that continuously track the position of the sun. The concentrated sunlight is absorbed on a receiver that is specially designed to

reduce heat losses. A fluid flowing through the receiver takes the heat away towards the power cycle, where e.g. high pressure, high temperature steam is generated to drive a turbine. Air, water, oil and molten salt are used as heat transfer fluids.[10]

Figure 5: Principle of concentrating solar beam radiation and the four CSP collector technology main streams realised up to date (Sources: DLR, SNL, Solarmundo, SBP)[11]



Thermal solar power in the PoA is defined as generation of thermal heat by solar energy that is converted into electricity. Under this definition makes no difference for the PoA if the solar thermal energy is generated by parabolic-trough, Fresnel, parabolic dish or concentrating solar tower technologies etc. Potential use of battery, thermal co-generation (projects, which also use fossil fuels for electricity generation) or thermal storage of solar energy are eligible under the PoA and will have no effect on the metering of net electricity provided to the grid (considering only the solar component).

The detailed technical characteristics of solar thermal power generation with grid connection can differ but contain mostly the following components:

- Solar reflector;
- Receiver
- Conventional power cycles using steam turbines, gas turbines or Stirling engines
- Electricity meters
- Optionally, storage for thermal energy or battery electricity storage;
- Optionally, fossil fuel combusting boilers or turbines (co-generation);
- Meters for measurement of fuel consumption

[10] DLR MED-CSP, Concentrating Solar Power for the Mediterranean Region, 2005: http://www.dlr.de/tt/Portaldata/41/Resources/dokumente/institut/system/projects/WP2_Technologies_Final.pdf

[11] DLR MED-CSP, Concentrating Solar Power for the Mediterranean Region, Final Report, German Aerospace Center (DLR), 2005: http://www.dlr.de/tt/desktopdefault.aspx/tabid-2885/4422_read-6562/

Projects that utilize heat for other purposes than power generation will not be included under the PoA.

A.4.2.2. Eligibility criteria for inclusion of a CPA in the PoA:

CPAs under the PoA are required to fulfil a range of criteria for inclusion with regards to environmental, regulatory, financial and program specific eligibility criteria considering the 'Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities', v. 01.0.[12]

Table 2: Definition of eligibility criteria for inclusion of a project activity as a CPA under the PoA

General eligibility criteria for inclusion of a CPA in the PoA	Comment / Mean of verification
(a) The geographical boundary of the CPA including any time-induced boundary has to be consistent with the geographical boundary set in the PoA.	The CPA implementer has to provide documentary evidence (geographical coordinates). The specific location of the CPA is checked through documentary evidence and geographical coordinates provided by the CPA implementer.
(b) The CPA under the PoA is a voluntary action	The CPA implementer has to confirm, in the inclusion agreement, that the CPA under the PoA is a voluntary action.
(c) The CPA is neither registered as an individual CDM project activity nor included in another registered CDM-PoA. To avoid double counting of emission reductions each CPA shall be uniquely identified and defined in an unambiguous manner by providing the following data to the CME prior to inclusion in the PoA: • Name of the CPA; • Name of the CPA implementer; • Contact details of the implementer including contact person, address, telephone and/or email address; • Brief project description including, installed capacity and other relevant technical specifications of each CPA; • Host country of the CPA and its specific location (e.g. GPS coordinates)	Besides the provision of the required information the CPA implementer has to confirm, in the inclusion agreement, that the CPA is neither registered as an individual CDM project activity nor included in another registered CDM-PoA.
(d) Start date of the CPA shall be provided through documentary evidence and comply with latest	The CPA implementer has to provide documentary evidence of the CPA start

[12] EB 65, Annex 3

	CDM guidelines and standards. CPA's start date should be after the commencement of validation of the PoA, i.e. the date on which the PoA-DD is first published for global stakeholder consultation, 14/03/2012. Additionally, the starting date of a crediting period of the CPA shall be the date of its inclusion in the registered PoA or any date thereafter. The duration of the crediting period shall not exceed the end date of the PoA.	date as defined in the latest version of the CDM Glossary (currently version 06.0)[13], in order to confirm that the CPA start date is after the commencement of validation of the PoA, i.e. 14/03/2012. The crediting period as defined in the CPA-DD is not exceeding the end date of the PoA.
(e)	The CPA involves the construction and operation of one or more greenfield grid-connected renewable energy project, using the following technologies: wind, photovoltaic (PV), incl. concentrated photovoltaic (CPV), or concentrated solar power (CSP); connected to the national/sub-national power grid of the individual host country, either directly or via local municipalities or private companies.	The CPA implementer shall provide in the CPA-DD the specifications of the technology applied including the level (e.g. installed capacity) and type of service (e.g. grid connected power generation for base load or peak load), and performance specifications including compliance with testing/certifications (e.g. technical data sheets and certifications)
(f)	The CPA implementer has signed an agreement with the CME governing the inclusion of the CPA into the PoA.	The agreement shall be provided to the DOE for validation.
(g)	The CPA must be applicable to and need to apply the CDM baseline and monitoring methodology 'ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources' Version 12.3.0[14]. The following applicability conditions apply: **Applicability conditions in version 12.3.0 of ACM0002** The 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).	The CPA-DD shall provide an assessment that the applicability criteria are met.

[13] http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf

[14] According to the "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities', Version 01.0 (EB65, Annex 3), if version 12.3.0 of ACM0002 applied by the PoA is revised or replaced, subsequent to being placed on hold, REM as the CME shall update the eligibility criteria to the requirements of the revised or new methodology with immediate effect. The new version of the PoA-DD (e.g. version 1.1) and new generic CDM-CPA-DD containing updated eligibility criteria validated by a DOE shall be submitted to the Board for approval.

The project activity is the installation of a power plant/unit of one of the following types: **wind power** plant/unit, **solar power** plant/unit,	
The methodology is not applicable to the following: • Project activities that involve switching from fossil fuels to renewable energy at the site of the project activity • Biomass fired power plants • Hydro power plants that result in new reservoirs or in the increase in existing reservoirs where the power density of the power plant is less than 4 W/m^2	
In addition, the applicability conditions included in the tools referred to in the methodology apply, which are: • "Tool to calculate the emission factor for an electricity system", Version 2.2.1[15] - Applicable for project activity that substitutes grid electricity - If Option II (consideration of off-grid power plants) of Step 2 is applied, the total capacity of off-grid power plants (in MW) should be at least 10% of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10% of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity. - In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country • "Tool for the demonstration and assessment of additionality", Version 6.0.0[16]	

[15] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf/history_view

- Provides a general framework for demonstrating and assessing additionality and is applicable to a wide range of project types. - Since the PoA applying ACM002, no further adjustments are required and no additional applicability conditions apply. For solar CSP projects in addition the following tool applies: • "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", Version 02[17] - The tool can be used in cases where CO_2 emissions from fossil fuel combustion are calculated based on the quantity of fuel combusted and its properties. Methodologies using this tool should specify to which combustion process *j* this tool is being applied.	
(h) The additionality of CPAs shall be demonstrated and assessed using the latest version of the "Tool for the demonstration and assessment of additionality" agreed by the Board, which is available on the UNFCCC CDM website. Additionality is proven on the CPA level for each CPA separately, as outlined in Section A.4.3 and E.5.1.of the PoA-DD	The CPA-DD shall demonstrate the eligibility and additionality of the CPA by using the latest version of the "Tool for the demonstration and assessment of additionality" agreed by the Board, which is available on the UNFCCC CDM website.
(i) The CPA has undertaken an environmental analysis as per requirements of the CDM modalities and procedures as outlined in Section C of the PoA-DD.	The CPA-DD shall provide information of the environmental analysis. The following documents shall be provided at CPA level: 1. Legislation on whether the EIA study is required. 2. EIA approval letter from the host country (if EIA is required).
(j) The CPA has undertaken a local stakeholder consultation as outlined in Section D of the	The CPA-DD shall provide information of the local stakeholder consultation.

[16] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v6.0.0.pdf/history_view

[17] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf/history_view

PoA-DD.	The following documents shall be provided at CPA level: 1. Minutes of meeting of the local stakeholder consultation meeting 2. Attendance list of the stakeholders.
(k) The CPA has provided an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance.	The affirmation shall be attached to the CPA-DD.
(l) The target group of the PoA are greenfield renewable energy projects connected to the grid.	The CPA shall be a greenfield renewable energy projects connected to the grid that is documented in the CPA-DD. The following documents shall be provided at CPA level: 1. CME database, and 2. Technical data sheet, and/or 3. Onsite visit, etc.

Conditions related to sampling requirements for the PoA in accordance with the approved guidelines/standard from the Board pertaining to sampling and surveys are not applicable for the PoA, as it covers projects without sampling and each CPA will be monitored individually.[18]

A.4.3. Description of how the anthropogenic emissions of GHG by sources are reduced by a CPA below those that would have occurred in the absence of the registered PoA (assessment and demonstration of additionality):

(i) The proposed PoA is a voluntary coordinated action

There are no mandatory laws or regulations in the host countries stipulating the development of a PoA for renewable energy activities. Likewise, no obligation exists for private entities to utilize or develop renewable energy projects. The proposed PoA is therefore a voluntary action by the CME. With the implementation of the PoA, the CME as the key project participant intends to facilitate the flow of carbon finance to renewable energy developers in the host countries. The CME is providing a framework and platform for renewable energy activities. While providing such a platform for potential CPAs, the CME is taking care of the development of the CDM cycle related tasks of the project activity, and will receive a certain return from the CPAs (e.g. service fee, share of CERs generated etc.).

(ii) If the PoA is implementing a voluntary coordinated action, it would not be implemented in the absence of the PoA

[18] The PoA implementing renewable energy projects is applying the monitoring methodology ACM0002 that does not use statistical sampling. All CPAs will be monitored and verified.

The PoA is a voluntary coordinated action by the CME allowing conditional participation of CPAs. The CME has been set up for the purpose of managing and coordinating this PoA. The voluntary coordinated action would not be implemented by the CME in the absence of the PoA. Additionality has to be proven on the CPA level for each CPA separately based on the latest version of the UNFCCC "Tool for the demonstration and assessment of additionality" (Version 6.0.0), as required in the CDM baseline and monitoring methodology "ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources" Version 12.3.0. For most CPAs, an investment analysis will be carried out to demonstrate that the proposed CPAs are not the most economically or financially attractive choice of investment. Optionally, barrier analysis could be used justifying that barriers prevent the implementation of the CPA according to the additionality tool. The aspects are discussed in section A.4.3., (v) and E.5. of this document.

Moreover, the fact that currently no or only few renewable energy facilities like the proposed ones under this CDM-PoA exist in the host countries, is due to the following barriers:

- "First-of-its-kind" characteristics and barriers;
- Difficulties in sustaining high levels of foreign direct investment from the private sector.[19]
- Technological, regulatory, political, and force majeure (which includes terrorism) risks: the wind/solar 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-PoA project activity, as demonstrated by relevant scientific literature[20];
- Lack of skilled and/or properly trained labour to operate and maintain the technology;
- Lack of infrastructure for implementation and logistics for maintenance of large scale renewable energy technologies;
- Uncertainty with regards to the electricity purchase price and conditions.

On the basis of the high risk factors listed above, CPA implementers would not build the projects without the financial incentive of the CDM.

(iii) If the PoA is implementing a mandatory policy/regulation, this would/is not enforced

Not applicable since there is no mandatory policy/regulation connected with this PoA.

(iv) If mandatory a policy/regulation are enforced, the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation.

[19] Nadejda Komendantova, Anthony Patt, Lucile Barras, Antonella Battaglini, '*Perception of risks in renewable energy projects: The case of concentrated solar power in North Africa*', in Energy Policy, Volume 40, January 2012, Pages 103–109, Available online 31 December 2009, ISSN 0301-4215, DOI: 10.1016/j.enpol.2009.12.008. and Columbia Program on International Investment: '*World investment prospects to 2011 - Foreign direct investment and the challenge of political risk'*, 2007 The Economist Intelligence, ISBN 0 86218 205 0

[20] E.g. Nadejda Komendantova, Anthony Patt, Lucile Barras, Antonella Battaglini, '*Perception of risks in renewable energy projects: The case of concentrated solar power in North Africa*', in Energy Policy, Volume 40, January 2012, Pages 103–109, Available online 31 December 2009, ISSN 0301-4215, DOI: 10.1016/j.enpol.2009.12.008; Nadejda Komendantova, Anthony Patt, Keith Williges: '*Solar power investment in North Africa: Reducing perceived risks*', in Renewable and Sustainable Energy Reviews, Volume 15, Issue 9, December 2011, Pages 4829-4835

Not applicable since there is no mandatory policy/regulation connected with this PoA.

(v) Demonstration of additionality

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, §10, '*PoAs that consist of one or more large scale projects as CPAs shall include eligibility criteria derived from all the relevant requirements contained in the additionality section of the large scale methodologies'*. All CPAs under the PoA will make use of the CDM methodology ACM0002 and its related tools regardless of their size.
Relevant eligibility criteria have accordingly been added to the eligibility criteria for inclusion of a CPA in the PoA in section A.4.2.2. For each CPA, additionality will be demonstrated as required by ACM0002, version 12.3.0. The methodology requests project participants that the additionality shall be demonstrated and assessed using the latest version of the "Tool for the demonstration and assessment of additionality" agreed by the Board, which is available on the UNFCCC CDM website.[21]

Key criteria and data for assessing additionality of a CPA

If investment analysis has been used to demonstrate the additionality of the proposed CPA, according to the "Tool for the demonstration and assessment of additionality", the CPA-DD shall provide evidence that the proposed CDM project activity would not be:

a) The most economically or financially attractive alternative; or

b) Economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs).

If barrier analysis has been used to demonstrate the additionality of the proposed CPA, the CPA-DD shall demonstrate that the proposed CDM project activity faces barriers that:

a) Prevent the implementation of this type of proposed project activity;

b) Do not prevent the implementation of at least one of the alternatives.

A.4.4. Operational, management and monitoring plan for the programme of activities:

A.4.4.1. Operational and management plan:

In the following the operational and management arrangements established by the coordinating/ managing entity for the implementation of the PoA are described. Additionally, the CME has created a separate document for the 'Operational and management arrangements established by the coordinating/managing entity for the implementation of the PoA "Programme for Grid Connected Renewable Energy in the Mediterranean Region"', which is available to the DOE for validation:

(i) A record keeping system for each CPA under the PoA,

[21] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v6.0.0.pdf/history_view

The CME will operate a PoA Project Database and a PoA Monitoring Database including CPA related information and data. Each CPA will be uniquely identified within these databases. A unique CPA identification number will be allocated by the CME for each CPA matching with the UNFCCC reference number.

