CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 03 - in effect as of: 28 July 2006

CONTENTS

Annexes

SECTION A. General description of project activity

A.1. Title of the project activity:

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Jbel Sendouq-Khalladi (Khalladi) wind farm project in Morocco
PDD version 1.1
Completed on 06/02/2012

A.2. Description of the project activity:

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The objective of the proposed project, the Jbel Sendouq-Khalladi ("Khalladi") wind farm project, developed by UPC Renewables SARL (hereafter referred to as "UPC"), is to generate electricity using state-of-the-art wind power generation technology.

UPC is one of the most successful privately owned wind energy developers in the world. Building on a track record of implementing wind energy projects in Europe and the United States, UPC has ongoing wind project development activities in Europe, North Africa, China, and the Philippines[1].

The proposed project is to be located in the Tangier-Tetouan Region, Fahs Anjra Province, Morocco. Wind turbines with a nominal unit capacity of 3 MWe will be installed, providing a total capacity of 120 MWe. The net expected electricity generation is estimated around 317,488 MWh/year[2]. The wind farm production will be wheeled through the national electricity grid, for the use of UPC Renewables' clients.

The proposed project is developed in the context of the new regulatory framework in Morocco (the Law 13.09). This new Law 13.09 was adopted in Morocco in March 2010 to promote large scale renewable electricity generation projects offering the possibility for private operators to produce electricity from renewable resources and to sell the generated electricity to a pool of clients.

The baseline scenario is the supply of equivalent annual power output by the national electricity grid. The baseline scenario is the same as the scenario existing prior to the start of implementation of the project activity.

The electrical energy produced by the project activity will substitute electricity currently supplied by the national grid managed by the public utility, Office National de l'Electricité (ONE), and thus result in the reduction of Green House Gas (GHG) emissions, mainly CO_2, associated with the fossil fuel dominated power plants feeding the national grid.

Using a new and renewable local source of energy, the proposed project will contribute to the reduction of GHG emissions, the decrease of the country's energy dependence vis-à-vis the importation of fossil fuels and will directly and indirectly help create new jobs. As such, the project activity is expected to contribute to the development of wind energy in Morocco and hence to help achieve the objectives of Morocco's national strategy for renewable energy development. Generally speaking, the project's contribution to Morocco's sustainable development can be summarized by the following benefits:

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[1] www.upcnarenewables.com

[2] Source : Annual Estimated Production Report- 20 November 2011

- Diversification of the national supply of energy;
- Project in line with the Moroccan government's objectives to increase the use of renewable energy and reduce reliance on imported fossil fuels. The diversification of energy sources for electricity production is one of the objectives of the new Moroccan energy strategy with an objective of 20% of renewable energy capacity in the nation's electricity production in 2012 and a targeted development of 2,000 MW of installed wind capacity by 2020[3].
- Local development of renewable energy usage;
- Reduction of the country's imports in hard currency by the use of wind power instead of electricity mainly currently produced from imported coal, oil products and natural gas;
- Reduction of national GHG emissions in accordance with the objectives of the UNFCCC ;
- Contribution to the development of national and foreign investments in the energy sector;
- Clean technology transfer and local capacity building in wind electricity generation and optimal use of wind energy in a heavy industry ;
- Increases local employment opportunities during the construction phase and subsequently for the project's operation phase.

A.3. Project participants:

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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)
Morocco (host Party)	UPC Renewables SARL (Private entity) Ultimate Carbon Trading (North Africa) Limited (Private company)	No

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

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A.4.1.1. Host Party(ies):

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Morocco

A.4.1.2. Region/State/Province etc.:

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Tangier-Tetouan Region / Fahs Anjra Province

A.4.1.3. City/Town/Community etc.:

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The project is located within three rural communes of Melloussa, Qsar Sghir and Khmis Anjra

[3] Reference: Ministry of Mines, Energy, Water and Environment. www.mem.gov.ma/Perspectives/energie_renouvelable.htm

A.4.1.4. Details of physical location, including information allowing the unique identification of this project activity (maximum one page):

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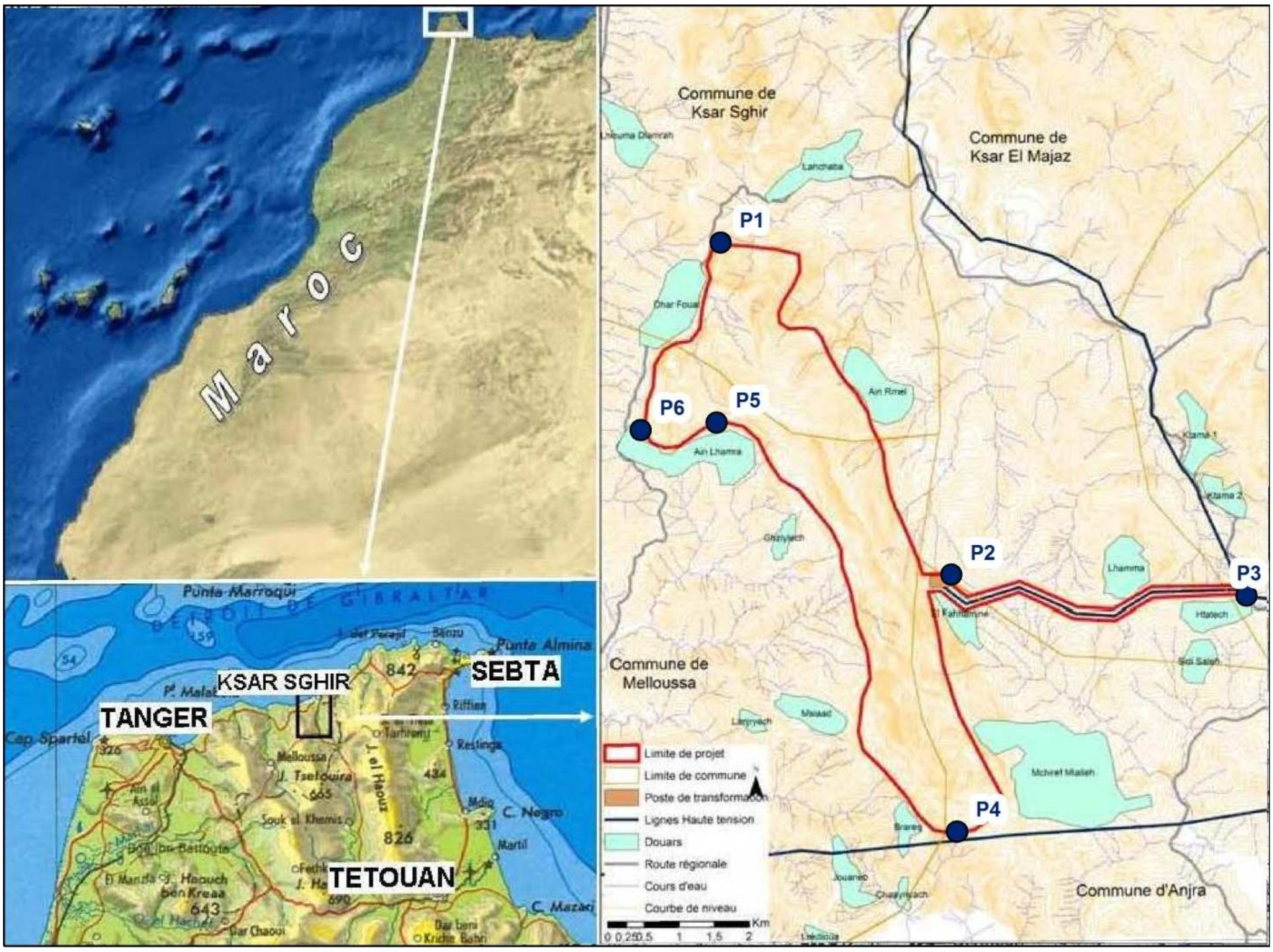
The proposed project is located in the north of Morocco, approximately 50 Km east of the town of Tangier, in the south of the Qsar Sghir village, between cities of Tangier and Sebta.



Points	Longitude	Latitude
P1	5°35'46,76''	35°47'37,84''
P2	5°33'36,41''	35°45'4,15''
P3	5°30'47,65''	35°44'54,83''
P4	5°33'32,17''	35°43'5,37''
P5	5°35'49,51''	35°46'14,66''
P6	5°36'31,92''	35°46'11,04''

Figure 1a: Location of the project site

The exact location of the project site and the 40 WTGs is depicted in the following figure:

