

October 28, 2011

Response of AfDB to Germany on Approval by mail: Morocco: One Wind Energy Plan



Morocco CTF IP Update and ONE Wind Plan Project

Consolidated Set of Answers to Questions Raised by Germany on both Documents

Risk and Mitigation measures

Question: Risk and Mitigation measures could have been developed in more detail, as the project design is quite complex.

Answer: Noted. We will be happy to answer to specific question on the proposed risks and mitigation measures. Please find an overview of the risks and proposed mitigation measures in Table 5 of the proposed IP update.

In addition, the AfDB team would like to point out that ONE's strong implementation capacity as described in Section 8, p.20 of the CTF Appraisal document is one of the main mitigation measures for the project complexity. ONE has built up over the last decades significant experience with complex projects and it has shown its capacity to implement such type of projects, one example of which is a large rural electrification program, with support from the AfDB. In addition, to date, ONE has financed 253.5 MW of wind generation capacity (equivalent to total installed wind capacity in Morocco) and a significant number of hydropower plants.

Local Content

Question: We are very interested to hear more about the approach to increase local content of the wind plan, as no details have been presented in the proposal how this component shall be realized.

Question: We are interested to hear more about the approach to increase local content of the wind plan, as it is mentioned that the proposal will encourage local manufacturing of wind equipment and services.

Answer: The WEP will be following the industrial integration approach of the Oarzazate Solar Project, where industrial integration will be a criteria in the sponsor selection. In addition, AfDB is planning to support ONE in its clean technology transfer approaches through bilateral trust funds housed at the AfDB and outside. Potential measures under consideration for additional local manufacturing support

are matching grants for wind manufacturing companies; tax incentives; targeted human resource training and others.

Subcomponents and Financing Plan

Question: Clarification should be given to the subcomponents, as the statements in Table 1 (Project capacity and Estimated investment by subcomponent p.13) and the text disagree: (number of wind farms, combined capacity and part of wind/hydroelectric generation to total power generated by the plan) .

Answer: The team confirms that Table 1 is accurate and applies. The team reviewed the indicated text and could not identify any discrepancies. However, we will be happy to explain on a case by case basis if further clarification is needed.

Question: Clarification to better understand table 2 (project financing, P.16). Why is the Wind farm in Djebel el Hadid presented as it is not included in the proposed CTF appraisal document?

Answer: The wind farm Djebel el Hadid will be financed by the World Bank Group, with a proposed CTF allocation of USD 25 million. As the wind farm development is not yet as far advanced as the rest of the program, it constitutes Phase two of the implementation, allowing the wind farms that are ready for implementation to move forward while the second phase will be granted additional preparation time. It is included in Table 2 as a reference and to indicate the full size of the WEP.

Question: It is not clear to us why the rural electrification plan is integrated in the proposal as CTF funding is not sought for this component.

Answer: The team decided to inform the CTF TFC on the rural electrification component for the following reasons (i) the AfDB will process the rural component jointly with the other components allowing for decreased transaction costs and higher ODA efficiency (in line with the Paris and ACCRA agreements); (ii) to highlight that ONE is pursuing an integrated approach, which allows to satisfy energy demand created by increased access to modern electricity services with renewable energy; and (iii) to highlight the innovative approach, which allows CTF to facilitate a pro-poor approach to renewable energy, generating increased access for rural populations.

Transmission Network

Question: What about the transmission infrastructure component?

Question: The proposal points out that wind power development is constrained by lack of dedicated transmission network and that CTF fund of the wind plan accelerates infrastructure development. Once again, please give some clarifications of the transmission infrastructure component of the proposal

Question: The proposal mentions that transmission infrastructure within wind farms shall be financed with CTF funds. We would appreciate to receive more detailed information what exactly shall be

financed and whether these investments are linked with the ongoing ONE electricity network programme (Renforcement du réseau de transport électrique).

Question: It is also not clear to us which measures shall be financed out of the transmission infrastructure component as in the project financing table this component is not mentioned.