Operation, monitoring and management of the projects will be at the CPA level: all relevant parameters included in the monitoring plan shall be monitored and recorded in each CPA by maintaining a record keeping system supervised by the CME.

According to the eligibility criteria, the following data must be provided to the CME prior to inclusion in the PoA and will be stored in the PoA Project Database:

Data for inclusion (CPA Inclusion records)	• Name of the CPA; • Name of the CPA implementer ; • Contact details of the implementer including contact person, address, telephone and/or email address; • Brief project description including installed capacity and other relevant technical specifications of each CPA; • Host country of the CPA and its specific location (e.g. GPS coordinates) • Documentary evidence according to the PoA inclusion criteria

The following data will be collected and stored in the PoA Monitoring Database:

Data during crediting period (CPA Monitoring Records)	• Unique CPA identification number • Verification status, CPA monitoring records and monitoring reports of each CPA.

The data for inclusion listed above will be provided by each CPA implementer prior to inclusion. After successful inclusion, the CPA implementer will record the required monitoring data (CPA Monitoring records), and will ensure that the CPA monitoring records are made available to the CME. The CME will be responsible for the management of the PoA Project Database and the PoA Monitoring Database, consisting of the data for inclusion and of all CPA monitoring records. All relevant parameters included in the monitoring plan shall be monitored and recorded in each CPA by maintaining a record keeping system supervised by the CME.
The CME will ensure that each CPA will maintain standard records, and will be responsible for centralizing and archiving the monitored data. All records will be stored for a period of two years after the end of the relevant crediting period. Relevant data capture, verification and storage procedures will be followed in maintaining the data to ensure its accuracy, validity and completeness.

(ii) 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 CDM project activity or as a CPA of another PoA,

Each CPA shall be uniquely identified within the PoA Project Database and PoA Monitoring Database described in (i) above. The geographical boundary for the PoA is limited by the borders of the host

countries eligible under this PoA. The PoA Project Database will report and contain the physical location of each CPA.

Prior to inclusion of a new CPA within the proposed PoA, the CME will check the UNFCCC CDM Project Database to verify whether a CDM project activity or CPA of another PoA for grid-connected renewable energy projects has already been registered within the host country.[22]

Each CPA included in this PoA will be provided with a unique identification number as a reference. To avoid double counting, each included CPA with its reference number will be linked with the geographic coordinates for each facility's specific site location.

For instance, the CPAs included in the PoA might be listed as follows:

CPA number	Type	Site name	Geo-coordinates	Capacity	Date of inclusion	CPA implementer
01	Solar	ErRachidia	XXX	25 MW	01/01/2013	Solerine Participations
02	Wind	xxx	xxx	xx MW	Xxx	…

In an instance where a CPA is already registered as a CPA of another PoA or CDM project activity, the CME will ensure through cross-checking and possible exclusion of the CPA that there is no double counting of the individual CPA for this PoA.

(iii) the provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA;

To ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA, the CPA operator shall enter into a contractual arrangement with the coordinating entity including respective provisions that:

- the CPA has not been and will not be registered as a single CDM project activity or as a CPA under another PoA;
- the project implementer is aware that the CPA will be subscribed to the present PoA; and
- there is an agreement between the CPA and the CME to participate in the PoA.

A template of the contractual agreement is annexed to the 'Operational and management arrangements established by the coordinating/managing entity for the implementation of the PoA "Programme for Grid Connected Renewable Energy in the Mediterranean Region"'.[23]

[22] Existing projects will be firstly verified at the following links:

http://cdm.unfccc.int/Projects/registered.html

http://cdm.unfccc.int/ProgrammeOfActivities/registered.html

or any other link available at the time of inclusion

[23] Available to the DOE for validation

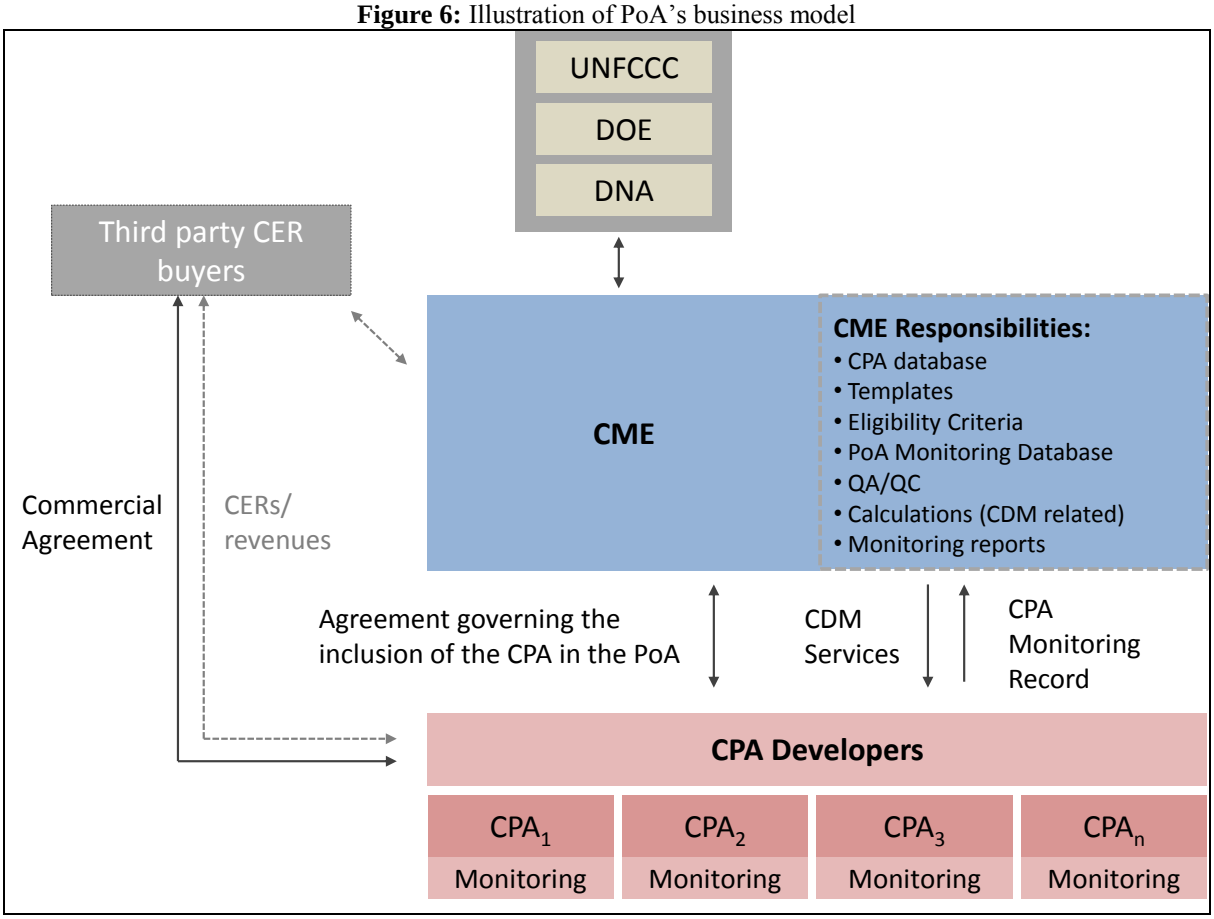
(iv) Overview of operational and management arrangements

R.E.M. as CME will be involved and engaged in the implementation phase of the PoA and in its continuous management. CPA implementers will be in charge of monitoring the parameters for the CPA and providing CPA monitoring records to the CME using the monitoring report form. The CME will oversee all monitoring activities associated with the PoA and will interact with the regulatory bodies, e.g. UNFCCC, DOEs and DNAs. Additionally, the CME will provide CDM services and necessary documentation to the CPA implementers. Some of this work and services may be subcontracted to affiliates or third party service provider.

The CME will agree with the CPA implementer on an agreement governing the inclusion of the CPA in the PoA. The agreement will include a confirmation by the CPA implementer that he/she is aware and agrees that the CPA will be subscribed to the PoA, that the project is in the boundary of the corresponding host country, that the CPA under the PoA is a voluntary action and that the CPA is neither registered as an individual CDM project activity nor included in another registered CDM-PoA. CPAs participating in the PoA will pay a modest fee for inclusion and verification to the CME that will cover the latter's operating expenditure.

The following figure illustrates the business model of the PoA.

Figure 6: Illustration of PoA's business model



(v) Roles and responsibilities of personnel involved in the process of inclusion of CPAs, including a review of their competencies

The CME will undertake the process of inclusion of CPAs as follows:

- the CPA status will be checked by a project manager qualified for CDM processes as per the procedure to avoid double accounting described in the paragraph (ii) above
- the CPA eligibility will be checked by a project manager qualified for CDM process and PoA guidelines
- the General Manager of the CME will sign a contractual agreement with the CPA implementer
- the CME may appoint in-house staff or any relevant third party with CDM expertise (e.g. CDM consultant) to launch the inclusion process, including contracting a DOE, gathering the CPA information and preparing the relevant documentation
- if the inclusion is carried out by a third party, the CME will be informed on a regular basis of the progress of the inclusion
- a technical review will be conducted as described in the paragraph below

The role, responsibilities and competency of personnel is summarized below:

Personnel	Role and responsibilities	Competency requirement
Project manager	- Check the CPA status - Check the eligibility of the CPA	Proven knowledge in climate change sector, including a minimum of 3-month experience in CDM
General manager	- Technical review - Final decision to include the CPA - Appoint a consultant or in-house staff to proceed with the inclusion	Proven knowledge in climate change sector, including a minimum of 1-year experience in CDM
Third party: CDM consultant	CDM inclusion process	Track record in registration and issuance of CDM projects, including Programmatic CDM

The competency requirements of the personnel involved in the inclusion process will be verified through CV and/or information publicly available, as available.

A training plan will be implemented in case relevant personal and/or CPA implementers would require some initial training on CDM related issues.

(vi) Procedures for technical review of inclusion of CPAs

The inclusion of CPAs will be controlled by the CME through a systematic technical review:

- if the inclusion is carried out by a third party, the CME will be informed on a regular basis of the progress of the inclusion and will be responsible for the technical review of the final documents. A final approval of the CME will be required before submitting the documentation to the CDM-EB for inclusion of CPAs

- if the inclusion is carried out internally by the CME, the final approval of the General Manager of the CME will be required before submitting the documentation to the CDM-EB for inclusion of CPAs

(vii) **Monitoring and verification**

The CME will implement a monitoring protocol that allows the Designated Operational Entity (DOE) to verify all CPAs in the PoA. As described previously, a PoA Monitoring Database will be established that contains all the CPA specific data required to identify and locate each CPA. Each CPA will comprise a single project activity (a single unit/plant or a cluster of units/plants), and hence the data will be monitored directly and submitted to the CME.

Monitoring will be carried out by each CPA implementer. For each CPA, all parameters will be monitored and recorded in the CPA monitoring records by the CPA implementer according to establishes procedures. Each CPA is responsible to appropriately measure the net electricity supplied to the grid and assuring the correct operation and maintenance of the measuring equipment. This will be done by respecting the calibration frequency as per methodology ACM0002, e.g. the manufacturer's requirements. The CME will store all the data submitted by the CPA implementer in an electronic database (PoA Monitoring Database). Primary data will be stored by the implementer as back-up.

Verification
All the CPAs will be verified; verification is initiated by the CME.[24] If several CPAs are included within a verification, the following procedure may be applied by the DOE:

- Full desk review and site visit for each and every CPA included in the verification; or
- Full desk review for each CPA included in the verification and site assessment on a sample-based approach. The sampling procedure to determine the CPAs that will be verified on site will be based on a stratified random sample, the strata being solar or wind power plant. At least one onsite assessment will be conducted. The DOE itself will chose randomly on which site(s) it will conduct a verification. Since the number of CPAs included in the proposed PoA will evolve during the crediting period, the sampling process is to be carried out for each verification.

Responsibilities
The CME will be responsible for the CDM aspects of the project. The CPA implementer will be responsible for the operation of the project.
The CME will be responsible for the preparation of the monitoring reports, based on the CPA monitoring records using the monitoring report form, and communication with the DOE during verification activities. The monitoring reports will aggregate all required monitoring information, i.e. CPA monitoring records, in order to allow the DOE to verify the emission reductions for each monitoring period of each CPA. Each monitoring report will unambiguously set out the data on emission reductions generation by each CPA during the monitoring period consistent with the requirements of this PoA-DD

[24] The PoA implementing renewable energy projects is applying the monitoring methodology ACM0002 that does not use statistical sampling. All CPAs will be monitored and verified.

and the corresponding CPA-DD. The use of the PoA Project Database and PoA Monitoring Database of CPA information and QA/QC procedures will ensure that double counting is not possible.

The start and end date of each monitoring period for each individual CPA, together with the CPA monitoring records attributable to that monitoring period will be recorded in the PoA Monitoring Database. Record keeping procedures undertaken by the CME will ensure that the CPA monitoring records attributed to a monitoring period can be clearly attributed to an individual CPA and will furthermore prevent double counting of emission reduction data.