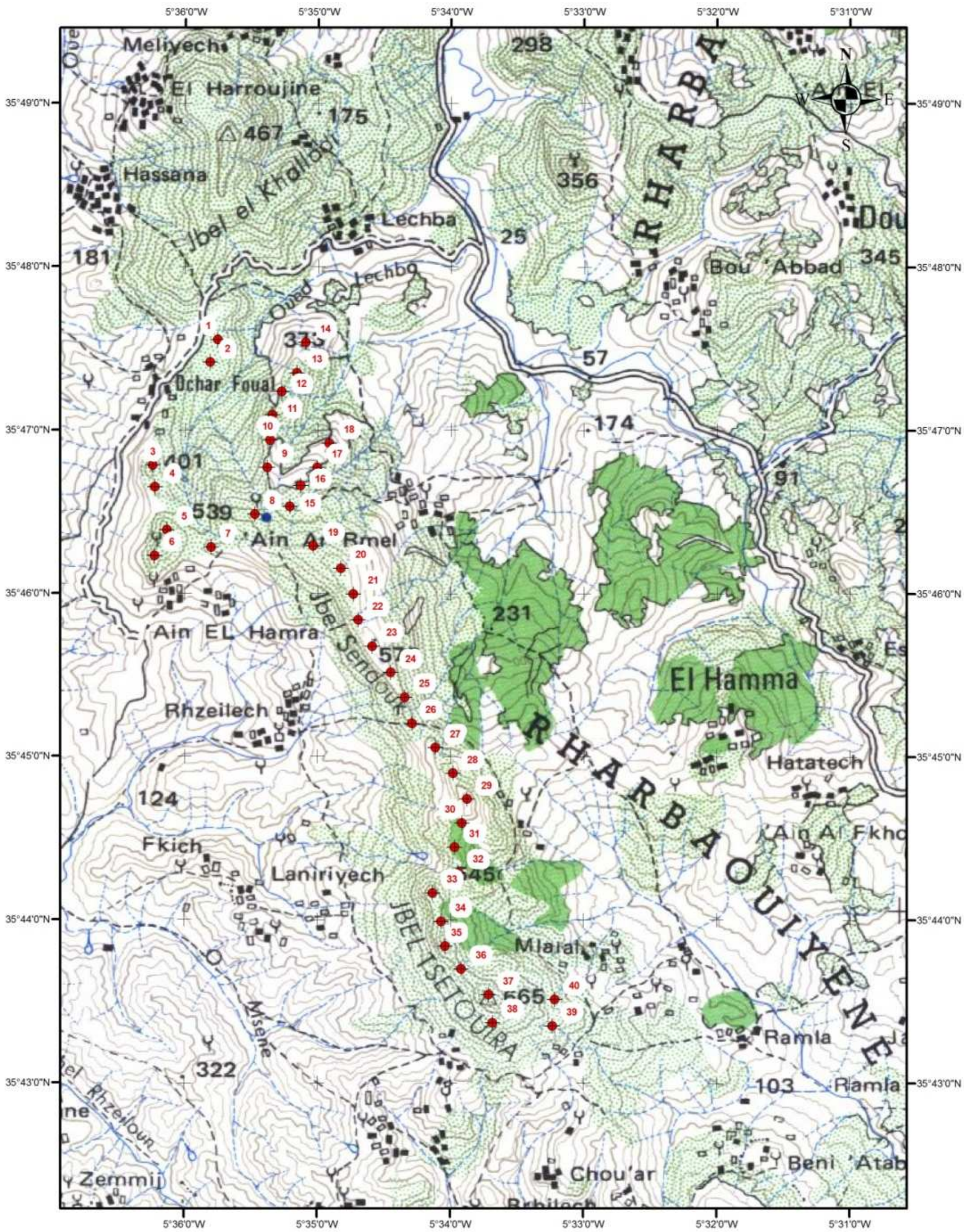


Figure 1b: Location of the project WTGs

A.4.2. Category(ies) of project activity:

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Sectoral Scope Number 1: Energy Industries (renewable -/non renewable sources)

A.4.3. Technology to be employed by the project activity:

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The project will have an installed capacity of 120 MW and it is expected to generate around 317,488 MWh per year. The 40 wind turbines to be installed have a nominal unit capacity of 3MW.

The wind turbines to be used in the proposed project activity will be supplied by the Danish manufacturer VESTAS[4] as there are no local suppliers in Morocco. Therefore, the proposed project activity will suppose a technology transfer from an Annex I country to Morocco.

The main technical characteristics of the project's turbines are summarized below:

- 40 V90-3MW turbines;
- Hub height of 80 m;
- Rotor diameter of 90 m;
- Blade length of 44 m. Blades are made out of a glass fibre/carbon spar with glass fibre airfoil shells;
- Turbines benefit from the latest Supervisory Control and Data Acquisition (SCADA) system for modern wind power plants: VestasOnline® Business.

An electrical substation will be built in order to elevate the medium voltage collected at the wind farm to very high voltage, before being distributed to the ONE substation.

33 kV underground electrical lines will connect the turbines to each other and will send the energy produced to the electrical substation.

A 225 kV very high voltage electrical line will transport the electricity produced by the wind farm to the ONE substation located in the west of Tetouan city. Approximately 23 km long, it will consist of a total of 80 poles.

It uses a renewable source of energy, namely wind energy to produce electricity. This technology is considered a clean technology since there is no gas emissions associated with the energy generation. Thus, the electrical energy produced by the project activity will substitute electricity currently supplied by the national grid which will result in the reduction of Green House Gas (GHG) emissions, mainly CO_2, associated with the fossil fuel dominated power plants feeding the national grid.

As described in section B.4, the baseline scenario is the supply of equivalent annual power output by the national electricity grid. The baseline scenario is the same as the scenario existing prior to the start of implementation of the project activity.

[4] www.vestas.com

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

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As specified in Section C, the chosen crediting period is 7 years renewable twice for a maximum total crediting period of 21 years.

According to the baseline study presented in part B of this report, the wind farm will reduce, during its first 7 years' crediting period, the GHGs emissions of about **1,312,395 tons of equivalent CO_2**, that is an average of **187,485 tons of CO_2 equivalent per year**.

Table 1: Annual estimation reductions over the first crediting period

Year	Annual estimation of emission reductions in tons of CO2e
2014	187,485
2015	187,485
2016	187,485
2017	187,485
2018	187,485
2019	187,485
2020	187,485
Total estimated reductions	**1,312,395**
Total number years of the first crediting period	**7**
Annual average over the first crediting period of estimated reductions (tons of CO2e)	**187,485**

A.4.5. Public funding of the project activity:

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The project activity does not involve any public funding from annex 1 countries.

SECTION B. Application of a baseline and monitoring methodology

B.1. Title and reference of the approved baseline and monitoring methodology applied to the project activity:

>>
ACM0002 (Version 12.2.0): Consolidated baseline and monitoring methodology for grid-connected electricity generation from renewable sources.

The Tool for the Demonstration and Assessment of Additionality (version 06.0)
The Tool to Calculate the Emission Factor for an Electricity System (version 02.2.1)
The Tool to Calculate Project or Leakage CO2 Emissions from Fossil Fuel Combustion (version 02).

According the methodology ACM0002, *the condition in the "Combined tool to identify the baseline scenario and demonstrate additionality" that all potential alternative scenarios to the proposed project activity must be available options to project participants does not apply to this methodology, as this methodology only refers to some steps of this tool*. As required by the approved methodology ACM0002 (Version 12.2.0), the project additionality will be demonstrated using the latest version of the "Tool for the Demonstration and assessment of Additionality".

The Tool to Calculate Project or Leakage CO2 Emissions from Fossil Fuel Combustion will not be used because there will be no fossil fuel combustion on-site.

B.2. Justification of the choice of the methodology and why it is applicable to the project activity:

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The proposed project can meet the applicability criteria of the baseline and monitoring methodology (ACM0002), therefore, the methodology is applicable to the proposed project.

Conditions as specified in methodology ACM0002	Compliance
This methodology is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	The proposed project activity is the installation of a new wind power plant at a site where no renewable power plant was operated prior to the implementation of the project activity. Moreover, the new power plant is connected to the Moroccan national grid.
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 proposed project activity is the installation of a new wind power plant.
In the case of capacity additions, retrofits or replacements: 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 expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;	This condition is not applicable.
In case of hydro power plants: • *One of the following conditions must apply:* o *The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of*	Not Applicable

reservoirs; or o *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; or* o *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.*	
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 all the following conditions must apply: • *The power density calculated for the entire project activity using equation 5 is greater than 4 W/m^2;* • *Multiple reservoirs and hydro power plants located at the same river and where are designed together to function as an integrated project that collectively constitute the generation capacity of the combined power plant;* • *Water flow between multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity;* • *Total installed capacity of the power units, which are driven using water from the reservoirs with power density lower than 4 W/m^2, is lower than 15MW;* • *Total installed capacity of the power units, which are driven using water from reservoirs with power density lower than 4 W/m^2, is less than 10% of the total installed capacity of the project activity from multiple reservoirs.*	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".	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, since in this case the baseline may be the continued use of fossil fuels at the site;*	The proposed project activity is not an activity that involves switching from fossil fuels to renewable energy at the proposed project site, nor does it involve biomass or hydro power type plants

• *Biomass fired power plants;* • *Hydro power plant that result in a new single reservoir or in the increase in existing single reservoir where the power density of the power plant is less than 4 W/m2.*	

The Tool for the Demonstration and Assessment of Additionality (Version 06.0)
ACM0002 / Version 12.2 require the use of this tool. The tool mentioned that once it is included with the methodology, the tool shall be used. No other criteria of application are mentioned in the tool. Consequently, the tool for the demonstration and assessment of additionality, Version 06.0 is used.

The Tool to Calculate the Emission Factor for an Electricity System (Version 02.2.1)
ACM0002 / Version 12.2 require the use of this tool. It is applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity.

B.3. Description of the sources and gases included in the project boundary:

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According to the methodology ACM0002 (Version 12.2), since the project is a grid connected wind power project, only CO_2 emission from fossil fuels fired power plants in baseline scenario need to be considered as summarized in the following table :

Source		Gas	Included?	Justification/Explanation
Baseline	CO2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity.	CO_2	Yes	Major emission sources
		CH_4	No	Excluded for simplification (conservative)
		N_2O	No	Excluded for simplification (conservative)

Spatial boundary:

According to the approved methodology ACM0002, Version 12.2.0 the spatial extent of the project boundary includes the project wind farm power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to.