Consolidated Answer: The transmission is not a component, much rather, the transmission costs related to the wind farms (i.e. connecting the wind farm to the grid) are incorporated in each subcomponent's estimated total investment. (The total cost of each subcomponent are indicated in Table 1 of the CTF Appraisal Document, also see below). Given its concessional nature, the CTF funding will be mainly directed towards financing the transmission element of EACH subcomponent, or, as written on p. 11 of the IP Update: "within wind farms, transmission infrastructure to evacuate electricity generated by wind farms and to increase absorptive capacity of the Moroccan grid". The rationale for using the concessional funds for transmission stems from the high additionality of transmission infrastructure: connecting wind farms to the grid are a costly factor which often prevents private sector participation.

Table 1:

Subcomponents	Total Capacity	Estimated Total Investment	Start of Construction	Completion of Construction (Expected)
	MW	USD millions		
Tanger2 Wind farm	150	393.44	2013	2015
Koudia El Baida Wind farm	300	896.26	2014	2017
Total wind subcomponents-	450	1,488.70		
STEP Abeld Moumen	350	308.78	2012	2015
Complexe hydroélectrique M'DEZ - EI MENZEL	170	368.95	2012	2015
Total hydro subcomponents	520	677.73		
Total wind and hydro subcomponents	1070	2,166.43		

Technical wind hydro energy production station

Question: From a technical point of view, the approach presented is incomplete. Firstly, the whole grid in this part of the country where the project is located has to be considered, not only the individual wind-hydro plants. Secondly, a sound model has to consider not only storage balancing but all ancillary services as well, so as need for balancing of frequency, need for voltage regulation and participation in primary and secondary reserve.

Answer: The Morocco national grid is well stabilised and controlled by a SCADA power transmission and distribution system that controls the injection and consumption of electricity into the grids. The control

system is integrated country-wide. This software-based system also controls the quantity demand during peak hours and enables the GoM to import the required quantity of electricity from Spain if there exists a supply-shortage within the country.

The existing system already controls and integrates wind power into the main grid. The control system will facilitate efficient utilisation of the existing power plants, making full use of the wind power resource capacity. It will be utilised to store the electricity when there is excess wind energy capacity that cannot be absorbed into the grid immediately.

Stakeholder and Donor Coordination

Questions: Project preparation and implementation requires intense donor coordination. Which measures are intended to optimize coordination in this and future projects?

Questions: In view of the high number of donors involved in the wind plan (also the German financial cooperation), it will be important to establish an effective coordination mechanism during project preparation and implementation as several steps have to be harmonized.

Question: No details regarding the “implementation potential/process” have been presented in the proposal. It would be helpful to get some details on this issue, in order to get a better understanding of the different stakeholders involved in the project (ONE, SIE, Hassan II fund, private sector, Ministry of Energy, IPP). Table 4 does not mention contribution from bilateral organisations to the Wind plan. German Financial Cooperation is also willing to contribute to the Wind Plan.

In view of the high number of donors involved in the wind plan (also the German financial cooperation), it will be important to establish an effective coordination mechanism during project preparation and implementation as several steps have to be harmonized.

Answer: Noted. Similarly to the strong donor coordination process undertaken during the preparation of the Ouarzazate project, COMAFTEP and ONE have conducted regular donor meetings during the Morocco IP update process. ONE is planning to conduct a joint mission to present the project to additional donors, among those national sponsors and bilateral donors and to propose their participation. The AfDB will be delighted to facilitate bilateral donor’s engagement and is highly supportive of this. ONE holds a strategic implementation position in the electricity sector, as described in Section 9.1. Implementation Potential, p.20 of the CTF Appraisal Document.

Financing terms

Question: The financial terms (40yr term, 0.25% interest rate) are to be considered very generous with respect to both, interest rate and maturity. The proposal does not provide a clear reason for the necessity of these very soft terms, this should be further clarified. Furthermore, the impact of CTF financing (20 or 40 yr term) on the cost of generation as opposed to the case without CTF financing is not tremendous, which again raises the question how the soft terms of the requested CTF contribution are to be justified.

Answer: Increasing the leveraging factor of a project (as in this case, to 14) does limit the impact of the concessionality as higher amounts leveraged dilute the impact of the concessionality. The proposed US\$150 million of CTF will leverage an estimated total of US\$ 2,166.43 billion, which is equivalent to a leverage factor of almost 14 times, which is by far higher than the CTF average leveraging factor of 8. The proposed update, indeed, would have the second highest leveraging factor of all CTF IP, right after Colombia (leverage factor of 18.)