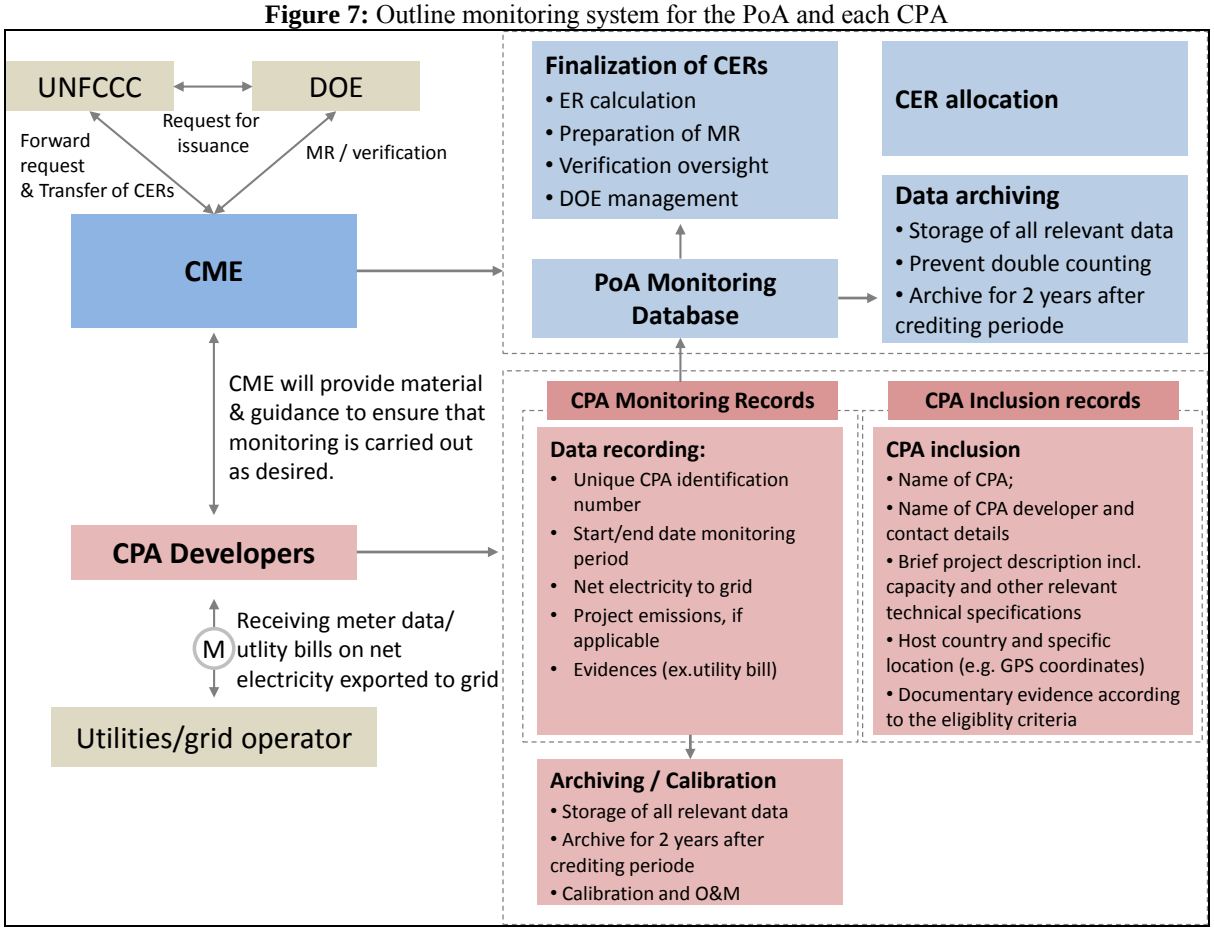
A.4.4.2. Monitoring plan:

Monitoring management structure
The CPA implementer will identify the responsible persons for monitoring, data collection and archiving. The management structure valid at the time of validation will be presented in the CPA-DD. This structure may evolve during the lifetime of the project and should be updated within each monitoring report.

The monitoring plan for parameters included in section E.7.1. will be implemented for each CPA with assistance from the CME as follows:

- The CPA implementer will implement each CPA individually and monitor and record all parameters, if applicable, included in section E.7.1. (CPA monitoring record). Each CPA implementer will store primary monitoring data.
- The CME will provide guidance to the CPA implementer on how the monitoring should be conducted and data should be collected with regards to emission reduction calculations.
- The CPA implementer will provide data on monitored parameters included in section E.7.1., required calculations, if any, and any documentary evidence to the CME.
- The CME will document and store all data related to parameters included in section E.7.1. provided by CPA implementer in a central electronic database (PoA Monitoring Database). The data for each CPA will be kept for at least two years after the end of the last crediting period for the CPA.
- The CME will review relevant CPA monitoring records, prepare the monitoring reports, and provide the monitoring reports to the DOE.

Figure 7: Outline monitoring system for the PoA and each CPA



Data collection, transmission and storage

The main data for calculating emission reductions of a CPA is the net electricity supplied to the grid by the power plant/ unit in year y. This data will be monitored by electricity meters and will be cross-checked against the relevant electricity sale receipts (and purchases) and/or records from the grid. The data measured on site will be collected manually or automatically and recorded by the CPA implementer on a regular basis as outlined in the monitoring plan below in E.7.

The monitored data at each CPA level will be sent to the CME for centralization and archiving. The CME will ensure that each CPA maintain standard records documenting and will be responsible for the centralizing and archiving of the monitored data of all CPAs included in the PoA. The monitored data will be kept for the full crediting period, plus two years after the end of the crediting period or the last issuance of CERs for this CPA (whichever occurs later).

Maintenance and calibration

Maintenance and calibration of measuring instruments will be carried out periodically and appropriately, according to the procedures, timing and methods recommended by the manufacturer or national/ international standards, as available.

Quality control

General malfunction of equipment: if the equipment fails repairs will be carried out. If the damaged equipment cannot be repaired, it will be replaced at the earliest by the same or an equivalent unit. In case of erroneous transmission of data, if necessary and feasible, portable tools like notebooks will be used in

order to read-out electricity meter(s) in order to determined $EG_{facility}$. Hence, in this case data will be recorded manually. Discrepancies: to avoid discrepancies between projected data in the DDs and actual data, cross-checks between meter readings and external sources (e.g. electricity invoices) will be carried out. Any source of inconsistencies will be clarified.

Emergency
For the case of emergency (earthquakes, explosions, fires etc.), an emergency preparedness plan will be adapted to the project activity. All employees involved in the project on-site will be trained in the code of conduct and required actions at time of commissioning of the plant.

(i) **Records of arrangements for training and capacity development for personnel**

Personnel will be trained on both operational and CDM aspects of the project. Training will be carried out internally and/or externally, either on site or remotely.
The CME will provide guidance to the CPA implementer on how the monitoring should be conducted and data should be collected with regards to emission reduction calculations.

The training will take place at the time of commissioning and will consist of:

- Training on operational aspects to personnel involved in the operation of the power plant. The training will be carried out by qualified personnel from the plant manufacturer or from the CPA implementer, as relevant
- Training on CDM aspects to the CPA implementer and the personnel on site. The training will be carried out either by the CME or by a CDM consultant. The trainees will be informed on the implications and obligations due to a CDM status: for instance in terms of data handling, metering, calibration, certification etc.

(ii) Measures for continual improvements of the PoA management

The PoA management will seek for continuous improvements such as:

- Allowing flexibility on the development of the PoA
- Ensuring a continuous update of the most recent UNFCCC guidelines
- Appointing CDM experts for inclusions of CPAs and/or training of personnel (A training plan will be implemented in case relevant personal and/or CPA implementers would require training on CDM related issues)

Please refer to the operational and management arrangement specification for more details.[25]

A.4.5. Public funding of the programme of activities:

The proposed PoA will not receive any public funds resulting from official development assistance from Parties included in Annex I to the Convention.

[25] 'Operational and management arrangements established by the coordinating/managing entity for the implementation of the PoA "Programme for Grid Connected Renewable Energy in the Mediterranean Region"', available to the DOE for validation

SECTION B. Duration of the programme of activities

B.1. Starting date of the programme of activities:

The start date of the PoA is the date of registration. It is anticipated that the start date of the PoA will be 31/12/2012.

B.2. Length of the programme of activities:

28 years

C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:

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

The PoA consists of individual renewable energy project activities potentially implemented in different geographical regions throughout the boundary of the PoA.

C.2. Documentation on the analysis of the environmental impacts, including transboundary impacts:

The EIA or environmental analysis as required by the host country will be done at a CPA level. All CPAs within the PoA will consist of renewable energy facilities. By replacing electricity from fossil fuel based power plants, these projects will directly contribute to reduce greenhouse gas (GHG) emissions. The positive environmental benefits of the implemented CPAs at a PoA level may include:

- Decreased air pollution linked to the use of the fossil fuels;
- Displacement of fossil fuels and GHG emission reductions; and
- Decreased dependency on fossil fuels.

C.3. Please state whether in accordance with the host Party laws/regulations, an environmental impact assessment is required for a typical CPA, included in the programme of activities (PoA),:

The requirement of an environmental impact assessment (EIA) by the host country will be determined at a CPA level, as national requirements vary from country to country.

SECTION D. Stakeholders' comments

D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:

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

Each CPA operates within a geographically defined boundary and within the host country(-ies). For this reason local stakeholder consultation is done on a CPA level to ensure that the stakeholders actually affected by the project activity are adequately informed and consulted.

D.2. Brief description how comments by local stakeholders have been invited and compiled:

Local Stakeholder consultation is performed at CPA level.

D.3. Summary of the comments received:

Not applicable

D.4. Report on how due account was taken of any comments received:

Not applicable

SECTION E. Application of a baseline and monitoring methodology

This section shall demonstrate the application of the baseline and monitoring methodology to a typical - CPA. The information defines the PoA specific elements that shall be included in preparing the PoA specific form used to define and include a CPA in this PoA (PoA specific CDM-CPA-DD).

E.1. Title and reference of the approved baseline and monitoring methodology applied to each CPA included in the PoA:

Applied methodology:

- ACM0002, version 12.3.0: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"[26]

Related tools:

- "Tool to calculate the emission factor for an electricity system", Version 2.2.1[27]
- "Tool for the demonstration and assessment of additionality", Version 6.0.0[28]
- "Combined tool to identify the baseline scenario and demonstrate additionality", Version 4.0.0[29]
- "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", Version 02[30]

[26] http://cdm.unfccc.int/methodologies/DB/UB3431UT9I5KN2MUL2FGZXZ6CV71LT

[27] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf/history_view

[28] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v6.0.0.pdf/history_view

[29] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v4.0.0.pdf/history_view

As the CPA is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is pre-defined according to ACM0002, and hence the "Combined tool to identify the baseline scenario and demonstrate additionality" is not required and applied. Additionally, the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" is not applicable to wind and solar PV CPAs, as for these energy projects according to ACM002, ver. 12.3.0 the project emissions are deemed zero.

E.2. Justification of the choice of the methodology and why it is applicable to each CPA:

This section shall demonstrate the application of the baseline and monitoring methodology to a typical - CPA.

The CPAs included in the PoA are grid-connected wind or solar power projects. Details of the wind and solar power technologies applied in a typical CPA are a provided in A.4.2.1. Version 12.3.0 of ACM0002 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 plant(s). The CPAs to be included in this PoA are greenfield projects (option 'a'). More details of the comparison of the project's characteristics and the applicability criteria as specified in version 12.3.0 of ACM0002 are given in **Table 3**.

The PoA is applying the monitoring methodology ACM0002 that does not use statistical sampling. All CPAs will be monitored and verified.

Table 3: Comparison of CPAs' characteristics and applicability conditions of ACM0002, version 12.3.0

Applicability conditions in version 12.3.0 of ACM0002	Characteristics of the CPA	Applicability criterion met?
The 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).	The CPA is a grid-connected renewable power generation project activity and falls under option (a) mentioned above (greenfield).	Applicable and met
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, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit	The CPA is the installation of the following type: wind power, solar PV, solar CSP. The CPA is grid-connected and falls under option (a) mentioned above.	Applicable and met
In the case of capacity additions, retrofits or	The CPA is the installation of the	Not

[30] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf/history_view

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	following type: wind power, solar PV, solar CSP. The CPA is grid-connected and falls under option (a) mentioned above. Hence, conditions to cases of capacity additions, retrofits or replacements do not apply to the CPAs under the PoA.	Applicable
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 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.	The CPA is the installation of the following type: wind power, solar PV, solar CSP. The CPA is grid-connected and falls under option (a) mentioned above. Hence, conditions to cases of hydro power plants do not apply to the CPAs under the PoA	Not Applicable
In case of hydro power plants using multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m^2 after the implementation of the project activity all of the […] conditions must apply, that are listed on page 3 of the methodology.	The CPAs are the installation of the following type: wind power, solar PV, solar CSP. The CPA is grid-connected and falls under option (a) mentioned above. Hence, conditions to cases of hydro power plants do not apply to the CPAs under the PoA	Not Applicable
The methodology is not applicable to the following: • Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity,	The CPA is the installation of the following type: wind power, solar PV, solar CSP. The CPA is grid-connected and falls under option (a) mentioned above. Hence, the	Met

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 new single reservoir or in the increase in an existing single reservoir where the power density of the power plant is less than 4 W/m^2	CPA does not comprise any (1) switching from fossil fuels to renewable sources, (2) biomass fired power plants, (3) hydro power plants and consequently the application criteria is not applicable.	
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"	The CPA is the installation of the following type: wind power, solar PV, solar CSP. The CPA is grid-connected and falls under option (a) mentioned above. Hence, conditions to cases of capacity additions, retrofits or replacements do not apply to the CPAs under the PoA.	Not Applicable
In addition, the applicability conditions included in the tools referred to in the methodology apply, which are: • "Tool to calculate the emission factor for an electricity system", Version 2.2.1[31] - Applicable for project activity that substitutes grid electricity - If Option II (consideration of off-grid power plants) of Step 2 is applied, the total capacity of off-grid power plants (in MW) should be at least 10% of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10% of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity. - In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I	Applicability conditions according to the "Tool to calculate the emission factor for an electricity system": • The CPA is grid connected and substitutes grid electricity; • Justify if Option 2 is used and corresponding conditions are met in the CPA-DD; • The project electricity system is identified according to the tool on CPA level and defined in the CPA-DD, and shall not be in an Annex 1 country. Applicability conditions according to the "Tool for the demonstration and assessment of additionality": • No additional applicability conditions apply	Applicable and met

[31] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf/history_view

country • "Tool for the demonstration and assessment of additionality", Version 6.0.0[32] - Provides a general framework for demonstrating and assessing additionality and is applicable to a wide range of project types. - Since the PoA is applying ACM002, no further adjustments are required and no additional applicability conditions apply. For solar CSP projects in addition the following tool applies: • "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", Version 02[33] - The tool can be used in cases where CO_2 emissions from fossil fuel combustion are calculated based on the quantity of fuel combusted and its properties. Methodologies using this tool should specify to which combustion process *j* this tool is being applied.	Applicability conditions according to the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion": • ACM0002 defines the combustion process as follows: For geothermal and 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 ($PE_{FF,y}$). The CPA is considering the project emission accordingly.	

As all CPA are the installation of a new grid-connected renewable power plant/unit, the baseline scenario is pre-defined according to ACM0002, and hence the "Combined tool to identify the baseline scenario and demonstrate additionality" is not required and applied.

This comparison shows clearly that of ACM0002, version 12.3.0., is applicable to the proposed PoA and allows wind power, solar PV and solar CSP CPAs to be included.

E.3. Description of the sources and gases included in the CPA boundary

According to ACM0002, version 12.3.0, the spatial extent of the project boundary includes the project activity and all power plants connected physically to the electricity system[34] that the CDM project power plant (CPA) is connected to.