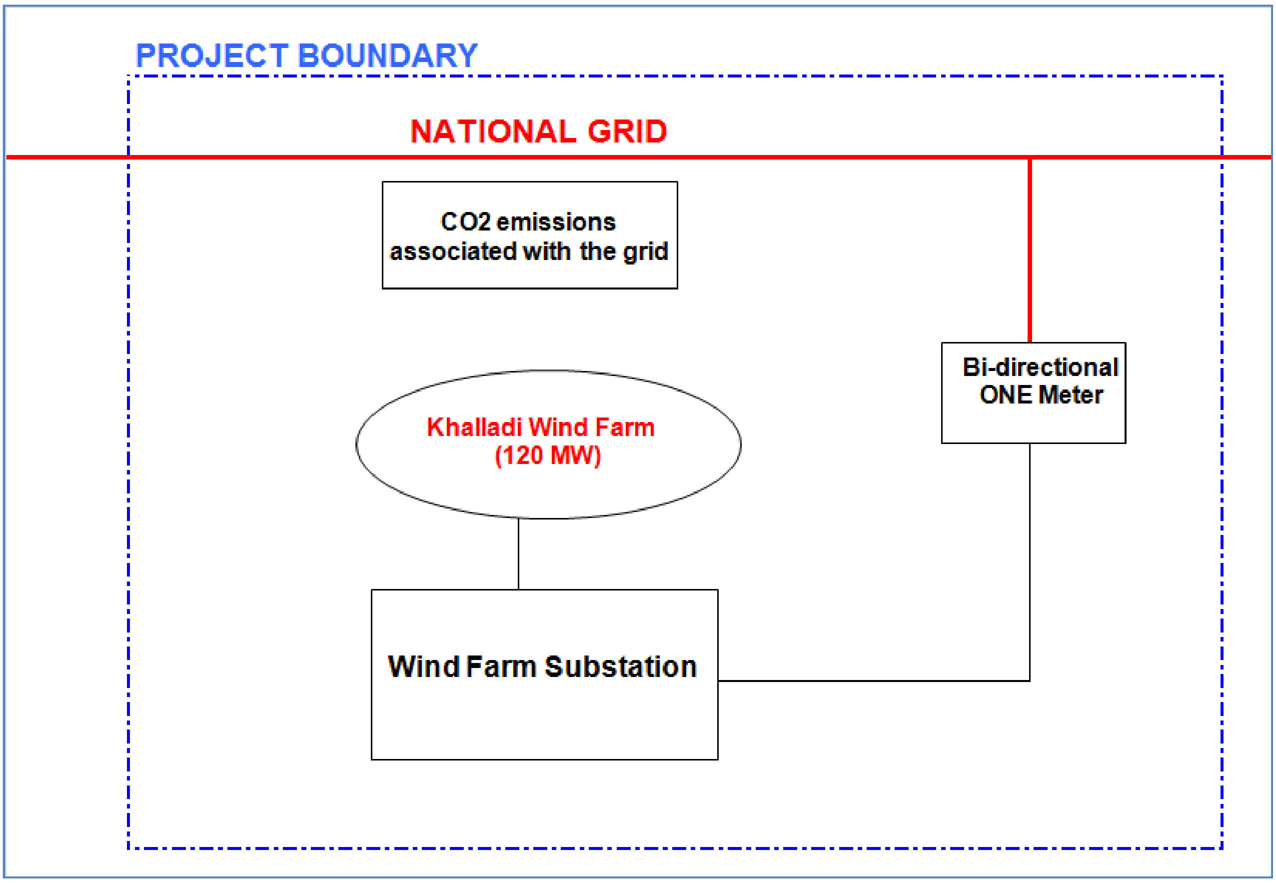

Figure 2 : Flow diagram of the project boundary

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

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According to the approved methodology ACM0002, if the project activity is the installation of a new grid-connected renewable power plant/unit, 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".

Thus the baseline scenario is the supply of equivalent annual power output by the national electricity grid.

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality):

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Prior consideration of CDM

The CDM was taken into account from the very beginning of the project. As shown in the following table, the official notification of the project to the CDM Secreatriat and to the AND took place before the starting date of the project activity, considered as the expected date of the wind turbines purchasing contract signature, namely April 2012.

Table 2: CDM timeline of the project

Milestone	Date
Starting of the wind measurement	26/10/2008
Wind farm study report	20/11/2011
CDM Consultant Agreement contract	19/10/2011
Notification of the project to the CDM Secretariat and to the Moroccan DNA	21/11/2011
EIA study presentation to the Ministry of Environment	15/12/2011
Stakeholders workshop held	02/02/2012
LoA issued by Moroccan DNA	Pending
Signature construction contract (expected)	April 2012
Construction start of the wind farm (expected)	August 2012
Wind farm expected Commissioning Date	December 2013[5]

Additionality

The following steps are used to demonstrate the additionality of the Project according to the methodological tool “Tool for the demonstration and assessment of additionality” (Version 6.0).

Step1. Identification of alternatives to the project activity consistent with current laws and regulations.

According to the additionality tool, 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. As ACM0002 has been selected and as a baseline scenario is prescribed in this document the identification of alternatives of the project activity is not necessary.

[5] Reference: Project planning evaluation by the project participant

Step2. Investment analysis.

The purpose of this step is to determine whether the project activity is economically or financially less attractive than other alternatives without an additional funding that may be derived from the CDM project activities. The investment analysis was conducted in the following steps:

Sub-step 2a. Determine appropriate analysis method

The three analysis methods suggested by the methodological tool "Tool for the demonstration and assessment of additionality" are Simple cost analysis (Option I), Investment comparison analysis (Option II) and Benchmark analysis (Option III).

Since the project activity will generate economic benefit through the sale of electricity other than CDM related income, the Simple cost analysis (Option I) is not appropriate.

Investment comparison analysis (Option II) is only applicable to projects where alternatives should be similar investment projects. The alternative baseline scenario of the project activity is the national power grid rather than a new investment project. Therefore (Option II) is not an appropriate method either.

Therefore, the Project will use Benchmark analysis method (Option III).

Sub-step 2b. Apply benchmark analysis (Option III)

The project's Internal Rate of Return ("IRR") of total investment is selected as a financial indicator.

Because the project could be developed by another entity than the project participant, the benchmark IRR of the Project is based *on parameters that are standard in the market and considering the specific characteristics of the project type*, according to the Tool for the Demonstration and Assessment of Additionality (Version 6.0).

The benchmark IRR is based on the benchmark study on power plants in Morocco that was conducted for the CDM registered projects of Haouma Wind Farm Project (Ref 4827) and the Akhfennir Wind Farm Project (Ref 4834) both developed by Nareva Holding[6].

This study concluded that the required project IRR of a private wind farm project in Morocco should be at least between 12% and 14%. As a conservative approach, the project participant has considered the 12% benchmark value for the project activity IRR. In this regard, it is worth mentioning that the CDM "Guidelines on the assessment of the investment analysis" (version 5.0)[7], has fixed the default benchmark for Group I projects in Morocco (Energy Distribution; Energy Demand and Waste handling and disposal) as 12%.

[6] http://cdm.unfccc.int/UserManagement/FileStorage/W6DFGB0P2V3ZY8MXH75SAQRKNTJE4C

[7] EB 62 Annex 5

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

The parameters used for calculation of the IRR of the project are shown in the following table:

Table 3 : Financial parameters*

Parameters	Unit	Value	Data source
Installed capacity	**MW**	120	Wind Study report
Total annual output	**MWh**	317,488.760	Wind Study report
Electricity tariff	**MAD/MWh**	524.85	Weighted average selling tariffs for all clients - See Financial model
Energy price inflation annual rate	**%**	0,97%	See Financial model
Fixed Asset Investment	**1,000 MAD**	1,538,441	Vestas quotations
O&M cost (first full operational year)**	**1,000 MAD**	39,363.3	See financial model
Annual cost inflation	**%**	2.32%	
Income tax	**%**	30	National tax regulation
Project expected lifetime	**Years**	20	

*The exchange rate used is the following: 1.0 MAD = 0.089286 Euro
** Farm 2nd operational year

In accordance with the benchmark analysis (Option III), the proposed project will not be considered as financially attractive if its financial indicator IRR is lower than the IRR benchmark of 12%.

Without the CDM revenue, the project has an IRR of 7.84% which is lower than the benchmark rate of 12%. Thus the proposed project is not financially attractive to the investors.

Sub-step 2d. Sensitivity analysis (only applicable to options II and III):

The purpose of the sensitivity analysis is to examine whether the conclusion regarding the financial viability of the proposed project is sound and tenable with those reasonable variations in the assumptions. The investment analysis provides a valid argument in favor 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 attractive or is unlikely to be financially attractive.

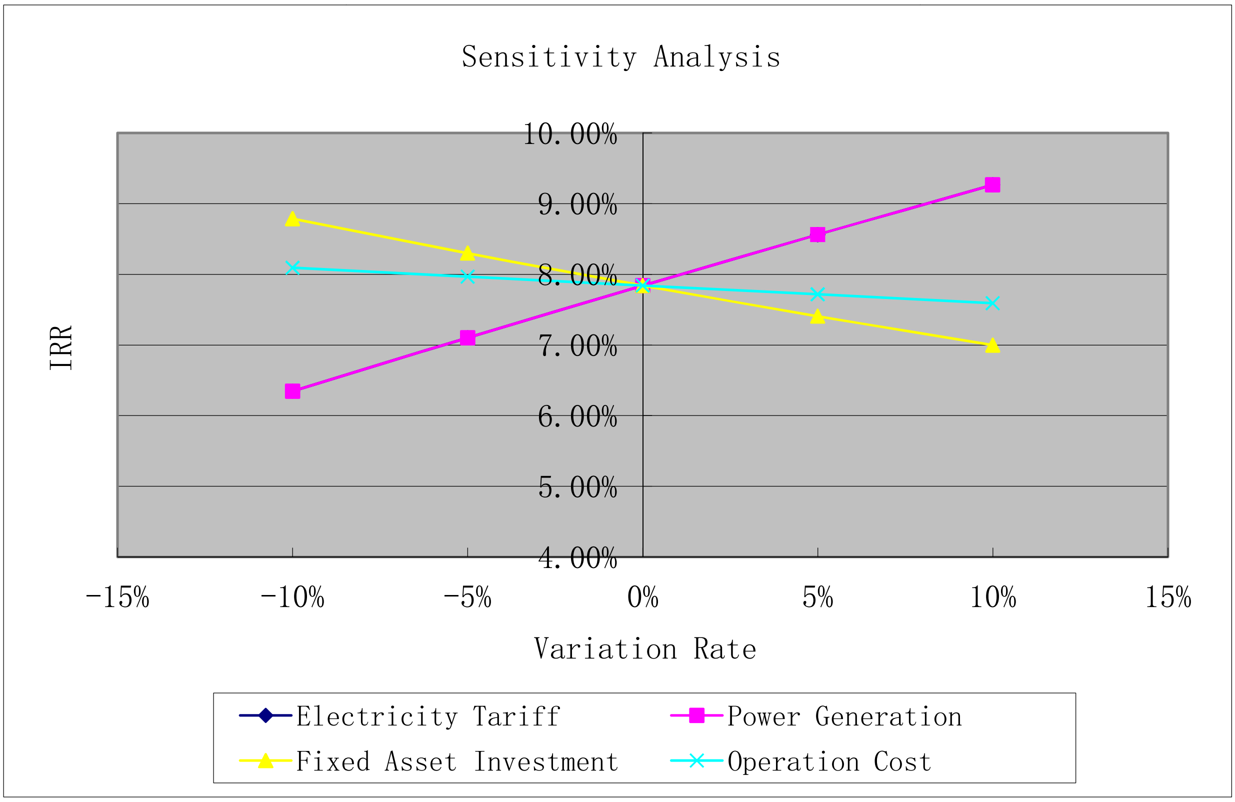
The following key parameters have been selected as sensitive elements to test the financial attractiveness for the proposed project:

(1) Fixed asset investment
(2) Electricity tariff
(3) Power generation
(4) Operation and Maintenance cost

The effect of changes in the fixed asset investments, electricity tariff, power generation and operation cost on the Internal Rate Return (IRR) has been examined. Assuming these four parameters to change within the range of (-10% +10%), then the outcomes of IRR sensitivities is presented in the following table and graphic.