Question: Since the project seeks a 40yrs maturity it should be clarified in particular whether the parallel AfDB loan will have the same maturity. Or will the CTF be the only creditor from year 20 on?

Answer: The Bank co-finances the project under with the AfDB standard conditions as agreed with GOM. And does foresee a maturity for 20 years, with a grace period of 5 years. While the total life of CTF loan is longer than AfDB loan, the AfDB will use all the oversight and due diligence in managing the outstanding CTF loan as it would with its own resources. Extended maturity of CTF resources helps with the concessionality, which is an essential enabling feature at the center of the whole Wind Plan financial structuring.

CTF Investment Criteria

Cost effectiveness

Question: The cost of each ton of CO2 saved related to the CTF support has unfortunately not been calculated. It would be useful to have detailed information about the cost-effectiveness calculation.

Answer: Please see table 2 of the IP update. The team is ready to explain further details if requested.

	Total Investment	CTF Investment	Avoided CO2-ton equivalent	Total Investment/ Ton of CO2	CTF Investment/ Ton of CO2
	US\$ millions	US\$ millions	Million tons	US\$/ton of CO2	US\$/ton of CO2
WEP	2,166.43	150	33.78	66.4	4.4

Question: Replication potential

Question: The CTF proposal intends to install 1070 MW of wind and hydropower. No figures have been presented to present the replication potential. The proposal outlines that CTF support will enable the creation of a wind market for the private sector. From our point of view this relationship could have been developed more in detail, as the private sector will be the main driver to realize Morocco’s total wind capacity, with 6 GW actually proven, and an estimated potential of up to 25 GW.

Answer: Noted and fully agreed on the enormous potential. Indeed, by supporting the first 2GWs, CTF will prove that this large scale of PPP approach works and will facilitate replication. WEP is initializing the

ambitious wind program of Morocco, which envisions the development of wind farms with a capacity of over 2000 MW until 2020. The successful implementation of WEP, the lessons learnt and the PPP model applied, combined with the stated natural resources and the policy improvements as described in the IP update note will facilitate replication.

Concessionality

Question: We would appreciate to receive more detailed information why such an important amount of highly concessional is needed to mitigate the costs and risks of the Wind Plan.

Question: Nevertheless, we would appreciate to receive more detailed information why such an important amount of highly concessional resources is needed to mitigate the costs and risks of the Wind Plan, as in certain cases the production of wind energy in Morocco could be competitive.

Consolidated Answer: The large size of WEP of 1070 MW and the enormous leverage factor of 14 requires a high level of concessionality. Please do note that despite the concessional CTF funding, the off-take tariffs remain high compared to other, non-renewable production sources of energy. Therefore, concessional resources are absolutely needed to ensure the economic and financial viability of the wind projects.

Question: On the other hand the proposal gives some indications of the impact of the CTF funding on the price of Kwh paid by ONE. It would be very helpful to get some detailed information about the financial model of the wind plan, as the allocation of such an important amount of highly concessional loan still has to be justified and that the impact of the CTF loan seems to be quite limited.

Answer: The wind generation elements will be implemented in form of PPP, therefore, the financial models hold the project IRR constant at the required rate of return of 11%¹. Recent PPP biddings in Morocco - subsidized with bilateral concessional climate finance - confirmed that 11 % is being considered the threshold IRR which private investors require for wind energy generation projects in Morocco. In consequence, the financial model applied keeps the Project IRR at 11%. Additionality can therefore be seen in the tariff amount which is about 0.6 cents US/kwh lower with CTF funding (see table 3 in IP, also included below) than without it allowing ONE to invest in the wind plan while at the same time attracting private financing which leverages the proposed CTF funding by over 14 times, as indicated in the IP update.

	Tariff without CTF US\$ cents/kWh	Tariff with CTF (*) 20 year maturity US\$ cents/kWh	Tariff with CTF (*) 40 year maturity US\$ cents/kWh
Price of Kwh paid by ONE	12	11.6*	11.4(**)

¹ It is standard in PPP to fix the Project IRR to a Required Rate of return for investors.

Average Electricity selling price (HV/VHV)	10.1		
ONE's subsidy to Wind generated electricity	1.9	1.5	1.3