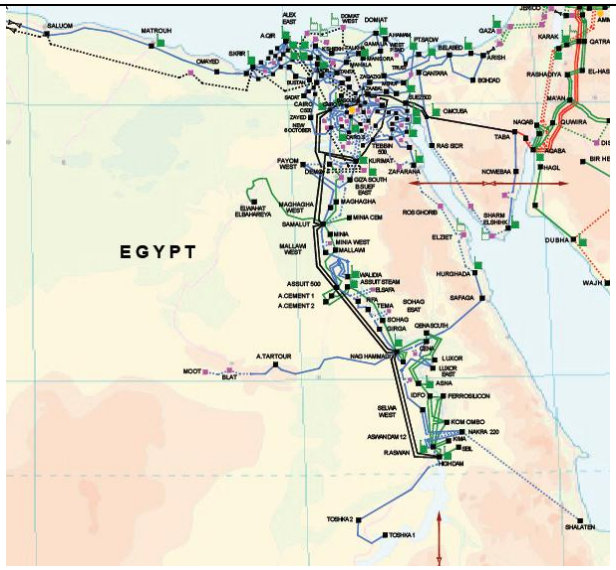
[32] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v6.0.0.pdf/history_view

[33] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf/history_view

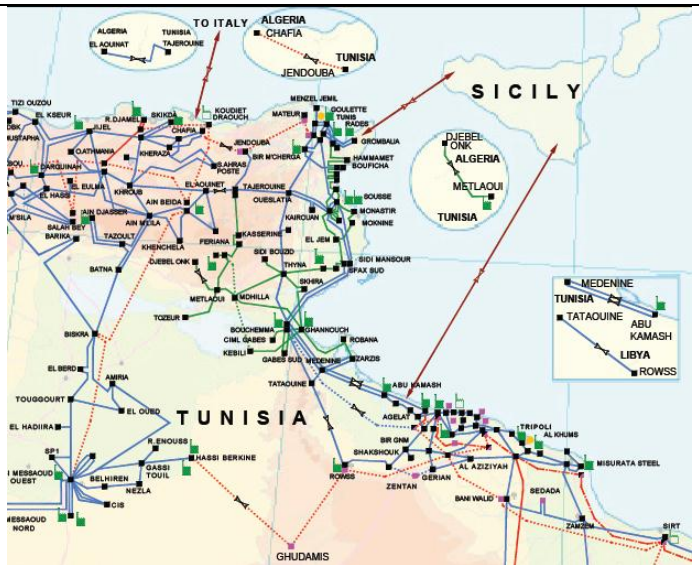
[34] Refer to the latest approved version of the "Tool to calculate the emission factor for an electricity system" for definition of an electricity system.

The transmission networks of the host countries are illustrated in the following figure.

Figure 8: Transmission network in the host countries

Egypt	
Lebanon	
Morocco	

Tunisia

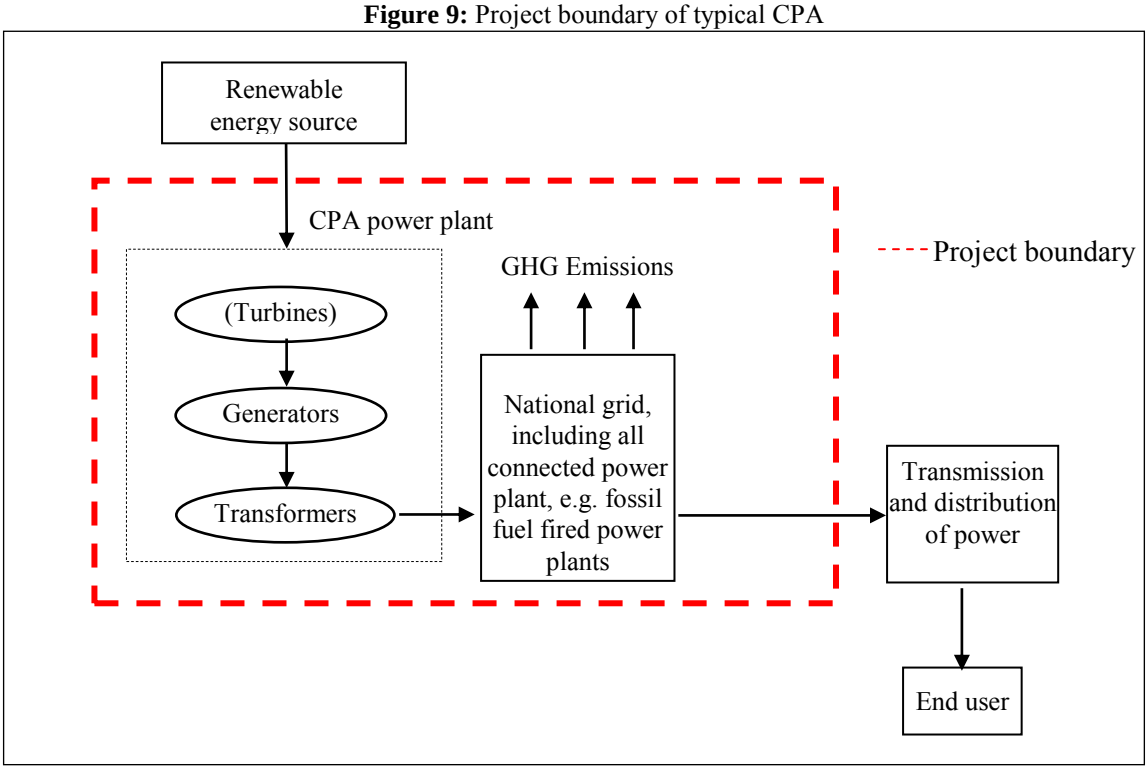


Source: Euro-Mediterranean Energy Market Integration Project (MED-EMIP)[35]

The flow diagram of a typical CPA boundary is shown in **Figure 9**.

[35] http://www.medemip.eu/Calc/FM/MED-EMIP/AUPTDE/Electicity_Interconnection_Maps/Arab_World.pdf

Figure 9: Project boundary of typical CPA



The GHGs and emission sources included in the project boundary are shown in Table 4.

Table 4: Sources and gases included in or excluded from the project boundary

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	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 scenario	For geothermal power plants, fugitive emissions of CH_4 and CO_2 from non-condensable gases contained in geothermal steam	CO_2	No	Not applicable under the CPAs.
		CH_4	No	Not applicable under the CPAs.
		N_2O	No	Not applicable under the CPAs.
	CO_2 emissions from combustion of fossil fuels for electricity generation in solar thermal power plants and geothermal power plants	CO_2	Yes	Main emission source. Applicable for CPAs employing solar thermal power plants only.
		CH_4	No	Minor emission source. Applicable for CPAs employing solar thermal power plants only.
		N_2O	No	Minor emission source. Applicable for CPAs employing solar thermal power plants only.
	For hydro power plants, emissions of CH_4 from the	CO_2	No	Not applicable under the CPAs.
		CH_4	No	Not applicable under the CPAs

	reservoir	N_2O	No	Not applicable under the CPAs

E.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

Identification of the baseline scenario

The baseline scenario for each CPA will be identified among the three alternatives described in the methodology, ACM0002 version 12.3.0.

As the CPAs will be the installation of a new grid-connected wind power plant/unit, according to ACM0002, the baseline scenario is 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".

E.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the CPA being included as registered PoA (assessment and demonstration of additionality of CPA): >>

Each CPA will be a grid-connected renewable energy generation project activity according to ACM0002 version 12.3.0. Under the PoA, the CPA project activity is the installation of a new grid-connected renewable energy plant/unit, therefore the baseline scenario is *the electricity delivered to the grid by the project activity that 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"*.

E.5.1. Assessment and demonstration of additionality for a typical CPA:

Additionality shall be demonstrated by establishing that in the absence of CDM, none of the implemented CPAs would occur. The proof of additionality is based on the eligibility criteria as outlined above and considering the latest 'STANDARD FOR DEMONSTRATION OF ADDITIONALITY, DEVELOPMENT OF ELIGIBILITY CRITERIA AND APPLICATION OF MULTIPLE METHODOLOGIES FOR PROGRAMME OF ACTIVITIES', Version 01.0.[36] The actual proof of additionality following the methodology ACM0002 and the "Tool for the demonstration and assessment of additionality" will be done on CPA level as follows.

(a) Identification of alternatives to the CPA;
(b) Investment analysis to determine that the CPA is either: 1) not the most economically or financially attractive, or 2) not economically or financially feasible;

[36] EB 65, Annex 3

(c) Barriers analysis; and
(d) Common practice analysis.

The currently latest version, version 06.0.0, of the additionality tool includes the following steps:

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

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

According to the CDM Validation and Verification Manual (EB55, Annex 01, Version 01.2, § 105), "the PDD shall identify credible alternatives to the project activity in order to determine the most realistic baseline scenario, unless the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario and no further analysis is required".[37]

According to methodology ACM0002 version 12.3.0, in cases where the project activity/CPA is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is defined as follows:

> *"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"."*

Hence, in accordance with methodology ACM0002, version 12.3.0, and the "Tool to calculate the emission factor for an electricity system", Version 2.2.1, baseline emissions are equal to power generated by the project activity and delivered to the grid, multiplied by the baseline emission factor. The baseline emission factor is equal to the combined margin (CM): a weighted average of the operating margin (OM) emission factor and the build margin (BM) emission factor.

Therefore, no further analysis of the alternatives to the project activity is required.

Sub-step 1b: Consistency with mandatory laws and regulations
The alternative, electricity delivered to the grid by the CPA would have otherwise been generated by the operation of grid-connected power plants, is in compliance with all existing applicable legal and regulatory requirements.
"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 (CPA) is not:
(a) The most economically or financially attractive; or

[37] Clean Development Mechanism Validation and Verification Manual or EB55 Annex 1 - Clean Development Mechanism Verification and Validation Manual (version 01.2)

(b) Economically or financially feasible, without the revenue from the sale of CERs.

The latest version of the "Guidelines on the assessment of investment analysis", version 05[38], is taken into account when applying this step.

Sub-step 2a: Determine appropriate analysis method

Three options can be applied for the investment analysis: the simple cost analysis, the investment comparison and the benchmark analysis.

The latest version of the "*Tool for the demonstration and assessment of additionality"* states:

> "If the CDM project activity and the alternatives identified in Step 1 generate no financial or economic benefits other than CDM related income, then apply the simple cost analysis (Option I). Otherwise, use the investment comparison analysis (Option II) or the benchmark analysis (Option III)".

The simple cost analysis is not applicable for the proposed CPAs because the project activities will produce economic benefit other than the CDM related income, notably from electricity sale.

The Guidelines on the assessment of investment analysis, version 05 (EB 62, Annex 5)[39], in paragraph 19 state *"If the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same (or substitute) products or services, a benchmark analysis is not appropriate and an investment comparison analysis shall be used. If the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate."*

The investment comparison analysis (Option II) is not applicable to the project because the alternative of the project is "equivalent electricity service provided by the grid", which is not a single project. Hence, the investment comparison analysis (Option II) cannot be applied and the benchmark analysis (Option III) shall be used.

Sub-step 2b: Option III. Apply benchmark analysis

Here, the financial/economic indicator, such as IRR, most suitable for the project type and decision context is to be identified.

The GUIDELINES ON THE ASSESSMENT OF INVESTMENT ANALYSIS (EB 62, Annex 5)[40], in paragraph 13 states *"In the cases of projects which could be developed by an entity other than the project participant the benchmark should be based on parameters that are standard in the market."*

[38] Source: http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf

[39] Source: http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf

[40] Source: http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf

When applying Option III, the financial/economic analysis shall be based on parameters that are standard in the market, considering the specific characteristics of the project type, but not linked to the subjective profitability expectation or risk profile of a particular project developer. Only in the particular case where the project activity can be implemented by the project participant, the specific financial/economic situation of the company undertaking the project activity can be considered.
Discount rates and benchmarks will be derived from:

(a) Government bond rates, increased by a suitable risk premium to reflect private investment and/or the project type, as substantiated by an independent (financial) expert or documented by official publicly available financial data;

(b) Estimates of the cost of financing and required return on capital (e.g. commercial lending rates and guarantees required for the country and the type of project activity concerned), based on bankers views and private equity investors/funds required return on comparable projects;

(c) A company internal benchmark (weighted average capital cost of the company), only in the particular case referred to above in paragraph 5. The project developers shall demonstrate that this benchmark has been consistently used in the past, i.e. that project activities under similar conditions developed by the same company used the same benchmark;

(d) Government/official approved benchmark where such benchmarks are used for investment decisions;

(e) Any other indicators, if the project participants can demonstrate that the above Options are not applicable and their indicator is appropriately justified.

If applicable to the individual CPA, the default values for the expected return on equity defined in the appendix of the "Guidelines on the assessment of investment analysis"[41] shall be used. The expected return on equity is composed of four elements: (a) a risk free rate of return; (b) an equity risk premium; (c) a risk premium for the host country; and (d) an adjustment factor to reflect the risk of projects in different sectoral scopes. All values are expressed in real terms.

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

Here the suitable financial indicator for the proposed CDM project activity is calculated, including all relevant costs (including, for example, the investment cost, the operations and maintenance costs), and revenues (excluding CER revenues, but possibly including *inter alia* subsidies/fiscal incentives,[42] ODA, etc., where applicable), and, as appropriate, non-market cost and benefits in the case of public investors if this is standard practice for the selection of public investments in the host country.

The investment analysis is presented in a transparent manner providing all the relevant assumptions, preferably in the CPA-DD, or in separate annexes to the CPA-DD, so that a reader can reproduce the analysis and obtain the same results. All critical techno-economic parameters and assumptions (such as

[41] Guidelines on the assessment of investment analysis, version 05, EB 62, Annex 5

[42] See EB guidance on the consideration of national/local/sectoral policies and measures for the baseline setting. The Executive Board at its 22nd meeting (Annex 3) clarified the treatment of national and sectoral policies. See also Information note on the implementation of E+/E- in the context of projects on the agenda of the fifty-third meeting of the CDM Executive Board

capital costs, fuel prices, lifetimes, and discount rate or cost of capital) are provided, justifying assumptions in a manner that can be validated by the DOE. In calculating the financial/economic indicator, the project's risks can be included through the cash flow pattern, subject to project-specific expectations and assumptions (e.g. insurance premiums can be used in the calculation to reflect specific risk equivalents).

Assumptions and input data for the investment analysis shall not differ across the project activity and its alternatives, unless differences can be well substantiated.