Table 4: Result of sensitivity analysis

	-10%	-5%	0%	5%	10%
Electricity Tariff	6.35%	7.10%	7.84%	8.56%	9.27%
Power Generation	6.35%	7.10%	7.84%	8.56%	9.27%
Fixed Asset Investment	8.79%	8.30%	7.84%	7.41%	7.00%
Operation and Maintenance Cost	8.09%	7.97%	7.84%	7.72%	7.59%



As shown in the previous Table and Figure the project IRR varies in the range of 6.35% to 9.27% when the above four financial indicators fluctuated within the range from -10% to +10%. The sensitivity analysis even with ± 10% variations of the financial key parameters, the project IRR is still lower than the benchmark of 12%.

Thus without CDM revenues, the proposed project is not financially attractive.

The project IRR could hit the benchmark rate of 12 % in three cases:

1. When the fixed asset investment varies to -36.30%
2. When the power generation varies to +30.30%
3. When the electricity tariff varies to +30.30%

As for the operation and maintenance cost parameter, the benchmark is never reached even if this parameter is put to zero.

The fixed asset investment is unlikely to change in a proportion more than few percent at most since the procurement contracts including wind turbines, civil works and electrical works are based on recent suppliers' quotations.

As for the annual output, the evaluation of the wind resource is based on wind measurements made locally during a continuous period of more than 30 months. Thus, the likelihood of an increase of +30.30% of the power generation is not realistic.

As for the last parameter, the Tariffs agreed with clients are already fixed so the selling price will not vary in a proportion more that the assumed annual inflation rate of around 1%.

Thus, the likelihood for the Project IRR to reach the benchmark rate of 12% is very unlikely.

Consequently, the conclusion regarding the Project CDM additionality is robust and supported by the sensitivity analysis.

Step 3. Barrier Analysis

The "Tool for the demonstration and assessment of additionality" (Version 6.0) states that project participants may choose to apply Step 2 (Investment analysis) or Step 3 (Barrier Analysis).

Step 4. Common practice analysis

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

The geographical scope considered for the common practice analysis is Morocco as the project activity is based in Morocco and will be connected to the Moroccan grid, like all power generation projects in Morocco. Furthermore, all projects in the country are developed under the same regulatory framework.
With regard to the widespread usual practices, it is worth mentioning that in Morocco the predominant practice of electricity supply is the national ONE grid.

Only one wind farm has been developed so far in Morocco without the CDM. All the wind farm projects already developed or under development in Morocco, are seeking CDM revenues, except the Koudia El Beida project, a 50 MW wind farm that went on production in 2000. The Koudia El Beida is the first wind farm built in Morocco and was considered as a pilot project. It is located 20 km at the north of Tetouan and 30 km at the east of Tangier. It consists of 84 wind turbines of a 600 kW capacity each. The financing and operation of Koudia al Baïda are insured by a Special Purpose Company, namely Compagnie Eolienne de Detroit (CED). The contract signed between CED and ONE is of BTO type (Build Transfer and Operate): CED builds, transfers the installations to ONE and was entitled to operate the wind site for a period of 19 years. During this operating period of 19 years, ONE buys the entire electricity produced.

The major difference between Khalladi and Koudia El Beida wind farms is that the Khalladi wind farm is an initiative of a private operator while the Koudia El Beida wind farm is an Independent Power Producer (IPP) contracted by ONE. The latter is a tender launched by ONE in which the bidder offers a tariff that allows him to make the project profitable.

In the case of the Khalladi wind farm, the price is negotiated with industrial clients who are themselves clients of ONE. As such, the UPC tariff must be competitive with the ONE public tariff.

Furthermore, it is worth mentioning that The Koudia El Beida tariff was not interesting for ONE. Indeed, in the PDD of the Essaouira wind farm[8], it is stated that ONE will not pay anymore similar level of tariff for future projects.

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

Morocco signed the Kyoto Protocol in 2002. The Koudia El Beida project was not eligible to CDM at the time of its implementation. All the other wind projects in Morocco are either registered or under CDM development.

Thus, the proposed project activity is not a common practice in Morocco.

In conclusion, the project activity is additional.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

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1. Baseline Emission Calculation

According to ACM0002**,** the baseline emissions include only CO2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity, calculated as follows:

$$BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$$

Where:

- BE_y = Baseline emissions in year y (tCO2/yr).
- $EG_{PJ,y}$ = 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/yr).
- $EF_{grid,CM,y}$ = Combined margin CO2 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” (tCO2/MWh).

Calculation of $EG_{PJ,y}$

According to the methodology ACM0002, $EG_{PJ,y}$ is calculated using the case (a), of Greenfield renewable energy power plants, because the project activity is the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity:

$$EG_{PJ,y} = EG_{facility,y}$$

[8] See PDD number 0030, Section A.4.4 page 6, registered the 29/10/2005.

Where:

- $EG_{facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y* (MWh/yr)

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

The Tool to Calculate the Emission Factor for an Electricity System (version 02.2.1) is applied to calculate the combined margin emission factor. This section describes how the emission factor of the Khalladi wind power project has been determined based on the instructions for calculating the emission factors of the operating margin (OM) and build margin (BM).

According to the tool the grid emission factor is calculated as per the following six steps:

STEP 1: Identify the relevant electricity systems.
STEP2: 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) emissions factor.

Step 1 - Identify the relevant electricity systems

The proposed project activity will be connected to the national grid of *Office National d'Electricité* ONE. As a public utility ONE has the monopoly of electricity transport and it manages the unique national grid in Morocco. The national grid is well identified and is referred to in all ONE official annual report activities.

The generated electricity is to be injected into the national grid. Thus, the relevant electricity system for the project activity is the national electricity grid.

The electricity system is entirely located in Morocco a non annex 1 country. The tool to Calculate the Emission Factor for an Electricity System (version 02.2.1) is thus applicable to the project activity.

ONE imports electricity from two connected electricity systems, the Spain national grid and the Algeria national grid. For the purpose of determining the operating margin emission factor, the CO_2 emission factor(s) for net electricity imports from the two connected electricity systems is considered 0 tCO_2/MWh.

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

The calculation of the operating margin and build margin emission factor will use the option I of the tool: *Only grid power plants are included in the calculation*.

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

The Tool to Calculate the Emission Factor for an Electricity System provides the following four options to determine the operating margin:

(a) Simple OM, or

(b) Simple adjusted OM, or

(c) Dispatch data analysis OM, or

(d) Average OM.

For the proposed project activity, option (a) (simple OM) has been chosen. This is because undertaking a dispatch data analysis (the preferred methodological option) cannot be done at a reasonable cost, since the data is not readily available from the relevant authorities and ONE. Since the low-cost/must-run sources for Morocco (hydro and wind) constitute less than 50% of the total generated electricity of the grid, the simple OM can be used[9].

The emission factor is calculated using the ex ante option and a 3 year generation weighted average (2008 to 2010) based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation.

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

The simple OM emission factor has been calculated based on a 3-year vintage (2008-2010). The OM is calculated as the generation-weighted emissions per electricity unit of all generating units serving the system, excluding low cost and must-run power plants.

The OM is calculated as follows (Option A), using a 3-year average:

$$EF_{grid,OMsimple,y} = \frac{\sum_m EG_{m,y}.EF_{EL,m,y}}{\sum_m EG_{m,y}}$$

Where:

- $EF_{grid,OMsimple,y}$ = Simple operating margin CO2 emission factor in year *y* (tCO2/MWh)
- $EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)
- $EF_{EL,m,y}$ = CO2 emission factor of power unit *m* in year *y* (tCO2/MWh)
- m = All power units serving the grid in year *y* except low-cost / must-run power units
- y = The three most recent years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex ante option).

$EF_{EL,m,y}$ is determined using option A1 of the Tool to Calculate the Emission Factor for an Electricity System.

[9] It is shown in annex 3 that during the last five years (2006 to 2010), the low cost must run sources for Morocco (hydro and wind) have accounted for less than 16% of the total generated electricity

$$EF_{EL,m,y} = \frac{\sum_i FC_{i,m,y}.NCV_{i,y}.EF_{CO2,i,y}}{EG_{m,y}}$$

Where

- $FC_{i,m,y}$ = Amount of fossil fuel type i consumed by power plant / 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* (tCO_2/GJ)
- i = All fossil fuel types combusted in power plant / unit *m* in year *y*

According to the provisions in the monitoring tables of the Tool to Calculate the Emission Factor for an Electricity System, $EG_{m,y}$ is determined once for each crediting period using the most recent three historical years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex-ante option).

The 3-year vintage OM was calculated using the data of all operational power fossil fuel fired plants providing electricity to the grid for the years 2008, 2009 and 2010. The data of the plants used in the Operating Margin calculation were provided by ONE. They are presented in Annex 3.

Step 5 - Calculate the build margin emission factor

According to the tool, the sample group of power units *m* used to calculate the build margin should be determined as per the following procedure:

(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 ($SET_{5\text{-units}}$) 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 ($AEGSET_{\geq 20\%,}$ 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 ($SET_{sample-CDM}$) the annual electricity generation ($AEG_{SET-sample-CDM}$, 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. $AEG_{SET-sample-CDM} \geq 0.2 \times AEG_{total}$l), then use the sample group $SET_{sample-CDM}$ to calculate the build margin. Ignore steps (e) and (f).

Otherwise:

(e) Include in the sample group $SET_{sample-CDM}$ 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 ($SET_{sample-CDM->10yrs}$).

The results for the determination of the sample group of power units m to be used for the calculation of the build margin are presented in the table below.

Table 5: Results for the determination of the group of units to be used for the BM calculation

Sample group of power units	Annual electricity generation (in MWh)	Proportion from total production of year 2010
$AEG_{SET5-units}$	1,734,133	6.4 %
$AEG_{SET\geq20\%}$	7,092,489	26.16 %
$AEG_{SETsample-CDM}$	5,024,367	18.53 %
$AEG_{\mathbf{SETsample-CDM->10yrs}}$	**7,585,730**	**27.98%**

The set of power capacity additions in the electricity system ($AEG_{SET\mathbf{sample-CDM->10yrs}}$) that comprises at least 20% of the system generation in 2010, includes the thirteen most recent power units, including two power plants registered as CDM projects (see annex 3). These units have generated in 2010, **7,585,730** MWh, This represents 27.98% of the overall electricity generated by all power plants in 2010. The detailed data on the electricity generation and fuel consumptions of the power plants, as provided by the public utility ONE, are presented in Annex 3.

In terms of the grid EF, the project participants have chosen option 1 of the tool consisting of 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 CDM-PDD submission to the DOE for validation. 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.*

The Build Margin emissions factor (BM) is calculated as the generation-weighted average emission factor of the most recently built plants, using the following formula:

$$EF_{grid,BM,y} = \frac{\sum_{i,m} EG_{m,y}.EF_{EL,m,y}}{\sum_{m} EG_{m,y}}$$

Where

- $EF_{grid,BM,y}$ = Build margin CO2 emission factor in year *y* (tCO2/MWh)
- $EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)
- $EF_{EL,m,y}$ = CO2 emission factor of power unit *m* in year *y* (tCO2/MWh)
- m = Power units included in the build margin
- y = Most recent historical year for which power generation data is available

The build margin has been calculated using the electricity data of the most recent year for which the data is available namely 2010.

Step 6 - Calculate the combined margin (CM) emissions factor

The final step in applying the tool is to calculate the combined margin emissions factor. This has been calculated as the weighted average of the emissions factor of the OM and the BM. The formula that has been used to calculate this weighted average emission factor is as follows:

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

Where

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

The default values of weighted factors are:
w_{OM} = 0.75 w_{BM} = 0.25

The specific NCV power plant values when available, the national default values for the fuels NCV when available, and the latest default values recommended in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories for the fuels emissions factors and for the fuels NCV were used to derive the OM and the BM emission factors of the grid.

The results of the EF calculation are presented in annex 3 and summarized below:

Table 6: Grid emission factors computation

Designation	EF in tCO2/MWh
« Operating Margin » (OM)	
2008	0.6218
2009	0.5814
2010	0.6138
Average OM on 2008-2010	**0.6059**
« Build Margin » (BM) 2010	**0.5444**
Combined Margin (weighted average OM and BM)	**0.590526**

2. Project emissions

According to the methodology ACM002, for most renewable power generation project activities, *PEy* = 0. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for as project emissions by using the following equation:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$$

Where:

- PEy = Project emissions in year *y* (tCO2e/yr)
- $PE_{FF,y}$ = Project emissions from fossil fuel consumption in year *y* (tCO2/yr)
- $PE_{GP,y}$ = Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year *y* (tCO_2e/yr)
- $PE_{HP,y}$ = Project emissions from water reservoirs of hydro power plants in year *y* (tCO_2e/yr)

The Khalladi project activity is a wind farm project that generates electricity using wind energy as a renewable energy source. The project activity doesn't involve any use of fossil fuels, neither geothermal nor hydro energy sources. Thus $PE_{FF,y}$, $PE_{GP,y}$ and $PE_{HP,y}$ are null and so is the project emissions:

$$PE_y = 0$$

3. Leakage emissions

According to the consolidated baseline methodology ACM0002, the main indirect emissions potentially giving rise to leakage in the context of electric sector projects result from activities such as power plant construction and upstream emissions from fossil fuel use. The project developer does not need to consider such indirect emissions when applying the methodology. Therefore the project activity can take no account of such leakages, Ly= 0 tCO2e.

4. Emission reductions

The project activity will generate GHG emission reductions by avoiding CO2 emissions from electricity generation by fossil fuel power plants. The emission reduction (ERy) during a given year y is calculated as follows:

ERy = BEy − PEy

Where

- ERy = Emission reductions in year y (t CO_2e/yr)
- BEy = Baseline emissions in year y (t CO_2e/yr)
- PEy = Project emissions in year y (t CO_2/yr)

Given the fact that the project emissions are null, the emission reductions are to be derived as:

$$ERy = BEy = EG_{PJ,y} \, x \, EF_{grid,CM,y}$$

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/yr)
- $EF_{grid,CM,y}$ = Combined margin CO2 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).

B.6.2. Data and parameters that are available at validation:

Data / Parameter:	$\mathbf{FC_{i,m,y}}$
Data unit:	t
Description:	Amount of fossil fuel type i consumed by power plant / unit m feeding the grid, in year y
Source of data used:	ONE official data
Value applied:	See Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	**$EG_{m,y}$**
Data unit:	MWh
Description:	Net electricity generated by power plant/unit *m* in year *y*
Source of data used:	ONE official data
Value applied:	See Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	**NCVi**
Data unit:	GJ/t
Description:	Net calorific value (energy content) per mass or volume unit of fuel i
Source of data used:	Specific NCVs power plant values when available Official Statistical book Annuaire des Statistiques - 2007 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value applied:	See Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to the Tool to Calculate the Emission Factor for an Electricity System (version 02.2.1), values provided by the fuel supplier of the power plants in invoices shall be used if data is collected from power plant operators. Otherwise the national average default value shall be used if values are reliable and documented in regional or national energy statistics / energy balances. If not, and only then, IPCC default values at the lower 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 shall be used.
Any comment:	

Data / Parameter:	**$EF_{CO2,i}$**
Data unit:	tCO2/TJ
Description:	Carbon emission factor per unit of energy of the fuel *i*
Source of data used:	2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value applied:	See Annex 3
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to the Tool to Calculate the Emission Factor for an Electricity System (version 02.2.1), the national average default value shall be used if values are reliable and documented in regional or national energy statistics / energy balances. Otherwise IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories shall be used.
Any comment:	

B.6.3. Ex-ante calculation of emission reductions:

>>
As described in B.6, the emission reductions of the proposed project are calculated as follows:

Baseline emissions

Annual generation of the wind farm is estimated at 317,488.760 MWh.

The calculation equation is as follows:

BEy = 317,488.760 * 0.590526 = 187,485 tCO_2/year

Project emissions

As established in section B.6 the project emissions are null.

PEy = 0

Leakage

According to the baseline methodology ACM0002, the leakage of the Project is not considered,
LPy = 0

Project Emission Reductions

Net emission reductions of the Project = Total baseline emissions – Total Project emissions
The total annual baseline emissions are **187,485 tCO_2 a year**.
The total annual Project emissions are **0 tCO_2**.
Thus the Project activity is expected to achieve **1,312,395 tCO_2e** of net emission reductions during the first 7-year crediting period.

B.6.4 Summary of the ex-ante estimation of emission reductions:

>>

Year	Estimation of project activity emissions (in tonnes of CO_2e)	Estimation of baseline reductions (in tonnes of CO_2e)	Estimation of leakage (in tonnes of CO_2e)	Estimation of overall reductions (in tonnes of CO_2e)
2014	0	187,485	0	187,485
2015	0	187,485	0	187,485
2016	0	187,485	0	187,485
2017	0	187,485	0	187,485
2018	0	187,485	0	187,485
2019	0	187,485	0	187,485
2020	0	187,485	0	187,485
Total (tons of CO_2e)	**0**	**1,312,395**	**0**	**1,312,395**

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

B.7.1 Data and parameters monitored:

Data / Parameter:	**$EG_{facility,y}$**
Data unit:	MWh
Description:	Electricity supplied by the Project activity to the grid
Source of data to be used:	Electricity meter reading at Project boundary
Value of data applied for the purpose of calculating expected emission reductions in section B.5	317,488.760 MWh/year
Description of measurement methods and procedures to be applied:	Data will be measured continuously on a ten minutes basis and daily recorded
QA/QC procedures to be applied:	Electricity supplied by the project activity to the grid. Double checked by the monthly accounting receipts established by ONE. The authorized representatives of the Project Participant and ONE have the right to propose testing inspection and calibration of meters. If the accuracy of meters does not meet the standards specified by the International Electro technical Commission (IEC), ONE repairs or recalibrates the meters, and, if necessary replaces the meter. If the tests indicate that the meter has a degree of inaccuracy higher than 0.2% the electricity production of the Project activity is adjusted retroactively in compliance with an agreement set between ONE and the Project participant.
Any comment:	

Data / Parameter:	EPy
Data unit:	MWh
Description:	Electricity supplied by the grid consumed in the site boundary
Source of data to be used:	Electricity meter reading at project boundary
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0 MWh
Description of measurement methods and procedures to be applied:	Readings will be measured hourly and monthly recorded
QA/QC procedures to be applied:	Electricity imported from the grid. Double check by accounting receipts established by ONE
Any comment:	

B.7.2. Description of the monitoring plan:

>>

a) The aim of the monitoring plan

Monitoring is a key procedure to verify the real and measurable emission reductions from the project activity. To guarantee the project's real, measurable and long-term GHG emission reductions, the monitoring plan is established.

b) Data to be monitored

Two main parameters will be subject to an ex-post monitoring:

- The electricity supplied to the power grid
- The electricity imported from the grid for the site local electricity needs.

The baseline emission factor is fixed on ex-ante calculation and thus doesn't need to be monitored every year as per the latest version of the "Tool to calculate the emission factor for an electricity system" (Version 2.2.1).