As per the "CLARIFICATIONS ON THE CONSIDERATION OF NATIONAL AND/OR SECTORAL POLICIES AND CIRCUMSTANCES IN BASELINE SCENARIOS" (EB 22, Annex 3 para 7b)[43], the EB notes "National and/or sectoral policies or regulations under paragraph 6 (b) that have been implemented since the adoption by the COP of the CDM M&P (decision 17/CP.7, 11 November 2001) need not be taken into account in developing a baseline scenario (i.e. the baseline scenario could refer to a hypothetical situation without the national and/or sectoral policies or regulations being in place)". Thus, additional income generated from any renewable energy specific tariffs (e.g. feed-in tariff for promoting renewable energies) approved by regulatory bodies need not be taken into account when calculating the project revenues, if the corresponding regulation was enforced after November 2001.

The CPA-PDD shall present a clear comparison of the financial indicators. If the CPA has a less favourable indicator (e.g. lower IRR) than the benchmark, then the CDM project activity cannot be considered as financially attractive.

Sub-step 2d: Sensitivity analysis

A sensitivity analysis is done that shows whether the conclusion regarding the financial/economic attractiveness is robust to reasonable variations in the critical assumptions. The investment analysis provides a valid argument in favour of additionality only if it consistently supports (for a realistic range of assumptions) the conclusion that the project activity is unlikely to be the most financially/economically attractive (as per Step 2c) or is unlikely to be financially/economically attractive (as per Step 2c).

The objective of the sensitivity analysis is to quantify the impact of reasonable variations of critical variables in the financial indicator (e.g. IRR) of the proposed project activity:

According to the "Guidance on the Assessment of Investment Analysis" (version 5)[44] variables that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation.

At least the typical main variables are to be considered in the sensitivity analysis:

1. Total investment cost of the CPA
2. Power sale prices and or other sales related incomes (e.g. capacity and energy sales, feed-in-tariffs, sales of renewable energy certificates (RECs))

[43] EB Clarification: http://cdm.unfccc.int/EB/022/eb22_repan3.pdf

[44] http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf

3. Power generation output

The financial analysis shall be performed by modifying each of the parameters by at least up to +/-10%, and assessing the impact on the financial indicator (without revenues from selling CERs).

Outcome of Step 2: If after the sensitivity analysis it is concluded that the proposed CPA is unlikely to be the most financially/economically attractive or is unlikely to be financially/economically attractive, then the CPA-DD shall proceed to Step 4 (Common practice analysis).[45]

Otherwise, unless barrier analysis below is undertaken and indicates that the proposed CPA faces barriers that do not prevent at least one alternative from occurring, the CPA is considered not additional.

Step 3: Barrier Analysis

This step serves to identify barriers and to assess which alternatives are prevented by these barriers. The latest approved version of the "Guidelines for objective demonstration and assessment of barriers", available on the UNFCCC website, shall be taken into account when applying this step.

If barrier analysis is carried out the CPA-DD will determine whether the proposed CPA faces barriers that:

- (3a) Prevent the implementation of this type of proposed project activity; and
- (3b) Do not prevent the implementation of at least one of the alternatives, if the CPA is not "first of its kind" according to the definition provided in paragraph 40(c)(i) of the "Tool for the demonstration and assessment of additionality", Version 6.0.0.

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 activity undertaken without being registered/included under this PoA. Typical barriers include: investment barriers, technological barriers, political barriers, and barriers due to prevailing practice. The latest version (at the time of drafting the CPA-DD) of "Guidelines for objective demonstration and assessment of barriers"[46] shall be used to demonstrate applicable barriers to the CPA.

For barriers other than barriers due to CPA being "first of its kind" as defined in paragraph 40(c)(i), *if the CDM does not alleviate the identified barriers that prevent the proposed project activity from occurring, then the project activity is not additional.*

Use the following Sub-steps:

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

[45] If the CPA implementers so wish, they may apply the Step 3 (Barrier analysis) as well.

[46] Guidelines for barriers: http://cdm.unfccc.int/Reference/Guidclarif/meth/meth_guid38.pdf

Establish that there are realistic and credible barriers that would prevent the implementation of the proposed CPA from being carried out if the CPA was not registered as a CDM activity / included in a PoA. 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 CPA 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 CPA, as demonstrated by relevant scientific literature or technology manufacturer information;

(d) The particular technology used in the proposed CPA is not available in the relevant region.

3. Barriers due to prevailing practice, *inter alia*:

The CPA is the "first of its kind".

(a) For the measures identified under paragraph 6 of the "Tool for the demonstration and assessment of additionality", Version 6.0.0, a proposed CPA is the First-of-its-kind in the applicable geographical area if :

(ii) 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

(iii) Project participants selected a crediting period for the CPA that is "a maximum of 10 years with no option of renewal";

(b) For the measures identified under paragraph 6, a proposed CPA that was identified as the First-of-its-kind CPA is additional and Sub-step 3 b of the "Tool for the demonstration and assessment of additionality", Version 6.0.0 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 of the "Tool for the demonstration and assessment of additionality", Version 6.0.0 applies.

Outcome of Step 3a: Identified barriers that may prevent one or more alternative scenarios to occur or conclusion that the CPA is additional.

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

Step 4. Common Practice Analysis

Unless the proposed project type has demonstrated to be first-of-its kind (according to Sub-step 3a), and for measures different from those listed in paragraph 6 of the "Tool for the demonstration and assessment of additionality", Version 6.0.0., the above generic additionality tests shall be complemented with an analysis of the extent to which the proposed project type (e.g. technology or practice) has already diffused in the relevant sector and region. This test is a **credibility check** to complement the investment analysis (Step 2) or barrier analysis (Step 3). Identify and discuss the existing common practice through the following steps as described in the "Tool for the demonstration and assessment of additionality", Version 6.0.0. and the "Guidelines on Common Practice" (currently version 1.0 as of EB 63, Annex 12)[47]:

As the PoA and the corresponding CPAs fall under the measures listed under paragraph 6 of the "Tool for the demonstration and assessment of additionality", Version 6.0.0., defined as

[47] Source: http://cdm.unfccc.int/Reference/Guidclarif/meth/meth_guid44.pdf

(b) Switch of technology with or without change of energy source (including energy efficiency improvement as well as use of renewable energies),

the CPA-DDs shall apply the following steps for the common practice analysis.

For measures that are listed in paragraph 6:

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

Based on the installed capacity (MW) of the proposed CPA, the applicable output range will be calculated at +/- 50% (in MW) of the proposed 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. Note their number N_{all}. Registered CDM project activities and projects activities undergoing validation shall not be included in this step.

CPA-DD will provide a database of projects in the applicable geographical area that are operational prior to the start date of the proposed CPA that lie within the output range as defined in Step 1. The database will include the installed capacity of individual projects and will be cross checked with the UNFCCC CDM pipeline to identify the registered projects. The registration number of the projects will be noted in the database and excluded from the calculation of N_{all}.

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}

'Different technologies' as defined under paragraph 8 the "Tool for the demonstration and assessment of additionality", Version 6.0.0. and paragraph 4 of the "Guideline for Common Practice Analysis", Version 1.0 will be applied to the database to identify projects/plants that apply technologies not concurrent with the proposed CPA. Other CDM project activities (project activities which have been published on the UNFCCC website for global stakeholder consultation as part of the validation process and/or projects that have acquired host country approval for the purpose of pursuing CDM) will not be included for the purpose of defining 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.

Once N_{all} and N_{diff} have been identified, the factor shall be calculated and CPA will be deemed as a "common practice" in the geographical area if

(a) the factor F, is greater than 0.2 and
(b) the value of $N_{all} - N_{diff}$ is greater than 3.

If similar activities are widely observed and commonly carried out, it calls into question the claim that the proposed CPA is financially unattractive or faces barriers. Therefore, if similar activities are identified as described above, then it is necessary to demonstrate why the existence of these activities does not contradict the claim that the proposed CPA is financially/economically unattractive or subject to

barriers. This can be done by comparing the proposed CPA to the other similar activities, and pointing out and explaining essential distinctions between them that explain why the similar activities enjoyed certain benefits that rendered it financially/economically attractive (e.g., subsidies or other financial flows) and which the proposed CPA cannot use or did not face the barriers to which the proposed CPA is subject. If necessary data/information of some similar projects are not accessible for PPs to conduct this analysis, such projects can be excluded from this analysis. In case similar projects are not accessible, the CPA-DD should include justification about non-accessibility of data/information.

Essential distinctions may include a serious change in circumstances under which the proposed CPA will be implemented when compared to circumstances under which similar projects were carried out. For example, new barriers may have arisen, or promotional policies may have ended, leading to a situation in which the proposed CPA would not be implemented without the incentive provided by the CDM. The change must be fundamental and verifiable.

E.5.2. Key criteria and data for assessing additionality of a CPA:

Each CPA is expected to assess and demonstrate additionality using an investment analysis approach following the approach described in the latest "*Tool for the demonstration and assessment of additionality*" as described in A.4.3 (v) and E.5.1.

E.6. Estimation of Emission reductions of a CPA:

E.6.1. Explanation of methodological choices, provided in the approved baseline and monitoring methodology applied, selected for a typical CPA:

Each CPA under the PoA will use ACM0002 "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources*" version 12.3.0.

The methodology is applicable for CPAs 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 plant(s).

Every CPA under the PoA will consist of a renewable energy project activity that is grid-connected and falls under option (a) mentioned above. A grid-connected renewable power generation CPA may be one of following:

- wind power plant/unit,
- solar power plant/unit (solar PV, CPV, CSP)

E.6.2. Equations, including fixed parametric values, to be used for calculation of emission reductions of a CPA:

The typical CPA is a renewable energy project, i.e. wind, solar PV, CPV or CSP, connected to a national or/sub-national grid. Emission reductions are calculated in accordance with the approved consolidated

baseline methodology of ACM0002, version 12.3.0, along with the "Tool to calculate the emission factor for an electricity system" (version 02.2.1), as follows:

Project emissions (PE_y)

For most renewable power generation project activities, including solar PV and wind, $PE_y = 0$. However, some project activities may involve project emissions that can be significant, e.g. CPS projects. These emissions shall be accounted for by using the following equation:

For wind and solar PV CPAs:

$$PE_y = 0 \quad \textbf{(1)}$$

Where:
PE_y = Project emissions in year *y* (tCO_2e)

For solar CPS CPAs:

$$PE_y = PE_{FF,y} \quad \textbf{(2)}$$

Where:
PE_y = Project emissions in year *y* (tCO_2e)
$PE_{FF,y}$ = Project emissions from fossil fuel consumption in year *y* (tCO_2)

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

Fossil Fuel Combustion ($PE_{FF,y}$)

For solar thermal (CSP) 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".[48]

According to the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", Version 02, $PE_{FF,y}$ corresponds to $PE_{FC,j,y}$ in the tool and process *j* corresponds to all sources of fuel combustion.

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:

$$PE_{FC,j,y} = \sum_i FC_{i,i,y} \times COEF_{i,y} \quad \textbf{(3)}$$

Where:
$PE_{FC,j,y}$ = Are the CO_2 emissions from fossil fuel combustion in process *j* during the year y

[48] Currently Version 02.

(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 $COEF_{i,y}$ can be calculated using one of the following two Options, depending on the availability of data on the fossil fuel type *i*, as follows:

Option A: The CO_2 emission coefficient $COEF_{i,y}$ is calculated based on the chemical composition of the fossil fuel type *i*, using the following approach:

If $FC_{i,j,y}$ is measured in a mass unit: $COEF_{i,j} = w_{C,i,y} \times 44/12$ **(4)**

If $FC_{i,j,y}$ is measured in a volume unit: $COEF_{i,j} = w_{C,i,y} \times \rho_{i,y} \times 44/12$ **(5)**

Where:

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

$w_{C,j,y}$ = Is the weighted average mass fraction of carbon in fuel type *i* in year y (tC/mass unit of the fuel);

$\rho_{j,y}$ = Is the weighted average density of fuel type *i* in year y (mass unit/volume unit of the fuel)

i = Are the fuel types combusted in process *j* during the year *y*

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:

$$COEF_{i,j} = NCV_{i,y} \times EF_{CO2,i,y} \quad \textbf{(6)}$$

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);

$EF_{CO2,i,y}$ = 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*

Option A should be the preferred approach, if the necessary data is available

Baseline emissions (BE_y)

Baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the CPA. 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:

$$BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y} \quad \textbf{(7)}$$

Where:

BE_y = Baseline emissions in year y (tCO_2e)
$EG_{PJ,y}$ = 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 latest version of the "Tool to calculate the emission factor for an electricity system" (tCO_2/MWh)

Calculation of $EG_{PJ,y}$
Since the typical CPA is the installation of a new grid-connected renewable wind power plant/unit at a site where no renewable power plant was operated prior to the implementation of the CPA, $EG_{PJ,y}$ is calculated as follows:

$$EG_{PJ,y} = EG_{facility,y} \quad \textbf{(8)}$$

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/yr)

Calculation of $EF_{grid,CM,y}$
According to the "Tool to calculate the emission factor for an electricity system" (version 2.2.1) the baseline emission factor ($EF_{grid,CM,y}$) is calculated as combined margin (CM), consisting of the combination of the operating margin (OM) and the build margin (BM) factors. OM and BM are calculated ex-ante based on official data source as public available and will be fixed during the first crediting period. See calculation and procedures provided in the "Tool to calculate the emission factor for an electricity system" (version 2.2.1) for determining the grid emission factor as described in details in below.

Procedures provided in the "Tool to calculate the emission factor for an electricity system" (version 2.2.1) for determining the grid emission factor are applied as follows:

STEP 1. Identify the relevant electricity systems.
STEP 2. Choose whether to include off-grid power plants in the project electricity system (optional).
STEP 3. Select a method to determine the operating margin (OM).
STEP 4. Calculate the operating margin emission factor according to the selected method.
STEP 5. Calculate the build margin (BM) emission factor.
STEP 6. Calculate the combined margin (CM) emission factor.

Step 1: Identify the relevant electricity systems

For determining the electricity emission factors, a **project electricity system** is defined by the spatial extent of the power plants that are physically connected through transmission and distribution lines to the CPA (e.g. the renewable power plant location or the consumers where electricity is being saved) and that can be dispatched without significant transmission constraints.

According to the "Tool to calculate the emission factor for an electricity system" (version 2.2.1), the emission factor for imports from connected electricity systems located in other countries is 0 tCO_2/MWh. Hence, the inclusion of the imported energy will only affect the total amount of electricity. Additionally, electricity exports have not been excluded from the total electricity generation.

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

Option I ("Only grid power plants are included in the calculation") has been chosen as corresponds to the procedure contained in earlier versions of the tool.

Step 3: Select a method to determine the operating margin (OM)

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods:

(a) Simple OM; or
(b) Simple adjusted OM; or
(c) Dispatch data analysis OM; or
(d) Average OM.

The simple OM method (option a) can only be used if low-cost/must-run resources[49] constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production.