According to the baseline study, the key parameter of the emissions' reductions evaluation is the net electricity supplied to the grid by the wind farm. The recommended monitoring methodology is based on a specific and continuous measure of both the electricity supplied to the grid and the electricity imported from the grid. The net electricity supplied to the grid, which constituted the key parameter of the emissions reductions evaluations, will be derived from the difference of these two key monitored parameters as shown in the following equation:

EG = El – Aux

Where :

- EG = Net generated electricity
- El = Electricity supplied to the power grid
- Aux = Electricity imported from the grid for the auxiliaries

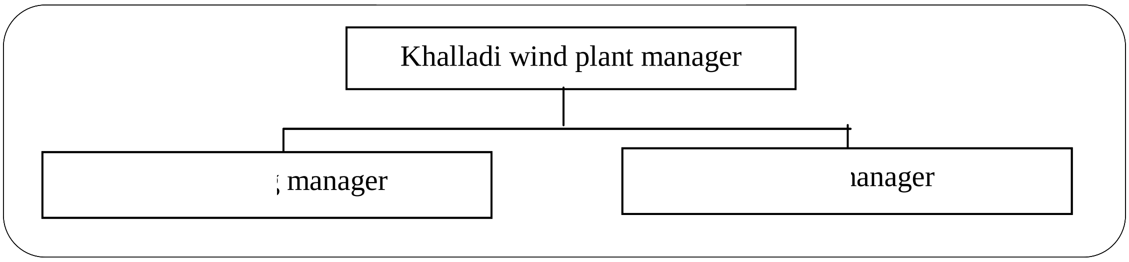
c) Monitoring management organization

The monitoring structure consists in a staff familiar with computers and data processing. Staff members will be designated for data collection and management and monthly monitoring reports will be established.

The responsible entity for monitoring is the Khalladi wind plant manager.

The CDM monitoring team to be implemented by the project participant will be structured as follows:

CDM Monitoring team



The responsibilities of the CDM Monitoring team members are the following:

- Wind plant manager : manage the work of CDM Monitoring team and take charge of all relevant matters with the monitoring activity
- Monitoring manager : monitor, collect and archive the data according to the monitoring plan
- Audit manager: audit the work of Monitoring manager and execute the QC/QA (Quality Control/Quality Assurance) procedures according to the monitoring plan

d) Monitoring equipment, installation and calibration

Khalladi wind farm uses electrical transformers located at the turbines' base to boost the electricity generated at low voltage 690V to medium voltage of 33 kV. All transformers are linked by 33 kV underground lines to the two 33/225 kV step-up transformers located in the project substation. The energy produced is then transferred over aerial 225 kV line around 23 km to ONE substation located in the west of Tetouan city.

Two highly accurate bidirectional electricity meters for each step-up transformer are used: a main meter and a back-up meter will be installed at each of the 33/225 kV step up transformer allowing to monitor simultaneously both the electricity supplied to the grid and the electricity imported from the grid .

The accuracy of the above mentioned electric meters is 0.2S. The installation and metering will be in accordance with to the International Electro technical Commission (IEC) and ONE standard.

The electricity meters will be installed and sealed by the Office National d'Electricité (ONE), which is the public utility that has the monopoly of the national electricity grid development and management. It will serve as the basis of the electricity supply and electricity imports accounting. The bi-directional ONE electricity meters will be regularly checked and calibrated by ONE according to its official maintenance and calibration procedures. The electricity meters are property of ONE.

The meters shall undergo testing and calibration carried out by ONE at least once a year.

The meters may be inspected at any reasonable time by ONE on the project participant's request. If, during any test, the accuracy of the meters fails to meet the standards specified by the International Electrotechnical Commission, ONE shall repair or recalibrate the meters and if it is necessary to replace a meter.

If the error of the main meter is out of the permissible limits or if the main meter have malfunction, the data of the backup meter will be referenced.

Meters will be jointly inspected, sealed or calibrated on behalf of the parties concerned and shall not be interfered with by either party (such removing, replacing, disassembling, sealing, seal-breaking, accident treatment and etc), except in the presence of the other party or its accredited representatives.

e) Data collection and management

The double meter readings of both the supplied and imported electricity will be transmitted electronically to UPC's monitoring computer and recorded every 24h. The daily meter readings data will be processed and stored electronically in a computer system with regular backup copy on a digital basis complemented by printed versions of the monthly electricity imports and exports.

An internal monitoring audit will be undertaken at the crediting period start up and routinely afterward as needed. Following the internal audit, the electronic data would be used in a spreadsheet procedure in order to calculate emissions reductions. The original data, the calculation procedures and the resulting emission reductions will be verified internally before the establishment of the monitoring report and the DOE verification

f) Training and monitoring procedures

The project participant will entrust the professional engineers and experts to train all the relative staff. The training contains CDM knowledge, operational regulations, quality control (QC) standard flow, data monitoring requirements and data management regulations etc

The monitoring procedure will be defined in a monitoring manual that include, in particular: (i) staff organization with job descriptions, (ii) instructions for data transfer and record handling protocols, and (iii) calibration checking procedures for the measuring equipment. This manual will be updated regularly according to the latest applicable EB monitoring recommendations and the recurrent corrective actions undertaken.

An internal audit procedure will ensure the quality control and will check the reliability and security of the monitoring. Following these audits, corrective actions will be decided, if necessary. In addition to periodic meetings, additional technical meetings among the technical team of the wind farm will be held, if necessary, in order to define the monitoring corrective actions to be carried out. Any corrective actions taken will be documented in case of equipment or system malfunction or breakdown.

Regular site audits will be made to ensure that monitoring and operational procedures are being observed in accordance with the monitoring plan.

All the data will be archived until two years after the end of the crediting period.

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

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Date of completion of Baseline Study: 27/01/2012
Name of person/entity determining the baseline: ADS Maroc ; Dr. Abdelmourhit Lahbabi.

Name of the person/entity responsible for the application of baseline and monitoring methodology: UPC Renewables SARL – M Peter Antony Gish as listed in Annex 1.

SECTION C. Duration of the project activity / crediting period

C.1. Duration of the project activity:

C.1.1. Starting date of the project activity:

>>

15/04/2012[10]

C.1.2. Expected operational lifetime of the project activity:

>>

20 years and 0 months

C.2. Choice of the crediting period and related information:

C.2.1. Renewable crediting period:

C.2.1.1. Starting date of the first crediting period:

>>

01/01/2014

C.2.1.2. Length of the first crediting period:

>>

7 years and 0 months

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>

N.A

C.2.2.2. Length:

>>

N.A

[10] Considered as the expected date of the wind turbines purchasing contract signature

SECTION D. Environmental impacts

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D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

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According to the new law 13-09 on renewable energies, released on March 2010, the project is subject to an EIA. Thus, the project participant has carried an EIA for the project activity and introduced it to the national committee of EIAs (CNEI) on 15/12/2011.

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

>>

More specifically the following impacts have been analyzed:

- ✓ Impacts during the construction period;
- ✓ Impacts during the operational period;
- ✓ Impacts during the dismantling period.

The EIA has shown that the environmental impacts of the project activities are not significant and have been mostly assessed as low, and transitory[11].

Adequate mitigation measures, good practices procedures and environmental monitoring for the construction, operational and dismantling phases have been recommended in the EIA.

The EIA report has been presented to the CNEI and the project activity has got the environmental acceptance from the CNEI required for the construction permit.

SECTION E. Stakeholders' comments

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E.1. Brief description how comments by local stakeholders have been invited and compiled:

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UPC Renewables organized a workshop on February 2nd 2012 on the project activities with concerned stakeholders including local authorities, population elected bodies, experts, local associations, etc. In total over 30 stakeholders attended this workshop.

The stakeholders were invited by means of an official letter to participate in this consultation workshop. A press release was also published on a nationwide daily newspaper[12].

[11] Project's EIA report- April 2011.

[12] L'Opinion of the 25/01/2012.

E.2. Summary of the comments received:

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The workshop started with presentations focused on the achievements and prospects of the CDM in Morocco and on the project technical characteristics, operational activities, implementation phases and its CDM development. The results of the project's environmental impacts were also presented during the workshop. Participants were invited to express their views and ask questions or to request clarifications to the workshop presenters and a debate and discussion followed

One of the key aspects was the speech made by the President of the Commune elected body of Khmis Anjra, representing the local population, who praised UPC Renewables for its investment project, for the creation of job opportunities for the community and for its sponsoring and contribution to various local social activities.

The main elements discussed and the questions raised during the workshop are summarized below:

1) Mr. Abderraouf BRITEL from the Department of Forestry requested more information on the project's EIA study, specifically on the measures to be taken in case of forest fire. He also noted that many similar projects were located in the region. In a second intervention he emphasized that there was little public information on the CDM, and a lack of support for the development of CDM projects.

2) Mr. Abdellah EL MOUATANI, representative of the Ministry of Energy and Mines, expressed concerns over the use of explosives during the construction phase of the wind farm tracks and the impact on surrounding homes. He also requested further clarification on the carbon emissions reduction and about the development of energy efficiency projects under the CDM.

3) Mr. Saidi Abdeslam DAHMAN from the TARGA Association, asked for more clarification regarding the financial aspect of carbon credits. He also asked for more information on the impacts of tracks construction on the local population.

4) Yasser FTOUH, representative of the Province Anjra Fahs, first extended congratulations to the project proponent and requested clarifications on the number of local jobs that will be created as well as the existence or not of an emergency plan in case of fire.

5) Mr. Driss NASSOU, from the newspaper la Depeche and Professor at the National School of Communication and Management hailed the project benefits and asked for more information on the technical aspects having missed the start of the presentations.

E.3. Report on how due account was taken of any comments received:

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At the end of the comments and questions session, the UPC Renewables representatives thanked the participants for their remarks and comments and provided the following answers to the questions raised:

1) In response to comments from Mr. BRITEL, it was reminded that the EIA took into account all environmental impacts of the project and with regard to forest fires, it was recalled that a fire warning system consisting of guards and surveillance cameras will be installed in the site. UPC Renewables representative confirmed that UPC will submit soon all required information on the project to the

Forestry Commission. It was recalled that UPC Renewables has followed all legal procedures for the land occupation and a land lease has been signed with the Ministry of the Interior.