The dispatch data analysis (option c) cannot be used if off-grid power plants are included in the project electricity system as per Step 2 above.

For the Simple OM, the Simple Adjusted OM and the Average OM, the emissions factor can be calculated using either of the two following data vintages:

• *Ex ante* option: If the *ex ante* option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. For grid power plants, use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CPA-DD to the DOE for validation/inclusion. For off-grid power plants, use a single calendar year within the five most recent calendar years prior to the time of submission of the CPA-DD for validation/inclusion.

• *Ex post* option: If the *ex post* option is chosen, the emission factor is determined for the year in which the CPA displaces grid electricity, requiring the emissions factor to be updated annually during monitoring. If the data required to calculate the emission factor for year *y* is usually only available later than six months after the end of year *y*, alternatively the emission factor of the previous year *y-1* may be used. If the data is usually only available 18 months after the end of year *y*, the emission factor of the year proceeding the previous year *y-2* may be used.

[49] Low-cost/must-run resources are defined as power plants with low marginal generation costs or power plants that are dispatched independently of the daily or seasonal load of the grid. They typically include hydro, geothermal, wind, low-cost biomass, nuclear and solar generation. If coal is obviously used as must-run, it should also be included in this list, i.e. excluded from the set of plants.

The same data vintage (*y*, *y-1* or *y-2*) should be used throughout all crediting periods.

The data vintage chosen should be documented in the CPA-DD and should not be changed during the crediting period.

Power plants registered as CDM project activities should be included in the sample group that is used to calculate the operating margin if the criteria for including the power source in the sample group apply.

Provided the data availability is given in the host countries the Simple OM shall preferably be used by the CPA. For the individual CPA the *ex-ante* data vintage shall be based on the latest data available when applying the Simple OM calculation. In case that during the length of the programme of activities the Simple OM will become not applicable anymore due to the defined conditions above, the CPA shall apply one of the remaining option provided by the "Tool to calculate the emission factor for an electricity system".

Step 4: Calculate the operating margin emission factor according to the selected method

(a) Simple OM

The Simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units.

The Simple OM may be calculated by one of the following two options:

- Option A: Based on the net electricity generation and a CO_2 emission factor of each power unit;[50]

  or

- Option B: Based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

Option B can only be used if:

(a) The necessary data for Option A is not available; and
(b) Only nuclear and renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is known; and
(c) Off-grid power plants are not included in the calculation (i.e., if Option I has been chosen in Step 2).

Option A - Calculation based on average efficiency and electricity generation of each plant

[50] Power units should be considered if some of the power units at the site of the power plant are low-cost/must-run units and some are not. Power plants can be considered if *all* power units at the site of the power plant belong to the group of low-cost/must-run units or if *all* power units at the site of the power plant do *not* belong to the group of low-cost/must-run units.

Under this option, the Simple OM emission factor is calculated based on the net electricity generation of each power unit and an emission factor for each power unit, as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} \quad \textbf{(9)}$$

Where:

$EF_{grid,OMsimple,y}$ = Simple operating margin CO_2 emission factor in year *y* (tCO_2/MWh)
$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)
$EF_{EL,m,y}$ = CO_2 emission factor of power unit *m* in year *y* (tCO_2/MWh)
m = All power units serving the grid in year *y* except low-cost / must-run power units
y = The relevant year as per the data vintage chosen in Step 3

Determination of $EF_{EL,m,y}$
The emission factor of each power unit *m* should be determined as follows:

- **Option A1**. If for a power unit m data on fuel consumption and electricity generation is available, the emission factor ($EF_{EL,m,y}$) should be determined as follows:

$$EF_{EL,m,y} = \frac{\sum_i (FC_{i,m,y} \cdot NCV_{i,y} \cdot EF_{CO2,i,y})}{EG_{m,y}} \quad \textbf{(10)}$$

Where:

$EF_{EL,m,y}$ = CO_2 emission factor of power unit *m* in year *y* (t CO_2/MWh)
$FC_{i,m,y}$ = Amount of fossil fuel type *i* consumed by power unit m in year y (Mass or volume unit)
$NCV_{i,y}$ = Net calorific value (energy content) of fossil fuel type *i* in year y (GJ/mass or volume unit)
$EF_{CO2,i,y}$ = CO_2 emission factor of fossil fuel type *i* in year y (t CO_2/GJ)
$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh))
m = All power units serving the grid in year y except low-cost/must-run power units
i = All fossil fuel types combusted in power unit *m* in year *y*
y = The relevant year as per the data vintage chosen in Step 3

- **Option A2**. If for a power unit *m* only data on electricity generation and the fuel types used is available, the emission factor should be determined based on the CO_2 emission factor of the fuel type used and the efficiency of the power unit, as follows:

$$EF_{EL,m,y} = \frac{EF_{CO2,m,i,y} \times 3.6}{\eta_{m,y}} \quad \textbf{(11)}$$

$EF_{EL,m,y}$ = CO_2 emission factor of power unit *m* in year *y* (t CO_2/MWh)

$EF_{CO2,m,i,y}$	=	CO_2 emission factor of fossil fuel type *i* in year y (t CO_2/GJ)
$\eta_{m,y}$	=	Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh))
m	=	All power units serving the grid in year y except low-cost/must-run power units
i	=	All fossil fuel types combusted in power unit *m* in year *y*
y	=	The relevant year as per the data vintage chosen in Step 3

- **Option A3**. If for a power unit m only data on electricity generation is available, an emission factor of 0 tCO_2/MWh can be assumed as a simple and conservative approach.

Determination of $EG_{m,y}$
For grid power plants, $EG_{m,y}$ should be determined as per the provisions in the monitoring tables.

Option B - Calculation based on total fuel consumption and electricity generation of the system

Under this option, the simple OM emission factor is calculated based on the net electricity supplied to the grid by all power plants serving the system, not including low-cost/must-run power plants/units, and based on the fuel type(s) and total fuel consumption of the project electricity system, as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum_i (FC_{i,y} \cdot NCV_{i,y} \cdot EF_{CO2,i,y})}{EG_y} \quad \textbf{(12)}$$

Where:

$EF_{grid,OMsimple,y}$	=	Simple operating margin CO_2 emission factor in year y (t CO_2/MWh)
$FC_{i,y}$	=	Amount of fossil fuel type i consumed in the project electricity system in year y (mass or volume unit)
$NCV_{i,y}$	=	Net calorific value (energy content) of fossil fuel type i in year *y* (GJ/mass or volume unit)
$EF_{CO2,i,y}$	=	CO_2 emission factor of fossil fuel type i in year y (t CO_2/GJ)
EG_y	=	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year *y* (MWh)
i	=	All fossil fuel types combusted in power sources in the project electricity system in year *y*
y	=	The relevant year as per the data vintage chosen in Step 3

For this approach (Simple OM) to calculate the operating margin, the subscript *m* refers to the power plants/units delivering electricity to the grid, not including low-cost/must-run power plants/units, and including electricity imports[51] to the grid. Electricity imports should be treated as one power plant *m*.

Conditional to the data availability in the host countries the Simple OM shall preferably be used by the CPA applying Option A1, if applicable.

[51] As described above, an import from a connected electricity system should be considered as one power source

Step 5: Calculate the build margin (BM) emission factor

In terms of data vintage, there are two options according to "Tool to calculate the emission factor for an electricity system" (version 02.2.1):

Option 1: For the first crediting period, calculate the build margin emission factor *ex ante* based on the most recent information available on units already built for sample group *m* at the time of CPA-DD submission to the DOE for validation/inclusion. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

Option 2: For the first crediting period, the build margin emission factor shall be updated annually, *ex post*, including those units built up to the year of registration of the CPA or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated *ex ante*, as described in Option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

The option chosen should be documented in the CPA-DD.

Capacity additions from retrofits of power plants should not be included in the calculation of the build margin emission factor.

The sample group of power units *m* used to calculate the build margin should be determined as per the following procedure, consistent with the data vintage selected above:

(a) Identify the set of five power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently (SET5-units) and determine their annual electricity generation ($AEG_{SET\text{-}5\text{-}units}$, in MWh);
(b) Determine the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities (AEG_{total}, in MWh). Identify the set of power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently and that comprise 20% of AEG_{total} (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) ($SET_{\geq 20\%}$) and determine their annual electricity generation ($AEG_{SET\text{-}\geq 20\%}$, in MWh);
(c) From $SET_{5\text{-}units}$ and $SET_{\geq 20\%}$ select the set of power units that comprises the larger annual electricity generation (SET_{sample});

Identify the date when the power units in SET_{sample} started to supply electricity to the grid. If none of the power units in SET_{sample} started to supply electricity to the grid more than 10 years ago, then use SET_{sample} to calculate the build margin. In this case ignore steps (d), (e) and (f).

Otherwise:

(d) Exclude from SET_{sample} the power units which started to supply electricity to the grid more than 10 years ago. Include in that set the power units registered as CDM project activities, starting

with power units that started to supply electricity to the grid most recently, until the electricity generation of the new set comprises 20% of the annual electricity generation of the project electricity system (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) to the extent is possible. Determine for the resulting set ($SET_{sample\text{-}CDM}$) the annual electricity generation ($AEG_{SET\text{-}sample\text{-}CDM}$, in MWh);

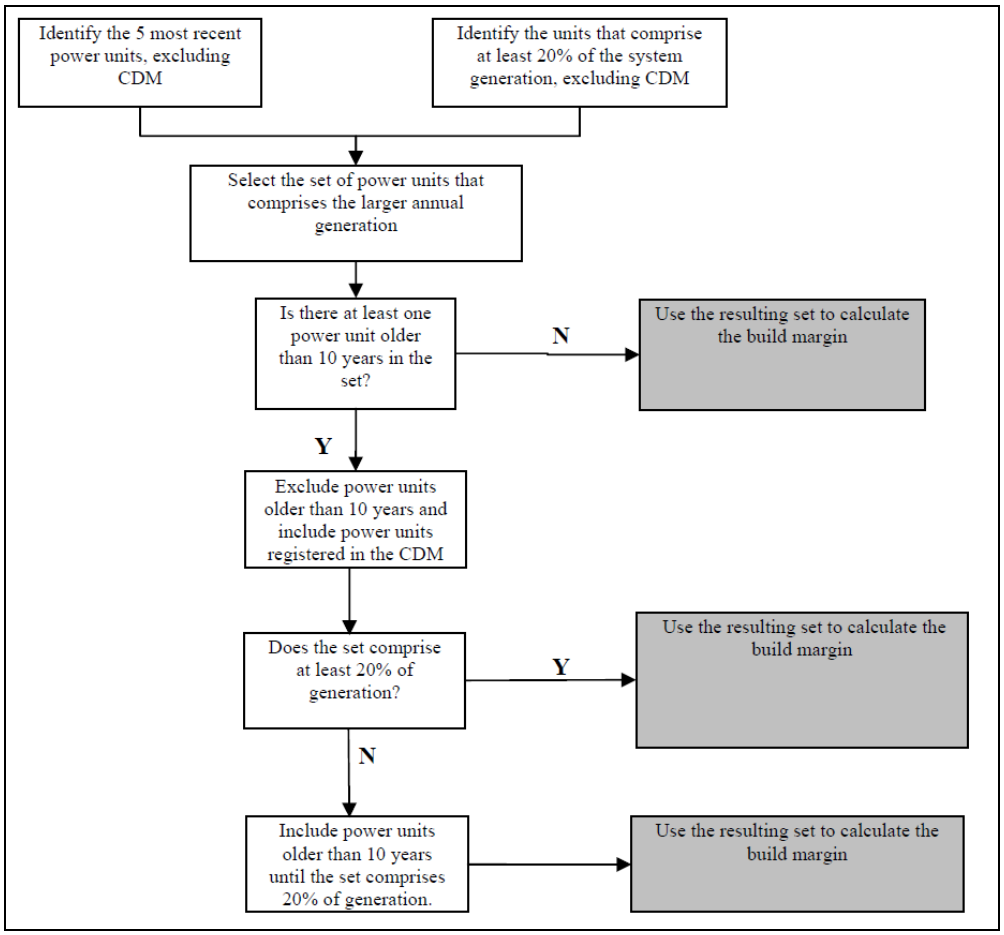
If the annual electricity generation of that set is comprises at least 20% of the annual electricity generation of the project electricity system (i.e. $AEG_{SET\text{-}sample\text{-}CDM} \geq 0.2 \times AEG_{total}$), then use the sample group $SET_{sample\text{-}CDM}$ to calculate the build margin. Ignore steps (e) and (f).

Otherwise:

(e) Include in the sample group $SET_{sample\text{-}CDM}$ the power units that started to supply electricity to the grid more than 10 years ago until the electricity generation of the new set comprises 20% of the annual electricity generation of the project electricity system (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation);

(f) The sample group of power units m used to calculate the build margin is the resulting set ($SET_{sample\text{-}CDM\text{->}10yrs}$).

The following diagram summarizes the procedure above:



The build margin emissions factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units *m* during the most recent year *y* for which electricity generation data is available, calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \cdot EF_{EL,m,y}}{\sum_m EG_{m,y}} \quad \textbf{(13)}$$

Where:

$EF_{grid,BM,y}$	= Build Margin CO_2 emission factor in year y ($t\ CO_2/MWh$)
$EG_{m,y}$	= Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)
$EF_{EL,m,y}$	= CO_2 emission factor of power unit *m* in year *y* ($t\ CO_2/MWh$)
m	= Power units included in the Build Margin
y	= Most recent historical year for which electricity generation data is available.

The CO_2 emission factor of each power unit *m* ($EF_{EL,m,y}$) should be determined as per the guidance in Step 4 (a) for the Simple OM, using options A1, A2 or A3, using for *y* the most recent historical year for which electricity generation data is available, and using for *m* the power units included in the build margin.

If the power units included in the build margin *m* correspond to the sample group $SET_{sample\text{-}CDM\text{->}10yrs}$, then, as a conservative approach, only option A2 from guidance in Step 4 (a) can be used and the default values provided in Annex 1 of the tool shall be used to determine the parameter $\eta_{m,y}$.

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.

The combined margin emissions factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM} \quad \textbf{(14)}$$

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 (%)

As per "Tool to calculate the emission factor for an electricity system"[52] the following default values should be used for w_{OM} and w_{BM}:

- Wind and solar power generation project activities: w_{OM} = 0.75 and w_{BM} = 0.25 (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods.

As the typical CPAs are wind power generation projects the weight applied to the operating and build margin emissions factors are w_{OM} = 0.75 and w_{BM} = 0.25 for calculating of the CM.

Leakage (LE_y)
As it is stated in ACM0002 version 12.3.0, no leakage emissions are considered.

Emissions reduction (ER_y)
Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y \quad \textbf{(15)}$$

Where:
ER_y = Emission reductions in year *y* (t CO_2e)
BE_y = Baseline emissions in year *y* (t CO_2e)
PE_y = Project emissions in year *y* (t CO_2)

Estimation of emissions reductions prior to validation

The CPA implementer 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. In case a different approach is selected, e.g. different option for calculating the OM, the CPA-DD shall explain and justify the choice. Where the grid emission factor ($EF_{CM,grid,y}$) 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 the 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 CPA, the CPA 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 CPA, the new regulation (formulated after the registration of the CPA) has to be examined to

[52] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf

determine if it applies to existing plants or not. 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 CPA 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.

E.6.3. Data and parameters that are to be reported in CDM-CPA-DD form:

The following parameters are applicable in case *ex ante* option is chosen for determining the Simple OM, the Simple Adjusted, Average OM or BM.

Data / Parameter:	$\mathbf{EF}_{grid,OM,y}$
Data unit:	tCO_2/MWh
Description:	Operating margin emission factor of the grid
Source of data used:	Determined at CPA level
Value applied:	Determined at CPA level
Justification of the choice of data or description of measurement methods and procedures actually applied :	Determined at CPA level according to the "Tool to calculate the emission factor for an electricity system" (version 2.2.1). • Simple OM, simple adjusted OM, average OM: Either once for each crediting period using the most recent three historical years for which data is available at the time of submission of the CPA-DD to the DOE for validation (*ex ante* option) or annually during the crediting period for the relevant year, following the guidance in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1) • Dispatch data OM: If available, hourly, otherwise annually for the year y in which the project activity is displacing grid electricity. Further guidance can be found in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1)
Any comment:	-

Data / Parameter:	$\mathbf{EF}_{grid,BM,y}$
Data unit:	tCO_2/MWh
Description:	Build margin emission factor of the grid
Source of data used:	Determined at CPA level
Value applied:	Determined at CPA level
Justification of the choice of data or description of measurement methods and procedures actually applied :	Determined at CPA level according to the "Tool to calculate the emission factor for an electricity system" (version 2.2.1). BM: For the first crediting period, either once *ex ante* or annually *ex post*, following the guidance included in Step 5 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). For the second and third crediting period, once *ex ante* at the start of the second crediting period.
Any comment:	-

Data / Parameter:	$EF_{grid,CM,y}$
Data unit:	tCO_2/MWh
Description:	Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the latest version of the "Tool to calculate the emission factor for an electricity system"
Source of data used:	Determined at CPA level
Value applied:	Determined at CPA level
Justification of the choice of data or description of measurement methods and procedures actually applied :	Determined at CPA level according to the latest "Tool to calculate the emission factor for an electricity system" (Version 2.2.1).
Any comment:	-

Data / Parameter:	$FC_{i,m,y}$, $FC_{i,y}$, $FC_{i,k,y}$, $FC_{i,n,y}$ and $FC_{i,n,h}$
Data unit:	Mass or volume unit
Description:	Amount of fossil fuel type *i* consumed by power plant / unit *m, k* or *n* (or in the project electricity system in case of $FC_{i,y}$) in year y
Source of data used:	Utility or government records or official publications. Determined at CPA level
Value applied:	Determined at CPA level
Justification of the choice of data or description of measurement methods and procedures actually applied :	• Simple OM, simple adjusted OM, average OM: Either <u>once</u> for each crediting period using the most recent three historical years for which data is available at the time of submission of the CPA-DD to the DOE for validation (*ex ante* option) or annually during the crediting period for the relevant year, following the guidance in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1) • Dispatch data OM: If available, <u>hourly</u>, otherwise <u>annually</u> for the year y in which the CPA is displacing grid electricity. Further guidance can be found in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1) • BM: For the first crediting period, either once *ex ante* or annually *ex post*, following the guidance included in Step 5 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). For the second and third crediting period, once *ex ante* at the start of the second crediting period.
Any comment:	-

Data / Parameter:	$EG_{m,y}$, EG_y, $EG_{k,y}$ and $EG_{n,h}$
Data unit:	MWh/yr
Description:	Net electricity generated and delivered to the grid by power plant/unit *m, k* or *n* (or in the project electricity system in case of EG_y) in year *y*
Source of data used:	Utility or government records or official publications
Value applied:	Determined at CPA level
Justification of the choice of data or description of	• Simple OM, simple adjusted OM, average OM: Either <u>once</u> for each crediting period using the most recent three historical years for which data is available at the time of submission of the CPA-DD to the DOE for

measurement methods and procedures actually applied :	validation (*ex ante* option); or annually during the crediting period for the relevant year, following the guidance in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1); • Dispatch data OM: Hourly. Further guidance can be found in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1); BM: For the first crediting period, either once *ex ante* or annually *ex post*, following the guidance included in Step 5 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). For the second and third crediting period, only once *ex ante* at the start of the second crediting period
Any comment:	-

Data / Parameter:	**$NCV_{i,y}$**
Data unit:	GJ/mass or volume unit
Description:	Net calorific value (energy content) of fossil fuel type *i* in year *y*
Source of data used:	The following data sources may be used if the relevant conditions apply: Data source: Conditions for using the data source Values provided by the fuel supplier of the power plants in invoices: If data is collected from power plant operators (e.g. utilities) Regional or national average default values: If values are reliable and documented in regional or national energy statistics / energy balances IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.2 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories:
Value applied:	Determined at CPA level
Justification of the choice of data or description of measurement methods and procedures actually applied :	• Simple OM, simple adjusted OM, average OM: Either once for each crediting period using the most recent three historical years for which data is available at the time of submission of the CPA-DD to the DOE for validation (*ex ante* option) or annually during the crediting period for the relevant year, following the guidance in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). • Dispatch data OM: Annually for the year y in which the CPA is displacing grid electricity or, if available, hourly. Further guidance can be found in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). • BM: For the first crediting period, either once *ex ante or annually ex post*, following the guidance included in Step 5 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). For the second and third crediting period, once *ex ante* at the start of the second crediting period.

Any comment:	Applicable if corresponding option according to the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1) is applied. The gross calorific value (GCV) of the fuel can be used, if gross calorific values are provided by the data sources used. Make sure that in such cases also a gross calorific value basis is used for CO_2 emission factor

Data / Parameter:	**$\eta_{m,y}$ and $\eta_{k,y}$**
Data unit:	-
Description:	Average net energy conversion efficiency of power unit *m* or *k* in year *y*
Source of data used:	Use either: • Documented manufacturer's specifications (if the efficiency of the plant is not significantly increased through retrofits or rehabilitations); or • For grid power plants: data from the utility, the dispatch center or official records if it can be deemed reliable; or • The default values provided in the table in Annex 1 of the "Tool to calculate the emission factor for an electricity system" (version 2.2.1) (if available for the type of power plant)
Value applied:	Determined at CPA level
Justification of the choice of data or description of measurement methods and procedures actually applied :	Monitoring frequency: Once for each crediting period If the data obtained from the manufacturer, the utility, the dispatch center of official records is significantly lower than the default value provided in Annex 1 (of the "Tool to calculate the emission factor for an electricity system" (version 2.2.1)) for the applicable technology, project proponents should assess the reliability of the values, and provide appropriate justification if deemed reliable. Otherwise, the default values provided in Annex 1 of the "Tool to calculate the emission factor for an electricity system" (version 2.2.1) shall be used.
Any comment:	Applicable if corresponding option according to the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1) is applied.

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

Data source	Conditions for using the data source
Values provided by the fuel supplier of the power plants in invoices	If data is collected from power plant operators (e.g. utilities)
Regional or national average default values	If values are reliable and documented in regional or national energy statistics / energy balances
IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC	

	Guidelines on National GHG Inventories	
Value applied:	Determined at CPA level	
Justification of the choice of data or description of measurement methods and procedures actually applied :	• Simple OM, simple adjusted OM, average OM: Either once for each crediting period using the most recent three historical years for which data is available at the time of submission of the CPA-DD to the DOE for validation (*ex ante* option) or annually during the crediting period for the relevant year, following the guidance in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). • Dispatch data OM: Annually for the year y in which the CPA is displacing grid electricity or, if available, hourly. Further guidance can be found in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). • BM: For the first crediting period, either once *ex ante or annually ex post*, following the guidance included in Step 5 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). For the second and third crediting period, once *ex ante* at the start of the second crediting period.	
Any comment:	-	

E.7. Application of the monitoring methodology and description of the monitoring plan:

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

In addition, the monitoring provisions in the tools referred to in this methodology apply.

Some parameters listed below under "data and parameters" either need to be monitored continuously during the crediting period or need to be calculated only once for the crediting period, depending on the data vintage chosen, following the provisions in the baseline methodology procedure outlined above and the guidance on "monitoring frequency" for the parameter. The calculation of the operating margin and build margin emission factors will be documented electronically in a spread sheet that should be attached to the CPA-DD. This will include all data used to calculate the emission factors accordingly to the methodology following the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1):

- The following information for each grid-connected power plant/unit:
  - Information to clearly identify the plant;
  - The date of commissioning;
  - The capacity (MW);
  - The fuel type(s) used;

- The quantity of net electricity generation in the relevant year(s);[53]
- If applicable: the fuel consumption of each fuel type in the relevant year(s);
- In case where the simple OM or the simple adjusted operating margin is used: information whether the plant/unit is a low-cost/must-run plant/unit.

- Net calorific values used;
- CO_2 emission factors used;
- Plant efficiencies used, if applicable;
- Identification of the plants included in the build margin and the operating margin during the relevant time year(s);
- The quantity of electricity displaced by the CPA;

The data should be presented in a manner that enables reproducing of the calculation of the build margin and operating margin grid emission factor.

E.7.1. Data and parameters to be monitored by each CPA:

Data / Parameter:	**$EG_{facility,y}$ / $EG_{PJ,y}$**
Data unit:	MWh/yr
Description:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data to be used:	CPA site: Direct, physical measurements as recorded by metering equipment (electricity meter) at CPA project site
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Determined at CPA level
Description of measurement methods and procedures to be applied:	Direct, physical measurements as recorded by metering equipment (electricity meter). Continuous measurement and at least monthly recording. CPA shall provide description of equipment used for measurement, if applicable, and its accuracy class.
QA/QC procedures to be applied:	Meters shall be calibrated periodically according to relevant industry standards or local standards. Generation data of the CPA shall be cross checked with records for sold electricity to ensure data reliability.
Any comment:	-

The following parameters are only applicable in case *ex post* option is chosen for determining the Simple OM, the Simple Adjusted, Average OM or BM as well as in case Dispatch data analysis OM is applied.

Data / Parameter:	**$EF_{grid,CM,y}$**
Data unit:	tCO_2/MWh
Description:	Combined margin CO_2 emission factor for grid connected power generation in

[53] In case of the simple adjusted OM, this includes the five most recent years or long-term averages for hydroelectricity production.

	year *y* calculated using the latest version of the "Tool to calculate the emission factor for an electricity system"
Source of data to be used:	Calculated as per the "Tool to calculate the emission factor for an electricity system"
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Determined at CPA level
Description of measurement methods and procedures to be applied:	Determined at CPA level according to the latest "Tool to calculate the emission factor for an electricity system" (Version 2.2.1).
QA/QC procedures to be applied:	-
Any comment:	-

Data / Parameter:	$\mathbf{EF}_{grid,OM,y}$
Data unit:	tCO_2/MWh
Description:	Operating margin emission factor of the grid
Source of data used:	Determined at CPA level
Value applied:	Determined at CPA level
Justification of the choice of data or description of measurement methods and procedures actually applied :	Determined at CPA level according to the "Tool to calculate the emission factor for an electricity system" (version 2.2.1). • Simple OM, simple adjusted OM, average OM: Either once for each crediting period using the most recent three historical years for which data is available at the time of submission of the CPA-DD to the DOE for validation (*ex ante* option) or annually during the crediting period for the relevant year, following the guidance in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1) • Dispatch data OM: If available, hourly, otherwise annually for the year y in which the project activity is displacing grid electricity. Further guidance can be found in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1)
Any comment:	-

Data / Parameter:	$\mathbf{EF}_{grid,BM,y}$
Data unit:	tCO_2/MWh
Description:	Build margin emission factor of the grid
Source of data used:	Determined at CPA level
Value applied:	Determined at CPA level
Justification of the choice of data or description of measurement methods and procedures actually applied :	Determined at CPA level according to the "Tool to calculate the emission factor for an electricity system" (version 2.2.1). BM: For the first crediting period, either once *ex ante* or annually *ex post*, following the guidance included in Step 5 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). For the second and third crediting period, once *ex ante* at the start of the second crediting period.