In response to his second intervention, the representative of the Department of Environment informed participants on the CDM awareness and capacity development activities carried out by the Department of Environment. Initially, the outreach efforts in the CDM have been focused on potential public institutions that could develop CDM projects. However, things changed since the promulgation of Law 13-09 on renewable energy, private operators are more interested on the CDM and increasingly seek the assistance of the Department of Environment.

2) In response to Mr. EL MOUATANI, it was said that the use of explosives for the construction of tracks will be very limited and that it will away from the homes. Thus, there will be no impacts on homes. The approach for calculating the emissions reduction was explained and it was indicated that it is the CDM Executive Board which sets out the rules for CDM projects eligibility and approves the procedures and methodologies for CDM projects development.

3) In response to Mr. DAHMAN, it was explained briefly how the additionality of a project must be justified and information was provided on the current CERs prices. In this regards, it was noted that the current prices are very low but they should increase in the future as the second commitment period of the Kyoto Protocol is engaged. It was also recalled that the tracks construction meets very strict standards and that during the operation phase of the project there will be an important maintenance work of these tracks.

4) In response to Mr. FTOUH, the UPC Renewables approach for project's implementation was recalled. It was explained how the UPC Renewables worked closely with the population representatives on the local benefits of the project's activities. UPC informed the participants that it has required the suppliers to provide locally manufactured towers after international certification in order to maximize the impacts of the project on the local economy. Finally, it was estimated that about 10,000 workdays will be created during the construction phase of the project. It was also recalled that there will be a prevention plan to limit forest fires risks.

Annex 1

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

Annex 3

BASELINE INFORMATION

Table A1: Morocco's Grid Capacity, electricity generation and consumptions for 2008-2010

Morocco's Grid Capacity, electricity generation and consumptions for 2008-2010, Source; ONE, 2012

Power Stations	Installed capacity in MW			Fuel Consumption in tons except for natural			Net electricity generation in MWh			Fuel	Starting year	Last reftrofit date
	2008	2009	2010	2008	2009	2010	2008	2009	2010			
Thermal Power stations												
Mohammedia												
Sub-total fuel oil	300	300	300.00	423,863	386,920	422,610	1,684,874	1,485,168	1,633,684	Fuel oil	1986	
Sub-total imported coal	300	300	300.00	351,227	223,427	144,500	823,853	490,904	323,992	Imported coal	1987	
Jerada	165	165	165.00				815,132	600,803	695,064		1971/1972	
Sub-total fuel oil				2,097	1,823	1,672				fuel oil		
Sub-total imported coal				393,870	289,033	420,536				imported coal		
Sub-total antharcite				0	37,544	0				antharcite		
Sub-total petroleum coke				72,165	40,382	0				petroleum coke		
Jorf Lasfar JLEC	1,320	1,320	1,320	3,658,979	3,526,183	3,632,455	10,022,801	9,771,604	9,847,176	Imported coal		
Unit 1	330	330	330								1994	
Unit 2	330	330	330								1994	
Unit 3	330	330	330								2000	
Unit 4	330	330	330								2000	
Kenitra	300	300	300	467,962	329,469	406,879	1,637,969	1,166,485	1,440,049	Fuel oil	1978/1979	
Tahaddart	380	380	380	484,139	482,208	373,268	2,867,981	2,842,551	2,153,708	Natural gas	2005	
Ain Beni Mathar	-	470	470		63,168	209,975		209,852	810,321	Natural gas + solar	05/2009	

Power Stations	Installed capacity in MW			Fuel Consumption in tons except for natural gas in 1000 Nm3			Net electricity generation in MWh			Fuel	Starting year	Last reftrofit date
	2008	2009	2010	2008	2009	2010	2008	2009	2010			
Thermal Gas Turbines												
Mohammedia (100 MW)	-	300	300									
Fuel oil					49,967	176,397		143,769	577,060	Fuel oil	2009	
Gasoil					1,630	2,392						
Mohammedia (33MW)	99	99	99								1991/92	2008
Fuel oil				31,914	8,769	28,654	85,691	167,354	650,158	Fuel oil		
Gasoil				643	196	154				Gasoil		
Tit Mellil	198	198	198								1993/94	
Fuel oil				99,496	26,284	50,205	276,833	75,027	140,527	Fuel oil		
Gasoil				1,217	59	29				Gasoil		
Tetouan 33	99	99	99								1994/1995	
Fuel oil				33,844	14,971	18,664	93,820	42,006	52,238	Fuel oil		
Gasoil				504	120	125				Gasoil		
Agadir	40	40	40								1974/1977	
Fuel oil				7,857	429	12,002	18,497	1,144	32,431	Fuel oil		
Gasoil				122	40	1,224				Gasoil		
Tanger	40	40	40								1975/1977	
Fuel oil				2,133	1,915	17,992	5,292	5,038	41,085	Fuel oil		
Gasoil				85	78	320				Gasoil		
Tétouan 20	40	40	40								1975/1977	
Fuel oil				4,861	1,234	4,258	11,684	3,152	9,555	Fuel oil		
Gasoil				217	86	22				Gasoil		
Laayoune	21	21	21								1988/1989	
Fuel oil				1,778	768	3,249	8,311	3,542	14,576	Fuel oil		
Gasoil				214	119	691				Gasoil		
TAG Laayoune	99	99	99								2007	
Fuel oil				18,340	62,609	73,443	246,841	193,887	244,997	Fuel oil		
Gasoil				68,906	10,161	24,537				Gasoil		
Dakhla	21	21	37.5								2002 & 06/2010	
Fuel oil				8,221	11,119	13,318	45,523	49,607	59,288	Fuel oil		
Gasoil												
Diesel power stations												
Tan Tan	-	116.7	116.7								19/03/2009	
Fuel oil					73,322	49,898	-	354,373	261,352	Fuel oil		
Gasoil					156	3,153						
Small Diesel units	**20**	**20**	**20**	**2,852**	**566**	**143**	**3,460**	**2,014**	**464**			
Sub Total Thermal	**3,442**	**4,329**	**4,346**				**18,648,562**	**17,608,280**	**18,987,725**			

Power Stations	Installed capacity in MW			Fuel Consumption in tons except for natural			Net electricity generation in MWh			Fuel	Starting year	Last reftrofit date
	2008	2009	2010	2008	2009	2010	2008	2009	2010			
Hydro power stations												
Afourer	93.60	93.6	93.6				227,759	401,900	373,300		1955	
Bine El Ouidane	135.00	135.0	135.0				94,197	293,100	295,500		1953/1954/1955	
Al Massira	128.00	128.0	128.0				10,066	87,100	270,100		1980	
Step Afourer	464.00	464.0	464.0				443,657	383,800	163,000		2004 & 2005	
Imfout	31.20	31.2	31.2				12,649	14,100	65,000		1947 & 1949	
Daourat	17.00	17.0	17.0				2,190	2,300	28,700		1950	
Sidi Said Maachou	20.80	20.8	20.8				0	0	0		1929	
Kasba Zidania	7.10	7.1	7.1				160	0	0		1935 & 1936	
Mohamed El Khamis	23.20	23.2	23.2				69,718	101,100	109,100		1967	
Bou Areg	6.40	6.4	6.4				8,245	10,000	12,600		1969	
Hassan 1er	67.00	67.0	67.0				57,514	115,600	151,100		1991	
Ahmed El Hansali	92.00	92.0	92.0				38,063	185,200	309,900		2003	
Moulay Youssef	24.00	24.0	24.0				18,704	62,700	44,300		1974	
Mansour Eddahbi	10.00	10.0	10.0				18,378	35,700	35,700		1973	
El Kansera	14.40	14.4	14.4				10,375	33,700	44,700		1935 & 1939	
Idriss 1	40.60	40.6	40.6				29,994	160,100	221,200		1978	
Al Wahda	240.00	240.0	240.0				97,490	599,100	947,500		1997 & 1998	
Allal El Fassi	240.00	240.0	240.0				162,740	297,400	281,300		1994	
Oued El Makhazine	36.00	36.0	36.0				13,793	84,600	115,100		1979	
Lalla Takerkoust	12.00	12.0	12.0				6,497	20,400	29,200		1938	
Lau	14.10	14.1	14.1				20,173	27,600	17,400		1934 & 1942	
Taurart	2.00	2.0	2.0				5,391	1,100	0		1951	
Aït messaoud	6.40	6.4	6.4				10,626	30,400	29,100		2003	
Fes Amont	1.20	1.2	1.2				0	0	0		1925	
Fes Aval	1.90	1.9	1.9				0	0	0		1934	
Sefrou	0.60	0.6	0.6				261	200	100		1994	
Taza	0.60	0.6	0.6				1,168	1,500	1,300		1929	
Meknes	0.60	0.6	0.6				0	0	0		1925	
Tanafnit	-	18.0	18.0				-	3,600	79,800		01/08/2009 & 09/11/2009	
El Borj	-	-	22.0				-	-	5,600		26/11/2010	
Sub Total Hydro	**1729.70**	**1747.70**	**1769.70**				**1,359,808**	**2,952,300**	**3,630,600**			

Power Stations	Installed capacity in MW			Fuel Consumption in tons except for natural gas in 1000 Nm3			Net electricity generation in MWh			Fuel	Starting year	Last reftrofit date
	2008	2009	2010	2008	2009	2010	2008	2009	2010			
Wind power												
CED	50.4	50.4	50.4				152,630	157,826	165,574		2000	
Koudia El Beida (ONE)	3.5	3.5	3.5				0	0	0		2000	
Essaouira Wind Farm	60.776	60.776	60.776				145,644	123,157	127,688		11/03/2007	
Tangier Wind Farm	-	140.250	140.250				0	110,253	365,553		07/04/2009	
Sub Total Wind	**114.7**	**254.9**	**254.9**				**298,274**	**391,236**	**658,815**			
Imports												
Import Algeria							49,400	35,700	36,900			
Import Spain							4,211,900	4,586,900	3,902,500			
Sub Total imports							**4,261,300**	**4,622,600**	**3,939,400**			
Transfer from National industrial plants												
National tranfers from industrial clients							39,900	126,100	151,840			
Sub Total national transfers							**39,900**	**126,100**	**151,840**			
Others												
(STEP Pumping* + Compensators+ Auxiliaries)**							-604,160	-541,600	-260,330			
Sub Total Others							**-604,160**	**-541,600**	**-260,330**			
Grand total	**5,287**	**6,332**	**6,370**				**24,003,684**	**25,158,916**	**27,108,050**			

* STEP pumping is a technique used by ONE to use pumping to store electricty by pumping water in low demand period and generating it at high demand periods

** Consumption of power plants auxiliaries supplied in very high and high voltages, of synchronous compensators supplied in high voltage and of STEP pumping /

Source: ONE statistical reports 2008-2009-2010 (See pages 2/2 of reports, table of Energie appelée)

Low cost must run contribution

Power type	2006		2007		2008		2009		2010	
	MWh	%	MWh	%	MWh	%	MWh	%	MWh	%
total hydro*	982,800	4.7%	901,800	4.0%	916,151	3.8%	2,568,500	10.2%	3,467,600	12.8%
total wind	183,200	0.9%	278,900	1.2%	298,274	1.2%	391,236	1.6%	658,815	2.4%
Subtotal low cost must run	**1,166,000**	**5.52%**	**1,180,700**	**5.22%**	**1,214,425**	**5.06%**	**2,959,736**	**11.76%**	**4,126,415**	**15.22%**
Net total electricity generated&imported	**21,104,600**		**22,608,100**		**24,003,684**		**25,158,916**		**27,108,050**	
total exluding low cost must run	**19,938,600**		**21,427,400**		**22,789,259**		**22,199,180**		**22,981,635**	

Source of the 2006 and 2007 data: Ministry of Energy, Mines, Water and Environment: http://www.mem.gov.ma/Chiffres_cle/ChiffreEnergie08-32.htm

*** Total hydro figures are excluding STEP generation**

Table A2: Calculation of the Operating Margin Emission Factor

OM Factor 2008-2009-2010

Power Stations	Fuel Consumption in tons*			Fuel	Emissions tCO2			Emission factor
	2008	2009	2010		2008	2009	2010	t CO2/t fuel
Thermal Power stations								
Mohammedia								
Sub-total fuel oil	423,863	386,920	422,610	Fuel oil	1,273,666	1,162,656	1,269,901	3.005
Sub-total imported coal	351,227	223,427	144,500	Imported coal	776,507	493,961	319,466	2.211
Jerada								
Sub-total fuel oil	2,097	1,823	1,672	fuel oil	6,301	5,478	5,024	3.005
Sub-total imported coal	393,870	289,033	420,536	imported coal	826,506	606,514	882,463	2.098
Sub-total antharcite		37,544		anthracite		83,237		2.217
Sub-total petroleum coke	72,165	40,382	0	petroleum coke	192,865	107,923	0	2.673
Jorf Lasfar	3,658,979	3,526,183	3,632,455	Imported coal	7,952,307	7,663,693	7,894,661	2.173
Kenitra	467,962	329,469	406,879	Fuel oil	1,406,179	990,021	1,222,631	3.005
Tahaddart	484,139	482,208	373,268	Natural gaz	884,906	881,944	682,749	
Ain Beni Mathar	0	63,168	209,975			115,532	384,067	

Power Stations	Fuel Consumption in tons*			Fuel	Emissions tCO2			Emission factor
	2008	2009	2010		2008	2009	2010	t CO2/t fuel
Thermal Gas Turbines								
Mohammedia (100 MW)								
Fuel oil	0	49,967	176,397			150,146	530,055	3.005
Gasoil	0	1,630	2,392			4,899	7,189	3.006
Mohammedia (33 MW)								
Fuel oil	31,914	8,769	28,654	Fuel oil	95,898	26,350	86,102	3.005
Gasoil	643	196	154	Gasoil	1,933	589	463	3.006
Tit Mellil								
Fuel oil	99,496	26,284	50,205	Fuel oil	298,976	78,981	150,861	3.005
Gasoil	1,217	59	29	Gasoil	3,658	177	87	3.006
Tetouan 33								
Fuel oil	33,844	14,971	18,664	Fuel oil	101,698	44,986	56,083	3.005
Gasoil	504	120	125	Gasoil	1,515	361	376	3.006
Agadir								
Fuel oil	7,857	429	12,002	Fuel oil	23,609	1,289	36,065	3.005
Gasoil	122	40	1,224	Gasoil	367	120	3,679	3.006
Tanger								
Fuel oil	2,133	1,915	17,992	Fuel oil	6,409	5,754	54,064	3.005
Gasoil	85	78	320	Gasoil	255	234	962	3.006
Tétouan 20								
Fuel oil	4,861	1,234	4,258	Fuel oil	14,607	3,708	12,795	3.005
Gasoil	217	86	22	Gasoil	652	258	66	3.006
Laayoune								
Fuel oil	1,778	768	3,249	Fuel oil	5,343	2,308	9,763	3.005
Gasoil	214	119	691	Gasoil	643	358	2,077	3.006
TAG Laayoune								
Fuel oil	18,340	62,609	73,443	Fuel oil	55,110	188,134	220,689	3.005
Gasoil	68,906	10,161	24,537	Gasoil	207,107	30,541	73,749	3.006
Dakhla								
Fuel oil	8,221	11,119	13,318	Fuel oil	24,703	33,411	40,019	3.005
Gasoil								
Diesel power stations								
Tan Tan								
Fuel oil		73,322	49,898	Fuel oil		220,325	149,939	3.005
Gasoil		156	3,153	Gasoil		469	9,477	3.006
Small Diesel units	2,852	566	143	Gasoil	8,572	1,701	430	3.006
Grand total					**14,170,292**	**12,906,061**	**14,105,952**	

* Except for Tahaddart where the Fuel consumption is expressed in 1000 Nm3

Table A3: Calculation of the Build Margin Emission Factor

Build Margin Emission Factor 2010

The power plant capacity additions in the electricity system that comprise 20% of the system generation and that have been built most recently

	Plant name	Technology	year operation	Fuel	MWh in 2010	% total Production	Accumalted %	Emissions tCO2	Emission factor tCO2/MWh
1	El Borj	Small hydro	2010	Hydro	5,600	0.02%	0.02%	0	
2	Tanafnit	Small hydro	2009	Hydro	79,800	0.29%	0.32%	0	
3	Ait Beni Mathar		2009	Natural gas + solar	810,321	2.99%	3.30%	384,067	
4	Tan Tan	Diesel	2009	Fuel oil	261,352	0.96%	4.27%	159,415	
5	Mohammedia	Diesel	2009	Fuel oil	577,060	2.13%	6.40%	537,245	
		AEGSET-5-units			**1,734,133**		**6.4%**		
6	TAG Laayoune	Gas turbine	2007	Gasoil/Fuel oil	244,997	0.90%	7.30%	294,438	
7	Tahaddart	Combined Cycle	2005	Nautral Gas	2,153,708	7.94%	15.25%	682,749	
8	Ahmed Hansali	Small hydro	2003	Small hydro	309,900	1.14%	16.39%	0	
9	Ait Messoud	Small hydro	2003	Small hydro	29,100	0.11%	16.50%	0	
10	Dakhla	Gas turbine	2002	Fuel	59,288	0.22%	16.72%	40,019	
11	Jorf Lasfar JLEC *	Steam power	2000	Imported coal	2,561,363	9.45%	26.16%	2,032,026	
		AEGSET-≥20%			**7,092,489**		**26.16%**		
12	Tangier	Wind	2009		365,553	1.35%	18.06%	0	
13	Essaouira	Wind	2007		127,688	0.47%	18.53%	0	
		AEGSET-sample-CDM			**5,024,367**		**18.53%**		
		SETsample-CDM->10yrs			**7,585,730**		**27.98%**		
	Total				**7,585,730**	**27.98%**		**4,129,959**	**0.5444**

Total electricity supplied to the grid in 2010	**27,108,050**	**100%**	
SETsample-CDM->10yrs	**7,585,730**	**27.98%**	**Selected**

* For the Jorf power plant: only the most recent unit build in 2000 has been considered.

Table A4: Calculation of Combined Margin Emission Factor

	Unit	Per year	
Operating Margin Emissions Factor in 2008	tCO2/MWh	0.6218	
Operating Margin Emissions Factor in 2009	tCO2/MWh	0.5814	
Operating Margin Emissions Factor in 2010	tCO2/MWh	0.6138	
Operating Margin Emissions Factor average 2006-2008	**tCO2/MWh**	**0.6059**	
Build Margin Emissions Factor	**tCO2/MWh**	**0.5444**	
Baseline Emissions Factor Wind and solar	**tCO2/MWh**	**0.590526**	= 0,75 x EF(OM) + 0,25 x EF (BM)

Table A5: Fuel data base

Fuel data base

Fuel Type	Reference IPCC	Net Calorific Value	Emission factor	
		GJ/t	t CO2/TJ	t CO2/t
Natural Gas	Natural gas		54.30	
Local coal	Anthracite	23.436*	94.6	2.217
Heavy fuel oil	Residual fuel oil	39.8**	75.5	3.005
Gasoil	Gasoil/Diesel	41.4**	72.6	3.006
Reference		* Ref. Annuaire statistique 2008-2009-2010 (5,600 kcal/kg) ** 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Volume 2-Chapter 1, Table 1.2)	2006 IPCC Guidelines for National Greenhouse Gas Inventories (Volume 2-Chapter 1, Table 1.4)	

	Year	NCV GJ/1000 NM3
NCV of natural gas used in Tahaddart power plant	2008	33.6610
	2009	33.6827
	2010	33.6853

Source: Energie Electrique de Tahaddart

Specific Fuel Data Base*

Power plant	Fuel type	Net Calorific Value		Emission factor	
		Mcal/t	GJ/t	tCO2/tJ	t CO2/t
JLEC	Coal	5,800	24.28	89,500	2.173
Mohammedia	Coal	5,900	24.70	89,500	2.211
Jerada	Coal	5,600	23.45	89,500	2.098
	Petcoke	7,700	32.24	82,900	2.673

***Figures in this table are based on the figures used by ONE for the Tangier wind power projet registered on the 07/06/2011 (project reference 4876, See Appendix 1 - 4876 - CER Sheet)**

Annex 4

MONITORING INFORMATION

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