Any comment:	-

Data / Parameter:	**$FC_{i,m,y}$, $FC_{i,y}$, $FC_{i,k,y}$, $FC_{i,n,y}$ and $FC_{i,n,h}$**
Data unit:	Mass or volume unit
Description:	Amount of fossil fuel type *i* consumed by power plant / unit *m, k* or *n* (or in the project electricity system in case of $FC_{i,y}$) in year y
Source of data used:	Utility or government records or official publications. Determined at CPA level
Value applied:	Determined at CPA level
Justification of the choice of data or description of measurement methods and procedures actually applied :	• Simple OM, simple adjusted OM, average OM: Either once for each crediting period using the most recent three historical years for which data is available at the time of submission of the CPA-DD to the DOE for validation (*ex ante* option) or annually during the crediting period for the relevant year, following the guidance in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1) • Dispatch data OM: If available, hourly, otherwise annually for the year y in which the CPA is displacing grid electricity. Further guidance can be found in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1) • BM: For the first crediting period, either once *ex ante* or annually *ex post*, following the guidance included in Step 5 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). For the second and third crediting period, once *ex ante* at the start of the second crediting period.
Any comment:	-

Data / Parameter:	**$EG_{m,y}$, EG_y, $EG_{k,y}$ and $EG_{n,h}$**
Data unit:	MWh/yr
Description:	Net electricity generated and delivered to the grid by power plant/unit *m, k* or *n* (or in the project electricity system in case of EG_y) in year *y*
Source of data used:	Utility or government records or official publications
Value applied:	Determined at CPA level
Justification of the choice of data or description of measurement methods and procedures actually applied :	• Simple OM, simple adjusted OM, average OM: Either once for each crediting period using the most recent three historical years for which data is available at the time of submission of the CPA-DD to the DOE for validation (*ex ante* option); or annually during the crediting period for the relevant year, following the guidance in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1); • Dispatch data OM: Hourly. Further guidance can be found in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1); BM: For the first crediting period, either once *ex ante* or annually *ex post*, following the guidance included in Step 5 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). For the second and third crediting period, only once *ex ante* at the start of the second crediting period
Any comment:	-

Data / Parameter:	**$NCV_{i,y}$**
Data unit:	GJ/mass or volume unit
Description:	Net calorific value (energy content) of fossil fuel type *i* in year *y*
Source of data used:	The following data sources may be used if the relevant conditions apply: Data source: Values provided by the fuel supplier of the power plants in invoices — Conditions for using the data source: If data is collected from power plant operators (e.g. utilities) Data source: Regional or national average default values — Conditions for using the data source: If values are reliable and documented in regional or national energy statistics / energy balances Data source: IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.2 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories — Conditions for using the data source:
Value applied:	Determined at CPA level
Justification of the choice of data or description of measurement methods and procedures actually applied :	• Simple OM, simple adjusted OM, average OM: Either once for each crediting period using the most recent three historical years for which data is available at the time of submission of the CPA-DD to the DOE for validation (*ex ante* option) or annually during the crediting period for the relevant year, following the guidance in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). • Dispatch data OM: Annually for the year y in which the CPA is displacing grid electricity or, if available, hourly. Further guidance can be found in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). • BM: For the first crediting period, either once *ex ante or annually ex post*, following the guidance included in Step 5 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). For the second and third crediting period, once *ex ante* at the start of the second crediting period.
Any comment:	Applicable if corresponding option according to the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1) is applied. The gross calorific value (GCV) of the fuel can be used, if gross calorific values are provided by the data sources used. Make sure that in such cases also a gross calorific value basis is used for CO_2 emission factor

Data / Parameter:	**$\eta_{m,y}$ and $\eta_{k,y}$**
Data unit:	-
Description:	Average net energy conversion efficiency of power unit *m* or *k* in year *y*
Source of data used:	Use either: • Documented manufacturer's specifications (if the efficiency of the plant is not significantly increased through retrofits or rehabilitations); or

	• For grid power plants: data from the utility, the dispatch center or official records if it can be deemed reliable; or • The default values provided in the table in Annex 1 of the "Tool to calculate the emission factor for an electricity system" (version 2.2.1) (if available for the type of power plant)
Value applied:	Determined at CPA level
Justification of the choice of data or description of measurement methods and procedures actually applied :	Monitoring frequency: Once for each crediting period If the data obtained from the manufacturer, the utility, the dispatch center of official records is significantly lower than the default value provided in Annex 1 (of the "Tool to calculate the emission factor for an electricity system" (version 2.2.1)) for the applicable technology, project proponents should assess the reliability of the values, and provide appropriate justification if deemed reliable. Otherwise, the default values provided in Annex 1 of the "Tool to calculate the emission factor for an electricity system" (version 2.2.1) shall be used.
Any comment:	Applicable if corresponding option according to the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1) is applied.

Data / Parameter:	**$EF_{CO2,i,y}$ and $EF_{CO2,m,i,y}$**
Data unit:	tCO_2/GJ
Description:	CO_2 emission factor of fossil fuel type *i* used in power unit *m* in year *y*
Source of data used:	The following data sources may be used if the relevant conditions apply: Data source: Values provided by the fuel supplier of the power plants in invoices — Conditions for using the data source: If data is collected from power plant operators (e.g. utilities) Data source: Regional or national average default values — Conditions for using the data source: If values are reliable and documented in regional or national energy statistics / energy balances Data source: IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories — Conditions for using the data source:
Value applied:	Determined at CPA level
Justification of the choice of data or description of measurement methods and procedures actually applied :	• Simple OM, simple adjusted OM, average OM: Either once for each crediting period using the most recent three historical years for which data is available at the time of submission of the CPA-DD to the DOE for validation (*ex ante* option) or annually during the crediting period for the relevant year, following the guidance in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). • Dispatch data OM: Annually for the year y in which the CPA is displacing grid electricity or, if available, hourly. Further guidance can be found in Step 3 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1).

	• BM: For the first crediting period, either once *ex ante or annually ex post*, following the guidance included in Step 5 of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1). For the second and third crediting period, once *ex ante* at the start of the second crediting period.
Any comment:	-

The following parameters are only applicable for project emissions from solar thermal (CSP) projects, which also use fossil fuels for electricity generation according to the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion".

Data / Parameter:	**$PE_{FF,y}$**
Data unit:	tCO_2/yr
Description:	Project emissions from fossil fuel consumption in year *y*
Source of data to be used:	As per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Determined at CPA level
Description of measurement methods and procedures to be applied:	As per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" Continuous measurement and at least monthly recording.
QA/QC procedures to be applied:	As per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"
Any comment:	Applicable to solar thermal (CSP) projects, which also use fossil fuels for electricity generation

Data / Parameter:	**$FC_{i,j,y}$**
Data 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 *y*
Source of data to be used:	Onsite measurements
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Determined at CPA level
Description of measurement methods and procedures to be applied:	Continuously measurement • 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.
QA/QC procedures to be applied:	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.
Any comment:	Applicable to solar thermal (CSP) projects, which also use fossil fuels for electricity generation

Data / Parameter:	$w_{C,i,y}$
Data unit:	tC/mass unit of the fuel
Description:	Weighted average mass fraction of carbon in fuel type *i* in year *y*
Source of data to be used:	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
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Determined at CPA level
Description of measurement methods and procedures to be applied:	Measurements should be undertaken in line with national or international fuel standards The mass fraction of carbon should be obtained for each fuel delivery, from which weighted average annual values should be calculated
QA/QC procedures to be applied:	Verify if the values under a) and b) 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 b) should have ISO17025 accreditation or justify that they can comply with similar quality standards.
Any comment:	Applicable to solar thermal (CSP) projects, which also use fossil fuels for electricity generation. Applicable where Option A is used of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"

Data / Parameter:	$\rho_{i,y}$
Data unit:	Mass unit/volume unit
Description:	Weighted average density of fuel type *i* in year *y*
Source of data to be used:	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).
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Determined at CPA level	
Description of measurement methods and procedures to be applied:	Measurements should be undertaken in line with national or international fuel standards The density of the fuel should be obtained for each fuel delivery, from which weighted average annual values should be calculated	
QA/QC procedures to be applied:	-	
Any comment:	Applicable to solar thermal (CSP) projects, which also use fossil fuels for electricity generation. Applicable where Option A of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" is used and where $FC_{i,j,y}$ is measured in a volume unit. Preferably the same data source should be used for $w_{C,i,y}$ and $\rho_{i,y}$.	

Data / Parameter:	**$NCV_{i,y}$**	
Data unit:	GJ per mass or volume unit (e.g. GJ/m^3, GJ/ton)	
Description:	Weighted average net calorific value of fuel type *i* in year *y*	
Source of data to be used:	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 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories	If a) is not available

Value of data applied for the purpose of calculating expected emission reductions in section B.5	Determined at CPA level
Description of measurement methods and procedures to be applied:	For a) and b): Measurements should be undertaken in line with national or international fuel standards 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 to be applied:	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.
Any comment:	Applicable to solar thermal (CSP) projects, which also use fossil fuels for electricity generation. Applicable where Option B of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" is used.

Data / Parameter:	**$EF_{CO2,i,y}$**
Data unit:	tCO_2/GJ
Description:	Weighted average CO2 emission factor of fuel type *i* in year *y*
Source of data to be used:	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 Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories	If a) is not available

Value of data applied for the purpose of calculating expected emission reductions in	Determined at CPA level

section B.5	
Description of measurement methods and procedures to be applied:	For a) and b): Measurements should be undertaken in line with national or international fuel standards. For a) and b): The CO2 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 to be applied:	-
Any comment:	Applicable to solar thermal (CSP) projects, which also use fossil fuels for electricity generation. Applicable where Option B of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" 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.

E.7.2. Description of the monitoring plan for a CPA:

The purpose of the monitoring plan will be to measure and record the net electricity delivered to the electrical grid. Details of the CPA monitoring plan will be described within each CPA, considering the following elements. See also **Figure 7** in A.4.4.2., illustrating the overall monitoring structure.

1. Management structure and responsibilities

The CME will implement a monitoring protocol consolidating all individual monitoring reports allowing the Designated Operational Entity (DOE) to verify all CPAs in the PoA. Monitoring will be carried out by each CPA. For each CPA, all parameters included in E.7.1. will be monitored, if applicable, by the implementer of the CPA. The main measure for the PoA is the measurement of net electricity supplied to the grid and assuring the correct operation and maintenance of the measuring equipment. The detailed organisational structure with specific functions of the CPA implementer and the CME is provided in **Figure 7** in A.4.4.2.

Data collection
The CME will establish and maintain a central a PoA Project Database and PoA Monitoring Database covering information and data of each CPA.

Each CPA will be uniquely identified within these databases. A unique CPA identification number will be allocated by the CME matching with the UNFCCC reference number.

According to the eligibility criteria the following data must be provided to the CME prior to inclusion in the PoA and will be stored in the PoA Project Database:

Data for inclusion (CPA	• Name of the CPA; • Name of the CPA implementer ;

Inclusion records)	• Contact details of the implementer including contact person, address, telephone and/or email address; • Brief project description including installed capacity and other relevant technical specifications of each CPA; • Host country of the CPA and its specific location (e.g. GPS coordinates) • Documentary evidence according to the PoA inclusion criteria

The following data will be collected and stored in the PoA Monitoring Database:

Data during crediting period (CPA Monitoring Records)	• Unique CPA identification number • Verification status, CPA monitoring records and monitoring reports of each CPA.

The data for inclusion listed above will be provided by each CPA implementer prior to inclusion. The CPA implementer will record the required monitoring data (CPA Monitoring records) and will ensure that the CPA monitoring records are made available to the CME. The CME will be responsible for the management of the PoA Project Database and the PoA Monitoring Database, consisting of the data for inclusion and of all CPA monitoring records. All records will be stored for a period of two years after the end of the relevant crediting period. Relevant data capture, verification and storage procedures will be followed in maintaining the data to ensure its accuracy, validity and completeness.

Each CPA will comprise a single unit/plant or a cluster of units/plants, and hence the data will be monitored directly at that CPA project site. Monitoring will be carried out by each CPA implementer and recorded in the CPA monitoring records. The CME will provide guidance to the CPA implementer on how the monitoring should be conducted and data should be collected with regards to emission reduction calculations. The start and end dates of each monitoring period for each individual CPA, together with the CPA monitoring records to that monitoring period will be recorded in the PoA Monitoring Database.

Data recording
For each CPA, all parameters included in E.7.1., if applicable, will be monitored by the CPA implementer and recorded electronically in a CPA monitoring record. The CPA implementer will provide the CPA monitoring records to the CME. The CME will document and store all data related to parameters included in section E.7.1. provided by CPA implementer in an electronic PoA Monitoring Database, while primary data will be stored by each CPA implementer.

Data calibration
Data calibration will be done considering the calibration frequency as per manufacturer's requirements. The CME will store all the data in an electronic database (PoA Monitoring Database). Primary data will be stored by the implementing entities (CPA implementers).

Data reporting
The CME will be responsible for the preparation of the monitoring reports and communication with the DOE during verification activities. The monitoring reports will compile all required monitoring information, i.e. CPA monitoring records, in order to allow the DOE to verify the emission reductions for each monitoring period of each individual CPA. The monitoring report will unambiguously set out the data on emission reductions generation by each CPA during the monitoring period consistent with the requirements of this PoA-DD and the corresponding CPA-DD. Record keeping procedures for the PoA

database undertaken by the CME will ensure that the data attributed to a monitoring period can be clearly attributed to an individual CPA and will furthermore prevent double counting of emission reduction data.

Data archiving
The CME will be responsible for the management of all CPA monitoring records associated with each CPA and the consolidated PoA Monitoring Database comprising of CPA specific data. All CPA monitoring records will be stored for a period of two years after the end of the relevant crediting period of the CPA. The CPA implementer is responsible to keep a copy of the raw monitored data and the CPA monitoring record.

2. Data quality control
The data and reports provided by each CPA implementer to the CME will be cross checked internally by the CME to ensure the accuracy and completeness of data. In case of mistakes, corrective action will be applied to avoid future similar mistakes. The following means of data transfer and the QA/QC measures will ensure the safety of data during transfer or back-up measures:

- Monitoring data (monitoring records) and relevant documentations will be transferred from the CPA implementer to the CME by email, if applicable, or other digital means, e.g. file sharing.
- Monitoring data (monitoring records) and relevant documentations (e.g. received utility bills) will be backed up by generating digital copies and storing on digital external data storage devices, e.g. CD-ROMs.
- Digital data and back-up data will be save of-site of the CPA at the CPA implementer and at the CME.

3. Guidance and monitoring personnel
The CME will provide all necessary information and guidance material that enables CPA implementers to conduct the monitoring process as required by the PoA. The CPA implementer ensures that every person that participates in the actual monitoring process for the CPA will be suitably qualified and trained in the operation and maintenance of the CPA. If required, these individuals will also receive special guidance on the application of the monitoring plan by the CME.

Leakage
No leakage emissions are considered.

E.8. Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)

The date of completing the baseline study and applying the monitoring methodology: 10/02/2012

Responsible entity:
Perspectives GmbH, Baumeisterstrasse 2, 20099 Hamburg, Germany (www.perspectives.cc)

Contact persons:

- Marc André Marr (Head of Carbon Project Services; marr@perspectives.cc),
- Stefan Wehner (Carbon Project Consultant; wehner@perspectives.cc)

Annex 1

CONTACT INFORMATION ON COORDINATING/MANAGING ENTITY and PARTICIPANTS IN THE PROGRAMME of ACTIVITIES

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

RENEWABLE ENERGY FOR THE MEDITERRANEAN

R.E.M.

Object: *Confirmation of non-use of public funding under the PoA "Programme for Grid Connected Renewable Energy in the Mediterranean Region"*

TO WHOM IT MAY CONCERN:

Dear Madam, Dear Sir,

By the present letter, we declare and confirm that the proposed Programme of Activity "Programme for Grid Connected Renewable Energy in the Mediterranean Region" undertaken by Renewable Energy for the Mediterranean (R.E.M.) does not benefit from any public financing. The programme is in compliance with the requirements of the UNFCCC Conference of the Parties (COP) and complies with 3/CMP.1, Annex, Appendix B, paragraph 2(f) as no public funds from Annex I countries are involved in the development of the mentioned programme.

Best regards,

le 4 juin 2012

REM
Represented by Marianne Paris, President

REM
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R.C.S. Paris 751 140 484 00013 - APE 3511 Z

Annex 3

BASELINE INFORMATION

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Annex 4

MONITORING INFORMATION

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